

WATER SHORTAGE IN MEDITERRANEAN

WATER SHORTAGE IN THE GLOB

Living of the Human being on the earth is directly related to the existence of water used for his wellbeing and development. The human being since his existence is concentrating his living on the side shore of the rivers, lakes, and springs. Since the four decades ago the problem of water is raised on the surfaces of the international scene and that was directly related to the increase of the human race population which have been increased from 2.3 billion 1940 to 5.7 billion 1995. In the same time the consumption of water has increased from 400-meter cube per year to 800-meter cube per person. [1].

- **About 2 billion people, nearly half the world's**
- **population, already lack an adequate supply**
- **of safe drinking water. An estimated 80 percent of the disease affecting people in the poorest countries of the world is caused by contaminated water supplies and lack of sanitation. In some cases, these shortages are caused by natural forces: the rains fall, rivers change their courses and take water elsewhere, or dry winds evaporate the reserve moisture on which humans and wildlife depend for survival**

- As you all know the resistance of portable water on the surface of the earth is 97.5% of all water in the earth, it is exist on the sea and ocean and these all not useable water. only 2.5% of these water is useable as drinking water, agriculture and industry [2].
- However, it can be mentioned here that 68.7 % of useable water for the human being concentrated as ice on northH and south pole of the earth, on the mountains and in the deep lakes and is not easy to attained. Only 3.1% from this water exists in aquifer possible to use and 0.3% only is available in lakes and rivers. [1-2]

- According to the reports published by the water resources institute, nine countries on the Globe are considered that there are in water crisis where these countries using consuming water more than it can be replaced. Libya, is the one of this country [2].
- Figure (1) shows the balance of water in Libya for the years 1995 to 2025 where the shortage of water has exists starting from the year 2000. Equivalent to 1.8 million meter cube per day and this will rise to 3.6 million meter cube per day in the year 2005 [3].

➤ **WATER SHORTAGE IN THE MEDITERRANEAN**

- **Despite differences between the arid and semi-arid Mediterranean countries in their societies, political systems, cultures, and economies, they are similar in many ways, such as the following**
- **Poor management practices, inefficient water use, and failure to place a high economic value on water, which result in resource degradation from water logging, soil and water Stalinization, and pollution of aquifers;**
- **Few incentives for water conservation in agriculture and numerous disincentives; Irrigation developing faster than water source mobilization (population growth and increasing demand for water for other uses are leading to rapid mining of aquifers, water shortages, competition, and conflict); and rising environmental opposition.**

Water availability and consumption 1995 MC

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- Algeria, Egypt, Libya, Mauritania, Morocco, Sudan, Tunisia
- 27.9 62.9 5.4 2.3 27.0 28.1 8.9
- Total Renewable kmc
- 14.3 58.3 0.6 11.4 30.0 88.5 4.12
- Annual Consumption kmc
- 4.5 55.1 4.6 1.6 11.0 17.8 3.1
- Per Capita availability Renewable Resources mc
- 512. 927.0 111.1 4956 1111 3149 463

- **In other case, many are competing for the water resource, overgrazing and inappropriate agricultural practices allow water to run off before it can be captured, or sewage contamination makes existing water supplies unusable. Without wells, storage reservoirs, and delivery systems, people don't have access to the resources available to them. The United Nations declared the 1980s as the decade for solving problems of clean water supplies and adequate sanitation for all. It is estimated that providing clean water and adequate sanitation for everyone in the world would cost about \$300 billion, approximately what the United States spends on its military each year**

Fresh and saline withdrawals to supply various end uses 2000/2020

Total average home use MC / person/ day
12617 / 18421

Total irrigation MC / person / day
94259400 / 137618724

- Total industrial, commercial /person/day
- 167737200 / 244896312 MC
- Total Consumption MC / year
- 262009217 / 382533457

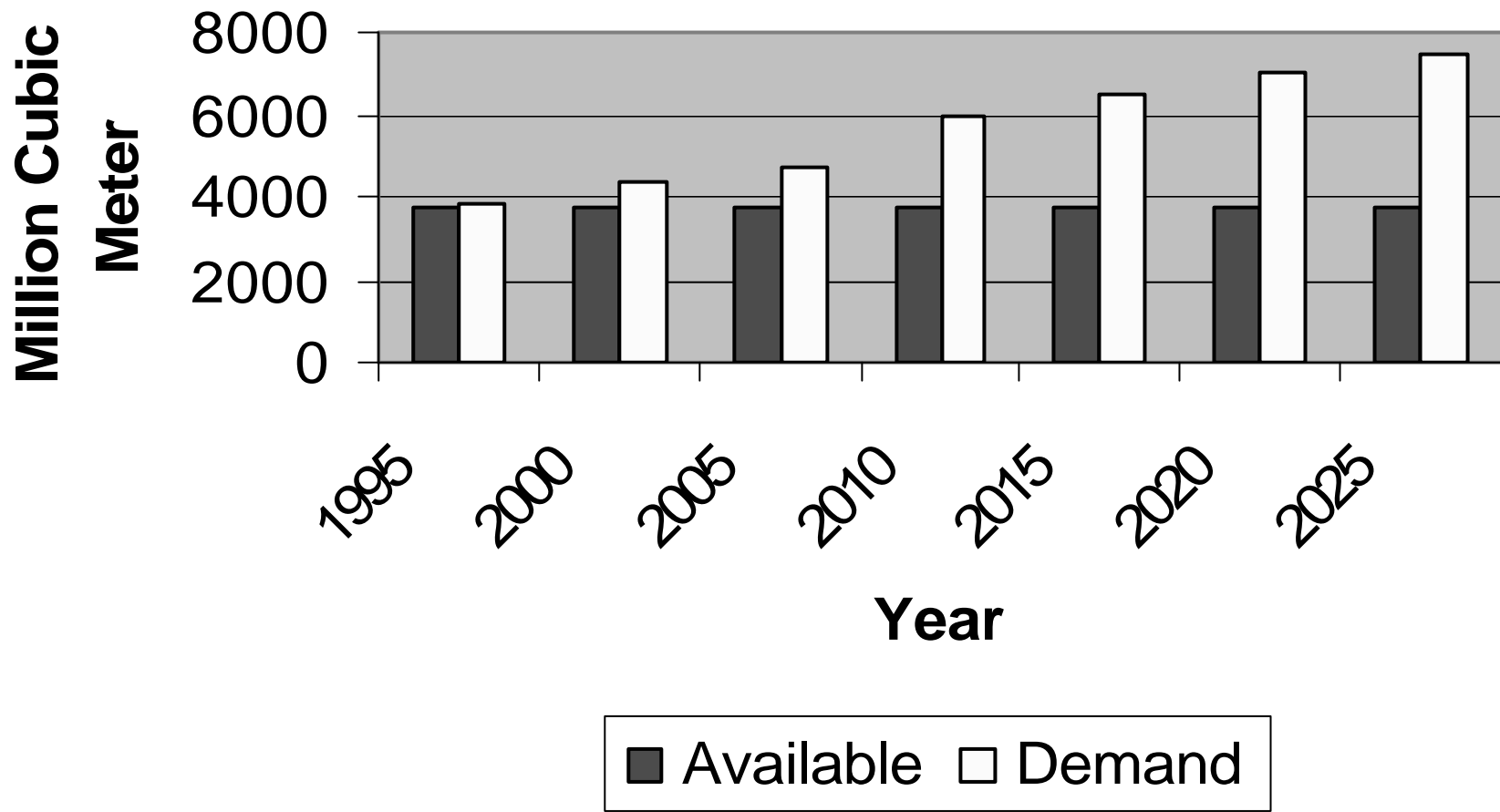
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- **In the Mediterranean 72% of their water recourses for irrigation, 10% for domestic use and 16% for the industry.**
- **Losses of irrigation water in the Mediterranean are extremely high on the average of (55%),**
- **Farm distribution (15%),**
- **Field application (25%)**
- **Irrigation system losses (15%).**
- **Only about 45% of water diverted or extracted for irrigation actually reaches the crops.**

- **For instance, reducing transport losses by 50% and improving irrigation efficiency from 40-50% to 80% could provide savings of nearly 52 km³/year, or more than 40% of total actual water losses in the region, and thus provide an additional supply of nearly 20% of the actual demand. Possible savings in irrigation constitute more than 70% of total water savings**

- **This effort should lead for doubling the world water desalination market. No way can be done without the generous funding in the R&D from the governments as well as the industry at large in the field. This market could reach more than \$70 billion over the next 20 years and over the next five years; \$10 billion have been already in the pipe line for the installation of new desalination plants, throughout the world, for producing over 5.3 million m³ per day.**

Fig. (1) The Balance of Water in Libya



- **Technologies for Desalinating**
- **The desalination plants in the globe producing only 1% of the world's drinking water. RO is the dominant process in the market. There exist over 12,500 desalination plants in the world, providing 20 million cubic meters per day**
- **The need for fresh water is rising every day, due to the world crises in supplying the current demand of water**

- **This is compelling the manufacturers of the desalination plants to look for reducing the costs per meter cube from the current pricing figure. This could be done only by intensifying funding the new research and development for the new desalination equipment. This R&D may lead to double the world water desalination production market. This effort should be on the world first priority agenda to meet this crises in the water shortage.**

Policy Issues

- **The main elements of sound policies for water resources management involve**
- **Water tariffs;**
- **Customer sensitivity;**
- **Maintenance;**
- **Long term sustainability and**
- **Incentives.**
- **Tourism need to be addressed carefully**

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- Due to the water shortage in Libya, a National Committee has been formed to find the possible ways and recommendations to concentrate on the water desalination [3].
- The first water desalination plant has been installed in 1964. Now more than 75 desalination plants has been installed using different technologies (MSF) (RO) and others.

Comparison for Production Cost of Water Desalination in Libya

- In different studies the cost of water desalination in Libya has been assist. Table (1) gives the average cost for producing water from desalination in cubic meter along the sea shore where different desalination plant have been installed.

Table (1) Comparison between the actual and the design for cubic meter of water from desalination plant

Location	Year of operation	Field water sources	Used Technology	Actual cost in USD	Design Cost in USD
El-Khomes	17 years	Sea water	Evaporation and RO	4.2	2.46
Zleiten	6 years	Sea water	Evaporation and RO	3.39	2.63
Tajoura	14 years	Sea water	RO	19.13	3.31
Central Tripoli Hospital	27 months	Well water	RO	1.6	1.28

From the above table it can be seen that the actual cost of producing water desalination is too high, comparing with the International costs.

- **Improvement of the efficiency of the already existing water resource management programs.**
- **Monitoring water resource usage.**
- **Development of an accurate water pricing system depending on supply and demand, as well as its scarcity.**
- **Development of local institutions to manage this scarce resource.**
- **Development of alternative techniques to extract water, such as desalination.**
- **Development of well trained local staff to ensure total and popular participation.**
- **Development of regional and international water partnerships.**

- **Combating Desertification**
- **Combating drought and desertification is the most challenging programs for the Mediterranean countries, however in the light of the Bonn Declaration on the commitments to enhance the implementation of the obligations of the Convention in particular in the following sectors**

- **Sustainable land use management, including water, soil and vegetation in affected areas;**
- **Sustainable use and management of rangelands;**
- **Development of sustainable agricultural and ranching production systems;**
- **Development of new and renewable energy sources;**
- **Launching of reforestation / forestation programmers and intensification of soil conservation programmers;**
- **Development of early warning systems for food security and drought forecasting;**
- **Desertification monitoring and assessment.**

- **The Johannesburg World Summit on Sustainable Development has delivered a unique and important outcome represented by the partnership Type II Initiatives as a new action-oriented approach. Italy and other countries if they are strongly committed to promote and support the international partnership and cooperation initiatives, towards a global sustainable development this commitment will reverse the current trends in the depletion and degradation of environmental resources, to improve domestic and international institutions and to alleviate poverty**

Recommendations

- **Participation in WDM IS Essential**
- **Strengthening Regional Partnerships**
- **Support the Adoption of WDM by Local Organizations and NGO'S**
- **Partnerships in financing combating desertification**
- **Utilizing solar and wind energy for pumping water when it is possible**
- **Solar and wind could play an important role to sustain development in water crises to meet the demand of the remote area**
- **Tourism industry needs to be evaluated.**

Reference:

1. Engelman, R., LE Roy, P. Sustaining Water, Population and the Future of renewable Water Supplies, Population Action International, Washington D.C, 1993.
2. The World Resources Institute, World Resources 1994-1995, Oxford University Press , New York, 1994.
3. Omer M. Salem (Water shortage in Libya) and the needs for its management for sustaining the development). Water authority report, Tripoli ,1998.