

**Water, Wetlands and Climate Change
Building linkages for their integrated management
Mediterranean Roundtable Discussion
10-11 December 2002, Athens**

MINUTES

OPENING SESSION

The 2-day roundtable dialogue was opened on Tuesday December 10, 2002 by Mrs. Moraitou, Adviser to the Deputy Minister for Environment, Greece, as part of the Mediterranean Water Week. Speaking on behalf of the Deputy Minister, Mrs. Moraitou expressed the interests of Greece in assessing the impacts of global climate change and acknowledged the importance of the Mediterranean Water Week and the IUCN/GWP Roundtable.

Mr. Arab Hoballah, Deputy Co-ordinator, UNEP Mediterranean Action Plan (MAP), reminded participants that the Johannesburg Summit had recommended balanced efforts to give priority to the three pillars of sustainable development: social aspects, economic development and the environment. He highlighted the crucial role that scientific knowledge played in efforts to understand, assess and manage climate variability. In the Mediterranean, this included the need to assess the key vulnerabilities of interdependent social, economic and environment systems for different scenarios of potential climate change. He referred to the 11 case studies already undertaken in the Mediterranean region under the Global Water Partnership that showed how climate change impacts are site-specific, and noted plans for further study of the interrelations of climate change and biodiversity would be discussed within MAP shortly.

Mr. Michael Scoullou, Chairman, GWP Mediterranean, explained that the results of the Mediterranean regional discussions would subsequently be integrated with the 4 other regional dialogues, and be brought to the Third World Water Forum in Kyoto in March 2003. Participants thus had an opportunity to provide input to international approaches to this issue. He noted the growing evidence of the effects of increased climate variability in the Mediterranean region, with more frequent occurrence of damaging floods, heat waves with elevated temperatures becoming more usual, and intensified drought. He referred to the importance of wetlands as buffer zones to moderate the adverse effects of climate variability and change, and at the same time, their vulnerability to climate change - particularly when they are stressed by human activities. He noted that responses and provisions to improve the adaptive capacity of wetlands had to be cross-linked to sustainable development initiatives and strategies in other sectors, such as mass tourism and agriculture. He referred to the lack of coherence between different sector policies in various countries in the region in this regard, and the absence of a wider regional strategy to mitigate the impact of climate change on water resources and wetlands – where impacts, and some of the measures to address the key vulnerabilities were cross-regional in nature.

Mr. Jamie Skinner, Director, IUCN Centre for Mediterranean Co-operation, thanked the guest organisations for supporting and enabling the multi-stakeholder dialogue. He noted that member countries of IUCN had requested help to set up this dialogue to exchange views on how to approach climate change adaptation, both in response to growing public interest and various government commitments such as under the UNFCCC and RAMSAR Conventions. The Roundtable in response to that request, including the background country studies and thematic papers that were prepared to inform the discussions. He noted that the IUCN Centre for Mediterranean Co-operation was only established in the past year and a half. IUCN now has 150 members in the region, in addition to its governmental membership. Its purpose is to address issues that Members considered important in nature conservation, and also to cross-link these issues with resource management actions and activities in other sectors, including water resource management. In this respect, one broader goal of the Water, Wetland and Climate Change initiative was to develop a better sense of the important policy and management linkages in these three areas, and subsequently identify key follow-up activities where the progress made by countries already in tackling the issues could be monitored and shared. The agenda for the roundtable also included discussion of a framework to move forward with national processes, as the beginning of a longer process.

SESSION 1: SETTING THE FRAMEWORK AND REGIONAL CONTEXT

The first presentation entitled “Ramsar Resolution COP8: Climate Change and Wetlands – Impacts, Adaptation and Mitigation” was delivered by Mr. Spyros Kouvelis, MedWet Co-ordinator of the Ramsar Convention. He enumerated the beneficial functions of wetlands in the climate system. He noted the various activities and resource management practices today that had adverse consequences on the survival, health and beneficial functioning of wetlands, including: agricultural reclamation of wetlands; urban and industrial land use; pollution; energy development; and, water regulations. He cited wetlands restoration as a measure to increase available carbon dioxide sinks, and how wetlands perform a variety of key functions as integral components of water resources and ecological systems – that directly and indirectly influence how these systems respond to climate variability. He noted that progress in ensuring the positive contribution of wetlands in the climate system, and wetland protection efforts more broadly, was being hampered by the lack of detailed knowledge of the distribution and use of wetlands in the region. He noted moreover, that measures to enable wetlands adapt to climate change primarily relate to human interventions, and depended on each country’s human capacities.

The second presentation by Mr. Brett Orlando, Policy Adviser on climate change from IUCN Headquarters, was entitled “Water, Wetlands and Climate Change: IUCN Regional and Global Support to the UNFCCC”. This was a key presentation in defining the background context for adaptation frameworks for the region. He noted the genesis of the IUCN initiative was the emerging scientific consensus that wetlands and water resources conservation can no longer be achieved without taking climate change into account. The Mediterranean Roundtable was one of 5 meetings organised worldwide under the IUCN initiative that covered 5 different regions (Meso-America, Southern Africa, West Africa, South and Southeast Asia, and the Mediterranean). He noted that the UNFCCC (Article 4) addressed climate change on two fronts: mitigation of emissions, and adaptation to the effects. The atmospheric science community had in past been put mitigation first on the political agenda, and the Kyoto Protocol spawned by the UNFCCC process now consists of measures to reduce GHG emissions – though Kyoto is yet to be ratified. While the adaptation work was slower to develop, there is now wider acceptance of the need to accelerate efforts in this area. Along this line, the Marrakech Accords (2001), agreed on three funds related to adaptation: the Special Climate Change Fund, the Least Developed Country Fund and the Kyoto Protocol Adaptation Fund from the Global Environment Fund. He suggested that in practice a number of impediments and perceptions have to be overcome to move forward, such as: climate science is not specific enough, as yet, to define a precise line of action; climate change is not universally viewed as a priority in the water sector; and, adaptation has local effects and imposes additional costs. He suggested three policy-oriented questions as entry points for the dialogue on adaptation frameworks, strategies and measures. These were: (1) what was the role of science in providing information for policy-making on adaptation, and specifically what information did the science community need to provide policy-makers to enable them to act; (2) what was the role of government either in taking adaptation actions, or to catalyse adaptation actions by others (e.g. water users, water managers, vulnerable communities, etc); and, (3) what was the role of large dams in adaptation – looked at from all perspectives.

The third presentation by Mr. Michel Hoepffner from Medias-France/IRD was on the “Present status of knowledge of climate change regional aspects and impacts in the Mediterranean: Synopsis of a Scientific and Strategic Report to Blue Plan”. He addressed the global controversy about global climate change and how this translated to the Mediterranean region, and updated participants on the state-of-the art of climate change scientific knowledge and key results from models and their comparisons. He noted that an increase of greenhouse effect gas is a significant trend and a sea-level rise of several mm per year is acknowledged (0.14 to 0.80 m from 1990 to 2100), but that the Global Circulation Models are at present not capable of simulating the current climate variability at regional scale - nor that of future climate change with the precision that is required by water planners and managers. At the same time he noted that lessons have to be learnt from the past climate evolution on what forms of adaptation may be required and would be appropriate in different circumstances. In conclusion, he postulated that scenario analysis was one way forward to deal with the uncertainties.

Questions directed to the Panel:

The Chairman then opened the session for discussion. Among the questions, Mr. Arab Hoballah answered the question from Malta on whether there would be linkages between MAP and the Sustainable Agriculture and Food Security (SAFS) as proposed in Johannesburg. It was discussed that the policies followed will be the ones for the European Union. Mr. Michael Scoullou highlighted that the integrated approach of water management is not well understood by all sectors. The example of Doñana was presented. Dr. Ziad D. Al-Ghazawi, a participant from Jordan, remarked that Global Circulation Models are difficult to implement at regional scale

and suggested incremental scenarios offered better way to assess the impacts of climate change and promote awareness and understanding of the effects.

SESSION 2: COUNTRY BRIEFING PAPERS: PERSPECTIVES ON WATER, WETLANDS AND CLIMATE CHANGE IN SELECTED MEDITERRANEAN COUNTRIES

Presentations were then made of the eight country baseline studies prepared as a resource for the discussions. PowerPoint versions of these presentations and those for the thematic papers that were presented are available separately, along with a 2-page summary and the full country paper. The following provides summary points.

Greece

Mr. Nicos Tsiourtis, an independent consultant (formerly with the government of Cyprus) presented the country baseline study for Greece. He reviewed the present water resources situation and provided a general analysis of the policies connected with improving the capacity to adapt to current climate variability – though they had not specifically been undertaken under the climate change framework. He noted that relative to its land area, Greece has the longest coastal area in the world, and thus also faces a longer-term threat from potential sea level rise. He noted that Greece has established a Climate Change Committee, that to date, has mainly addressed the mitigation (emission reduction) aspects. Nonetheless, as part of its water resources management activities some initial adaptation steps have been taken to improve awareness. For example, one measure taken by the Ministry of Agriculture was to develop a programme to inform farmers on potential climate change effects.

France

Mr. Jean-Luc Redaud, from the Ministry of Agriculture, introduced the French report. He noted that France was facing major floods as well as a general degradation of wetlands and experienced severe droughts in south-west of France, which led to increased irrigation needs and water shortages. One study was undertaken of the potential impact of climate change in the Rhône basin. More broadly, measures that would improve adaptation are starting to occur as part of water resources management activities, where they coincide. On the institutional level, an inter-ministerial Committee on Greenhouse Effects was set up in 1992 to look a measures to mitigate climate change by reducing GHG emissions. No specifically identified adaptation measures (apart from normal water management and basin planning activities) have been taken as yet, apart from limiting water abstraction for irrigation and to compensate farmers in basins facing periodic severe droughts, but the processes are being studied. Upstream measures such as reforestation are taken to prevent floods as part of catchment management, as well as focusing on early warning systems.

Morocco

Mr. Jamal Alibou, from the CERSHE, presented the country study entitled, “Water resources management in Morocco and its adaptation to Climate Change”. He noted that the imbalance between water resources availability in the North (69% of total water availability) and South defined many of the water resources management policies and measures Morocco has adopted in past. More broadly Morocco is susceptible to many of the potential climate changes influences (lower precipitation, hotter climate) that would exacerbate current stresses such as water scarcity, soil erosion processes and water degradation. He noted that Morocco has established the High Council on Climate Change, a new State Secretary for Water, and a coordinated process for climate change response under the Prime Minister’s office. Some examples of measures adopted by the government to address the water quality aspects, that also relate to potential climate change pressures included increasing the number of wastewater plants and water resources protection standards, though they have not been systematically developed as measures for adaptation to future climate change per se, and are geared more to adjusting to current variability and water scarcity.

Tunisia

Mr. Habib Ben Boubaker presented the paper prepared by Mr. Yadh Labane, from the National Institute of Meteorology, on the situation in Tunisia. He noted that more than 94% of water resources are used for agriculture, tourism being the next largest consumer. Tunisia established a National Committee on Climate Change in 1992 in response to the UNFCCC and had recently established an inter-ministerial committee (2001) to broaden the scope of concern. He noted that a preliminary assessment of climate change vulnerability and adaptation was contained in the Initial Communication of the Tunisian Government to the UNFCCC in 2001, and that it covered a number of adaptation concerns including accelerated sea level rise (ASLR) and the vulnerable position of Tunisia agriculture, urbanization and tourism industry in this regard. He noted the absence of quantitative assessments of climate change impacts and the related uncertainties as one of the main constraints to developing more specific adaptation responses.

Following these initial four country presentations the Panel took questions. Discussion was on the following issues/questions:

- ☞ the potential risk of drought and its frequency in central France
- ☞ the merits of building dams to regulate floods versus other non-structural measures
- ☞ the 18 actions for the National Plan for Environment in Morocco for awareness raising
- ☞ the alternatives to building dams in Morocco in dry areas
- ☞ Modelling of Mediterranean of the effects of sea level rise and evaporation.
- ☞ The extent to which measures on agricultural sector exist that could be the starting point to build an adaptation strategy
- ☞ the based on wastewater reuse and desalination in the Water Master Plan in Israel.

Mr. Redaud expressed the view that irrigation development (in France) will go to northern parts and that no additional dams will be built due to the public opposition. For flood management, mountainous areas will be restored. Agriculture pollution is an increasing pressure, in addition to climate change pressure on agriculture. Mr. Alibou recognised the impact of dams on the remaining Moroccan wetlands. He noted there was no planned adaptation in the agriculture sector to climate change as yet, such as to develop alternative agriculture patterns based on other crops or technologies. Mr. Tsiourtis acknowledged the role of farmers in adaptation. Mr. Ben Boubaker recommended a focus on water use in agriculture citing that water scarcity is the main issue in many parts of the Mediterranean, worsened by climate change.

Presentation of the remaining country studies resumed.

☞ **Italy**

Mr. Lorenzo Rilasciati, presented the country baseline study for Italy. In discussing the water resource situation, he noted that 73% of water resources in Italy are withdrawn for various uses, and that recent trends show a 14% rainfall decrease in the South. Of 597 wetlands, 47 sites are now designated Ramsar areas. In 1997 Italy established an Inter-ministerial Working Group for the Implementation of the Kyoto Protocol, followed by an Inter-ministerial Committee in 2002, and a Sustainable Development Commission of the Inter-ministerial Committee for Economic Planning and the Directorate for Global Environment, International and Regional Conventions. He noted that as yet, there is no specific legal framework for adaptation, or where it is explicitly mentioned. However, there are a number of concrete adaptation measures being taken to address sea rise level, desertification, agriculture and wetlands. Italy's 2nd National Communication to the UNFCCC also provides an overall vulnerability assessment and some adaptation measures – which will be elaborated further in Italy's 3rd National Communication to the UNFCCC. These link up with the 2002 Environmental Action Strategy for Sustainable Development that focused on three priorities: conservation and replenishment of water resources, acceptable chemical quality, and sustainable water pricing. Reducing leakage in water supply systems, water consumption, reusing treated wastewater, reducing the pollution load are the current objectives. He noted, there is a need for development of new water supplies and additional legal tools.

☞ **Cyprus**

Mr. Nicos Tsiourtis presented the country paper for Cyprus. He noted that Cyprus was a small island relying on local rainfall patterns and has a comparatively extensive hydrological monitoring system in place. Records over the past 100 years indicate clearly that rainfall has been decreasing by 1 mm/year since the beginning of the century, whereas mean temperatures increased by 0.5°C. He noted that a major update of the national water resources plan in the 1980's had showed that previous water resources assessments (that were the basis for planning) had over estimated water availability by as much as 40%. As a consequence of these findings, Cyprus mounted a more aggressive programme for supply-efficiency and added non-conventional supply sources to the system including desalination, which now makes up 11% of total water supply. Cyprus has established the National Climate Change Committee to implement the UNFCCC Convention and an Ad-Hoc Drought Committee. Re-evaluating of resources, intensifying water demand-management measures, re-using domestic effluents, developing desalination, introducing new legislation are some examples of measures either being taken or being considered to improve capacity for adaptation. He noted the central importance of public awareness in promoting measures that would improve adaptation capacity both through government action and water user actions.

☞ **Turkey**

Mrs. Selmin Burak, Associate Professor of Istanbul University, Institute of Marine Sciences and Management, presented the country baseline study for Turkey. She reviewed the different climatic zones in Turkey where there were considerable differences in water availability and water-related stress - which meant that adaptation

measures needed to be tailored to specific regions of the country. In those areas of greatest water scarcity, climate change would affect the arid land by increased desertification. She noted that Turkey is an Annex 1 country to the UNFCCC, but has not yet ratified the Convention. She noted that in response to the UNFCCC as Specialised Commission on Climate Change was established in Turkey. Overall, she noted there are a limited number of incentives to promote water-efficiency in meeting agriculture needs and most water resources development activities have so far focused on the supply-side water management activities. Turkey is also a signatory to RAMSAR, with evolving policies, previous activities such as draining of wetlands for agriculture purposes have been stopped and environmental flows have been recognized.

The floor was then opened for questions and panel discussion on the three above country papers. The questions and discussions addressed the following issues:

- ☞ whether in Cyprus, the 5% allocation of water for environmental use is released even in drought year.
- ☞ Whether the increase of rainfall for Cyprus (1.0 mm/year) was from a model or from direct observation.
- ☞ what the effects of water resource availability were on agriculture patterns and other sectors such as tourism in Cyprus
- ☞ what were the main reasons a decrease of CO₂ emissions in Italy over the 1990s
- ☞ whether in Cyprus and Turkey, environmental flows affect the water requirements during drought.

Mr. Tsiourtis confirmed that the tourism activities are very important in Cyprus with 30 million visitors-nights, which increase water demand permanently. Almost 25% of domestic water consumption is used by tourism industry. The value for rainfall increase comes from measurement. In drought conditions, the allocation for environment is not ensured. Mrs. Burak explained that the flow should be secured in the riverbeds in Turkey for wetland maintenance, and there are the beginnings of environmental flow policies.

SESSION 3: CROSSCUTTING THEMATIC PAPERS

The four thematic papers were presented followed by discussion.

☞ Mediterranean Water Resources Planning and Climate Change Adaptation

Mr. Lawrence Haas, consultant to the IUCN Centre for Mediterranean Co-operation, presented this paper. He noted the evolutionary shift to integrated water resources management (IWRM), informed by Agenda 21, the Dublin Principles provided the wider conceptual framework for adaptation planning. Here also, the UNFCCC (Article 4) envisaged adaptation planning processes and plans as discrete activities initially to focus attention and mobilize awareness, public debate and consensus on measures – but he suggested they would necessarily be integrated existing water resources planning activities. He noted the region's water resources systems have been largely planned, designed, and are today managed on the basis of past hydrological conditions. And suggested that because of this, the “re-tooling” of planning procedures and tools, and the re-planning and continuous adjustment water resources systems may become a defining feature of resource planning in coming years. He noted that IPCC's 3rd Assessment Report (2001) and UNFCCC's generic guidelines for National Adaptation Programmes of Action (NAPAs-2001) provide a reference for Mediterranean adaptation planning processes. And suggested three strategic orientations for strategies and measures: (1) reducing the risk associated with hydrological variability, and secondly to extreme events; (2) closing the demand-supply gap in water resources; and, (3) balancing human sector and nature needs. The emphasis and interactive mix of measures (policy, institutional, non-structural and structural) would be determined by assessing vulnerabilities in relation to current management practice and incremental scenarios for climate change. He noted that adaptation measures that improve the performance of water resources systems in today's climate conditions, whose further delay could increase vulnerability, or lead to increased costs at a later stage, sometimes referred to as “least-regret” measures, are a sensible starting point – the low hanging fruit.

☞ National Approaches to Drought Preparation in the Mediterranean

Prof. Tayeb Ameziane El Hassani from the Agronomic and Veterinarian Institute of Hassan, Morocco, presented the “National Approaches to Drought Preparation in the Mediterranean”. He noted the different types of drought that represent different levels of hazard, risk and vulnerability. They require a set of responses that are both common, and specific to the type of drought and the context. Southern parts of the Mediterranean region are more vulnerable to drought, though basins in northern counties also experience drought cycles. The drought phenomenon and its effects are unique to each area and sometimes 6 continuous dry years can occur, for example as has occurred in Morocco historically. He noted that at present most countries have largely developed emergency response programmes for drought. However, reactive responses do not reduce vulnerability despite

the high cost involved, nor do they produce adaptation to reduce the adverse impacts on the long-term basis. Generally, there is a need to develop drought preparedness programmes and measures involving the stakeholders and have these ready to implement on the onset of drought conditions, with pre-agreed measures. He discussed the type of the institutional capacities and measures that are required, such as a National Drought Observatory that was established in Morocco. But more broadly, integrating science and policy should be the objective to improve drought management, and a key to adapting to current and future variability.

☞ **Adaptation Strategies for Improved Flood Management in the Mediterranean**

Mr. Luca Guerrieri from Italy presented a paper on “Adaptation Strategies for Improved Flood Management in the Mediterranean”. He noted the different types of floods such as slow rising floods that occur over the whole basin and flash floods with different response times require different adaptation responses. He noted that there is considerable debate about the precise effect of climate change on the intensity and frequency of extreme events, and that climate science needed to address this issue. Nevertheless, the evidence points to a trend of more economic and social damage from floods in the Mediterranean, coupled with more people and infrastructure in vulnerable areas and with precipitation events that increase erosion and runoff. The trend to more urbanisation in flood plains would increase future vulnerability – if not addressed by catchment management and land use controls in vulnerable flood plains. He suggested that response measures include the structural (traditional) and non-structural (e.g. public information and education), and that a complementary mix is needed that is context specific. Examples of recent approaches and measures to flood management were given for France, Spain and Italy, in particular with integrated river basin plans. He noted also the climate change adaptation could have beneficial effects for flood management.

☞ **Biophysical and Socio-Economic Impacts of Climate Change on Water and Wetlands in the Mediterranean**

Mr. Habib Kraiem from Tunisia presented a paper on “Biophysical and Socio-Economic Impacts of Climate Change on Water, Wetlands in the Mediterranean”. He reviewed the results of the assessments of the impact of climate change made by IPCC. He mentioned the changes in supplies of and demands for water, food, energy, and other tangible goods that are derived from these systems; the changes in opportunities for non consumptive uses of the environment for recreation and tourism; the changes in non-use values of the environment such as cultural and preservation values; the changes in incomes; the changes in loss of property and lives from extreme climate phenomena and the changes in human health.

The panel discussion covered the following questions/issues:

- Whether more flash floods are witnessed in France observed in all Mediterranean countries
- On the status of radar warning systems in France
- Whether there was bilateral cooperation on flood and drought management
- On the difference between perceptions and the actual role of dams in flood management

It was noted that in France, the scientific community cannot relate the higher occurrence of flash floods to climate change and the question was posed whether there were answers from other countries. Prof. Tayeb Ameziane El Hassani noted that a coordination mechanism for flood and drought management should be developed in each country.

SESSION 4: INTEGRATED MANAGEMENT OF WATER AND WETLANDS UNDER CLIMATE CHANGE SCENARIOS

Two Working Groups were then formed, one working in English and one in French. Discussion in the English-speaking group was chaired by Mr. Nicos Tsiourtis from Cyprus and facilitated by Mr. Brett Orlando (IUCN-Headquarters) and Mr. Lawrence Haas (IUCN-Consultant). Discussions in the French-speaking group were facilitated by Mr. Jamie Skinner (IUCN-Director of the Mediterranean Co-operation Centre), and Ms. Julie Ladel (IUCN-Consultant).

Annex A attached to these Minutes provides summary points from the discussions by each group on this theme.

In conclusion, information and measures are needed to better link water resources management and wetlands management in different hydrological conditions, such as drought, normal hydrology and floods. Those issues discussed broadly related to relieving pressure on wetlands from human activities (land use, water abstractions from rivers and aquifers, pollution) and secondly, to those measures that increase the capacity of wetland systems to autonomously adapt to increased climate variability and extremes (e.g. shifts the hydrological cycle and elevated temperatures).

SESSION 5: WAYS FROWARD ON CLIMATE CHANGE ADAPTATION STRATEGIES IN WATER RESOURCES MANAGEMENT

The same two Working Groups as above were maintained for this session. Annex B to these Minutes also provide summary points from the discussions by each group.

It was discussed that many “adaptation” measures are taken now, that are not specifically called adaptation measures. There is need to clarify what measures reinforce current water resources management practices, and those measures that are additional – that is needed to improve adaptive capacity, specifically to the incremental effects of climate change. There was also a need to identify adaptation measures in specific sectors, where the specificity would help make it clear what measures are appropriate, and where there is currently limited action. Discussion also centred on how to structure adaptation processes and improve institutional capacity for the implementation of measures identified. Here it was felt the UNFCCC provided a general framework (including institutional arrangements in the country to respond to the UNFCCC, such as Commissions, Inter-Departmental Working Groups, Panels of Experts, etc.), and under Article 4 agreement was to produce adaptation plans and measures, and show how these were integrated with other resource planning activities, and those specifically in the health and social sectors and water resources sectors, coastal systems and the environment. However, it did not fully capture the partnership concept between the government, private sector and civil society and the full engagement of water users of all types.

FINAL SESSION - WRAP-UP

The results of the dialogue will be presented for discussion at the Third World Water Forum in March 2003 in Kyoto. The Mediterranean region was described as a good example compared to other regions as it comprises rich and poor countries and countries with amply and scarce water resources. The lack of more coherent studies was highlighted. It was recommended that measures for adaptation to climate change could be included in a more natural way in national policies. Some participants proposed that efforts regarding the exchange of data on climate change impacts in the Mediterranean should not be scattered. The website of IPCC (www.ipcc.org) could be a good portal for other links in the region. The Climate Action Network was also mentioned with its regional scope on Europe. The monitoring programme of long-term impacts of the SSO named “ROSELT” (www.roselt-oss.teledetection.fr) was advertised and Medhycos developing scenarios specific to the region.

Recognising the additional pressure of climate change on water resources and wetlands management and the need for adaptation, the Chairman of the roundtable, Mr. Michael Scoullos, closed the dialogue by noting the three pillars of education and public awareness: participation, empowerment and access to justice. The 2-day roundtable organised by IUCN and GWP was then declared closed.

Annex A:

THEME 1: INTEGRATED MANAGEMENT OF WATER AND WETLANDS UNDER CLIMATE CHANGE SCENARIOS

The general question posed for the Working Groups as an entry point for discussion was “What information and what measures are needed to better link water resources management and wetlands management in different hydrological conditions, such as drought, normal hydrology and floods?”

Working Group in French Language

The French-speaking Working Group included 18 participants with governmental officers, scientists or NGO leaders (2 from Algeria, 2 from Greece, 2 from France, 5 from Morocco, 1 from Monaco and 6 from Tunisia). There was a general concern that climate change impacts such as the higher frequency of severe drought and floods should be studied more.

The topics addressed during this session were:

- ecosystems and needs
- socio-economy
- policy consistency
- coastal ecosystems and sea level interactions
- the ability to defend wetlands, and
- national dialogues

Consensus emerged that environmental rights should be introduced when dealing with allocation of water to enable ecosystem sustainability. Possible migration of animal and vegetal species from some parts of the Mediterranean to the others could happen due to climate change and their impact on the receiving ecosystems are unknown. A lack of knowledge of wetlands and ecosystems is obvious and awareness should be raised on these environmental topics. The role of scientists in explaining the stakes of wetlands conservation to planners and elected persons was acknowledged. However, it was noticed that the message brought to them are often not clear enough or focussed and this should be improved.

Other aspects include:

- ☞ There is a lack of studies and analyses on the impact of climate change on wetlands. Their economic value is hard to assess but their value as a production area is crucial. Wetlands also represent important ecotourism sites with added value. Therefore, awareness should be raised towards various targets and knowledge about these ecosystems should be promoted.
- ☞ Regarding coastal ecosystems, there is a lack of knowledge of the impacts of climate change and a transfer of know-how to protect them would be beneficial within the Mediterranean region.
- ☞ The ability of NGOs to defend wetlands should be reinforced in order to get governments to protect and maintain them, for instance with extended regulations.
- ☞ There is a lack of consistency of water resources and wetlands conservation policies within countries, between Mediterranean countries and between donor agencies, which sometimes support diverging actions.
- ☞ The national dialogues should consider the grassroots and the ideas and concerns from this group should be raised towards the decision-makers. Participation and consultation should be improved.

Further items discussed concerned the abundance and scarcity of water which is encountered in the Mediterranean region and which make it diverse. Water savings and efficiency of uses should be promoted based on an active sensitisation, financial incentives, technical progress to limit evaporation and aquifer recharge. Finally, the solution of building dams was extensively addressed and considered as a last resort. Dams are mainly used as a support to irrigation. They should be revised since their design to improve their flexibility to adapt to climate change and to the scale of events faced. They lead to an increase of evaporation and sedimentation, which should be limited as possible. Finally, a good solution consists of creating newly forested areas in water catchments. And traditional methods of storing water and combating floods should be restudied.

Working Group in the English Language

The group first discusses wider issues on improving and integrating information used in planning and management activities, before discussing the more specific information needs and measures to improve the co-ordination of wetlands and water resources management. Concerns here focused on the quality, reliability and access to information, and how information (or the lack of it) shapes opinions, and how it is applied in practice. Key groups that need to interact with a common set of information (regarding climate, water resources and wetlands), include the climate change science community, water managers, policy and decision-makers, water users, stakeholders involved in various aspects of resource management and use, and researchers from the various physical, natural and social sciences disciplines.

The discussion touched on the following aspects:

- ☞ A common definition/understanding for what constituted drought, and different levels of drought;
- ☞ An impact matrix approach to help link specific water resources management actions to the effects on wetlands for different climate variability scenarios, particularly extremes;
- ☞ Viewing the water resources-wetlands interaction in the context of wider land-water management and coastal zone management;
- ☞ linkages to agricultural were key given the sectors dominant position as a water user (surface and ground water) and in water quality (e.g. fertilizer and pesticides in runoff and groundwater infiltration);
- ☞ better information was needed to present the “case”, on the direct connection between wetland protection and adaptation, and the effects of climate change. For example, the driving forces, pressures, the impacts and responses needed to go both to opinion formation processes (e.g. general public, stakeholders and interest groups), and more precise information needed to flow to decision-making; and
- ☞ agencies in Europe have been struggling with the data issues related to water resources management: validity, reliability, comparability and accessibility.

Information Needs and Linkages

It was discussed that information requirements related to: (1) awareness building, (2) planning (involving preparation of impact and vulnerability assessments, and eventual identification of measures to address for key linkages, and (3) managing the agreed interventions (policies and physical measures) including monitoring the effectiveness and impact of the measures taken. Another dimension was a need to improve information to exchange within countries, and between countries.

Better and more accessible information was needed in a number of areas: e.g.

- ☞ on the resource base (specifically wetland trends such as area, quality, functionality and threats)
- ☞ on public infrastructure and landuse pressuring wetlands (e.g. urbanization and settlement trends)
- ☞ on how flow regulation and water quality infrastructure such as dams and water treatment plants are managed, and what flexibility is there for beneficial operational changes
- ☞ on hydrological data (all types including ground water sources)
- ☞ on administrative overlaps and jurisdictions in managing water resources-wetlands interactions
- ☞ on indicators for key thresholds (reliable and comparable)
- ☞ on human pressures - information on illegal settlements in vulnerable areas
- ☞ for deciding water allocation priorities for human sectors and wetlands (and their negotiation / determination)
- ☞ for modelling and simulation studies of impacts of climate variability on wetlands
- ☞ on the positive and negative aspects of floods on wetlands

Other site-specific data on wetlands was needed to define specific actions to safeguard wetlands functions. These include data on: pollution levels, sediment, water needs matched to the hydroperiod, ground water recharge, scenarios for assessing the impacts of climate change on specific wetlands and to link environmental flows to drought indexes, and to assess the interactive effects and critical thresholds.

Measures

Those discussed broadly related to relieving pressure on wetlands from human activities (land use, water abstractions from rivers and aquifers, pollution) and secondly, to those measures that increase the capacity of

wetland systems to autonomously adapt to increased climate variability and extremes (e.g. shifts the hydrological cycle and elevated temperatures). Representative measures included:

Improving water availability (e.g.)

- ☞ Taking pressure off competing water uses (through sector-specific demand management, reuse and wastewater, changing to less water intensive crops)
- ☞ ground water recharge measures (riparian zone)
- ☞ improving environmental flows for flow regulation structures (dams, and diversions), and

Improving water quality (e.g.)

- ☞ reducing pollution inflows to rivers
- ☞ enforcement of environmental measures

Information and measures to support decisions on wetland restoration were also seen as important.

Annex B

THEME 2: WAYS FORWARD ON CLIMATE CHANGE ADAPTATION STRATEGIES IN WATER RESOURCES MANAGEMENT

Working Group in French Language

The French-speaking Working Group proposed the following adaptive technical, institutional and financial measures to climate change:

- to encourage water savings by suitable irrigation technique (e.g. drip irrigation systems)
- to encourage the re-use of treated wastewater
- to restore mountainous areas, and to forest new areas in basins
- to select cultural species suitable for the future climatic regime
- to develop different scenarios on the future of agriculture
- to develop seasonal forecasting

- to establish an integrated water management system based on river basins (water agencies)
- to build capacity and train water users on water savings processes (for the tourism sector)

- to exempt from tax and to attribute a subsidy for the acquirement of irrigation equipment saving water
- to revise water tariff to be closer to the real cost of water
- to establish a pollution reduction fund to protect the resource
- to establish an additional tax for tourists to allocate to improved sound water management

Working Group in English Language

General discussion was that each Mediterranean country currently has many different processes that deal with different aspects of climate adaptation (directly and indirectly) including those vulnerabilities that are sector specific. For example, processes for the EU Water Framework and Environment Directives now provided a comprehensive framework that is binding on European countries, and at the same time inspirational for other Non-EU Mediterranean Countries. Adaptation thus comes on top of these - sometimes as reinforcing measures, and at other times as additional measures, or adjusting the priorities. There are also transboundary considerations where countries share rivers and aquifers, and where management (adaptation) interventions in one country would affect other countries, either directly through the hydrological linkages, or indirectly through second order effects, such as agriculture policies that shape water-use practices. The context for deciding which strategies are most appropriate is the rapidity of change, increasing complexity, and urgency - all leading to a more dynamic situation.

To promote political will for adaptation action there is need to mobilise constituencies for dialogue and partnerships, and not just narrow lobbies. One key role of government is facilitating this dialogue. To better make the case for action, it may be best to show the impacts of climate change across all sectors, not just water resources. Broadly, it is a multi-sector argument (e.g. agriculture, health, regional development, water resources, coastal resources). The use of incremental scenarios of climate change may be appropriate to address the scepticism and deal with the question of uncertainty. The example of the Jordan study was discussed in this regard (e.g. impacts and vulnerabilities related to different demand-supply gaps, or incidents of higher floods) not just the general notion that things will get worse.

Other aspects discussed included:

- adaptation is not high on political agenda, mitigation is still perceived as the primary response to climate change;
- water professionals and NGOs are ahead of political decision makers on seeing the need for adaptation;
- finance was ultimately an important consideration in selecting adaptation measures for poor countries;
- While there were common challenges, there were different between adaptation measures appropriate in the southern and northern Mediterranean areas;
- Network-based activities including the professionals and NGOs are very important in preparing for adaptation and improving the quality and nature of information on which to base policies and set priorities;
- Many adaptation measures (relieving pressure on the system, increasing flexibility to respond as events unfold) would focus on the agricultural sector, as the main water consumer

- empowerment of stakeholders was an important aspect in identifying selecting and implementing measures
- in screening adaptation measures important criteria included: (1) the effectiveness of the measures; (2) the cost of implementing; (3) the requirements for capacity building; and (4) the barriers that needed to be overcome. Also consideration of whether the measures would be required “with or without climate change”, or for different climate change scenarios.
- Elimination of some of the perverse subsidies was noted as something that most conferences cite. Nevertheless it remains real. Better definition of the opportunities (what are perverse subsidies and their effects, what are the economic and political implications of their removal, etc.) is needed. Some may be easier, and some also may be difficult in practice to implement. For example, agricultural policies that promote water intensive practices, are linked to agricultural policies in EU and internationally.

It was discussed that many “adaptation” measures are taken now, that are not specifically called adaptation measures. There is need to clarify what measures reinforce current water resources management practices, and those measures that are additional – that is needed to improve adaptive capacity, specifically to the incremental effects of climate change. There was also a need to identify adaptation measures in specific sectors, where the specificity in doing so would help make it clear what measures are appropriate, and where there is currently limited action.

For “least regret” adaptation measures

General discussion was on the distinction between short, medium and long-term measures. For least regret measures, some measures were seen as easy to put on paper, such as laws restricting building in floodplains or ground water fees linked to the volume of abstraction; however, implementation and enforcement of the measures may be more difficult and require institutional capacity - that may, or may not be present.

Least regret measures – where implementation can be accommodated more easily in many countries:

- awareness, education and capacity building
- metering water in industrial uses
- linking integrated water resources management in the basin context with integrated coastal area resource management processes
- progressive water pricing, also linked to the timing of use and hydrological conditions such as drought
- optimising reservoir operations linked to monitoring systems
- establishing environmental flow policies in the context of IWRM
- all-inclusive dams assessments (e.g. looking at operations, safety of spillways, sediment management, releases of water, and ultimately the choices between refurbishment and removal)
- some demand management measures
- total water quality approaches to integrate all water quality effects that are exacerbated by climate change and its first order impacts on the hydrological systems
- Flood zoning and land-use restriction in floodplains and riparian zones of rivers

Other measures that may be “least regret” that can be implemented in some countries more readily, but in other contexts require investment and enabling conditions:

- early warning/monitoring systems with improved real-time data on hydrological conditions in the basin
- recycled use of water
- reducing agriculture chemicals in the system
- biodiversity protection measures
- seawater use
- wastewater treatment
- forest management [considering the agro-forestry-water linkages]
- health-related measures
- regulation to address the efficiency of water supply organizations (focusing them on supply-efficiency)
- watershed management focused on climate variability pressures
- Sustainable agriculture extending to education and Perma-Culture

Adaptation processes

Discussion centered on how to structure adaptation processes and improve institutional capacity for the implementation of measures identified. Here the UNFCCC provided a general framework (including institutional arrangements in the country to respond to the UNFCCC, such as Commissions, Inter-Departmental Working Groups, Panels of Experts, etc.), and under Article 4 agreement was to produce adaptation plans and measures, and show how these were integrated with other resources planning activities, and those specifically in the health and social sectors and water resources sectors, coastal systems and the environment.

Three broader strategies moving forward with adaptation processes were discussed as:

1. Awareness, education and information programs
 - ☞ involve the key local constituencies, the various lobbyists and communications
 - ☞ include public awareness of measures and their effectiveness
 - ☞ establish the awareness and incentive for environmental actions
 - ☞ within in the country build political constituency and pressure for action.

2. Forming a National Commission on Water Resources, or mandating an appropriate existing body to oversee or coordinate activities: e.g.
 - ☞ to provide working definitions and climate change scenarios (incremental)
 - ☞ to ensure coherence in cross-sector approach to climate change adaptation
 - ☞ to ensure sector-specific measures (agencies in the sectors) are taking climate change into account in policy formulation, planning and management
 - ☞ to initiate programmes to engage/inform the public
 - ☞ to ensure the government functions effectively in role and in initiating dialogue processes (mechanisms are in place at the national level, and other levels, in sectors etc)

3. Strengthening Implementation Capacity – for measures that would improve adaptive capacity e.g.
 - ☞ harmonize actions and debate on the trade-offs of measures across-sectors
 - ☞ include risk-based assessments
 - ☞ have coherent steps taken within sectors, and ensure they are given due priority or integrated with existing management practices
 - ☞ improve enforcement, legal instruments, monitoring