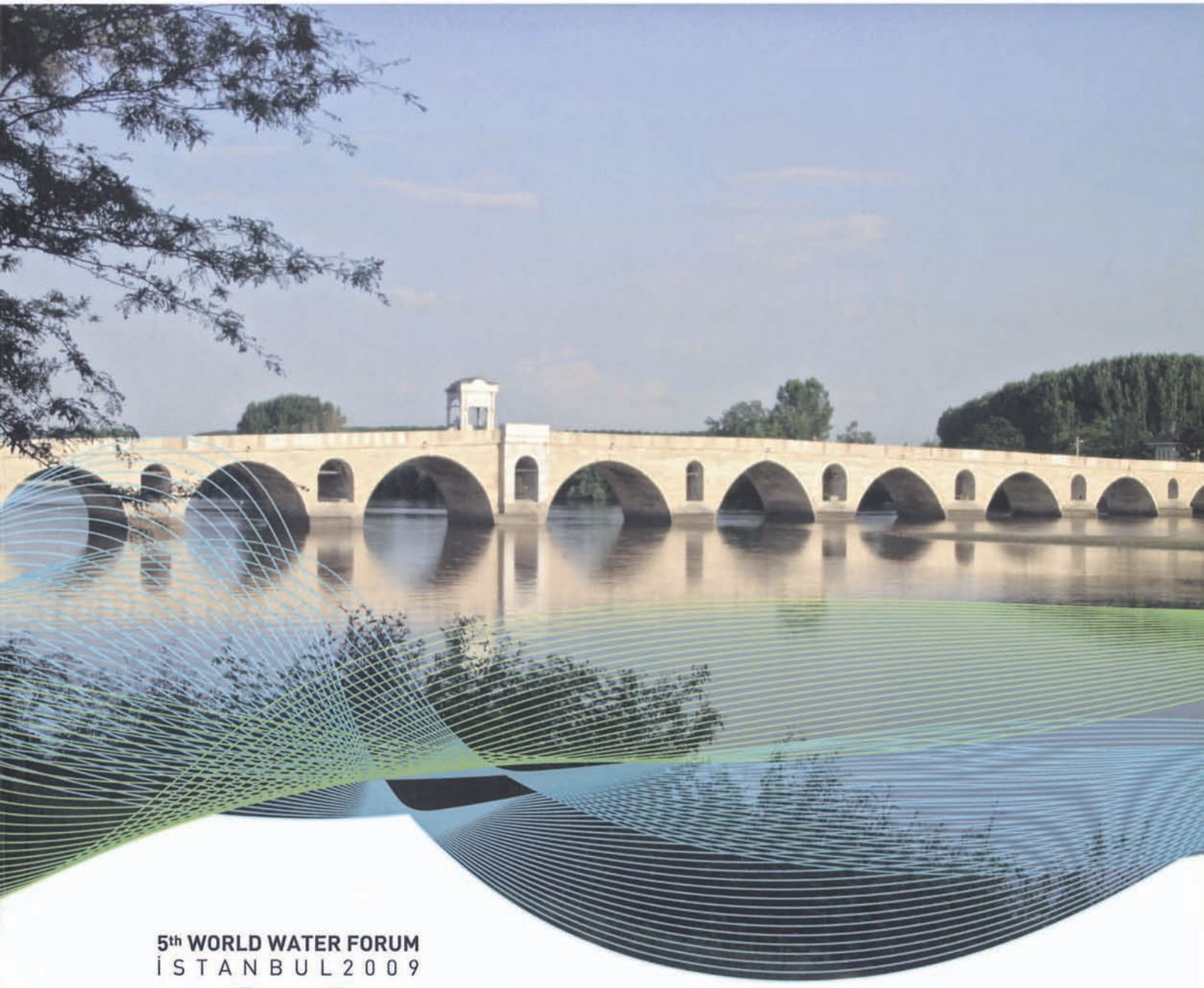
Regional Document

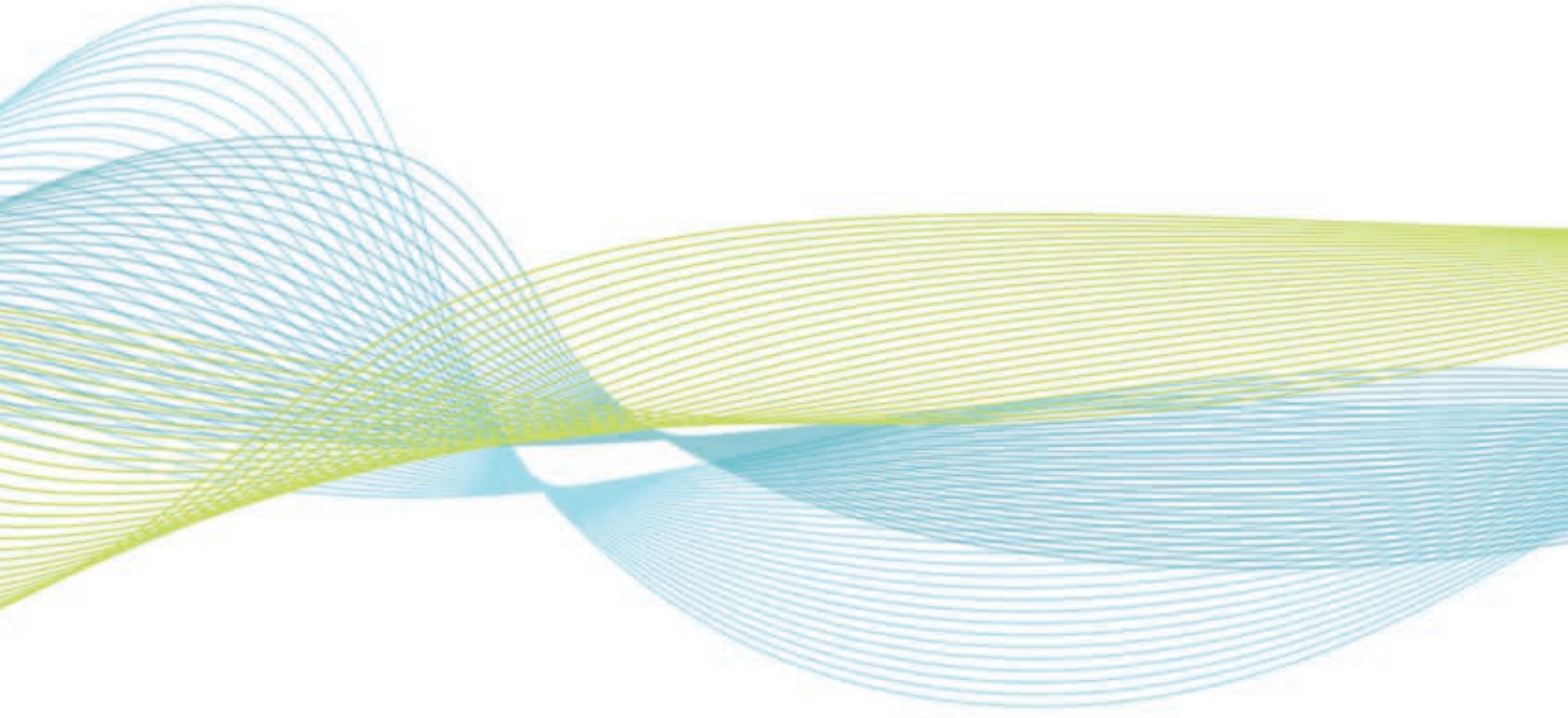
IN and AROUND TURKEY



5th WORLD WATER FORUM
İSTANBUL 2009

BRIDGING
DIVIDES
FOR WATER

T.C.
Çevre ve Orman
Bakanlığı



WARNING:

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Cover Photo
Fahrettin Filiz (Meriç Bridge, Edirne, Turkey)

Published by
5th World Water Forum Secretariat
TITLE: *In&Around Turkey* Regional Report

Graphic Design
PAB Mimari Tasarım

Edit by
35 mm Studio Service

Printed by
Oluşur Basım

This publication has been printed on recyclable paper.

Distributed free of charge.

Acknowledgements

This regional document has been prepared by a team comprising of Prof. Dr. Ayşegül TANIK (Istanbul Technical University, İstanbul/Turkey), Prof. Dr. Necdet ALPASLAN (Dokuz Eylül University, İzmir/Turkey), Assoc. Prof. Dr. Güleda ENGİN (Gebze Institute of Technology, Gebze-Kocaeli/Turkey), Dr. Senem BAYAR (Gebze Institute of Technology, Gebze-Kocaeli/Turkey), MSc. Kevser ŞENTÜRK (The General Directorate of State Hydraulic Works, Ankara/Turkey) and Yeliz DEVLET (The General Directorate of State Hydraulic Works, Ankara/Turkey).

The General Directorate of State Hydraulic Works would like to thank to H.E. Prof. Dr. Veysel EROĞLU (Minister of Environment and Forestry, Turkey) and Prof. Dr. Hasan Z. Sarıkaya (Undersecratary of Ministry of Environment and Forestry) for their invaluable support. The leadership and significant coordination of Mr. Hamza ÖZGÜLER (Regional Coordinator of the In & Around Turkey Region), Mr. Hasan ÖZLÜ (Forum Coordinator of the General Directorate of State Hydraulic Works, Turkey) and Mr. Adem Avni ÜNAL (Political Process Contact Point) in producing and editing the document is highly recognized and appreciated.

The General Directorate of State Hydraulic Works highly appreciates the reviews and valuable comments received from the Ministry of Foreign Affairs, Ambassador Mrs. Sumru NOYAN, Mrs. Sibel ALGAN, Dr. Altay ALTINÖRS, Ms. Simla Yasemin ÖZKAYA.

The General Directorate of State Hydraulic Works gratefully acknowledges the contributions of 5th World Water Forum National Consulting Committee Members, especially Prof. Dr. Mehmet KARPUZCU, for their valuable support realizing this report. Special thanks are due to Senior Officer Ms. Serpil KÖYLÜ DALGIN (Ministry of Environment and Forestry).

The General Directorate of State Hydraulic Works also appreciates and extends deep thanks to the Regional Directorates of State Hydraulic Works, all organizations and institutions that have attended to the meetings of In & Around Turkey regional process of the 5th World Water Forum.

If anyone, who has contributed to this regional report in any way, was not cited, this was unintentional and the General Directorate of State Hydraulic Works extends his sincere gratitude to those.

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FOREWORD

Gaining inspiration from the ability of water to unite and integrate, it has been decided to set the main theme of the Forum as "Bridging Divides for Water". Considering our region within the framework of the Regional Process of the Forum, we have already determined that each region of the world faces specific challenges with regards to water. As part of its Preparatory Process, the Forum has involved regional coordinators with a view to addressing those specificities, selecting the themes of the Forum framework that are most relevant to them. In this way, through a number of regional meetings, it has become possible to publish regional reports which underline the most important aspects of proper water management in each region, identify the obstacles to overcome and propose solutions.

The regional contributions to the Forum are being implemented through specific regional preparatory processes in 5 main areas - namely: Africa, the Americas, the Asia-Pacific region, Europe, and the sub-regions around the host country, Turkey. Here, in Istanbul, we will have the opportunity to share the views which were gathered from the regional perspective.

The principle of the approach for the region *In & Around Turkey* was to localize the issues as much as possible in the preparatory period. This scale-reducing approach aims to ensure that regional issues are better represented at the Forum.

The meetings organized can be classified into two categories: meetings In Turkey and meetings in the sub-regions *Around Turkey* . The basic aim of the regional meetings in Turkey was to bring together all the local regional stakeholders to prepare a discussion platform, to maximize national contributions to the content of the Forum during its local stage, and to decide on the results to be passed on to the public opinion during the Forum week.

We hope that the 5 th World Water Forum will bring more to the world than ideas, discussions and possible solutions to today's water issues. The Forum is inviting the world to Istanbul to hear diverse concerns, improve understanding of divergent points-of-view, and hopefully resolve our various divides by focusing on what we have in common – our need for water to survive. The 5 th World Water Forum is being held to construct bridges over the water-related gaps in the world. It is a pleasure for us to host this event, at which all the regional processes will converge.

Haydar KOÇAKER
Director General
State Hydraulic Works (DSI)

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IN&AROUND TURK EY

REGIONAL DOCUMENT

1 INTRODUCTION

Turkey, bridging the two continents of Europe and Asia, is the host country for the 5 th World Water Forum to be held in Istanbul from 16 to 22 March, 2009. The overarching theme of the Forum is " Bridging Divides for Water " which means connecting the different perspectives of stakeholders, sectors and regions. This Forum will, therefore, be joining people and regions to find common solutions for water-related challenges.

In this regard, the Forum offers a valuable opportunity for all stakeholders to discuss water issues. In order to build on the lessons from the previous Fora and create increased commitment from the global water community, the World Water Council and the Turkish organizers have worked out an improved framework for the preparation of the Forum.

The preparatory process of the Forum has been conducted by the General Directorate of State Hydraulic Works (DSI) of Turkey under the Ministry of Environment and Forestry (MEF), the Ministry of Foreign Affairs (MFA), Istanbul Greater Metropolitan Municipality (IBB) and Istanbul Water and Sewerage Administration (ISKI). Indeed, the 5 th World Water Forum process is using a "pyramid" approach, in which all issues, themes, topics and sessions will ultimately lead to the achievement of a clear set of experiences, recommendations and commitments for bridging water divides among actors, sectors and present and future generations. The main idea behind this Forum is to make it a turning point for water management throughout the world. The target group, therefore, is the whole of society.

The 5 th World Water Forum regional process has taken place in the spirit of "bridging divides". A number of regional coordination meetings have been held both at the level of continents and on the sub-regional or national scale. The regional process has been supported by the thematic process and will ultimately be integrated with the political outcomes of the Forum. The regional preparatory processes were carried out in the four continent-based regions - namely, Africa, the North, Central and South Americas, the Asia-Pacific region and Europe, and in three specific regions - namely *In & Around Turkey* ; the Mediterranean and the MENA/ Arab Countries.

The Forum preparation processes consisted of thematic, regional and political components. The regional process, which has produced substantial contributions to both the thematic and political processes of the Forum, has already been completed. The regional process also provided an opportunity to *bridge the divides for water* with the tireless efforts of the representatives from various sectors. Figure 1.1 presents the relationship between the processes mentioned.

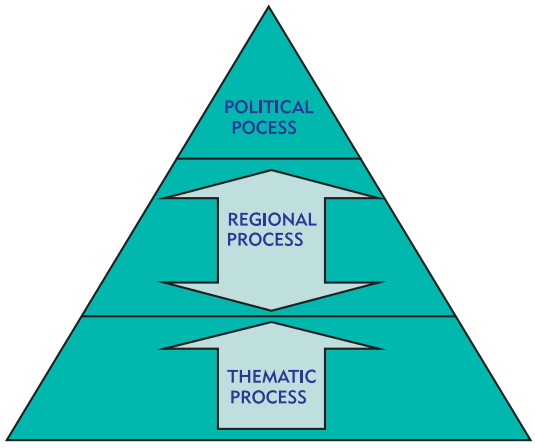


Figure 1.1 The relationships among thematic, regional and political processes

The objectives defined by the Regional Process Coordination were as follows:

- To motivate and mobilize actors in the region and promote region-specific contributions to the Forum;
- To contribute to the thematic process by providing regional perspectives based on regional insights into the issues and on the priority actions required;
- To contribute to the political process by organizing decision-makers in the region and providing inputs to the political process of the Forum;
- To improve our understanding of divergent points of view and share solutions; and
- To establish bridges between the divides on water issues.

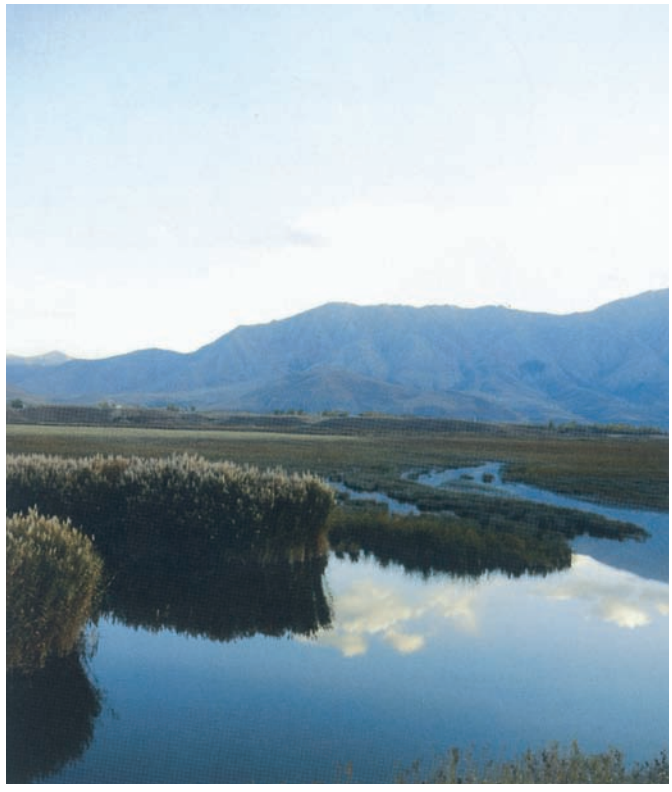
To achieve these objectives with a regional perspective, a series of *In & Around Turkey* meetings were conducted with the following aims;

- To discuss regional and local water issues,
- To elaborate the outcomes of the sub-regional meetings in the regional meeting that will be held during the Forum week, and
- To present the conclusions of the regional meetings at the 5th World Water Forum so as to contribute to the post-Forum synthesis process.

In Turkey meetings, led by the Regional Directorates of the DSI, were held in various provinces of Turkey facing critical local water challenges. In total, 16 *In Turkey* meetings were conducted under different Forum Themes based on water challenges and possible solutions. These meetings discussed in depth not only the local problems of the province in question, but also similar water disputes in the surrounding provinces. Annex I presents the questions held by the roundtable discussion groups.

Meanwhile, *Around Turkey* meetings were organized in Amman, Bishkek, Sarajevo, Skopje, Nicosia and Istanbul. Since one of the aims of these meetings is to enhance national and international collaboration among the interest groups in the regions, discussion platforms were formed with the participation of different groups dealing with regional water challenges and disputes, thereby ensuring an exchange of experiences among stakeholders, including decision and policy makers.

The following sections of this report will briefly summarize the outcomes and the key messages derived from the above meetings in terms of dividing problems and bridging solutions for water within the framework of the six Forum Themes.



2

REGIONAL PROCESS

2.1 Preparatory Stages

The *In & Around Turkey* preparatory process was led by the General Directorate of the State Hydraulic Works (DSI) under the Ministry of Environment and Forestry of Turkey (MEF). The main responsibilities of the DSI and MEF were to enhance the communication and technical guidance of the preparatory process, compose the regional document, provide regional input for the Political Process and the Thematic Process, and determine "divides" and "bridges". Information on the Thematic Process of the Forum is given in Annex II.

The meetings held in different regions and sub-regions focused on different themes of the Forum, according to their priorities and region-specific water problems. For example, Theme 3 was the main subject of the meetings held in the Middle East, the Balkans, Central Asia and the Mediterranean. On the other hand, both Theme 1 and Theme 3 received great emphasis during the *In Turkey* meetings.

The meetings were conducted in full awareness of the fact that the Thematic and Regional Processes are the driving forces of the Political Process. The meetings were organized into opening sessions, presentations, debates/discussions and panels/closing sessions.

Table 2.1 presents the list on *In & Around Turkey* Meetings in chronological order.

2.2 Initial Meeting of the Preparatory Process

The Preparatory Process was initiated at a "kick-off meeting" staged during the International Congress on River Basin Management which was held between 22 and 24 March 2007 in Antalya, Turkey. The follow-up procedures of *In & Around Turkey* meetings (strategies, schedule, venue, etc.) were discussed and agreed during the kick-off meeting.

The meeting was organized by the General Directorate of State Hydraulic Works (DSI) in collaboration with the World Water Council. The main purpose of this International Congress was to contribute to the regional preparatory activities for the 5 th World Water Forum. The scope of this congress was mainly Theme 3, "Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs".

At the initial meeting of the Preparatory Process, it was decided that the outputs of these meetings should be action-oriented and that documents summarizing all the outputs would be prepared at the end of each meeting.

The issues which emerged from the kick-off meeting of the Preparatory Process for the Forum can be summarized as follows:

- Specific focus on "water for food",
- Participation of water users and the general public in Integrated Water River Basin Management,
- Public / Private Partnership,
- "Water and Culture" inter-relations,
- 5th World Water Forum needs to address the fact that increasing "efficiency" will actually increase consumption by the largest users (nature and agriculture); instead, the thrust needs to be on "productivity",
- Water for People, which focuses on the critical junction of water and social development. From this perspective, the Southeastern Anatolia Development Project (GAP), which is a human-oriented social transformation set-off by water projects, needs to be discussed as a response to the pragmatic approach that water development projects are narrow-sighted and do not take societal needs into consideration.

Table 2.1 List of *In & Around Turkey* meetings in chronological order

Date	Event	Venue
February 26-27, 2008	Water Management Strategies and Practices in Arid and Semi-Arid Regions	Amman/JORDAN/ MIDDLE EAST
March 27-28, 2008	Snow Hydrology	Erzurum/TURKEY
April 10 -11, 2008	Irrigation/Drainage	Adana/TURKEY
April 16 -17, 2008	Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs	Sarajevo/BOSNIA and HERZEGOVINA/ BALKANS
April 24 -25, 2008	Thermal and Mineral Waters	Afyonkarahisar/TURKEY
May 15-16, 2008	Water Management / Drought	Ankara/TURKEY
May 22-23, 2008	Karstic Hydrology	Antalya/TURKEY
May 28-29, 2008	Climate Change, Water Resources Management, Governance and Capacity Building Issues in Central Asia	Bishkek/KYRGYZSTAN/ CENTRAL ASIA
June 12-13, 2008	Irrigation/Salinity	Şanlıurfa/TURKEY
June 19-20, 2008	Floods	Edirne/TURKEY
June 26-27, 2008	River Basin Pollution	İzmir/TURKEY
June 26-27, 2008	Historical Water Structures	İzmir/TURKEY
July 03-04, 2008	Water Issues in Eastern Europe: Impact of Climate Change, Vulnerabili ty Assessments and Adaptation Measures	Skopje/ EASTERN EUROPE
July 10-11, 2008	Wetlands	Kayseri/TURKEY
July 24-25, 2008	Floods/ Inundation/ Landslides	Samsun/TURKEY
August 07-08, 2008	Inundation/ Landslide s/ Protection of River Beds	Trabzon/TURKEY
Augu st 21-22, 2008	Lake Hydrology	Van/TURKEY
September 03-05, 2008	Water Usage/ Treatment/ Re -use	Bursa/TURKEY
September 11-12, 2008	Groundwater/ Drought	Konya/ TURKEY
September 25-26, 2008	Water and Energy	Artvin/ TURKEY
October 09-11, 2008	Water in the Med iterranean Basin	Nicosia / MEDITERRANEAN
November 08-09, 2008	Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs	Istanbul/ TURKEY/on behalf of Ukraine /BLACK SEA

2.3 *In Turkey* Meetings

Due to its geographical location, Turkey has a variety of climatic conditions which are directly related to different water problems. For this reason, the *In Turkey* meetings, which were held with widespread participation, addressed region-specific water problems.

In all, 16 *In Turkey* meetings were organized between March 2007 and November 2008 in collaboration with the DSI, its Regional Directorates, scientists and NGOs (particularly the Union of Farmers, the Chamber of Farmers and the Chambers of Civil, Environmental and Agricultural Engineers) in order to address the region-specific water issues of Turkey.

These meetings included various presentations and workshops and were spread over two days, allowing ample time for discussion and interaction. The details of the meetings (date, venue and number of presentations and participants) are given in Table 2.2. The provinces where *In Turkey* meetings were held are shown in Figure 2.1.

The outputs of these meetings were action-oriented. At the end of each meeting, documents summarizing all the outputs were prepared. The meetings included the following sessions:

- Day 1: Four sessions (one opening session and 3 technical sessions)
- Day 2: Two sessions (a morning workshop and an afternoon panel)

More than 250 papers were presented in the 16 *In Turkey* meetings and these have been published in Turkish in the form of individual proceedings. They can also be reached via the website given in Annex III.

Table 2.2 List of the *In Turkey* meetings

Date	Event	Venue	Number of presentations	Number of participants
March 22-24, 2007	River Basin Management	Antalya/TURKEY		553
March 27-28, 2008	Snow Hydrology	Erzurum/TURKEY	15	212
April 10 -11, 2008	Irrigation/Drainage	Adana/TURKEY	16	326
April 24 -25, 2008	Thermal and Mineral Waters	Afyonkarahisar/TURKEY	22	449
May 15-16, 2008	Water Management/ Drought	Ankara/TURKEY	15	521
May 22-23, 2008	Karstic Hydrology	Antalya/TURKEY	16	307
June 12-13, 2008	Irrigation/Salinity	Şanlıurfa/TURKEY	15	421
June 19-20, 2008	Floods	Edirne/TURKEY	15	301
June 26-27, 2008	River Basin Pollution	İzmir/TURKEY	15	151
June 26-27, 2008	Historical Water Structures	İzmir/TURKEY	26	159
July 10-11, 2008	Wetlands	Kayseri/TURKEY	15	227
July 24-25, 2008	Floods/ Inundation/ Landslides	Samsun/TURKEY	14	150
August 07-08, 2008	Inundation/ Landslides / Protection of River Beds	Trabzon/TURKEY	15	450
August 21-22, 2008	Lake Hydrology	Van/TURKEY	15	275
September 03-05, 2008	Water Usage/ Treatment/ Re -use	Bursa/TURKEY	34	232
September 11-12, 2008	Groundwater/ Drought	Konya/ TURKEY	15	343
September 25-26, 2008	Water and Energy	Artvin/ TURKEY	19	449

Figure 2.1 The provinces where *In Turkey* meetings were held

2.4 *Around Turkey* Meetings

The geographic and climatic variations in the sub-regions made it necessary to hold meetings in different countries representing the various regions - namely, the Middle East, Central Asia, the Balkans, Eastern Europe, the Mediterranean and the Black Sea (Table 2.3). Figure 2.2 shows the participating countries.

These meetings, like the *In Turkey* meetings, were arranged and organized under the leadership of MEF and DSI. They served as fruitful platforms bringing together all local and regional stakeholders so as to provide regional, national and sub-regional contributions, all of which have been directly passed on to the 5th World Water Forum. The implementation of all these activities within a limited period of time may be considered as a success of the Preparatory Processes for the Forum. Unlike the *In Turkey* meetings, at which symposium-type presentations were made, the first day of each of the *Around Turkey* meetings was given over to the presentation by country representatives of their own individual studies. The second days were devoted to various round-table discussion groups on the determined themes.

Table 2.3 List of *Around Turkey* meetings

Date	Event	Venue	Number of	Number of
Feb 26-27, 2008	Water Management Strategies and Practices in Arid and Semi-arid Regions	Amman/JORDAN/MIDDLE EAST	10	131
April 16-17, 2008	Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Need	Sarajevo/BOSNIA and HERZEGOVINA/ BALKANS	7	187
May 28-29, 2008	Climate Change, Water Resources Management, Governance and Capacity Building Issues in Central Asia	Bishkek/KYRGYZSTAN/ CENTRAL ASIA	16	199 120
July 03-04, 2008	Water Issues in Eastern Europe: Impact of Climate Change, Vulnerability Assessments and Adaptation Measures	Skopje/Former Yugoslav Republic of Macedonia/ EASTHERN	5	125
October 09-11, 2008	Water in the Mediterranean Basin	Nicosia/ MEDITERRANEAN	69	
November 08-09, 2008	Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs	Istanbul/ TURKEY, on behalf of Ukraine/BLACK SEA	5	155

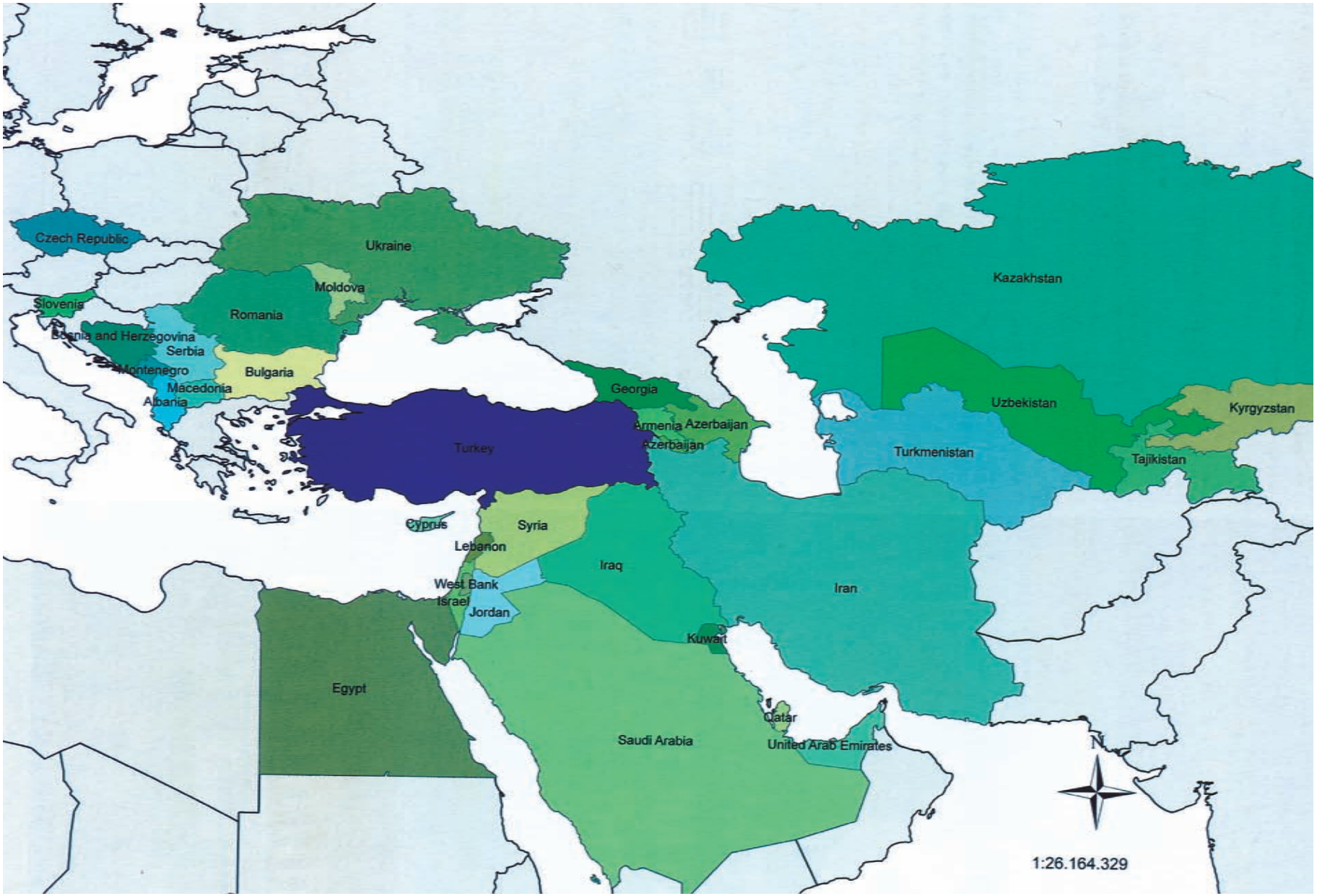


Figure 2.2 Countries participating in *Around Turkey* meetings

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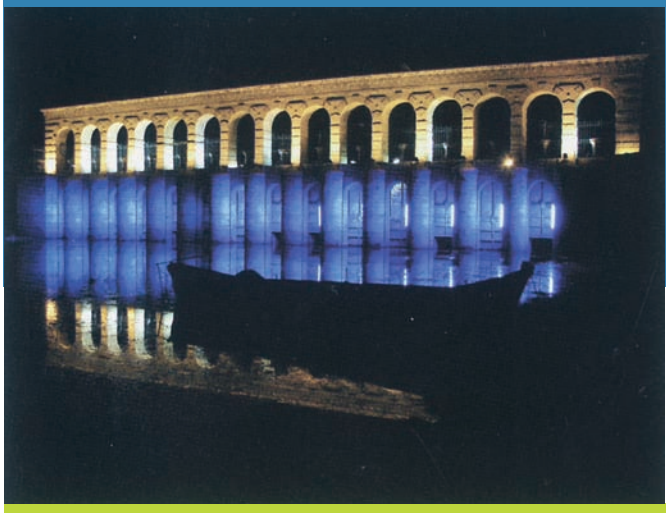
THE MAJOR WATER ISSUES IN THE REGION



The main water issues in the region are derived from the reports of each *In Turkey* and *Around Turkey* meetings. They will be presented below in a summarized form.

3.1 *In Turkey* Meetings

The 16 national meetings conducted in various regions of Turkey focused on different water-related issues. The issues discussed and messages agreed are set out below, in accordance with the themes of the Forum.

In most of the local meetings, inter-relations were observed between the themes, as illustrated in Table 3.1. It can be seen that the main water problems of Turkey are basically related to Theme 1 (Global Change and Risk Management) and Theme 3 (Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs) of the Forum.

Table 3.1 Relationship between the *In Turkey* meetings and the Forum Themes

Forum Themes / Meetings and Main Topics	Theme1 Global Change& Risk Management	Theme2 Advancing Human Development and the MDGs	Theme3 Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs	Theme4 Governance and Management	Theme5 Finance	Theme6 Education, Knowledge and Capacity Development
Erzurum "Snow Hydrology"	■					
Adana "Irrigation and Drainage"	■		■	■		
Afyonkarahisar "Thermal and Mineral Waters"			■	■		
Ankara "Water Management and Drought"	■		■			
Antalya "Karstic Hydrology"			■			
Şanlıurfa "Irrigation and Salinity"	■			■		■
Edirne "Floods"	■		■			
İzmir "Water Basin Pollution"	■		■		■	■
İzmir "Historical Water Structures"						■
Kayseri "Wetlands"			■			
Samsun "Floods/Inundation/ Landslides"	■			■		
Trabzon "Inundation/Landslides/Protection of River Beds"	■			■		
Van "Lake Hydrology"	■		■			
Bursa "Water Usage/Treatment/ Re-use"		■	■			■
Konya "Groundwater and Drought"	■			■		■
Artvin "Water and Energy"			■	■		

3.1.1 Key Messages under Theme 1: Global Change and Risk Management

Global change results in significant variations in water resources spatially, temporally, quantitatively and qualitatively. Thus, adaptation actions need to be implemented. The outcomes and the key messages derived from the *In Turkey* meetings under Theme 1 are as follows:

Change is being observed in precipitation patterns in the Anatolian Region due to the effects of global warming. In recent years, a decrease in snowfall has also been recorded and snows have been seen to melt earlier. A series of studies is needed to assess the records of meteorological events and determine the water resources available. Adaptation strategies, including early warning systems for extreme events, need to be implemented. Biodiversity conservation needs to be emphasized in the context of national and global sustainable development efforts. In addition, sectoral adaptation strategies ought to be improved and/or developed. (Message of the meeting on Snow Hydrology, Erzurum)

Improved risk management studies should be incorporated into adaptation strategies to achieve various insurance options. (Messages of the meetings on Snow Hydrology, Erzurum and Groundwater and Drought, Konya)

The maximum amount of water storage is highly recommended. Moreover, possibilities of inter-basin water transfer should be considered. (Message of the meeting on Irrigation and Drainage, Adana)

Local impacts of global climate change should be well identified, and short, medium and long-term hazard and mitigation scenarios should be developed accordingly. The impact of climate change in areas like water and agriculture should be examined within the context of these scenarios. Related policies should be carried out by a single national entity and supported by the local operational and institutional stakeholders. Meanwhile, priority should be attached to widespread public participation and training in order to increase awareness about the protection of nature, water and energy. (Messages of the meetings on: Water Management and Drought, Ankara; Floods, Edirne; Lake Hydrology, Van and Groundwater and Drought, Konya)

A systematic water quality and quantity data collection (monitoring) network should be implemented. Time, location, flow rate and water quality data are the priority values to be included simultaneously in the system. Arrangements should be made for data storage, data processing and dissemination (easy access). Statistical evaluation of collected data, modelling and Geographical Information Systems (GIS) techniques should be used as tools to support decision-making. Finally, special emphasis should be given to research and development activities, and adaptation to global climate change should be considered by all sectors in their system planning. (Messages of the meetings on Groundwater and Drought, Konya, and Water Basin Pollution, Izmir)

Although floods have negative effects, their benefits may be harnessed in some areas, such as the creation of arable land and the contribution which they make to the cleaning of the riverbed. In view of the need for further studies on the subject, universities, NGOs, governmental organizations, professional chambers and the public should be encouraged to collaborate. (Message of the meeting on Floods, Edirne)

Efficient and effective irrigation practices need to be scaled up in order to conserve water. The provision of agricultural services should be based not only on theoretical background, but also on how they are used in practice. Since modern irrigation methods are rarely used due to the economic constraints faced by farmers, better surface irrigation practices need to be considered and applied by farmers during a transition period. In addition, a national soil survey should be executed. (Message of the meeting on Irrigation and Salinity, Şanlıurfa)

Legal arrangements should be made in order to define the hierarchy, competencies and responsibilities of the related institutions regarding climate change and its adverse effects. (Message of the meeting on Lake Hydrology, Van)

The prevention of migration needs to be emphasized. Agriculture and agro-industry can be regarded as important sectors in mitigating migration by providing various employment possibilities. Within this framework, farmers should be trained under the coordination of all related sectors, and a bridge should be formed between farmers and research institutes. In view of the characteristics of the region (high and mountainous areas), winter tourism is proposed as another potential source of employment. (Message of the meeting on Snow Hydrology, Erzurum)

Migration may also be prevented by providing sufficient and satisfactory revenues to farmers. (Messages of the meetings on Snow Hydrology, Erzurum, and Water Management and Drought, Ankara)

Land-use planning is essential to ensure that land is allocated according to its quality. Land registration processes should be established in the short term. (Message of the meeting on Water Management and Drought, Ankara)

Institutional coordination should be developed in land-use planning and implementation with a view to ensuring sustainability. Universities and public institutions should coordinate to develop projects which satisfy human needs. The public should be informed about non-structural precautions and planned actions against possible dangers. The local media should emphasise the importance of sustainability and raise sensitivity about institutional coordination and collaboration. Everything should be done to ensure that the proper policies are implemented without exception. (Message of the meeting on Floods/Inundation/Landslides, Samsun)

There is an urgent need to develop efficient disaster and risk management strategies. Risky areas should be identified and contingency plans coupled with early warning systems should be established. The public should be informed about contingency actions. (Messages of the meetings on Snow Hydrology, Erzurum, and Inundation/Landslides/Protection of River Beds, Trabzon)

Scenarios need to be generated to predict the damage that may be caused by disasters. Strategies should be adopted for coping with the effects of disasters in such a way as to protect natural life, the environment and historical structures. (Message of the meeting on Snow Hydrology, Erzurum)

Institutional coordination is needed to establish contingency plans backed by modern engineering, design and application experiences like early warning systems, GIS technologies and/or mathematical models and expert systems. Moreover, cooperation among administrations and institutions must be strengthened and current laws and regulations enforced. Public awareness should be raised on the effects of natural disasters. Since the northern Turkey has a humid climate, flooding is one of the most common problems. In order to overcome this problem, priority should be attached to the establishment of early warning systems and the development of risk management maps. (Messages of the meetings on Floods, Edirne and Inundation/Landslides/Protection of River Beds, Trabzon)

All policies and precautions related to air-water-soil should be decided jointly by all the stakeholders. Policies must be enforced without exception. Among these, drought management is an important component of disaster mitigation plans. Developing strategies for effective drought management is crucial for sustainable development and environmental welfare. Another policy for disaster management is to establish proactive strategies. (Message of the meeting on Groundwater and Drought, Konya)

3.1.2 Key Messages under Theme 2: Advancing Human Development and the Millennium Development Goals (MDGs)

Improving water resources development is a critical factor for meeting the Millennium Development Goals (MDGs). It is vital not only for meeting Target 10, which specifically concerns water, but also for eradicating extreme poverty and hunger, achieving full primary education, promoting gender equality and women's empowerment, reducing child mortality, improving health, combating disease, and improving environmental sustainability in general. Therefore, the importance of sustainable utilization of water resources for achieving the MDG's and human development was widely discussed at the *In Turkey* meetings. The results of the meetings indicated that the water-related problems differ widely depending on the geographical characteristics of each region. The outcomes and the key messages derived from the *In Turkey* meetings regarding Theme 2 can be summarized as follows;

> Human beings have the right to reach safe drinking water and sanitation. Therefore, emphasis should be placed on the supply of safe drinking water and sanitation. To this end, water infrastructures should be improved and water treatment plants should be controlled in an effective manner. (Message of the meeting on Water Usage/Treatment/Re-use, Bursa)

> Of the eight Millennium Development Goals, Goal 3 calls for the empowerment of women and the promotion of gender equality. It sets specific targets for eliminating gender disparity. The advancement of women is in turn critical for achieving the goals. Therefore, women's participation in decision-making should be encouraged, and education at all levels must be supported. (Message of the meetings on Water Usage/Treatment/Re-use, Bursa)

> Halving by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation is one of the targets of the MDGs. Water conservation and protection of water resources have a critical role to play in achieving this goal. Efforts to save and re-use water should therefore be promoted. Environmental factors and local conditions should be considered in the preparation of water-related projects. The re-use of treated wastewater in a controlled manner should be encouraged to decrease water demand. Desalination could be considered as an emerging alternative method of water abstraction. (Message of the meeting on Water Usage/Treatment/Re-use, Bursa)

> The conservation of water quality is as important as the protection of water quantity. Since waterborne diseases are

Golden Horn Environmental Rehabilitation Project

Istanbul's rapid growth has led to large squatter settlements with inadequate and ill-maintained water supplies and wastewater services. The population, estimated at 2.8 million in 1980, increased to 8.4 million in 1995. Wastewater was discharged untreated into the Golden Horn, the Sea of Marmara and the Bosphorous. Over time, the static parts of the waters of the Golden Horn, which is an estuary connected to the Sea of Marmara, became anaerobic and the beaches of the Sea of Marmara became highly contaminated. In 1985, there were 700 industrial sites and 2,000 businesses on the banks of the Golden Horn producing a smell that caused great discomfort to the people living in the area. In 1994, ISKI began an environmental rehabilitation project which involved:

- Blocking water sources flowing into to the Golden Horn and treating them at the treatment plants.
- Dredging the sludge, approximately 5 million m^3.
- Removing the Galata Bridge in order to sustain currents.
- Closing the industrial sites and dockyards on the banks.
- Constructing recreation areas, green fields and parks on the banks.

This rehabilitation project, one of the world's largest estuary cleaning projects, has cost a total of US$653 million. At one time, the water of the Golden Horn had ceased to sustain any marine life. Now, 33 differences species of fish are observed in the estuary. The value of coliform bacteria per 100 millilitres, which was as high as 350,000 in 1998, has fallen to 1.000. The estuary is now open to swimming, rowing and navigation. The Golden Horn Environmental Protection Project was awarded First Prize in the Metropolis Award in 2002. (Altınbilek, D. (2006). Water Management in Istanbul, Water Res. Dev. Vol.22, No.2, pp. 241-253)

Golden Horn, Year 1995

Golden Horn, Year 2004

still one of main threats to human heath, the construction of wastewater collection and storm water drainage networks is very important. It is recommended that sewer and storm water drainage systems should be separated in order to construct and operate wastewater treatment plants. (Message of the meeting on Water Usage/Treatment/Re-use, Bursa)

Wastewater treatment plants are one of the most important instruments for protecting water resources. Every effort should be made to plan, design, construct, operate and maintain them. Existing wastewater treatment plants should be upgraded in compliance with the current legislation. Wastewater treatment sludge should be treated and disposed of in accordance with the principles of sustainability. The possibility of benefiting economically from the sludge should be investigated via Research & Development studies. (Message of the meeting on Water Usage/Treatment/Re-use, Bursa)

3.1.3 Key Messages under Theme 3: Managing and Protecting Water Resources and their Supply Systems to Meet Human and Environmental Needs

One of the aims of this Theme is to put into practice the desire to highlight the challenges related to management and protection of water resources and to form a synergy within civil society related to these issues. Adequate supplies of water of good quality are essential for human beings, while the functions of ecosystems need to be preserved, and water-related diseases must be combated. The importance of sustainable water resources management in the context of socio-economic development has to be recognized at the same time as the multiplicity of interests in utilizing water resources for water supply and sanitation, hydropower generation, agriculture, industry, urban development, inland fisheries, transportation, and recreation. These issues were discussed extensively during the *In Turkey* meetings. The outcomes are presented below:

The balance between utilization and protection should be considered at the level of basin management as stated in the Water Framework Directive. (Message of the meeting on Water and Energy, Artvin)

To protect water resources and reduce water pollution, appropriate integrated basin management strategies need to be implemented. Fulfilment of these strategies necessitates coordination of the related institutions. The legal framework needs to be applied, and the necessary infrastructure completed. Effective management of water resources should be considered in conjunction with the social and environmental aspects of water. (Message of the meeting on Water Usage/Treatment/Re-use, Bursa)

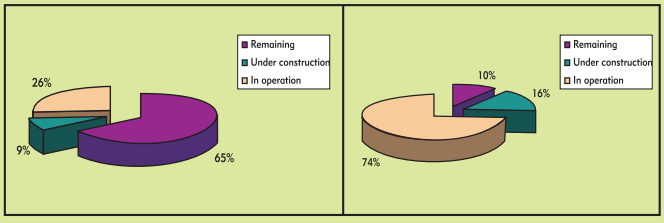
It is essential to rehabilitate the water distribution networks and run the systems with minimum loss and leakages. A stringent control mechanism should be developed for the utilization of groundwater resources. (Messages of the meetings on Water Usage/Treatment/Re-use, Bursa, and Water Basin Pollution, Izmir)

The allocation of the energy structures in river basins is a subtle problem. Therefore, it is important, when designing and planning such energy structures, to abide by the principles of integrated basin management and sustainable development in order to achieve a balance between utilization and protection. Public objections are to be minimized by promoting public participation during the investment and operation periods. Public benefit may also be achieved through the sharing of revenues. The Çoruh basin is a typical example of such a dispute. A management strategy similar to the Southeast Anatolian Project (GAP) should be developed in the Çoruh Basin. (Message of the meeting on Water and Energy, Artvin)

The Southeast Anatolian Project (GAP)

Research into the potential of the River Euphrates (Fırat) began in 1936 upon the directives of Mustafa Kemal Atatürk. The Administration for Electricity Studies (EIEI), which had been established in 1935, set up the Fırat, Keban and Kemaliye Flow Inspection Stations on the Euphrates in 1936. In 1945, a flow inspection station was also established on the River Tigris (Dicle) at Diyarbakır. Data thus started to accumulate for use in future years. Studies accelerated following the establishment of General Directorate of the State Hydraulic Works (DSI) in 1954, and as a result "Basin Reconnaissance Reports" covering all basins, were prepared, starting from the most important basins.

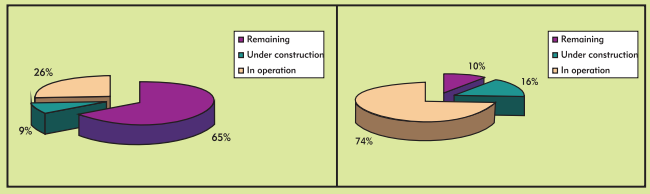
At the beginning, the research was directed towards the planning of the Lower Euphrates and was referred to as the Lower Euphrates Project. With the addition of the Dicle Basin, the work was named the Euphrates and Tigris Basin *Water and Soil Resources Development Project.* Eventually, it came to be known as the Southeastern Anatolian



GAP provides 22% of Turkey hydroelectric energy potential and 21 % of its irrigation potential. Nowadays, GAP is not a water and soil resources development project only; it is commonly described as an integrated development project affecting the economic and social life of the region and guiding the development of other sectors such as urban-rural infrastructure, agricultural infrastructure, transportation, industry, education, health, housing and tourism. This project covers all or some parts of the provinces of Gaziantep, Adıyaman, Şanlıurfa, Diyarbakır, Mardin, Siirt, Batman, Şırnak and Kilis cities. According to the 2007 gensus, about 10% of Turkey's population lives in these provinces.

By constructing 22 dams and 19 hydroelectric power plants on the rivers Euphrates and Tigris and their tributaries, it is intended to generate 27 billion kWh of energy using a total installed capacity of 7500 MW and to irrigate economically about 1,06 million ha of land. Of the 13 big projects, 7 are in the Euphrates Basin and 6 in the Tigris Basin.

GAP Energy Projects Economically Irrigable GAP Irrigation Projects



The Southeastern Anatolian Project (GAP) is a human-centered regional development project targeting the full fledged socio-economic development of Southeastern Anatolia. As a project adopting the principle of sustainable development, GAP covers investments in such areas as: rural and urban infrastructure, transportation, industry, education, health, housing, tourism and other sectors, in addition to dams, hydraulic power plants and irrigation schemes on the rivers Euphrates and Tigris. The Project has the main challenge of substantially improving the quality of life of the people and closing the development gap existing between this particular region and the other regions of the country. Thus, GAP is becoming a focus of attention for the world not only for its technical characteristics and physical magnitude but also for its humanitarian and innovative approaches. The project has already started to bring benefits to people of the region by generating employment, raising income levels and expanding the service capacity of urban and rural centers. The capital accumulated following the advent of irrigation will be used in in-field services, and financial support will be obtained from farmers themselves, resulting in a decrease in government expenditure for farming services. It has been observed that farming services on land opened up to irrigation have been developed by farmers in parallel with the increase in their economic conditions. For this reason, using the channel provided by Irrigation Unions founded on land opened up to irrigation, it will be a realistic approach to give information and guide farmers about the development of farming services. After to the advent of irrigation, cotton, corn and wheat started to be grown intensively on the Harran Plain. Recent tests done in the Research Institutes of the Ministry of Agriculture and Village Affairs at Çukurova and Harran Universities showed that fruit trees (especially almonds, plums, apricots and pomegranates) can be grown if the region is irrigated. The DSI has continued to conduct research on the dam basins – notably in the areas of land consolidation, the development of farming services, freshwater fishing and organic agriculture – in a friendly partnership with the Ministry of Agriculture and Village Affairs and other relevant organizations.

Flood management on transboundary waters should be improved in coordination with the other riparian countries. Reliable collection, exchange and evaluation of data should be encouraged. A good relationship between the riparian countries is the most important precondition for this. Although technical experts can agree on the sustainable utilization of transboundary waters, decision-makers and politicians must also have a desire to carry out these mutually acceptable strategies. The River Maritsa/Evros/Meric is a typical example of a transboundary river system shared by three countries. (Message of the meeting on Floods, Edirne)

Turkey has one-eighth of the world's overall geothermal potential. The majority of this potential has relatively low enthalpy, but still is used for heating purposes. Studies are under way to examine the possibility of using this energy in a cost-effective manner as a wind power resource. Since geothermal power requires no fuel, it is therefore emissions-free and insusceptible to fluctuations in fuel costs. Geothermal energy is also considered as a form of renewable energy. Research & Development work needs to be carried out on geothermal reservoirs to improve their utility. Moreover, geothermal research needs to be spread to each thermal field throughout Turkey. The extraction, usage, protection, treatment and re-injection of water require centralization to ensure better control and monitoring. Since the demand for geothermal water is increasing rapidly, it is necessary to determine the capacity accurately through drillings and other geophysical research methods, with the aim of sustainable utilization. (Message of the meeting on Thermal and Mineral Waters, Afyonkarahisar)

Groundwater resources should be used with utmost care. There is a high risk of groundwater contamination in karstic areas due to the structural characteristics of the soil. Therefore, in such sensitive areas, the best ways of making use of the water must be determined with care, and land-use maps should be revised in consideration of the karstic terrain. There is a need for qualified technical personnel in such areas if the water is to be protected against pollution. People living in karstic basins should be well informed on the sensitivity of these areas to contamination. (Message of the meeting on Karstic Hydrology, Antalya)

Wetland management should be participatory, and inter-sectoral water use should be well identified. Management plans should be sustainable and applicable. The related laws and regulations should be reviewed, and new arrangements made, bearing in mind the problems which occur in practice. It is important to raise public awareness about the benefits of protecting the wetlands. Wetland management plans have to cover the entire basin which includes the wetlands. Wetlands should be included in the water budget of the basins. General water quality and discharge standards should be defined and additional water quality standards should be drawn up for all wetlands which take into account the assimilation capacity of the recipient environment and endemic species. Agricultural activities around the wetlands must include crop patterns that do not require much water. The survival of wetlands has to become a primary concern of society and of all organizations and institutions. (Message of the meeting on Wetlands, Kayseri)

Wetlands in Turkey

Wetlands have an important place in basic life media. Together with the tropical forests, they are the ecosystems of greatest biologic production. Most of the species requiring special protection according to the Habitat Directive of EU are species dependent on or related to wetlands. There are more than 250 wetlands in Turkey with a total area exceeding 2 million hectares. The observations, surveys, inventories and evaluations which have been carried out so far indicate that 135 of these wetlands have international importance. Twelve of them have been added to the Ramsar list.

The Kızılırmak, Yeşilırmak and Sakarya deltas on the Black Sea coast, the Kocaçay delta on the coast of the Sea of Marmara, the Meriç, Gediz, Büyük Menderes and Güllük deltas on the Aegean coast and the Göksu, Seyhan and Ceyhan deltas on the Mediterranean coast are the most important wetlands of Turkey in terms of biological diversity.

Wetland Protection (Lake Uluabat)

Lake Uluabat is located at the south of Sea of Marmara in the Karacabey and Mustafakemalpaşa districts of the Bursa Province in northwestern Turkey. A large freshwater lake, Uluabat is one of Turkey's richest wetlands in terms of aquatic plants. Its plants and the richness of its plankton and small aquatic fauna make Uluabat a very important feeding area for various species of wildlife.

Lake Uluabat is currently under active consideration for protection measures. No such measures are in force at present, and there is some evidence that a process of degradation is taking place. Lake Uluabat has its only outlet is in the northwest, where it drains into the Kocaçay River. When water levels drop too much, the river starts feeding the lake instead of draining it. The entire west side of the lake, and several kilometers of the Mustafakemalpasa River, is now embanked. Incoming silt has formed an inland delta, which is largely used for agriculture. The water of the lake is used to irrigate surrounding fields. The area is one of the most productive agricultural areas of Turkey, featuring arable land, fruit orchards and stockbreeding. Industry is limited and mostly based on agriculture and the area is of archaeological importance. As a step in the process of protecting this valuable wetland, the Ministry of Environment commissioned a research project in 1997 to investigate the ecological and biological value of Lake Uluabat. Several other conservation actions have been carried out by the Ministry, such as regular inspections of the lake by the Provincial Office staff of the Ministry. In 1998, a project to establish a management plan for the site was proposed with the support of the Ministry.

A pollution inventory of Lake Van should be prepared and the sources of pollution should be determined. This work should be backed by long-term projections. Municipalities should lead these efforts. More hydro-meteorological stations are required in the Lake Van Basin to cope with coastal erosion problems. (Message of the meeting on Lake Hydrology, Van)

Training activities and international joint studies should be conducted to improve irrigation and drainage methods. Care should be taken when using low-quality drainage water for agricultural purposes, and the quality and quantity of the water should be controlled and monitored. With a view to improving environmental awareness and protection, the roles, authorities and responsibilities of the institutions concerned should be clarified and a legal infrastructure should be put in place. (Message of the meeting on Irrigation and Drainage, Adana)

There is a need to develop low-cost irrigation technologies, such as land levelling, simple water diversion structures, and improvements in scheduling and rotational irrigation, sprinkler irrigation, drainage infrastructure and water harvesting. (Message of the meeting on Irrigation and Drainage, Adana)

More dams and regulators are required in order to store and save more water resources that would enable the transfer of water from one basin to another. New projects must be initiated for groundwater dams, rainwater harvesting and re-use of treated wastewater. Existing facilities are insufficient to supply an adequate amount of water.

Therefore, sustainable water resources management should be achieved through a holistic approach which takes into account legal, technological, educational and cultural aspects. (Message of the meeting on Water Management and Drought, Ankara)

Legal and administrative arrangements for water protection and usage should be made effective. The Gediz Basin is once case where adequate financing and administrative incentives are crucial for realizing this goal. The development and expansion of organic agricultural activities should be encouraged to minimize pollution. Even in the traditional agricultural activities, control, certification and consultancy services should be strengthened. The adoption of technical solutions should be backed by incentives and sanctions. An integrated river basin management model should be adapted in a participatory spirit in accordance with the socio-economic structure of the region. (Message of the meeting on Water Basin Pollution, Izmir)

Projects related to the protection of the wetlands have to be conducted at the level of the entire basin, including all water structures. Water allocation should be well planned so that necessary precautions can be taken especially during long dry periods. Rational water use and the modification of existing crop patterns can be considered as options to cope with extreme climatic conditions. The sustainability of the wetlands in the region must be one of the main agenda items in water resources development plans and all stakeholders should act accordingly. (Message of the meeting on Wetlands, Kayseri)

Re-use of wastewater should be encouraged at regional level subject to strict quality control of the treated water. (Message of the meeting on Water Usage/Treatment/Re-use, Bursa)

3.1.4 Key Messages under Theme 4: Governance and Management

The quality of governance and management has a profound effect on operational issues for water supply and utilization. Many aspects of the existing structures, roles, policies, procedures and recommendations for management and governance were addressed during the *In Turkey* meetings. The key messages which emerged are as follows;

Existing laws and regulations should be applied thoroughly. (Message of all the meetings)

It is important to establish coordination and mutual understanding between farmers, irrigation associations and water suppliers. (Message of the meeting on Irrigation and Drainage, Adana)

With a view to improving environmental awareness and the protection of nature, the roles, authorities and responsibilities of the institutions concerned should be clarified. Legislation should be prepared taking into consideration the interests of all stakeholders. (Message of the meeting on Irrigation and Drainage, Adana)

Cooperation needs to be established among universities, private enterprises and the government. Technology production and transfer should be achieved. (Messages of the meetings on Thermal and Mineral Waters, Afyonkarahisar; and Floods/Inundation/Landslides, Samsun)

Farmers and irrigation organizations should cooperate on problems concerning irrigation. Ensuring maximum attendance of farmers at training programmes may be an appropriate way to address irrigation problems. The irrigation-related problems on the Harran Plain are quite similar to those prevailing in the other agricultural regions of Turkey. (Message of the meeting on Irrigation and Salinity, Şanlıurfa)

The efficiency of irrigation associations need to be improved. (Message of the meeting on Irrigation and Drainage, Adana)

Caution is to be exercised in the engagement of the private sector in small-scale hydropower structures, and public participation in decision making processes is to be encouraged. The public must be considered as one of the governing actors in the process. (Message of the meeting on Water and Energy, Artvin)

3.1.5 Key Messages under Theme 5: Finance

The issue of financing water services is at the core of the debate on privatisation and commercialisation. Since financial constraints are the most important problem of water services, existing legislation on investment has to be reviewed and analyzed. This issue was discussed at the *In Turkey* Meetings and the recommendations given below were derived;

> In irrigation networks, water use should be priced in consideration of equity principles. (Message of the meeting on Water Basin Pollution, Izmir)
>
> Technological advances cannot be fully applied in the country due to economic constraints.
>
> Available funds should be allocated in accordance with the priority water issues.
>
> Recourse to international sources of finance is resulting in more expensive investments.
>
> Privatization may be proposed as one of the tools to facilitate drinking water supply and distribution. However, this may lead to an increase in sales prices and cause disputes. (Message of the meeting on Water Usage/Treatment and Re-use, Bursa)
>
> The allocation of water to the private sector for energy production is another emerging issue in the energy policies of states. This item, like the above, should be handled and implemented with utmost care. (Message of the meeting on Water and Energy, Artvin)

3.1.6 Key Messages under Theme 6: Education, Knowledge and Capacity Development

Education, public awareness and knowledge could make a difference in reducing the impact of major water problems. Education is necessary in order to know how to deal with all kinds of water-related problems. Information is the first step to solutions and more generally to making us aware of the need for improved water management in the world. Supplying clean water and adequate sanitation in schools improves community health standards. Since 'today's children are tomorrow's leaders', they will be the ones to make decisions on how to manage water resources in a sustainable manner. With a view to finding appropriate and innovative solutions and building a better future, the participants of the *In Turkey* meetings suggested the following points;

> Press and media are the most important tools for public awareness on water saving and protection against pollution. (Messages of the meetings on Water Usage/Treatment/Re-use, Bursa; Groundwater and Drought, Konya, and Water Basin Pollution, Izmir)
>
> Water saving efforts should be promoted among farmers by training them on suitable crop patterns versus. water demand. (Message of the meeting on Groundwater
>
> Recent agricultural technologies should be encouraged and incentives should be provided to the users. (Message of the meeting on Irrigation and Salinity, Şanlıurfa)

Zeugma

A Bridge From Past to Present

Zeugma is a well preserved Greco-Roman city situated on what was a border crossing into the Roman Empire on the Euphrates River. In ancient times, it was an important crossing point across the river Euphrates for the many people who inhabited the Mesopotamian region. In modern times, the extent of Zeugma's rich remains were not clearly understood except by a handful of archaeologists and researchers who were committed to finding Zeugma's past under the soil and ash that covered it. With the completion of the Birecik Dam, one of the key projects being implemented by GAP, this dormant area was thrust into the lime light in the summer of 2000. GAP RDA formed a multi-national team of archaeologists and other professionals who were dedicated to preserving the archaeological treasures of Zeugma. GAP-RDA obtained cooperation from the Packard Humanities Institute (which graciously funded the project), the Turkish Ministry of Culture and other institutions in the Turkish government. Within a few weeks, over 100 archaeologists and conservators from the United Kingdom, Italy, France, and other countries as well as 50 Turkish archeologists and 250 other workers were working around the clock to rescue record and preserve Zeugma's archeological wealth. Findings included rare mosaics, statues, frescoes and other artifacts which otherwise would never have come to light. Zeugma has been a unique example of cooperation and solidarity for the preservation of cultural heritage in the course of water resources development.

Gypsy Girl Oceanus e Tethys Mosaico

Municipalities and local authorities should be more actively engaged in technological developments and improvements related to water and sanitation issues. (Message of the meeting on Irrigation and Salinity, Şanlıurfa)

Historical hydraulic structures should be documented through a chronological survey. This information should be integrated into GIS and registered by related offices. Common principles should be adopted among all institutions involved with historical hydraulic structures. All stakeholders (photographers, architects, archaeologists, art historians and engineers) should work together. Local governments may organize meetings with the participation of inhabitants. Public awareness should be raised on related studies and the principles adopted. In the preparation of water supply projects for cities, the necessary measures should be taken to protect historical water infrastructures. The study of such infrastructure should be introduced into the curricula of academic institutions. The importance of Historical Hydraulic Structures should be underlined in textbooks as well as in popular books written in a simple and effective manner. (Message of the meeting on Historical Water Structures, Izmir)

During the Regional Process of the Forum, some technical meetings and symposia were organized. One of these meetings was the Isotope Hydrology Symposium that was organized by the Technical Research and Quality Control Department of DSI to keep track of studies and recent technological developments, explain them to the engineers and scientists working in the field of hydrology, and exchange information between academia and staff of the State Organizations. This symposium was also supported by UNESCO/IHP and the IAEA. It was held in Istanbul on 13-17 October 2008. Various papers and studies on isotope techniques were presented. The use of isotope techniques in hydrological and hydro-geological studies has recently gained importance. The objectives of the symposium were;

- To exchange information and knowledge by bringing academicians and engineers from state organizations together,
- To translate the studies conducted into practice and share information,
- To emphasize capacity building,
- To ensure communication among those working in the field of isotope, and to achieve communication through the internet,
- To promote the use of modern techniques for surveys, project development and implementation,
- To assist data collection using certain standards which will provide a common platform among the various organizations, and
- To explore the possibilities of cooperation between organizations in the realization of large projects related to the activities of those organizations.

3.2 *Around Turkey* Meetings

The six *Around Turkey* meetings were arranged and organized under the leadership of the MEF and the General Directorate of the DSI.

At the *Around Turkey* meetings, stakeholders, organizations and institutions had an opportunity to work together and discuss water-related issues. Working group meetings attended by numerous

Table 3.2 Relationship between the *Around Turkey* meetings and the Forum Themes.

Forum Themes / Meetings and Main Topics	Theme1 Global Change& Risk Management	Theme2 Advancing Human Development and the Millennium Development Goals	Theme3 Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs	Theme4 Governance and Management	Theme5 Finance	Theme6 Education, Knowledge and Capacity Development
MIDDLE EAST "Water Management Strategies and Practices in Arid and Semi-arid Regions"			■			
BALKANS "Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs"			■			
CENTRAL ASIA "Climate Change, Water Resources Management, Governance and Capacity Building Issues in Central Asia"	■		■			■
EASTHERN EUROPE "Water Issues in the Eastern Europe: Impact of Climate Change, Vulnerability Assessments and Adaptation Measures"	■					
MEDITERRANEAN "Water in the Mediterranean Basin"	■		■			■
BLACK SEA "Managing and Protecting Water Resources and Their Supply Systems to Meet Human and Environmental Needs"			■			

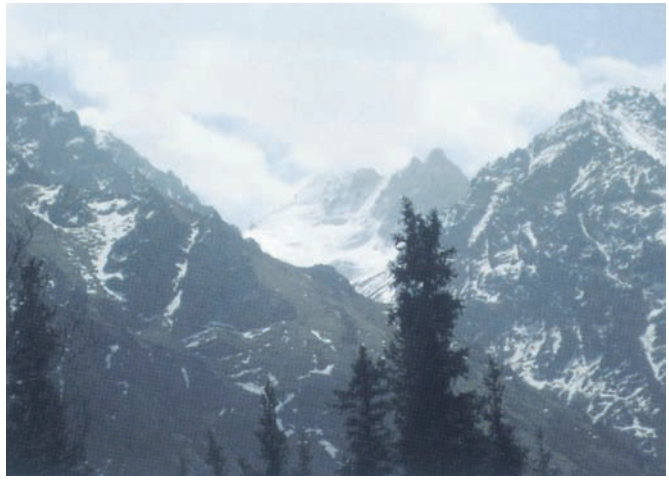
experts from various countries in the region experiencing similar problems proved a fruitful source of contributions to the Thematic Process of the Forum. Many interesting ideas and comments emerged. Each of these meetings began with an opening ceremony. Following the ceremony, representatives from the countries participating made presentations about their water-related problems and the solutions they proposed, with a view to these being conveyed to the Forum.

Table 3.2 presents the list of the *Around Turkey* meetings in the form of a matrix that relates the main topic of each meeting with the Themes of the 5 th World Water Forum.

3.2.1. Key Messages under Theme 1: Global Change & Risk Management

The most critical water issues listed below for *Around Turkey* were discussed at 4 different meetings held in Amman, Bishkek, Skopje and Nicosia:

> In the First Regional Meeting of *Around Turkey,* which took place in Amman, Jordan on 26-27 February 2008, it was emphasised that scientific tools fitting the specifications of the Middle East Region needed to be developed and modified in order to evaluate and mitigate the effects of climate change. The need was expressed for the creation of a network among the neighbouring countries in the region in order to ensure the sustainable utilization of water resources and share climate-related data. On the basis of the scientific studies, the network could give guidance to the decision-makers. (Message of Middle East Meeting, Amman)
>
> The issues of climate change, population growth, industrialization, urbanization and deforestation are



placing huge stress on the water resources of Central Asia, according to participants in the Bishkek, Kyrgyzstan meeting (28-29 May 2008). Another point raised during the meeting was the melting of glaciers in the mountainous areas due to global warming, resulting in floods in the rivers and lakes. This may cause an increase in the amount of water in the Amudarya and to a lesser extent in some tributaries of the Syrdarya and Zarafshan. Understanding the effects of climate change is crucial for developing regional and national adaptation strategies. Integrated water management and water storage are important components in that respect. (Message of Central Asia Meeting, Bishkek)

- ✓ CO_2 emissions should be decreased by using renewable energy, especially hydro-energy. The re-use of treated wastewater and the utilization of modern irrigation techniques are essential for water conservation. Furthermore, public awareness should be raised. Hydro-meteorological data and information should be derived continuously and systematically. Monitoring and measurement networks need to be improved to this end. Regional solutions are required to address regional problems such as the aridity of the Aral Sea. (Message of Central Asia Meeting, Bishkek)

- ✓ The fourth Regional Preparatory Meeting that took place in Skopje, Former Yugoslav Republic of Macedonia* on 03-04 July 2008, with participation from 5 countries, brought a call for the generation of different regional climate change scenarios reflecting different levels of effects (high, medium and low). The participants also stressed that these scenarios should be supported by proper weather observations and a database. Coordination and cooperation should be enhanced among state institutions and universities. Since the re-networking of measurement and observation stations is costly, topologically similar pilot regions can be used and their results can be transferred to ungauged parts of basins. There is a clear need to establish climate change-specific measurement and observation systems. There also exists a need for additional information on the respective roles of human impacts (inappropriate river channel maintenance, land-use changes within the river basin, etc.) and climate change impacts in the increased frequency of floods. (Message of Eastern Europe Meeting, Skopje)
- ✓ In the "Regional Meeting on Water in the Mediterranean Basin" held in Nicosia on 09-11 October 2008, the following results were derived on the problems of climate change and the Mediterranean Basin. Climate change is a global issue which has adverse effects on both poor and rich countries. Whilst the rich countries are releasing a substantial part of the greenhouse gases, the emissions of the developing countries are increasing continuously as they demonstrate rapid economic growth. The effects of climate change speed up groundwater exploitation, and so the water tables of aquifers are likely to go on falling. Climate change mitigation and adaptation measures for surface water and groundwater resources management are essential to ensure sustainability. Similarly, the availability of water in transboundary river basins is also affected by the climate change and is a subject for transboundary cooperation. A common and reliable database should be set up which includes all sorts of data related to water quality and quantity, and the scientists and experts concerned should have direct and free access to it. Moreover, the interpretation of water-related statistics is as important as their collection. Statistical models for the reliability of hydrological cycle models should be utilized together with the climate models. Groundwater reservoirs will play an important role by providing a means of storing of flood water to be used during dry periods. (Message of Mediterranean Meeting, Nicosia)

- ✓ The quality and quantity of fresh water flowing to the marine environment are decreasing significantly, with adverse effects on coastal and marine ecosystems. Meteorological models should be used to evaluate uncertainties. Sectoral policies and plans for mitigating the effects of climate change ought to be revised or developed. (Message of Mediterranean Meeting, Nicosia)

- ✓ "Migration and land-use changes and human settlements' is an issue that will be discussed at the 5th World Water Forum. This subject was discussed in Skopje, Former Yugoslav Republic of Macedonia on 03-04 July 2008 with the participation of 5 countries. In the meeting, the participants raised the following points: "Drought is one of the main driving forces of migration", "One of the main reasons for insufficient water supply is inadequate hydraulic structures, primarily reservoirs, and lack of investment", "Economic development, and especially equitable income distribution in a country, is important to prevent migration". (Message of Mediterranean Meeting, Nicosia)

* Turkey recognizes the Republic of Macedonia with its constitutional name.

The available land-use maps need to be further developed. Relevant databases should be improved in order to facilitate decision-making. In order to achieve efficient land-use and sustainable water policies, it is important to define the roles and responsibilities of the various stakeholders in decision-making processes. Even though policies are well formulated, they cannot always be fully implemented, especially in transition countries, due to lack of capacity and financial resources. Climate change has been affecting water availability and land-use adversely. Therefore, proper water and land management methodologies should be ensured in order to increase the income levels of local communities. Coordination and collaboration among land-use and water policy makers must be achieved. (Message of Mediterranean Meeting, Nicosia)

In the fourth Regional Preparatory Meeting that took place in Skopje, Former Yugoslav Republic of Macedonia on 03-04 July 2008, the following disaster mitigation measures were proposed in order to reduce the negative effects:

- Shift from a state scale and reactive approach (emergency/crises management) to a regional scale and pro-active approach (basin management, monitoring, forecasting, contingency plans),
- Raise the awareness of public on the need for disaster mitigation,
- Mobilize support through partnerships,
- Expand disaster mitigation activities within societies,
- Advocate for legislation and government actions,
- Encourage and support efforts to incorporate disaster mitigation into community decision making. (Message of Eastern Europe Meeting)

3.2.2. Key Messages under Theme 2: Advancing Human Development and the Millennium Development Goals

In relation to Theme 2, two different meetings were organized in Jordan and Bosnia Herzegovina, the outcomes of which are presented below;

The main conclusion of the Regional Meeting in Amman, Jordan on 26-27 February 2008 was "Privatization appears as a solution at the first glance; however, financing remains the main challenge". There is a considerable difference between the water and sanitation services provided in rural and urban areas in the Middle East. In some regions, the majority of the population does not have access to adequate water supply and sanitation. Because of the lack of adequate sanitation services, sewage flows directly into streams, rivers, lakes and wetlands, affecting coastal and marine ecosystems, fouling the environment and threaten the health of millions of children. The re-use of treated wastewater is recommended especially in arid regions. (Message of Middle East Meeting, Amman)

The other critical issue discussed at the same meeting was related to modern irrigation techniques. Farmers should be trained in modern and more efficient irrigation systems. Pilot projects need to be developed, and capacity building at all levels should be considered. Public-Private Partnership should be promoted in the implementation of irrigation projects. (Message of Middle East Meeting, Amman)

The main issue of the meeting that took place in Sarajevo, Bosnia Herzegovina on 16-17 April 2008 was "the harmonization and gradual implementation of the water-related EU acquis". The countries of the region are either member states or candidate or potential candidate members of EU. In this respect, the Water Framework Directive provides an adequate and exemplary legal framework for sustainable water management. (Message of Balkans Meeting, Sarajevo)

Financial resources need to be mobilized for existing and future plans and programs for drinking water supply, wastewater collection, treatment and re-use and agricultural needs. In the same meeting, it was pointed out that sanitation and wastewater treatment are important to improve the quality of life. Research on the re-use of wastewater needs to be emphasized for saving water. Insufficiently maintained water distribution systems and illegal water utilization are two important barriers to water conservation. Moreover, industry must be encouraged to

use treated wastewater instead of groundwater and other water resources. A strong legal framework is needed for water management. However, laws and legislation will not be enough by themselves; monitoring and enforcement by the relevant authorities is equally crucial. EU standards could be helpful in addressing water-related problems. The concept of integrated river basin management should be used to manage water resources in a sustainable manner. In order to provide adequate water services and make necessary investments, full cost recovery financing systems are essential in principle. In water management, in addition to existing finance models, the Public-Private Partnership (PPP) model is worth considering. (Message of Balkans Meeting, Sarajevo)

There is a need to raise public awareness on the importance of saving water. The real meaning of the term "right to water", the costs of services and individual responsibilities should be identified clearly. (Message of Balkans Meeting, Sarajevo)

3.2.3. Key Messages under Theme 3: Managing and Protecting Water Resources and their Supply Systems to Meet Human and Environmental Needs

The subjects of Theme 3 were addressed in five different regions of *Around Turkey* – namely: Eastern Europe, Central Asia, the Mediterranean, the Balkans and the Black Sea. The following outcomes were obtained;

In the Third Regional Meeting of *Around Turkey*, which took place in Bishkek, Kyrgyzstan on 28-29 May 2008, the following critical points relating to the subject of "Basin Management and Transboundary Cooperation" were discussed. The Central Asia region is relatively rich in water resources. Most of them are transboundary rivers. For the last 16 years, transboundary cooperation has made it possible to avoid any serious conflict in the region concerning water delivery among different states and zones, even in previous years of scarcity or flooding. Nevertheless, the existing cooperation among the countries of the region needs to be improved further. Although the political will generally exists, lack of understanding and confidence at the technical level is the main barrier to enhanced cooperation. By building dialogues at different levels, it may be possible to merge different views and positions. Exchange of reliable data and information is crucial. Furthermore, international mechanisms should work coherently to strengthen and advance transboundary cooperation. (Message of Central Asia Meeting, Bishkek)

Policies on water allocation in different sectors (energy, irrigation and environment) require strengthening of the provisions of the legal and institutional framework for the purposes of better management. Similarly, it would be useful to consider financial tools that would provide for the sharing of benefits, expenses and compensation for damage. This calls for comprehensive basin development plans with stronger participation of all riparian countries based on Integrated Water Resources Management (IWRM) principles. The promotion of regional and sectoral dialogues in the context of agreements among member countries is essential, if different sectoral and country priorities for water use are to be reconciled with the interests of society and nature. (Message of Central Asia Meeting, Bishkek)

The Chu and Talas Rivers, both comparatively small rivers, are a good example of effective bilateral cooperation in Central Asia. The cooperation agreement on the utilization

of the waters of the two rivers signed in 2000 could even be applied to the larger Aral Sea Basin. (Message of Central Asia Meeting, Bishkek)

The Chu-Talas experience can be taken as an example, particularly for small transboundary rivers. Effective cooperation should be developed and enhanced among the riparian states in order to utilize transboundary water resources in an equitable, rational and sustainable manner. Integrated water management plans could be developed at the basin level. However, the sustainable and effective management of water resources at national level should be the main priority. All stakeholders should be included in this process. (Message of Central Asia Meeting, Bishkek)

The need for reform of water resources management and governance in Central Asia was emphasised. The contents and phases of the reform, can be outlined as follows, with particular emphasis on the decentralization aspect:

- Sustainable water resources management at the transboundary level (Aral Sea basin, agreements, strengthening of organizations at the regional/basin level, ecosystem demands, economic tools like cost benefit analysis, information exchange, water demand and limitation);
- Decentralization of water resources management in line with economic reforms, mostly in agriculture sector, requiring tools and instruments for all concerned (states, sectors and stakeholders) and instruments of good governance such as institutions, and the legal and regulatory framework (development and harmonization);

- Economic tools (the part of the state and the boundaries of its responsibility; financial mechanisms for water conservation and resource protection such as tariffs, subsidies, privileged loans and incentives);
- Technical and technological aspects (hydrometrics, automation, water allocation tools);
- Environmental needs (pollution control, ecological releases, and protection zones), and
- Capacity building (equipment, training, field trips). (Message of Central Asia Meeting, Bishkek)

The meeting held in Istanbul Turkey on 08-09 November 2008 addressed several significant water issues. There is a need to improve joint efforts and actions in response to water issues in the region based on IWRM principles. The management of the water resources in any basin must be taken into account socio-economic, environmental and technical factors in a comprehensive manner. Water-related information should be disseminated to the related stakeholders. Water should be seen as a source of cooperation among the riparian countries rather than a cause of contention and distrust. Confidence-building efforts among the countries in the region can be improved through the exchange of hydrological data and by sharing water experiences. Joint training and technical assistance programmes and cross-border projects can be developed to enhance regional cooperation further. The effects of climate change and environmental pollution have to be taken into account in the conservation of the water resources in the region. (Message of Black Sea Meeting, Istanbul)

The following critical points were also discussed at the Istanbul meeting. In order to ensure the quality and quantity of water in the Black Sea region, joint database projects should be encouraged among the various states. Collaboration among the hydro-meteorology and water institutions of the different countries should be improved. Furthermore, environmental, hydrological, geological and topographical data and information should be collected and shared in a reliable and extensive manner. Integrated river basin planning and management needs to be achieved so as to minimize the negative environmental effects of water utilization in the domestic, agricultural, industrial and energy sectors. Due to the climate change, floods and droughts are the main problems of the region. Possible solutions to these problems include increasing the capacity of existing reservoirs and the transfer of water between basins, when possible. Efforts need to be exerted to ensure that modern technology is used in water management. "Drip irrigation" in agriculture could serve as one example. Last but not least, municipal solid waste disposal sites are another important problem that poses a significant risk to river water quality in the region. Solid waste disposal needs to be managed properly. (Message of Black Sea Meeting, Istanbul)

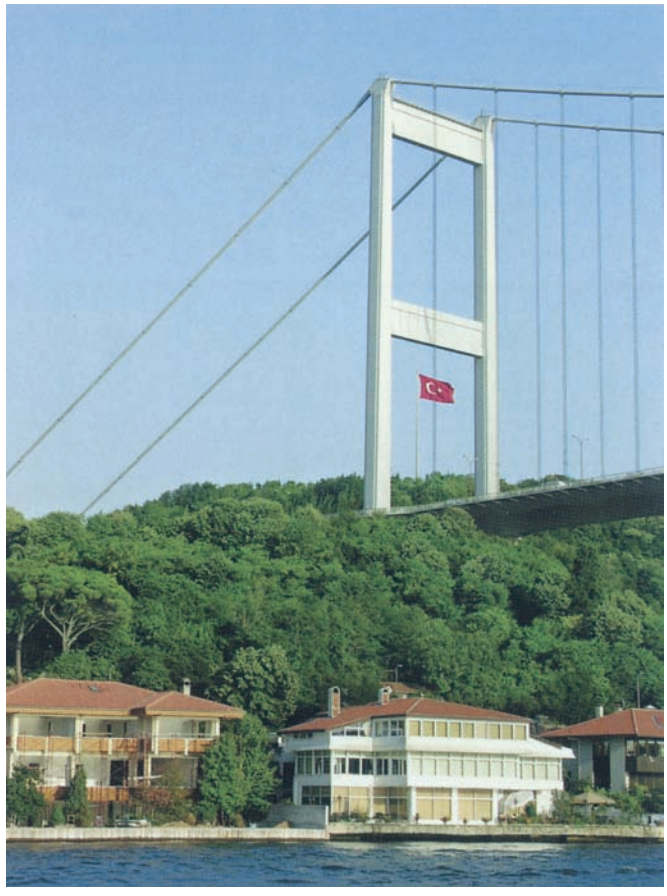
In the meeting held in Skopje, Former Yugoslav Republic of Macedonia on 03-04 July 2008, the conclusion was reached that sustainable, equitable and rational transboundary river basin management should be achieved through the participation of all riparian countries. Effective collaboration among the riparian states could protect land from floods, drought and erosion, and ensure better water pollution control. Satisfactory quality and sufficient quantity of water should be the ultimate objectives of policy-makers seeking to satisfy basic human needs as well as to reduce health risks, develop tourism and recreation activities and make sure that ecosystems function well. GIS and early warning systems should be developed through cooperation among the countries in the region. Integrated models (including climate and hydrology) should be developed and operated to represent and capture climate change conditions at the country and inter-state levels. (Message of Eastern Europe Meeting, Skopje)

Attention should be paid to the following issues in integrated water resources management:

- Utilization of modern technologies;
- Ensuring a common understanding and achieving compromise among water users and sectors;
- Re-assessment of available water and land resources;
- Better financing;
- Improving water-related legislation and avoiding gaps and duplications;
- Increasing public awareness and involvement of stakeholders in decision making, and
- Prevention of corruption. (Message of Eastern Europe Meeting, Skopje)

The following points were also raised:

- Conjunctive use of surface and groundwater should be optimized.
- The amount of water used for domestic, agricultural and industrial purposes and water quality are the main factors in water pricing. Rational water pricing should be achieved.
- The value, cost and price of water needs to be assessed within the context of climate change, changes in land-use, population growth and migration from rural areas to urban areas.
- Political and legislative issues related to the effect of environmental/ecological issues on water utilization should be kept in mind.
- Floods and droughts should be considered in IWRM plans.
- Emergency preparedness plans and early warning



systems should be developed for the prevention and mitigation of water-related disasters. (Message of Mediterranean Meeting, Nicosia)

Because of population growth and the increase in demand for water, new water infrastructure and networks should be established. For example, open channel irrigation systems cause a significant increase in consumption, as they lead to high evaporation. Therefore, closed conduit systems should be designed and implemented for irrigation purposes. The materials used in water structures should also be durable and strong enough to cope with natural disasters. The maintenance and viability of networks has to be provided for within long term plans. Existing technologies should be improved and better methods should be used to protect water quality. Water contamination and inadequate wastewater treatment plants are important problems to be addressed. Since monitoring and control systems for water quality parameters are not always adequate, the related legislation should be examined and improved. Public awareness about water conservation should be raised and appropriate water pricing policies should be prepared. Extreme precipitation is the main concern of urban areas. However, storm water may be considered a potential freshwater resource. The utilization of treated wastewater for domestic use requires advanced treatment technologies. (Messages of Mediterranean Meeting, Nicosia; Black Sea Meeting, Istanbul)

The preparation of land-use plans is one of the most important factors in the allocation of water resources to meet human needs and the requirements of the ecosystem. In this context, the amounts of water required for domestic, agricultural and industrial use should be identified carefully. (However, it is hard to determine adequate ecosystem water requirements). Adequate water quality is important not only for human health, but also for the conservation of ecosystems. Ecosystem components should be identified in order to determine the quantity and quality of water required for the functioning of the ecosystem. (Message of Balkans Meeting, Sarajevo)

Along with the same subject, the following points were made at the meeting held in Istanbul, Turkey on 08-09 November 2008. In the management of water resources including wetlands, it is considered costly to pay attention to integration and sustainability. The role of education and the socio-economic and environment dimensions of water management are frequently ignored. In order to integrate the ecological planning of land and water resources, the ecological status of the resources needs to be determined

in advance. For the purposes of integrated management, technical, economical and ecological studies should be carried out together. Ecosystems are somehow affected by all activities that take place in river basins. During the planning process, all actors should take the protection of ecosystems into consideration. In most countries of the region, relevant legislation is in place, but when it comes to implementation, there are big gaps. In order to introduce the ecosystem approach, reference may be made to the EU Water Framework Directive. As a result of the meeting, the two most important environmental issues related to water in the Black Sea Region were found to be eutrophication and invasion of species in the water media. (Message of Black Sea Meeting, Istanbul)

The issue of "Managing and Protecting Surface, Ground and Rain Water and Soil" was discussed in Istanbul, Turkey on 08-09 November 2008 and the following critical issues were identified. Sustainable utilization of land and water resources must be ensured. In order to protect water resources, irrigation should be made more efficiently and water-saving measures should be improved. There is a close connection between land and water resources. Accordingly, soil conservation and water management should be handled together. Supply and demand management

should not be separated from one another. The "Polluter pays" principle should be put into effect. Water and land-use activities should be optimized taking into account the principles of sustainability. Implementing agricultural and land-use practices such as afforestation that increase the water retention capacity of the soil would be an effective solution in the Black Sea region. Since the rehabilitation of polluted groundwater and soil is challenging and quite costly, precautionary measures should be implemented where necessary. Storm water run-off and discharges must be taken into account when designing infrastructure. The region is suitable for creating underground reservoirs to increase water availability and supply. (Message of Black Sea Meeting, Istanbul)

Raising public awareness and participation, promoting education about land and water resources management, ensuring the implementation of policies on access to safe drinking water and emphasizing the interconnection between water quality deterioration and human health in water management are all important issues to be considered by decision makers. The geographical characteristics of the region should be taken into consideration in land and water management (If the region is prone to landslides, this may hinder accessibility to wells, resulting in instability of hydraulic structures) Moreover, in view of both meteorological conditions and human-induced activities, soil erosion is a major problem in the region. Therefore, precautionary upstream measures should be taken during the construction of dams and reservoirs to cope with siltation problems. (Message of Black Sea Meeting, Istanbul)

3.2.4. Key Messages under Theme 4: Governance and Management

The only meeting organized in Jordan was related to Theme 4. The main outcomes of the meeting are as follows:

On the subject of "Institutional Arrangements, Optimizing Public and Private Roles in Water Services", attention was drawn to the following critical issues (Amman, Jordan on 26-27 February 2008). PPP seems to be a more appropriate model than privatization. While taking into consideration the needs and requirements of local authorities, central authorities should maintain their role in planning, policy making, administrative and legislative work. Furthermore, good governance and international best practice ought to be promoted. (Message of Middle East Meeting, Amman)

In the same meeting, under "Water Management Strategies and Practices in Arid and Semi-arid Regions", it was emphasized that water scarcity and drought are becoming increasingly important issues in the Middle East. Political, financial, technical and capacity constraints need to be overcome in order to ensure the availability of water resources in the region. Cooperation and joint projects should be promoted wherever possible, in addition to the application of new technologies. The "Right to Water" is an issue which needs to be elaborated more in international fora. Technology transfer and capacity building is an important issue for the region. (Message of Middle East Meeting, Amman)

3.2.5. Key Messages under Theme 5: Finance

The two meetings held in Jordan and Turkey dealt with financing issues, the subject of Theme 5, and the following points were raised:

Public Private Partnership (PPP) was a mutually agreed solution at the meeting held in Jordan on 26-27 February 2008. A tailor-made lending system needs to be elaborated and tested. Accordingly, the private sector should be introduced through both debt and equity. Privatization has failed in some cases in the developing countries in the absence of any regulation on water management. Projects with a financially high rate of return, such as non revenue, should be given priority. (Message of Middle East Meeting, Amman)

The meeting held in Turkey on 08-09 November 2008 reached a similar conclusion with respect to PPP. The other outcomes were:

- Well prepared master plans and feasibility reports play a crucial role in financing.
- The master plans are also helpful for defining the water allocation among different sectors (agriculture, energy etc.).
- Projects ranked as high priority by investors should seek funding and financing. (Message of Black Sea Meeting, Istanbul)

3.2.6. Key Messages under Theme 6: Education, Knowledge and Capacity Building

The meetings that were held in Bishkek and Nicosia were on the topics of Theme 6. The following issues were raised:

The main focus at the Bishkek meeting was on raising public awareness. For this purpose, it was suggested that integrated training programs should be developed at the regional level. Furthermore, public awareness and concern should be created on water issues. It is also essential to involve NGOs and attract media attention. (Messages of Central Asia Meeting, Bishkek, and Mediterranean Meeting, Nicosia)

Joint and reliable hydraulic and hydrological databases should be established and information should be exchanged on standards. Technological innovations should be followed regularly. Partnerships can be developed for capacity building. New models and techniques should be applied in order to utilize water resources in the most sustainable manner. Regional cooperation should be strengthened, particularly in the Aral Sea Basin. (Message of Central Asia Meeting, Bishkek)

Training on the conservation and re-use of water should be initiated at all levels. Basic information on the concepts of conservation and the re-use of water should be introduced into primary education curricula. Secondary school curricula should include not only theoretical knowledge on water issues, but also practical experience of them through experiments and site visits. In the universities, novel methods of water conservation and re-use, the optimization of available resources and capacity building should be encouraged through specific programs. Public awareness on water issues should become a part of public education through dedicated workshops and cultural events. Decision and policy-makers should work in collaboration with technical experts in the preparation of regulations and legislation on water. Communication between technicians and politicians should be strengthened in the region. (Message of Mediterranean Meeting, Nicosia)

Approaching water issues from the cooperation perspective may influence the "Alliance of Civilizations" positively. Accordingly, the topic of " Water as a Historical Scene for the Alliance of Civilizations " was discussed in every *Around Turkey* regional meeting. The common basic outcomes of the discussions were as follows:

Cases of successful implementation and success stories related to historical water works (policies and techniques) should be presented for the alliance of the civilizations.

It is proposed that an inventory study of historical water works should be conducted with possible financial support from different organizations.

Historical water works should be preserved for future generations.

The watersheds of historical reservoirs should be preserved from the adverse effects of human interference (roads, settlements, deforestation etc.).

In developing water policies, alliances of neighbors should be considered and well evaluated in addition to the physical parameters of the basins.

Considering that water connects people and establishes an environment for civilizations, it is anticipated that the outcome of the roundtable discussions will contribute to the global project of the Alliance of Civilizations, a UN initiative.

"Water and Culture" should be discussed as a separate topic of the 5 th World Water Forum.

4

BRIDGING THE DIVIDES

The main aim of the 5 th World Water Forum, as can be understood from its motto, is to bridge the divides for water. In this report, in order to bridge the divides, solutions were offered to the water-related problems encountered in the sub-region. Prior to bridging, the divides initially have to be clarified. But no matter what the wording is, the vital issue is the "bridging of all divides", in one way or another – in other words, building bridges between local people, societies, culture and so on to promote the convergence of joint and sustainable solutions to water issues, problems and conflicts. Bridging may also be systematically perceived as: (i) bridging the divides between countries; (ii) bridging the divide between problems and solutions; (iii) bridging the divide between the local points and the Forum topics, and last but not least, (iv) bridging the divide between present and the future conditions. It is hoped that this report will contribute to efforts to overcome the problems of water issues by stimulating the reader to investigate the challenges.

This *In & Around Turkey* report was produced by focusing on the bridging of the divides on the critical regional water issues which emerged during the series of meetings. It is well known that the divides are similar at the sub-regional level, thus, bridging is accomplished without considering the boundaries of the regional countries. In other words, the divides and bridges are universal, like water itself, which is shared by all humans. The bridges formed were compiled and presented under the themes of the Forum. This section refers to the bridging that covers all the aforementioned components.

The challenging divides under Theme 1, "Global Change and Risk Management", are risk management, adaptation policies and migration. The bridges for these divides are:

- Disaster mitigation;
- Migration management;
- Land-use management and the registration process;
- Emergency plans for disaster management;
- Early warning systems for extreme weather events and droughts, the prevention of floods and risk maps for inundation;
- Hydro-meteorological monitoring system in real time;
- Network formation (i.e., joint contingency planning and early warning systems);
- Regional and national adaptation strategies, and
- Hydraulic structures.

Among the items mentioned above, disaster mitigation is the only item that directly affects the public. This is basically due to improper land-use allocation, illegal settlements, and weak land-use registration processes. Land-use planning needs to be carried out in parallel with emergency plans. One of the components of the emergency plans is the inundation maps produced via the hydro-meteorological monitoring system and network formation. This may be achieved by regional and national adaptation strategies in general, and through the implementation of hydraulic structures in particular.

Under Theme 2, "Advancing Human Development and the Millennium Development Goals (MDGs)", the emerging problems are defined as sanitation, pollution, water scarcity and energy. The corresponding mitigation measures are:

- Migration management;
- Application of modern industrial techniques;
- Application of modern and practical agricultural practices;
- Construction of energy (hydro and geothermal) plants in a sustainable manner in water basins;
- Preparation of pollution inventories (systematic data bases);
- Data and information harmonization;
- Water and wastewater treatment;
- Sanitation services in rural and urban areas;
- New water resources (re-use of treated wastewater, rainwater harvesting, desalination);
- Water-borne disease control, and
- Raising Public awareness and participation.

Migration cuts across all or most of the MDGs, but one of the closest links is with ensuring environmental sustainability.

Water resources can be a powerful vehicle for addressing most of the MDGs through agricultural activities, water services, sanitation and health. The agricultural sector is therefore of utmost importance, as it consumes the majority of water resources, requiring employment of modern agricultural practices. Energy is also needs to be generated in a sustainable manner.

Meanwhile, development brings with it the problem of environmental deterioration, unless protective measures are envisaged in parallel with the development of the sectors. Accordingly, sanitation services must be provided in rural and urban areas, and water and wastewater treatment plants must be constructed. This may also lead to the control of water-borne diseases. Pollution inventories, data collection and processing are important tools for supporting the decision-making process, and thus for ensuring the appropriate provision and operation of the said infrastructure services. Those efforts must be continuous and systematic. The most important driving force for all these issues is public awareness and participation.

Under Theme 3, "Managing and Protecting Water Resources and their Supply Systems to Meet Human and Environmental Needs", the challenges encountered are "sustainable basin management", "water resource(quantity and quality problems)", "water storage techniques", "water conservation" and "transboundary waters". The approaches to be taken in response are:

- Integrated river basin management;
- Flood management (including. transboundary waters);
- Wetland management;
- Sustainable irrigation methods and modern drainage systems;
- Inter-basin water transfer;
- Conservation of ecology and taking into account ecological functions in water management (Flora-fauna, endemic species);
- Water supply infrastructure;
- Wastewater treatment;
- Storm water drainage;
- Sustainable use of groundwater resources(identification, contamination, use);
- Inquiry on new water resources (treated wastewater, rainwater, desalination);
- Cooperation on transboundary waters, and
- Public training and active participation.

Most of the items listed under Theme 3 refer to technical and managerial instruments. However, the integrated river basin management approach spans political, social and economic issues as well as technical ones, and the success of this approach depends on the fulfilment of all the components. Flood and

wetland management, irrigation and drainage, inter-basin water transfer if necessary, water supply, wastewater treatment, storm water drainage, abstraction of groundwater and the development of new water resources are all engineering practices. These efforts may be accomplished by implementing a proper legal framework, mobilizing financial resources, and forcing the hand of decision-makers through public awareness and participation.

The challenges of Theme 4, "Governance and Management", are "inadequate cooperation, collaboration and administration". The emerging divides are the lack of institutional coordination and communication, uncertainties concerning the authorities of technicians and politicians, and gaps and overlaps in laws and regulations. The bridges by which these divides are to be overcome are as follows:

- Improving national water policy;
- Efficient management among the authorities;
- Clear identification of the role of local authorities on water issues;
- Administrative incentives;
- Public Private Partnership (PPP), and
- Public awareness.

The divides falling under Theme 4 may best be bridged through the efforts of central government within each country, and by international collaboration at the administrative level. At each stage in the communication process, care must be taken to maximise coordination between technicians and politicians. Above all, it is recommended, despite some controversial matters, that water issues should be managed by a single entity. National water policies are also important for the execution of water-related tasks and for the allocation of responsibilities via organizational arrangements such as PPP and irrigation associations. Among all these items, public participation continues to play the key role.

The challenges faced under Theme 5, "Finance", are "Gross National Product, funds and credits and financing institutions". The actions required are:

- Allocation and mobilization of financial resources (based on priorities);
- Cost/benefit analysis;
- Global fund mobilization;
- Governmental and private investments;
- Public Private Partnership (PPP), and
- Reasonable pricing of water use.

Finally, under Theme 6, "Education, Knowledge and Capacity Development", weaknesses in general education, knowledge sharing and capacity building need to be addressed with the aid of:

- Public training (particularly for farmers);
- Awareness raising;
- Education at early ages;
- Gender education and participation;
- Innovative technologies;
- Technology transfer and capacity building;
- Data dissemination and information exchange, and
- Protection of historical hydraulic structures.

Having underlined the vital importance of general education, knowledge sharing and capacity building, it is logical to propose that the real bridges are public training, an increase in awareness, gender education and participation in water-related issues.

After reviewing of all the divides and corresponding bridges, it is not hard to recognize that the issues most commonly emphasized at all the meetings of the Regional Process have been public training and participation, awareness raising and education on the conservation of water resources. Other common issues are:

- Development and implementation of policies of adaptation to climate change;
- Systematic data collection and information exchange among all stakeholders;
- Enhanced cooperation among riparian countries on transboundary waters;
- Strengthened collaboration between countries and international organizations dealing with water, and
- Streamlining of water-related policies among countries in the same region.

As a final remark, it may be added that water can be used as a powerful tool for achieving peace and security. In this context, the crucial factor is to know how to employ this tool in the most appropriate manner for the benefit of all sides. The *In & Around Turkey* activities presented an excellent illustration of how this can be done.

5 CONCLUSIONS

This regional document summarizes the activities which took place throughout the preparatory stages of the Forum. It is important to note that this document does not constitute a regional overview of the water status, water related data, technical forecasts and future projections of the countries taking part. Rather, it reports on the preparatory activities conducted within the past two years under the leadership of the Turkey. One aim of the DSI, the leader organization, was to set out the emerging local water problems through a series of *In Turkey* meetings held in different provinces of the country. The holding of 16 regional meetings was a real success, given the need to maintain close collaboration and communication with, and ensure the participation of, such a wide range of participants from various disciplines, sectors and parts of society. The outcomes reflect the current water-related issues of the country as expressed in the presentations and discussions which took place at the meetings. Within this report, the main outcomes are given in the form of Key Messages.

Besides the *In Turkey* meetings, DSI also organized a series of *Around Turkey* meetings in countries representing different regions. Consequently, the present document also collates and shares information on the main challenges which these regions, with their different cultures, religions, social backgrounds and levels of economic welfare, are facing.

This report was written after the completion of the all preparatory meetings. Summarized documents of the *Around Turkey* meetings are given in Annex IV. Substantial contribution to both the thematic heading and political process of the 5 th World Water Forum with the intention of bridging solutions the dividing challenges was aimed to be established. For this purpose, the outcomes of these *In* & *Around Turkey* meetings were extracted and harmonized under the main themes of the Forum to best fit the aims of this great occasion that is repeated once every three years.

The common and individual problems on water issues are regarded as divides and the probable solutions are considered as bridges. The outcomes and the messages derived in the preparatory meetings are the key elements of this document. Moreover, bridging the divides section is written by synthesising the overall extracted information reached from the Meetings. The document relies on the outputs of the referred meetings.

The common water problems encountered *In & Around Turkey* may be listed as climate change, drought, floods, migration, energy, sanitation, irrigation, water scarcity, public awareness and participation, finance, lack of institutional cooperation and collaboration, and legal frameworks. The importance of each of these weaknesses varies from country to country within the sub-region. This suggests that collaborative efforts could lead to the

minimization of certain problems. Similarly, joint research projects may be initiated to overcome the problems. Such activities may then be regarded as the best achievable bridges. Examples might include integrated water resources management, early warning systems, risk and disaster management, data networks, new technologies - including best available technologies - and pollution prevention practices.

The messages achieved and referred will hopefully be discussed in the Regional Meeting that will be held in the 5 th World Water Forum, and the elaborated messages will contribute to figuration of the post Forum process.

ANNE X 1

Some of the thematic questions held during the *In & Around Turkey* meetings

Themes	Question(s)
Theme 1: Global Change and Risk Management	➢ Water is life. If there is a climate change, what measures should be taken for water shortage? ➢ What is the current state of knowledge and what actions and tools are needed to enable a better understanding, assessment, and prioritization of the impacts of climate change on the water cycle and water services? ➢ What is needed to make climate information more relevant for successful adaptation by policy makers, local governments and managers of water resources and water services?
Theme 2: Advancing Human Development and the Millennium Development Goals	➢ What could be the individual and institutional precautions in order to avoid pollution of water resources and to reduce water consumption? ➢ What could be done to increase efficiency in management of treatment plants and to use appropriate treatment technologies? ➢ What measures are necessary to obtain adequate and consistent monitoring for progress on the Millennium Development Goals (MDGs) and how to use these for national policies to improve services? ➢ What elements are required to expedite sustainable access to water and sanitation services and how can local entrepreneurs, financing institutions and operator partnerships contribute?
Theme 3: Managing and Protecting Water Resources and their Supply Systems to Meet Human and Environmental Needs	➢ What strategies should be followed for the joint tenancy of underground and aboveground waters in order to prevent irrigation and drainage problems? ➢ In the context of transboundary waters flood management, how can managers of water resources and stakeholder groups adapt with the impacts of climate change at short- and long-terms? ➢ In the framework of economic, social and environmental benefits how can adaptation works are carried out among managers of water resources, user groups and stakeholders for the protection of water resources?
Theme 4: Governance and Management	➢ How did the assignment of irrigation and drainage administration rights to irrigation associations and local governments affect the stakeholders? ➢ Decentralisation of water governance: How to strengthen government and local water management authorities? ➢ Public/private roles in water services: An artificial divide what are the experiences and the emerging trends involving the private sector in urban and rural areas? ➢ What challenges and opportunities does it generate?
Theme 5: Finance	➢ How can we carry out environmental actions and economic development harmoniously? ➢ The capacity to lend is there, the capacity to borrow is not: what can the different stakeholders do to increase the borrowing capacity of service providers? ➢ Could private water providers be associated with the development of public water services? How and to what extent?
Theme 6: Education, Knowledge and Capacity Development	➢ What studies have been carried out on historical hydraulic structures and what can be done today? ➢ How can we follow and put into practice the technological developments in planning water structures in order to ensure water security and minimize the impacts of possible future draughts and floods? ➢ Effect of modern irrigation techniques on growth and energy? ➢ How should strategic investments be designed and funded by government? ➢ Incentives and Subsidies? ➢ Who should pay for installing network in irrigated systems?

ANNE X 2

List of the 5th World Water Forum Themes and Topics

Topics	Themes	Issues	Overarching Theme
Topic 1.1 Adapting to Climate Change	Theme 1 Global Changes & Risk Management	Providing Water for Sustainable Development	Bridging Divides for Water
Topic 1.2 Water-related Migration, Changing Land Uses and Human Settlements and Water			
Topic 1.3 Managing Disasters			
Topic 2.1 Ensuring Water, Sanitation and Hygiene for All	Theme 2 Advancing Human Development and the MDGs		
Topic 2.2 Water for Energy, Energy for Water			
Topic 2.3 Water and Food for Ending Poverty and Hunger			
Topic 2.4 Multiple Use and Functions of Water Services			
Topic 3.1 Basin Management and Transboundary Cooperation	Theme 3 Managing and Protecting Water Resources and their Supply Systems to Meet Human and Environmental Needs		
Topic 3.2 Ensuring Adequate Water Resources and Storage Infrastructure to Meet Agricultural, Energy and Urban Needs			
Topic 3.3 Preserving Natural Ecosystems			
Topic 3.4 Managing and Protecting Surface, Ground, Soil and Rainwater			
Topic 4.1 Implementing the Right to Water and Sanitation for Improved Access	Theme 4 Governance and Management	Enabling Mechanisms for Development	
Topic 4.2 Improving Performance Through Regulatory Approaches			
Topic 4.3 Ethics, Transparency, and Empowerment of Stakeholders			
Topic 4.4 Optimizing Public and Private Roles in Water Services	Theme 5 Finance		
Topic 5. 1 Sustainable Financing for the Water Sector			
Topic 5.2 Pricing Strategies as a Tool for a Sustainable Water Sector			
Topic 5.3 Pro-Poor Financing Policies and Strategies			
Topic 6.1 Education, Knowledge and Capacity Development Strategies	Theme 6 Education, Knowledge and Capacity Development		
Topic 6.2 Water Science and Technology: Appropriate and Innovative Solutions for the 21st Century to Address the Needs of Society			
Topic 6.3 Using the Assets of Professional Associat ions and Networks to Achieve the Millennium Development Goals			
Topic 6.4 Data for All			
Topic 6.5 Water and Culture			

ANNE X 3

Information on the regional preparatory meetings *In Turkey*

The topic, date and venue of the meeting	The name of the proceeding	Web site of the meeting
River Basin Management,	International Congress River Basin Management Volume 1 and 2	http://www.dsi.gov.tr/english/nehir_havza_e.htm
Snow Hydrology, March 27-28, 2008,	Snow Hydrology Proceeding Book	http://www.dsi.gov.tr/duyuru/su_forumu_dosya/karhidrolojisi_erzurum/default.html
Irrigation/Drainage, April 10-11, 2008,	Irrigation and Drainage Proceeding Book	http://www.dsi.gov.tr/su_forumu_duyuru.htm
Thermal and Mineral Waters, April 24-25, 2008,	Thermal and Mineral Waters Proceeding Book	http://www.termalkonferans.aku.edu.tr/index.htm
Water Management/ Drought, May 15-16, 2008, Ankara	Water Management and Drought Proceeding Book	http://www.dsi.gov.tr/duyuru/su_forumu_dosya/kuraklik_su_yonetimi/index.htm
Karstic Hydrology, May 22-23, 2008,	Karstic Hydrology Proceeding Book	http://www.dsi.gov.tr/su_forumu_duyuru.htm
Irrigation/Salinity, June 12-13, 2008,	Irrigation and Salinity Proceeding Book	http://www.sulama-tuzlanma.org/index.html
Floods, June 19-20, 2008,	Floods Proceeding Book	http://www.dsi.gov.tr/duyuru/su_forumu_dosya/Taşkın%20Konferansı%20Edirne%20(19%20-%2020%20Haziran%202008)/index.html
River Basin Pollution, June 26-27, 2008,	River Basin Pollution Proceeding Book	http://www.dsi.gov.tr/duyuru/su_forumu_dosya/havza_kirliligi/index.htm

The topic, date and venue of the meeting	The name of the proceeding	Web site of the meeting
Historical Water Structures, June 26-27, 2008, İzmir	Historical Water Structures Proceeding Book	http://www.dsi.gov.tr/duyuru/su_forumu_dosya/havza_kirliligi/index.htm
Wetlands, July 10-11, 2008,	Wetlands Proceeding Book	http://sulakalanlar.erciyes.edu.tr/
Floods/ Inundation/ Landslides, July 24-25, 2008, Samsun	Floods/ Inundation/ Landslides Proceeding Book	http://www.dsi.gov.tr/su_forumu_duyuru.htm
Inundation/ Landslides/ Protection of River Beds, August 07-08, 2008, Trabzon	Inundation/ Landslides/ Protection of River Beds Proceeding Book	http://www.dsi.gov.tr/su_forumu_duyuru.htm
Lake Hydrology, August 21-22, 2008, Van	Lake Hydrology Proceeding Book	http://www.dsi.gov.tr/duyuru/van_konferans/index.htm
Water Usage/ Treatment/ Re-use, September 03-05, 2008,	Water Usage/ Treatment/ Re-use Proceeding Book	http://www.dsi.gov.tr/bolge/dsi1/bursa_konferans/index.html
Groundwater/ Drought, September 11-12, 2008, Konya	Groundwater and Drought Proceeding Book	http://www.dsi.gov.tr/bolge/dsi4/konferans/index.htm
Water and Energy, September 25-26, 2008, Artvin	Water and Energy Proceeding Book	http://www.dsi.gov.tr/bolge/dsi26/Konferans/index.html
3rd National Isotope Techniques on Hydrology October 13-17, 2008,	3rd National Isotope Techniques on Hydrology	www.dsi.gov.tr

ANNEX 4

Summarized documents of the *Around Turkey* meetings

5th WORLD WATER FORUM REGIONAL PROCESS SUB-REGION of "IN&ARO UND TURKEY" 26-27 February 2008 Amman, JORDAN

"WATER MANAGEMENT STRATEGIES AND PRACTICES IN ARID AND SEMI-ARID REGIONS"

FINAL DOCUMENT

The First Regional Meeting of the 5 th World Water Forum took place in Amman on 26-27 February 2008, with the participation of approximately 150 persons from 19 countries. Jordanian, Turkish, Israeli and Kuwaiti Ministers were present at the meeting hosted by the Jordanian Ministry of Water and Irrigation and the Turkish Ministry of Environment and Forestry. Presentations were made by the Arab Water Council, Egypt, Iraq, Israel, Jordan, Kuwait, Palestine, Tunisia, the League of Arab States, World Water Council and Turkey. The roundtable meetings among the Counties of this arid and semi-arid region, sharing similar problems, were very fruitful and gave informative results about the water management strategies. Many interesting ideas have emerged and comments have been made during the roundtable discussions.

The major points of the discussions of this meeting are as follows:

Theme 1: Adaptation of Water Management to the Climate Change

Scientific tools fitting to the specificities of the region should be developed and modified in order to evaluate the effects of the climate change and to establish scenarios to mitigate its effects. The creation of a network in the region is necessary in order to share water and climate related data with a view to providing input for scientific studies to give guidance to the decision makers.

Theme 2: Financing

The autonomy of water agencies should be ensured in order to increase their credibility to benefit from the existing surplus money for credit purposes in the global financing institutions with a view to funding water infrastructure and water sectors. A tailor made lending system needs to be studied and tested. Therefore the private sector should be introduced both to debt and equity side. Privatization without any regulation on water management has failed in some cases in the developing countries. "Public Private Partnership" is a mutually agreed solution in this respect. Financially high rate of return projects such as non revenue should be given priority.

Theme 3: Availability of Water Resources

Political, financial, technical and capacity constraints ought to be overcome in order to ensure the availability of water resources in the region by good will, sustainable and equitable cooperation, joint projects and benefit sharing among countries, wherever possible, as well as developing and applying new technologies. The "Right to Water" is an issue to be elaborated more in the international fora including the 5 th World Water Forum.

Technology transfer and capacity building is an important issue for the region.

Theme 4: Institutional Arrangements, Optimizing Public and Private Roles in Water Services

Public Private Partnership seems a more convenient model than privatization for optimizing public and private roles in water services.

The governments should continue to exercise their authority on policy making and administrative and legislative work, whereas the responsibility of water management should be left to the local authorities, unions and cooperatives. Furthermore, good governance and international practices ought to be promoted.
Failure and success stories and lessons learned should be presented as case studies during the 5th World Water Forum aiming to establish a comprehensive database.

Theme 5: Urban Water and Sanitation

There is a considerable difference between water and sanitation services in rural and urban areas in the region. To remedy this, privatization appears as a solution at the first glance, however financing stays as the main challenge. In using treated wastewater reuse for artificial recharge should be done.

Theme 6: Modern Irrigation Techniques

Measures should be taken in order to increase the awareness of the farmers on the modern and more efficient irrigation systems. Pilot projects ought to be developed and demonstrations made in order to train farmers.

Public Private Partnership could be promoted in the implementation of irrigation projects by convincing decision makers to practice this model in their investments. Capacity building at the level of end users should be considered through farm demonstrations, pilot projects and workshops.

5th WORLD WATER FORUM REGIONAL PROCESS SUB-REGION of "IN&AROUND TURKEY" 16-17 April 2008 Sarajevo, BOSNIA and HERZEGOVINA

"MANAGING AND PROTECTING WATER RESOURCES AND THEIR SUPPLY SYSTEMS TO MEET HUMAN AND ENVIRONMENTAL NEEDS"

FINAL DOCUMENT

The Second Regional Preparatory Meeting of the 5th World Water Forum took place in Sarajevo on 16-17 April 2008, with the participation of more than 150 people from 6 countries. The meeting was hosted by the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina and the Ministry of Environment and Forestry of Turkey. Ministers from Bosnia and Herzegovina and Turkey attended to the meeting. Presentations were made by Bosnia and Herzegovina, Croatia, Montenegro, Romania, Serbia and Turkey. Roundtable meetings followed by many experts from the countries of the region sharing similar problems were fruitful and provided guidance for managing and protecting water resources to meet human and environmental needs. Many interesting ideas and comments have emerged in this context. In the closing session, the president of World Water Council participated.

The major points raised in this regional meeting are as follows:

Theme 1: Ensuring adequate water resources and storage infrastructure to meet agricultural, energy and urban needs

Financial resources are needed in order to realize the existing and future plans and programs for drinking water supply, wastewater collection and treatment, reuse and agricultural needs.

The countries of the region are either the member states or the candidate and potential candidate countries of the EU. Therefore, harmonization and gradual implementation of the water related EU acquis is very important. The Water Framework

Directive provides an adequate and exemplary legal framework for sustainable water management.

Theme 2: Preserving Natural Ecosystem

In order to meet the human needs and ecosystem requirements, preparation of land usage plans is one of the most important factors effecting the allocation of water resources. Furthermore, water demand management is crucial for all uses.
The amount of water necessary for domestic, agricultural and industrial use could be determined reasonably. However, it is hard to determine adequate ecosystem water requirements. Ensuring the quality of water necessary for the conservation of ecosystems is also important.

The amount and the quality of water for ecosystems must be satisfied on site. Ecosystem components should be identified in order to determine properly the amount and the quality of water required for the functioning of ecosystem.

Theme 3: Managing and protecting surface, ground and rainwater

Sanitation and wastewater treatment are important to improve the quality of life.

To save water, we should emphasize research on the recycling of wastewater. Insufficiently maintained water distribution systems and illegal water utilization are the two important barriers against water saving. Moreover, industries must be encouraged to use treated wastewater instead of using ground and other water resources.

We need to have strong legal framework for water management. However, laws and legislations will not be enough itself, monitoring and enforcement by the relevant authorities are needed. EU standards could help to address water related problems. Integrated river basin management concept should be utilized to manage water resources in a sustainable manner.

In order to provide adequate water services and make necessary investments, full cost recovery financing systems are essential in principle. In water management, in addition to existing finance models, the PPP (Public Private Partnership) is worth consideration.

Awareness of the public should be raised about the importance of water, the real meaning of the term "right to water", the costs of services and the individual responsibilities.

5th WORLD WATER FORUM REGIONAL PROCESS SUB-REGION of "IN&AROUND TURKEY" 28-29 May 2008 Bishkek, KYRGYZSTAN

"CLIMATE CHANGE, WATER RESOURCES MANAGEMENT, GOVERNANCE AND CAPACITY BUILDING ISSUES IN CENTRAL ASIA"

FINAL DOCUMENT

The Third Regional Preparatory Meeting of the 5th World Water Forum took place in Bishkek on 28-29 May 2008, with the participation of more than 200 people from 13 countries. The meeting was hosted by the Ministry of Agriculture, Water Management and Processing Industry of Kyrgyzstan, the Ministry of Environment and Forestry of Turkey, the Interstate Coordination Water Commission of Central Asia and the Global Water Partnership Central Asia and Caucasus. Ministers from Kyrgyzstan, Turkey, Tajikistan and Turkmenistan attended to the meeting. Presentations were made by Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Turkey, as well as by the representatives of the ICWC, EC IFAS, and regional offices of SDC, IWMI and ADB. Roundtable meetings followed by many experts from the countries of the region sharing similar problems were fruitful and provided guidance for managing and protection of water resources to meet human and environmental needs. Many interesting ideas and comments have emerged in this context.

The major points raised in this regional meeting are as follows:

Theme 1: Climate change effect on water resources in Central Asia

Climate change, population growth, industrialization, urbanization and deforestation create huge stress on the water resources of the region.

Glacier melting in the mountainous areas due to the global warming is resulting in floods in the rivers and lakes. On the other hand, glacier melting has supported until now proper additional

water resources in rivers, but reducing of volume of glaciers cause expectation that in next 20 years flow of Amudarya and partly some tributaries of Syrdarya and Zarafshan rivers can fail on 25-30 per cent, that will present big challenge to the region.

Understanding the effects of the climate change is central for developing regional and national adaptation strategies. Water storage and integrated water management are important elements in that respect. CO_2 emissions should be decreased by using renewable energies, hydro-energy in particular. Re-use of the waste water and utilization of the modern irrigation techniques are essential for water saving. Furthermore, public awareness should be created on the adaptation strategies.
Hydro-meteorological data and information should be collected regularly. Observation and measurement networks should be improved.
Regional solutions are needed for addressing the regional problems such as the desiccation of the Aral Lake.

Theme 2: Basin management and transboundary cooperation

The region is relatively rich in water resources, but there are many transboundary rivers. However, as it is expected that water stress in the region will increase gradually due to the negative effects of the climate change and pollution, cross-border cooperation is essential in order to address water problems of the region. Main focus is on the access to clean drinking water, irrigation for food security and energy generation.

Transboundary dialogue and cooperation in the region for the last 16 years has permitted to avoid any serious conflict for water delivery to different states and zones, even in previous water scarce and flooding years. Nevertheless, the existing cooperation among the countries of the region is not sufficient and must be improved. Although political will generally exists, the lack of understanding and confidence at the technical level is the main barrier to enhance cooperation. Regional program of consensus building dialogues at different levels could be developed so as to merge different views and positions. Exchange of reliable data and information is crucial. Furthermore, international mechanisms should work coherently to strengthen and advance transboundary cooperation.

Cross-sectoral interests of hydropower, irrigation and environment requires strengthening of legal and institutional framework of cooperation, same as use of financial tools that would account of sharing benefit, expenses and compensation of damage. This calls for comprehensive basin development plans, which need to be developed with stronger participation of all riparian countries and should be based on IWRM principles. Promotion of regional and sector dialogues oriented specifically towards long-term development of the region as a whole and stronger adherence to agreements by member countries is a must in order to merge different sectoral and country priorities on water use with the interest of society and nature.

The Chu-Talas experience can be taken into account particularly in small transboundary rivers. Inter-national Commissions should be established by the riparian states in order to manage transboundary water resources in an equitable and sustainable manner. Integrated water management plans could be developed at the basin level. However, good management of water resources at the national level is central at first. All stakeholders should be included in this process and bottom-up approach need to be followed.

Also, the discussions reflected that there is a need for a reliable system of data capturing, information sharing and training based on successfully implemented regional projects improving water management with IWRM, SCADA systems, etc.
It was suggested that "strengthening of international water law" should be a subject of discussion on the 5th World Water Forum.

Theme 3: Water resources governance (organizational aspects of efficient water management)

Water resources management and governance should be reformed in the region. Content and phases of the reform, from the decentralization point of view in particular, is as follows;

- Transboundary level (Aral Sea basin, agreements, strengthening of organizations on regional/basin level, ecosystem demands, economical tools – cost and benefits sharing, information exchange, water demand and limitation)
- National level
- Basin level
- System level
- Water users' association level

Decentralization of water resources management in line with the economic reforms, mostly in agriculture sector, requires the tools and instruments for all inclusive (states, sectors and stakeholders) and good governance such as;

- Institutions
- Legal and regulatory framework (development and harmonization)
- Economic tools (what is state share and what are the boundaries of responsibility, financial mechanisms – tariffs,

subsidies, privilege loans, incentives for water saving and resources protection)
- Technical and technological aspects (hydrometrics, automation, water allocation tools)
- Environmental needs (pollution control, ecological releases, water protection zones)
- Capacity building (equipment, training, including study tours)

Integrated water resources management is an important concept for bridging water users (sectors, states, downstream-upstream), water providers (states, decision makers, sectors) and stakeholders.

Theme 4: Capacity building and education

Training of the trainers is crucial in the region. Furthermore, education of the technical people as well as the women and children is central. Integrated training programs could be developed at the regional level.

Joint and reliable hydraulic and hydrological data bases should be established. Information exchange on the standards ought to be ensured. Technological innovations should be followed regularly. Partnerships can be developed for capacity building. New models and techniques should be applied in order to utilize water resources in an equitable way.

Strengthening regional cooperation, particularly in the Aral Sea Basin, could include the following;

- Institutional and legal aspects
- Training activities
- Information systems and data base
- Integrated water resources management
- Introduction of the automation systems
- Modelling tools for decision support systems

Furthermore, public awareness and concern on water issues should be created. NGOs involvement and media attraction are essential to this end.

5th WORLD WATER FORUM REGIONAL PROCESS SUB-REGION of "IN&AROUND TURKEY" 03-04 JULY 2008 SKOPJE, MACEDONIA

"WATER ISSUES IN THE EASTERN EUROPE: IMPACT OF CLIMATE CHANGE, VULNERABILITY ASSESSMENTS AND ADAPTATION MEASURES"

FINAL DOCUMENT

The Fourth Regional Preparatory Meeting of the 5th World Water Forum took place in Skopje, Former Yugoslav Republic of Macedonia on 03-04 July 2008, with the participation of more than 100 experts from 5 countries. The meeting was hosted by the Ministry of Agriculture, Forestry and Water Supply of Macedonia and the Ministry of Environment and Forestry of Turkey. Ministers from Macedonia, Albania and Turkey attended to the meeting. Presentations were made by Albania, Czech Republic, Slovenia, Macedonia and Turkey. Roundtable meetings, followed by many experts from the countries of the region sharing similar problems were fruitful and provided guidance on the water issues in the Central and Eastern Europe. Many interesting ideas and comments have emerged in this context. The major points raised in this regional meeting are as follows:

Theme 1: Climate change effect on water resources in Eastern Europe

Good transboundary river basin management requires participation of all riparian countries. It also helps to protect from floods, droughts and erosion, so that increase economic and living standards, decrease life and property losses and achieve better water pollution control. Good water quality and sufficient supply of water should be the ultimate objective of the policy makers in order the decrease health risks, develop tourism and recreation activities and ensure well functioning of ecosystems.
Integrated models (including climate and hydrology) should be developed and operated to represent and capture climate change conditions at country and interstate levels. Different climate change scenarios with regional climate models must be

formed to reflect different levels of effects (high, medium and low). These scenarios must be supported by proper weather observations and data base. Coordination and cooperation amongst state institutions and universities should be enhanced. Since re-networking of measurement and observation stations is costly, topologically similar pilot regions can be used and their results can be transferred to the ungauged parts of the basins.
There is a clear need for establishment of climate change specific measurement and observation systems. There also exists a need for additional information on the actual human impacts (inappropriate river channel maintenance, land-use changes within the river basin etc.) versus climate change impacts to the increased frequency of floods.

Theme 2: Migration and changing land-uses, human settlements and water

The reason for the migration and changing land-uses, human settlements and water is mostly underdevelopment and improper infrastructure in rural areas.

Drought is the biggest water problem and one of the driving forces for migration. Moreover, the supply of water is not enough for all water-related purposes mainly due to the lack of hydraulic structures. Therefore, not only low income and insufficient food supply, but also lack of water is the reason for migration. Economic development, especially equitable income distribution in the whole territory of a country, is also important.

The available land-use maps need to be further developed. Relevant databases should be improved in order to facilitate decision making.

For land-use and water policies, it is important to define different political and professional levels in decision making processes. Even though policies are well formulated; they can not always be fully implemented, especially in transition countries, due to the lack of capacity and financial resources.

Climate change will adversely affect water availability and land-use and as a result of this poor rural population would suffer from decreased agricultural production unless proper water and land management is ensured. This would also be a possible driving force for migration.

Assessment of water demand related to climate change is needed. There must be coordination between land-use and water policy makers.

Theme 3: Mitigating disasters

Nowadays, in addition to the effects of rapidly expanding human activities leading to water contamination and pollution, the climate change causes serious consequences such as heavy rainfalls, erosion, wildfires, desertification, more frequent droughts and floods in the region. Therefore, national governments of the region, taking into account their specific circumstances, should make their best efforts to minimize possible adverse effects of the water-related disasters by all mitigation activities, integrating wisely structural and non-structural measures.

The following disaster mitigation measures in general can be taken to reduce the negative effects on humans:

- Shift from state scale and reactive approach (emergency/ crises management) to a regional scale and pro-active approach (basin management, monitoring, forecasting, contingency plans).
- Raise the awareness of the need for disaster mitigation
- Mobilize support through partnerships
- Expand disaster mitigation activities within societies
- Advocate legislation and government actions
- Encourage and support efforts to incorporate disaster mitigation into community decision making.

As a general statement for all the themes discussed, water master plans of the countries in the region should be updated and further developed.

5th WORLD WATER FORUM REGIONAL PROCESS SUB-REGION of "IN&AROUND TURKEY" 9-12 October 2008 Lefkosa, CYPRUS

"REGIONAL MEETING ON WATER IN THE MEDITERRANEAN BASIN"

FINAL DOCUMENT

The Fifth Regional Preparatory Meeting of the 5th World Water Forum took place in Nicosia on 09-12 October 2008, with the participation of more than 150 people from 44 countries. The meeting was hosted by the Near East University and the General Directorate of State Hydraulic Works of Turkey. Ministers from the Turkish Republic of Northern Cyprus attended to the meeting. Presentations were made by several scientists and experts from different countries. Roundtable meetings followed by many experts from the countries of the Mediterranean region and some others sharing similar problems were fruitful and provided guidance for water issues in the region. Many interesting ideas and comments have emerged in this context.

The major points raised in this regional meeting are as follows:

Theme 1: Climate Change and the Mediterranean Basin

Climate change is a global issue which pertains both poor and rich countries. Whilst the rich countries are releasing substantial part of the greenhouse gases, emissions of the developing countries are ever-increasing as they are demonstrating rapid economic growth.

The effects of climate change speed up groundwater exploitation so that the drop of water- table in aquifers are likely.
Climate change mitigation and adaptation measures for surface-water and ground-water resources management are essential.
Water availability in transboundary river basins is also affected by the climate change and is a subject of transboundary cooperation.

A common data base which includes all sorts of data related to water quality and quantity should be set up and scientists and experts, who have interest, should have a direct and free access to it. Moreover, interpretation of the water related data is as important as their collection.

Statistical models for the reliability of hydrological cycle models together with the climate models should be utilized.
Groundwater reservoirs will play an important role by means of storing of flood water to be used during dry periods.
Quality and quantity of fresh water flowing to the marine environment is decreasing significantly causing adverse effects on coastal and marine ecosystems.

Meteorological models should be used to evaluate uncertainties. There is also a need for communication on the limits of and possible errors created by such models among all users that have different expertise (e.g. climatologists, hydrologists, water managers, and agricultural/social/economical experts).
Sectoral policies and plans ought to be revised or developed incorporating possible effects of the climate change.

Important aspects with regard to the water are climate change are vulnerability, mitigation and adaptation.

Theme 2: Water and Infrastructure in the Mediterranean Basin

New infrastructure and networks should be established and the materials to be used in water structures should be durable and strong enough to cope with natural disasters. The maintenance and viability of networks has to be taken into consideration within long term plans.

Water treatment technologies are available for more than two centuries and also developing gradually. The present technologies, which can not cope with removal of hazardous waste should be developed to ensure adequate treatment to have good quality of water. Chemicals contamination in water is an important problem to be addressed.

Governments should control water consumption by creating public awareness on water scarcity and following appropriate pricing policies. Monitoring and control systems for suspended solid, COD, BOD etc. are not enough in some cases to protect water resources and the environment.

Intense and extreme precipitation is a concern in urban areas in particular. However, storm water could be considered as a potential water resource. It should be collected in urban areas and diverted to rivers or lakes. Moreover, waste-water can also be used for supplying fresh water. In some areas or agglomerations where

collection and treatment infrastructure exist, reuse of sewage water is more economic to reuse and should be considered prior to rain and storm water harvesting. However, in the other areas, the situation would be the other way around.

Open channel irrigation systems increase consumption as they allow high evaporation. Therefore, closed conduit systems should be for irrigation purposes. Moreover, open systems should be replaced with the closed systems to reduce loss of water by other means. The use of treated wastewater in irrigation could also be an option, but it is complicated since its chemical content can be high. The utilization of treated wastewater for domestic use needs advanced treatment technologies.
Sewage sludge is a kind of biomass which can be used for energy production. It has also a fertilizing value.
Water education and understanding of IWRM are important. Similar examples of the region should be followed and best practices and experiences ought to be shared.
Water infrastructure also covers education (knowledge transfer), monitoring and inspection items.
Main points of the roundtable:

- Water management usually does not account for ecosystem
- Sustainable pricing of water to ensure future supplies.
- Irrigation technologies for water saving.
- Increasing public awareness
- Water stream tolerant crops should be preferred in water scarcity areas
- Rainwater harvesting at household level for domestic purposes
- Ground water recharging in catchment areas
- Water education
- Just use of water for all purposes, domestic, agricultural and industrial.

Theme 3: Integrated Water Resources Management in the Mediterranean Basin

For the integrated water resources management; new and better technologies/information, common understanding and compromise among water users and sectors, re-assessment of available water resources, better financing, appropriate institutional structure and legislative framework for water management, better water supply and demand management, involvement of public, stakeholders and NGOs in decision making and ethics and social responsibility aspects are essential.
Conjunctive use of surface and groundwater should be optimized.
Water pricing is a must to ensure efficiency. Water also has a social value. The amount of water used for domestic, agricultural and industrial purposes as well as the water quality has influence on water pricing. Political and legislative issues with respect to the effect of environmental/ecological issues on water utilization should be considered.

The value, cost and price of water within the framework of changing climate, land-use changes, population growth and migration from rural to urban ought to be taken into account.
Tackling with the extreme water events, namely floods and droughts, is one of the central aspects of the IWRM. Emergency preparedness plans and early warning systems should be put in place for the prevention and mitigation measures.

Theme 4: Innovative Solutions for the Water Problems in the Mediterranean Basin

Education on the conservation and re-use of water should be initiated at the kindergarden level and should be continued till the university. Children should be introduced to the basic information on the concepts of conservation and reuse of water at early ages. Secondary school education should also include experiments, site visits related to the water issues.

The university students and professors should be encouraged to work on the solutions of more complex water problems. At the graduate and expert level research, novel methods of water conservation and reuse, optimization of available resources and resource creation should be encouraged by specific programs.
Education on water issues should be made part of the community education through dedicated workshops and cultural events that are specifically defined for the different cultures and religious denominations.

Training modules and workshops, which are based on best practice modules, on different aspects of water issues should be organized. The emphasis should be given the need for cross-expertise practices for improved and more efficient solutions.
Workshops among water providers should be organized in each community to discuss the optimum combination of state of the art solutions.

Legislators should work closer with experts to define regulations in order to achieve increased level of performance through the application of state of the art solutions. Worldwide experience application could be adapted to the local level. Politicians should welcome 'public-private sector interaction' in order to facilitate the financing of the improvements in the water sector.

Enhancing communication between technical people and politicians should be strengthened in the region.

5th WORLD WATER FORUM REGIONAL PROCESS SUB-REGION of "IN&AROUND TURKEY" 10-11 October 2008 Kremenchug, Ukraine

"REGIONAL MEETING ON EDUCATION, KNOWLEDGE AND CAPACITY BUILDING IN WATER ISSUES"

FINAL DOCUMENT

Sub-Regional "Meeting on Education, Knowledge and Capacity Building in Water Issues" of Eastern European countries, Ukraine, Byelorussia, Moldova and Turkey, was held in Kremenchug, Ukraine, on October 10-11, 2008 at the Kremenchug Technical University. The Meeting dealt with the implementation of MDGs within the sub-region in terms of access to clean water, ensuring human rights for water and defining place of education, knowledge, youth and capacity building in the process.

Concerned about the proper implementation of MDGs in terms of right for water, access to clean water and role of education, knowledge and capacity building in the process within the Sub-region;

Having noted with grave concern that during the current ongoing transition period of Sub-regional countries it has still not been possible to address the urgent and complex problem of water issues, in particular regarding the ensuring human rights for clean water;

Reaffirming Principle 16 of the Rio Declaration on Environment and Development which states that national authorities should endeavor to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without adversely affecting international trade and investment;
Reiterating the commitment to the goals of the Johannesburg Declaration on Sustainable Development and the Plan of Implementation adopted at the World Summit on Sustainable Development in Johannesburg, South Africa, September 2002;
Committed to the principles of EU Conception on Education for Sustainable development, international movement regarding Human rights for Water and European Regional Process to the 5th World Water Forum

Taking note of necessity for ensuring participation of Sub-regional countries in the process where strong concern about the water problems and rights for water state-of the art exist along with not sufficient state of Water Technology and Science;

Define the following main problems within the Sub-Region:

- Luck of understanding of human rights for water in particular at the local level which is illustrated by number of cases of their violation;
- Weak involvement of Ukrainian youth in the process who are responsible for future water;
- Low level of water monitoring and weak public access to data base;
- Luck of effective stimulation of precautionary principles, currently all efforts are concentrated on elimination the consequences of water contamination;
- Weak using of biotechnology for water purification.

A suggestion for problem's solving:

- Encouraging youth involvement in the process including the creation of international network between Eastern European and Western and Central European Youth;
- Stimulating participation of Ukrainian youth in the preparation process toward 5th World Water Forum ;
- Attracting attention to rights for water among broad stakeholders including local governmental officials and university faculty, journalists by providing a number of training programs and broad media campaign;
- Stimulating of the broad information campaign and advisory service regarding interconnection between rights for water violation and state of human health;
- Strengthening research concerning biochemistry and biotechnology for water purification;
- Supporting efforts for improving state of water monitoring

Created the following Messages to the 5th World Water Forum :
"Youth is the best investment for Future Water"
"Full recovering of used water properties"

Call all stakeholders, public or private, international and European

institutions to actively support efforts, applying the principle of common but differentiated responsibilities, to implement solutions of the Sub-regional meeting of Eastern European countries and to deliver threats and challenges of the countries to the 5th World Water Forum participants;

Recommend that, consistent with the already expressed European and international concern regarding the region, donors, including the EU Commission and the GEF, World Bank should be encouraged in their funding priorities and budgets, enabling support for the start up and later implementation of selected aims within Sub-Region;

Recommend that a Working Group be established to develop a Programme of Action within Sub-Region, to enable concerted actions in collaboration with governments, appropriate national and international organizations, and other stakeholders, including professional and public interest organizations and industry, youth. Recommend further that this working group should start its multilateral activities without delay.

5th WORLD WATER FORUM REGIONAL PROCESS SUB-REGION of "IN&AROUND TURKEY"

REGIONAL MEETING ON BLACK SEA WATER ISSUES

08-09 NOVEMBER 2008

ISTANBUL, TURKEY

"MANAGING AND PROTECTING WATER RESOURCES AND THEIR SUPPLY SYSTEMS TO MEET HUMAN AND ENVIRONMENTAL NEEDS; FINANCING ISSUES"

FINAL DOCUMENT

As a part of the sub-region "In/*Around Turkey*", the sixth Regional Preparatory Meeting of the 5th World Water Forum took place in Istanbul, Turkey on 08-09 November 2008, with the participation of more than 100 experts from 6 countries. The meeting was jointly hosted by the Ministry of Environment and Forestry of Turkey, General State of Hydraulic Works and General Secretariat of the 5th World Water Forum. Presentations were made by the representatives from Azerbaijan Bulgaria, Moldova, Romania, Ukraine and Turkey. Roundtable meetings, followed by many experts from the countries of the region sharing similar problems were fruitful and provided guidance on the water issues in the Black Sea Region. Many interesting ideas and comments have emerged in this context.

The major points raised in this regional meeting are as follows:

Theme 1: Basin Management and Transboundary Cooperation

Joint efforts and actions based on Integrated Water Resource Management responsive to water issues in the region should be improved.

Water resource management in basin scale must be developed considering socio-economic, environmental and technical issues

altogether.
Information related to water should be shared by all stakeholders that ought to communicate and cooperate effectively.
Confidence building efforts among the countries of the region can be improved in addition to exchange of hydrological data and sharing experiences.
Joint training and technical assistance programmes and cross border projects can be developed to further regional cooperation.
As regards conservation of water resources in the region, the effects of climate change and pollution has to be taken into account.
'Reasonable and equitable' solutions must be aimed in transboundary river issues.
Another important issue is to provide people with clean and healthy water and decrease water related diseases as marked in the UN-ECE Protocol on Water and Health.

Theme 2: Ensuring Adequate Water Resources and Storage Infrastructure to Meet Agricultural, Energy and Urban Needs

In order to ensure good quality and sufficient quantity of water pouring into the Black Sea, the countries in the region should be encouraged to create a joint database and make collective projects. Collaboration among the hydro-meteorology and water institutions should be improved to achieve this. Furthermore, environmental, hydrological, geological and topographical data and information should be collected and shared in a reliable and extensive manner as much as possible.
In view of minimizing negative environmental effects of water utilization for domestic, agricultural, industrial and energy generation purposes in the river basins of the Black Sea region, integrated river basin planning and management should be ensured.

Due to the effects of the climate change, floods and droughts and rising freshwater demand, increasing the capacity of new and existing reservoirs and interbasin water transfer, when possible, can be considered.

It is needed to attach priority to technologies that will provide effective usage and sustainable planning of water resources. It should be encouraged to use latest techniques such as drip irrigation that save water by minimizing leakages and blow-outs in the water supply networks.

Municipal solid waste dump sites in the region have a significant risk on river water quality and this issue needs to be managed appropriately.

Theme 3: Preserving Natural Ecosystems

By "preservation" in this context, it is meant conservation.
In the management of water resources, with due respect to integration and sustainability, preservation of ecosystems is considered as costly. Therefore, the role of education, the socio-economic and environment dimensions are left out most of the time.

Sustainability of ecosystems needs special attention from finance and planning point of view. Thus, in order to integrate the ecological planning of land and water resources, the ecological status of the resources are needed to determine in advance.
For the integrated management, technical, economical and ecological studies should be carried out together. Ecosystems are somehow affected by all activities that take place in river basins. Special attention should be paid to the conservation, preservation and restoration of wetlands. If there is not an adequate integrated water management, it is inevitable to affect negatively the ecosystems.

During the planning process, protection of ecosystems should be considered by all sectors and water users. Therefore, all stakeholders should participate in decision-making processes.
In most countries of the region, relevant legislation is in place, but when it comes to implementation, there are big gaps.
In order to introduce the ecosystem approach, the EU Water Framework Directive could be consulted.
The two most important environmental issues related to water in the Black Sea Region are eutrophication and invasion of species in the water media

Theme 4: Managing and Protecting Surface, Ground, Rainwater and Soil

Sustainable utilization of land and water resources must be ensured. In order to protect water resources, irrigation efficiencies and water-saving measures should be improved. There is a close connection between land and water resources, therefore soil conservation and water management should be dealt with together.

Both supply and demand management should be considered together.

"Polluter pays principle" should be implemented.

Utilization and protection balance ought to be considered for the management of land and water resources. Water and land-use activities should be optimized taking into account sustainability

principles.

Implementing agricultural and land-use practices such as afforestation that increase the water retention capacity of soil would be an effective solution in the Black Sea region
As rehabilitation of polluted groundwater and soil is challenging and quite costly, precautionary measures must be implemented first where necessary. However, development of rehabilitation technologies for contaminated groundwater and soil is necessary, since this is a widespread problem in the region.
Given the meteorological and climate conditions of the region, it is essential to improve storm water management supported by meteorological and hydrological early warning systems and risk assessment maps. Storm water run-off and discharges must be taken into account when designing infrastructures.
The region is suitable for creating underground reservoirs to increase water availability and supply.

There is an urgent need to set up and update databases using new technologies such as GIS, remote sensing and modeling tools for monitoring and assessment of surface and ground water resources as well as land resources in terms of quality and quantity.

Improving awareness-raising and participation activities, and promoting education on land and water resources management, ensuring implementation of right to water and emphasizing interconnection between water quality deterioration and human health, according to the regional characteristics are important for the public at large and for the farmers in particular.

All land and water management practices should take into account the geographical characteristics of the region, specially the fact that the region is prone to land sliding which may hinder accessibility to wells, lead to instability of hydraulic structures. Moreover when combined with the meteorological conditions and human-induced activities, soil erosion comes out as a major problem in the region, so that specifically, precautionary upstream measures need to be taken into account when building dams and reservoirs to cope with siltation problems.

Finally, integrated water resources management must be applied.

Theme 5: Financing Issues

The well prepared master plans and feasibility reports play a crucial role in financing which will be helpful for defining the priority of the water projects.

Instead of going on with the financing arranged by lenders for a project specified by them, financing should be secured for the projects which were ranked high priority by investors.

Privatization programmes in water management failed in some cases because of its political nature. Therefore, Public Private Partnership (PPP) can be a mutually agreed solution.

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