

## WATER

### A KEY CHALLENGE FOR THE MEDITERRANEAN COUNTRIES

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#### I. WATER

Let me start my presentation with some shocking facts about the water situation in the Arab countries, which are already in the midst of a water crisis:

- In the 20<sup>th</sup> century, the world’s population tripled and the use of water grew sixfold.
- 1.2 billion people are without access to safe water and 2.6 billion are without basic sanitation.
- The annual total number of people dying because of unsafe water amounts to 1.8 million.
- By 2050 an additional 3 billion people will be born mostly in countries already suffering from water shortage.
- By the year 2025, a full 35% of the world population will be living under conditions of water scarcity or stress compared to about 6% in 1990.
- The Arab region is one of the driest in the world. More than 70% of the land is dry and rainfall is rare and poorly distributed. Due to climate change by the end of 21<sup>st</sup> century, Arab countries are predicted to experience an alarming 25% decrease in rainfall and a 25% increase in evaporation (“*Verdunstung*”) rates.
- With 5% of the world population, Arab countries have just 1% of worldwide freshwater resources.
- Thirteen Arab countries are among the world’s nineteen most water-scarce nations. Alarmingly the 2010 report of the Arab Forum of Environment and Development has found that Arabs will face, as early as 2015, the condition of severe water scarcity, at which the annual per capita share will be less than 500 cubic meters per capita per year; This is below one-tenth of the worlds average, currently estimated at over 6,000 cubic meters; nine Arab countries will be below 200 cubic meters, six of which below 100 cubic meter. Water scarcity is a limitation to economic development, food production, and human health and well being.
- More than 45 million people in the Arab world lack access to clean water or safe sanitation.
- High rates of economic growth, rapid growing population and climate change are expected to worsen water shortages in the region.
- Climate change has a huge impact on water resources. Water flow in the Euphrates may decrease by 30% and in the Jordan River by 80%. An average increase in temperature of 2°C may decrease the flow

in the Nile by 50%. Climate change will lead to a heightened occurrence of extreme phenomena, such as droughts or floods, increasing both their frequency and intensity. Water availability will decrease because of climate change by 10-30% in arid regions.

- There is a steadily growing demand for water to supply cities and agricultural areas, whereas water resources have remained more or less stable. New water resources are expensive to exploit. Most available water resources have been developed.
- Water use in the Arab region is dominated by agriculture. Over 85% of fresh water is used for agriculture – the world average is 70% - with more than half wasted due to unsustainable practices.
- An important percentage of available water is used poorly or insufficiently in Mediterranean countries. 1/3 of the water produced and distributed to provide drinking water for cities and villages is lost along the networks through misuse.
- The Arab countries have over 50% of the world's desalination (*oder "sea water salt removal"*) capacity. At the projected rate of annual increases, current desalination capacity will be doubled by 2016, using expensive polluting technologies. The discharge (*"Absetzung"*) from the desalination stations contributes heavily to increase salinity and higher temperatures of seawater in coastal areas.
- To meet increasing demands for domestic, agricultural, and industrial water uses, underground aquifers are being pumped at rates exceeding their replenishment limits. For example, the average annual abstraction from groundwater in all sub-basins in Jordan is about 160% of the annual renewable average of recharge.
- Water pollution is also a serious challenge. The use of high levels of chemicals in agriculture as well as to increasing inflows of domestic and industrial wastewater into water bodies. The lack of sanitation facilities for large segments of the population contributes to water pollution by raw sewage.

Hence, water has become an inhibiting factor for the development of most of the Mediterranean countries and, thus, poses a vital challenge at the economic, social and political levels.

## **II. THE MEDITERRANEAN SEA**

The Mediterranean Sea constitutes a unique economic, social, health and cultural common heritage for all neighbouring countries. But it is intensely used by sectors such as shipping, fisheries and tourism, combined with climate change, who have added pressure on the marine environment and the Biodiversity.

Let me go into detail here by talking about the 6 main problems with which the Mediterranean Countries are struggling currently the most:

## **1. Climate Change**

One consequence of climate change is the sea level rise. It is already visibly in the Mediterranean area. For the next century (2100) a sea level rise between 30 cm and 100 cm and temperature shifts of a mere 0.05-0.1°C in the deep sea will have adverse effects on populations across the Mediterranean: Rising sea levels will submerge parts of the coast, it will also mean rising salt water levels groundwater supply and reduce the availability of drinking water. A 30 cm rise in sea level would flood 200 square kilometres of the Nile Delta, displacing over 500,000 Egyptians.

## **2. Biodiversity loss**

Climate change as well as other factors like urbanisation and human pressure, pollution from the land and maritime transport, illegal fishing practices and overfishing of several biological marine resources, heavy maritime traffic, excessive and insufficiently controlled exploitation of underground resources will have a growing and unsustainable impact on the loss of biodiversity and the degradation of marine and coastal ecosystems in the Mediterranean. The Mediterranean Sea, home of 7 to 8% of all marine species known, while representing only 0.8% of the planet's ocean surface, is an important ecological area for the unique diversity of life. 19% of the Mediterranean known species are at risk.

All Mediterranean countries ratified the Convention on Biodiversity and agreed to reduce the biodiversity loss, and committed to reach a target of protecting at least 10% of each eco-region by 2020. Protected maritime areas and marine reserves are recognised by several international agreements and by the European Union as essential instruments for a comprehensive marine environment conservation strategy leading to a sustainable use of sea resources and action against loss of biodiversity.

## **3. Overfishing**

Fishery is a major source of livelihoods and food resources, as well as an important economic sector, across the Mediterranean region. But fish stock levels in the Mediterranean Sea are alarmingly low. Overfishing is a permanent factor of disturbance of the coastal and marine environment of the Mediterranean and one of the main causes of food loss.

Many fish men follow the rules regarding size and age of the catch, but illegal and unregulated fishing activities and "pirate fishermen" continue operating. Overfishing and semi-industrial resulted in a cleanout of many of the main Mediterranean fish stocks.

In recent years fishing activity has increased in catch quantity, while quality has steadily and sometimes dramatically decreased. The European Environment Agency says that over 65% of all fish stocks in the

region are outside safe biological limits and the United Nations Food and Agriculture Organisation, that some of the most important fisheries — such as albacore and bluefin tuna, hake, marlin, swordfish, red mullet and sea bream — are threatened.

The EU adopted 2002 a general drift net ban in all EU waters. Despite that, numerous infringements remain because of monitoring difficulties, thus leading every year to thousands of whales, dolphins, seals and sea turtles death in the net systems, capturing even young and small fish, which prevents the recovery of fish stocks.

A greater coordination of all institutions and organisations involved in fishery management in the Mediterranean region, could promote a comprehensive and integrated fishery strategy focusing on the recovery of the Mediterranean fish stock, the conservation of the different Mediterranean marine ecosystems and the promotion of biodiversity.

#### **4. Pollution**

The Mediterranean is an almost completely closed basin with a slow rate of water renewal. The limited water exchange with the open oceans makes the sea very liable to pollution, with pollution levels having risen significantly since the 1970s. Industrial emissions, municipal waste and urban wastewater are responsible for up to 80% of pollution in the Mediterranean Sea. Marine litter particularly affect both high sea and coastal areas. The United Nations Environment Programme has estimated that 650,000,000 t (720,000,000 short tons) of sewage, 129,000 t (142,000 short tons) of mineral oil, 60,000 t (66,000 short tons) of mercury, 3,800 t (4,200 short tons) of lead and 36,000 t (40,000 short tons) of phosphates are dumped into the Mediterranean each year. Many marine species have been almost wiped out because of the sea's pollution. One of them is the Mediterranean Monk Seal which is considered to be among the world's most endangered marine mammals. The Mediterranean is also plagued by marine litter. A 1994 study of the seabed using trawl nets around the coasts of Spain, France and Italy reported a particularly high mean concentration of litter; an average of 1,935 items per km<sup>2</sup>. Plastic debris accounted for 76%, of which 94% was plastic bags.

The Barcelona Convention requests the contracting parties to prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area and to protect the marine environment in that Area so as to contribute towards its sustainable development. The Mediterranean countries adopted in June 2010 new concrete measures with a timeline to limit the impact of dangerous chemicals and pesticides origination from industrial and agricultural activities on the marine environment in the region.

## **5. Shipping**

In the Mediterranean Sea are some of the world's busiest shipping routes. It is estimated that approximately 220,000 merchant vessels of more than 100 tonnes cross the Mediterranean Sea each year — about one third of the world's total merchant shipping. These ships often carry hazardous cargo, which if lost would result in severe damage to the marine environment.

The discharge of chemical tank washings and oily wastes also represent a significant source of marine pollution. The Mediterranean Sea constitutes 0.7% of the global water surface and yet receives seventeen percent of global marine oil pollution. It is estimated that every year between 100,000 t (98,000 long tons) and 150,000 t (150,000 long tons) of crude oil are deliberately released into the sea from shipping activities.

Approximately 370,000,000 t (360,000,000 long tons) of oil are transported annually in the Mediterranean Sea (more than 20% of the world total), with around 250-300 oil tankers crossing the Sea every day. A major oil spill could occur at any time in any part of the Mediterranean. The risk of collision is very high. But also without a huge tanker accident, 100,000 to 150,000 tons of oil up yearly flowing in the water because of illegal pumping, leakage and carelessness. Because the guilty party is difficult to identify, the majority of such events remain unpunished.

Another problem with the increasing industrial use of the Mediterranean, is the dramatic increase of the noise level in the sea from shipping, oil and gas exploration and promotion, construction work and military activity. Certain forms of noise in the ocean being the cause of death, serious injury and increasing vulnerability to diseases among whales and other marine mammals as well as fish.

## **6. Tourism**

With a unique combination of pleasant climate, beautiful coastline, rich history and diverse culture the Mediterranean region is the most popular tourist destination in the world — attracting approximately one third of the world's international tourists. Therefore tourism is one of the most important sources of income for many Mediterranean countries. It also supports small communities in coastal areas and islands by providing alternative sources of income far from urban centres. However, tourism has also played major role in the degradation of the coastal and marine environment. Rapid development has been encouraged by Mediterranean governments to support the large numbers of tourists visiting the region each year. But this has caused serious disturbance to marine habitats such as erosion and pollution in many places along the Mediterranean coasts.

Tourism often concentrates in areas of high natural wealth, causing a serious threat to the habitats of endangered Mediterranean species such as sea turtles and monk seals. It is ironic that tourism in this region is destroying the foundations of its own existence. And it is inevitable that the tourists will leave the Mediterranean as it becomes more depleted of its natural beauty.

Tourism increases too the public water use, particularly during the peak summer holiday months and especially in southern European coastal regions already subject to considerable water stress. In addition to using water for food, drinks and personal hygiene, tourism is associated with activities such as swimming and golf that significantly increase water use.

### **III. TRANS-BOUNDARY WATER RESOURCES**

Most Arab states depend for their water supply on rivers and/ or aquifers that are shared with neighbouring countries, like the Jordan and Nile River. The Nile, Tigris and Euphrates are the major rivers and contribute almost 80% of the total surface water flow in Arab countries. Of all renewable water resources in Arab countries, two thirds originate from outside the region. And yet not a single formal agreement for joint management of shared water resources exists in the region. International law is inadequate in defining and regulating the use of shared water resources. Few agreements have been reached about how water should be shared, like the UN Convention on the Non-Navigational Uses of International Watercourses, which codifies the core principles of International Water Law and is often used to conclude joint management and water sharing agreements. Only seven Arab states have ratified this Convention.

*In my first year as chair of the Committee on energy, environment and water we focused on the Jordan River. We travelled to Jordan, Israel and the Palestine Territories on a fact-finding mission to take a closer look at the situation of the Jordan and to talk with the responsible politicians as well as with NGOs and local people. These 3 days were a very shocking experience for me. As a result, we wrote a special report on the situation in the Jordan Valley, who got a lot of attention and hopefully lead to a constructive agreement between the riparian states of the Jordan River. The report encourages the riparian states of the Jordan Valley too to have the cultural and natural riches of the Jordan Valley recognized as UNESCO World Heritage in order to safeguard and protect this unique region.*

#### **The Jordan River**

The Jordan River Valley is a special geological and geographical segment of the Great Rift which extends from Syria to the Dead Sea. The Jordan River is one of 261 transboundary water systems worldwide, of  
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which 19, among them the Jordan River, have more than 5 riparian states. The Jordan River (360 km) is the principal water reservoir for the riparian states - Syria, Jordan, Lebanon, Israel and the Palestinian Territories; For Lebanon, Israel and the Palestinian Territories, these areas constitute the most important source of drinking water. Israel alone covers 35% of its water needs from the Jordan.

With the exception of the Jordan, all rivers have either dried up or have become sewage canals. And there is not much left of the Jordan, either. 90% of its water is drawn by Israel and Jordan, the rest is utterly polluted. In the north, the over-exploited tributaries of the Jordan have shrunk within half a century and today carry only less than one tenth of the original amount of water. In the south, the chemical industry draws on the Jordan's mineral-rich water. What is left is polluted and full of waste. Pollution has taken on a dangerous extent (high concentration of E.coli in the drinking water). The Jordan River has turned into a miserable and contaminated rivulet that only carries the historical name of the river and does not longer supply the Dead Sea with water.

The appropriation of the Jordan is a major factor in the Israeli-Palestinian conflict. The continuation of current policies will probably turn into a point of contention between the parties to the conflict in the years to come. Cooperation to safeguard the water resources is the only way forward. In order to solve the water problem by cooperation it is necessary to implement plans for a joint administration, decision-making on an equal footing, and the joint management of these resources.

*This year we are planning to go on another fact finding mission. This time to Egypt to take a closer look on the Nile River.*

#### **IV. CONCLUDING REMARKS**

The Arab world is already witnessing a water crisis and the pressure on water resources for people's everyday lives is already obvious. In future, it will become even stronger, particularly in areas where it is already significant, leading to a widening of the gap between the North and the South. Arabs cannot afford to waste a single drop of water. The water sector is receiving increasing attention among policy makers and development agencies in the region. But without fundamental changes in policies and practices, the situation will get worse, with drastic social, political and economic consequences.

Globally, requirements are going to rise. In certain countries of the South they could double or even triple. From Turkey to Uganda, and from Morocco to Oman, nations with some of the highest birth-rates in the

world are all concerned about how to find enough water to sustain urban growth and to meet the needs of agriculture, the main cause of depleting water resources in the region. All of these countries depend on either the three great river systems, which have an average renewal rate of between 18 days to three months, or on vast underground aquifers some of which could take centuries to refill.

Some situations actually harbour high potential for conflict. After signing the 1979 peace treaty with Israel, Egyptian President Anwar Sadat said his nation will never go to war again, except to protect its water resources. King Hussein of Jordan identified water as the only reason that might lead him to war with the Jewish state.

International cooperation is very difficult because in most Mediterranean States, each policy is pursued by its own administration, just as each international agreement is performed within its own set of rules, making an overview of the cumulative impact activities a difficult objective to attain. Water management is rendered particularly difficult by the fact that 60% of the region's watercourses run through several countries and the large proportion of the Mediterranean marine space is made up of high seas which makes it difficult for coastal States to plan, organise and regulate activities that directly affect their territorial seas and coasts. But the preservation of land and water resources needs to be addressed through both regional and international cooperation.

From this point of view, the Union for the Mediterranean, with its focus on concrete projects, offers a real opportunity for improving water management in the region and for an exchange of good practices towards reducing of the negative impacts of human activities. The Union can further develop and facilitate access to accompanying financing mechanisms in order to support projects, programmes and political and political initiatives aiming at protecting the Mediterranean marine environment. It can also help by investing into research to promote water supply and resource management.

Governments should urgently implement sustainable water management policies which rationalize demand to ensure more efficient use. The possibilities for exploiting conventional water sources are limited; numerous countries are trying to develop new supply routes, mainly through water imports and non-conventional water production methods. Investing in wastewater treatment and wastewater recycling especially for agricultural irrigation purposes will be the first step. Currently 43% of annually generated wastewater is discharged in untreated form. Only 1/3 is reuse. But the reuse of recycled water, particularly in agriculture, still requires technical progress and scientific testing before it can be applied on a large scale. Desalination of seawater and brackish subterranean water is already practised, but the cost is still high and the technique involves considerable consumption of energy. Therefore we must encourage

investments technologies like in “clean” seawater desalination.

In most Mediterranean countries, a more economical use of water and, thus, a decreased in demand, would save a quantity of water nearly as large as the additional water resources that would be required to cover expected increase in water demand over the next 20 years. It is generally recognised that saving most of the water lost or squandered is technically feasible and would be a great deal less costly than stepping up water production to cover projected future needs. Hence, demand-side management should be accorded as much attention as supply-side management. Such an approach requires not only profound changes in strategy, but also in the nature of investments and in individual and collective behaviour. The in-country awareness must change for example through communications campaigns targeting the general public and highlighting sustainable use of water resources.

We, the politicians and you, universities, professors and students have to work together. I congratulate the Aristotle University of Thessaloniki for the implementation of the new AUTH Center of Integrated Water Management and to your cooperation with the EMUNI and other universities in the Mediterranean Region. This is not only about scientific studies. It is moreover about the creation of future orientated, sustainable Jobs and finding a solution for essential questions of survival and existence.