Water Demand Management - Security for the MENA Region

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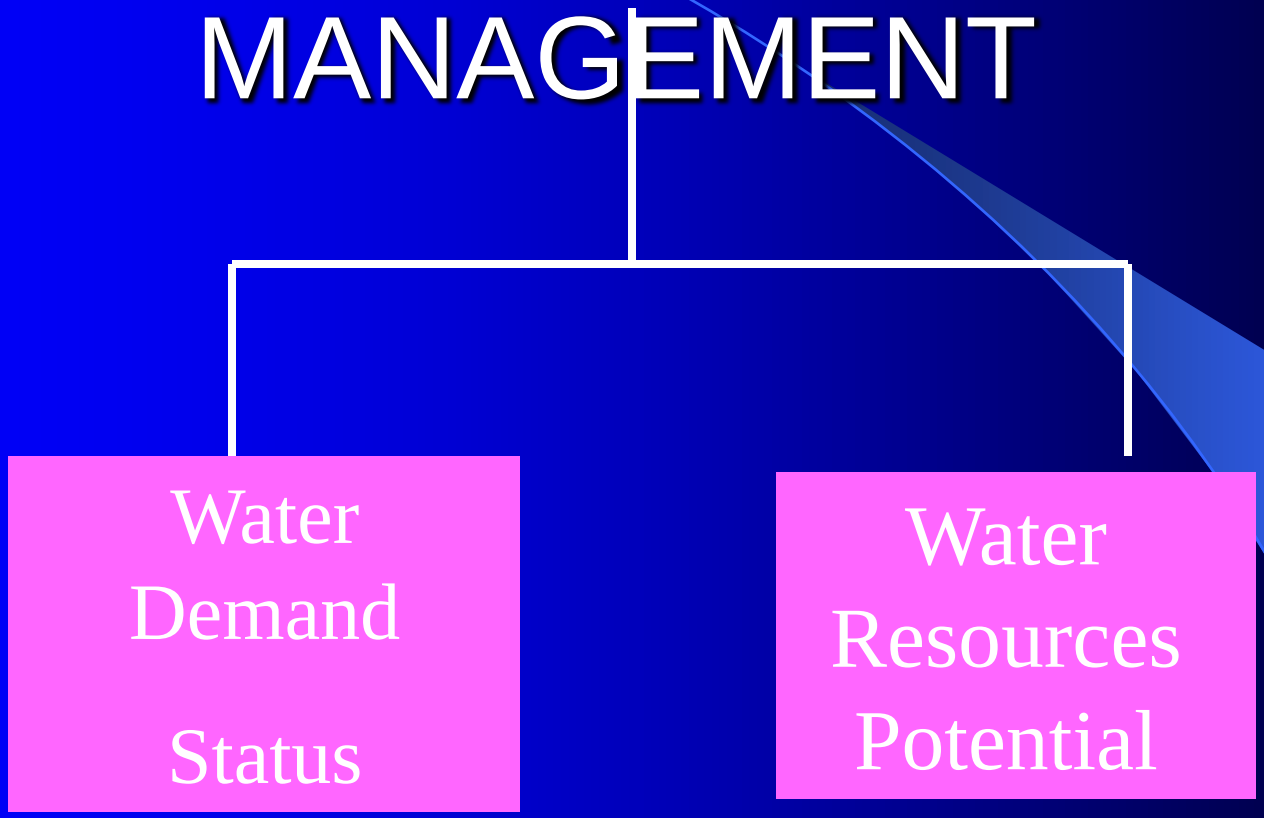
OBJECTIVES

- To introduce the water demand (WDM) management as a tool of integrated water resources management
- Review the status of water resources in the MENA region, and to which extent the WDM tools are applied in the region
- Highlight the obstacles facing the integration of WDM into water policies in the region and suggestions to overcome such obstacles

WATER RESOURCES MANAGEMENT



Fresh Water Availability

- During the 20th Century, the world population has increased by about 4 folds (from 1.6 billion to 6 billion)

- During the same period, irrigated land increased from 50 millions hectares to 267 million hectares

- Human use of water has increased by 35 folds over the past three centuries, and by 4 folds since 1940

* Growing demand on water has put enormous pressure on the water resources

- The traditional approach to meet the rising demand was by developing and expanding water resources.

- This has created a serious problems of unbalanced water resources, water shortages, and to the degradation of water resources quality.

Need for New Management Paradigm

- Focusing on the other side of the water management process (DEMAND SIDE)

WATER RESOURCES MANAGEMENT

- **MODERN (Integrated Management)**
- Analysis and management of water demand through the application of water demand management tools to improve the efficiency of water uses in different consumption sectors

- TRADITIONAL
- **Meeting the demand by increasing supply**
- More wells
- More reservoirs
- Extending water distribution system

What is Water Demand Management?

The new approach - *water demand management*- seeks to find an acceptable equilibrium between limited water resources and competing, usually increasing, demands for water, using policy and technical means.

There are many definitions , *Perhaps the simplest definition of water demand management is that provided by the International Development Research Centre (IDRC):*

-- To get the most from the water we have.

Objectives of WDM:

- Economic efficiency
-Social development and social equity
-Environmental protection
-Sustainability of water supply and services
- political acceptability

Most of WDM strategies applied around the world today can be classified under four categories :

-Economical

-Institutional/administrative

-Technical

-Educational /behavioural

Economical	**Institutional / Regulatory**	**Technical**	**Educational/ Behavioural**
- well designed water tariff system - financial incentives for water conservation - enforcing polluter pays principle - Water allocation through market	- legislation and regulations to conserve water - building and plumbing codes - capacity building of the water institutions - monitoring and controlling of land use - decentralization and local-level management	- Applying metering to measure consumption - Leak detection - Pressure monitoring and control in the networks - Using water saving devices - Using digital techniques to monitor and distribute water	- Seminars and workshops - Media campaigns - School curriculum - Competitions and festivals

History of the Water Demand Management

-Mankind has attempted several methods to capture, store, and drain water.

-With the development of irrigated agriculture , there was a need to convey water through irrigation channels.

-The progress achieved in the field of hydraulics, hydrology and civil engineering sciences made it possible to meet the increased demand on water.

During the second half of the last century, enormous expansion of the water resources infrastructure had been taken place worldwide, including the MENA region, driven mainly by three main factors:

- - Population growth
- - Changing standards of living
- Expansion of irrigated agriculture

Principles of Water Resources Sustainability

-- Holistically, as a finite and vulnerable resource.

-- At the lowest appropriate level using a demand-based participatory approach.

-- By involving women, who often play a pivotal role as water providers and users and as protectors of the environment.

--As an economic good.

Elements of Water Demand Management Strategy

-Stressing equitable access to water, reflected in a strategy that is specifically designed to improve service delivery to the poor;

-Treating water as both an economic as well as a social good, and managing and pricing it accordingly;

-Balancing the management of losses and consumption with the development or expansion of supplies; and

-Managing a change in organizational culture from being technology focused and supply driven, to one which puts people first and is demand responsive.

WDM BENIFITS

According to the Water Supply Collaborative Council , WDM, if fully pursued and implemented can lead to:

- -Reduction in water demand by 30%-50% with no deterioration in life-style.
- -Significant reduction in capital requirements for expansion of supply.
- -Reduction in wastewater production, and therefore the requirements for new wastewater treatment systems.
- -Financially stable water systems.
- -Enhancement and adoption of new technologies that usually have short payback periods.

Overview of Water Resources Availability in The MENA Region

-MENA is one of the driest regions in the world.

-For the 5% of the total world population living in the region, less than 1% of the world's renewable freshwater is available for their use

-The average annual per capita share from water resources in MENA is about 1250 m^3/person/year, which is about one third of the water availability in Asia, and 16% of Africa's.

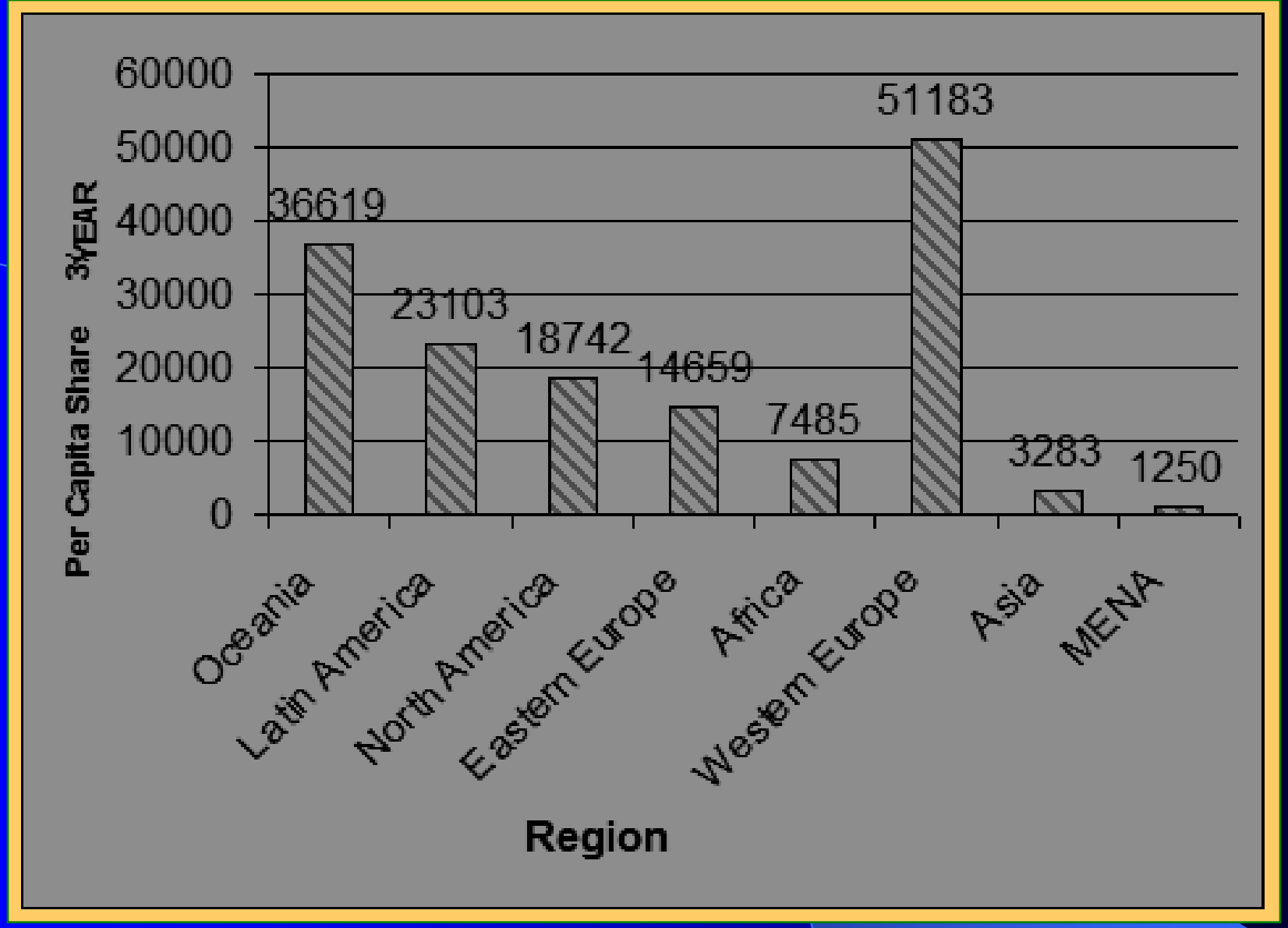


Figure (1) Annual water availability per person in MENA region as compared to other regions of the world

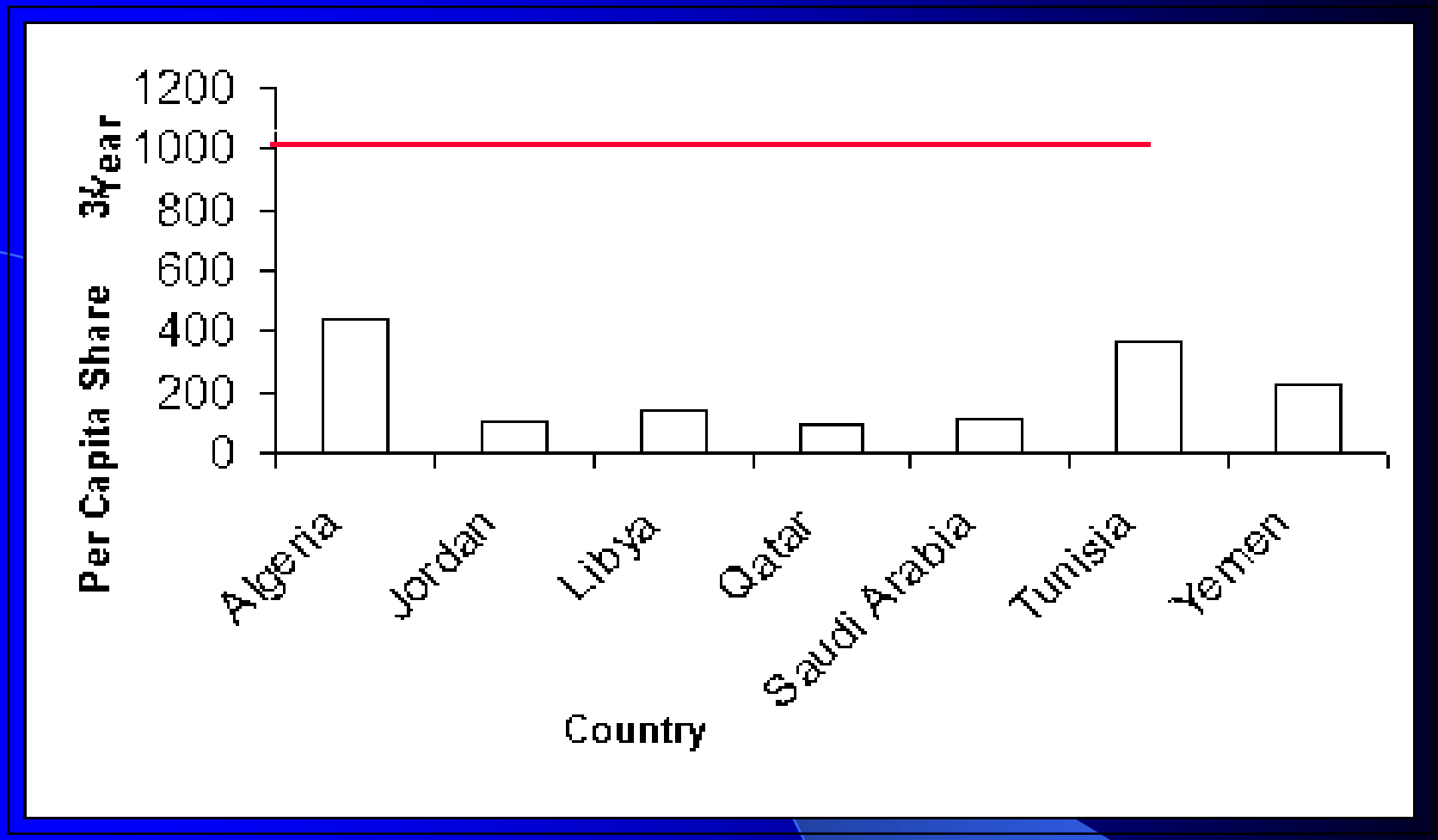


Figure (2) Water availability per person in water poor countries of the MENA as compared to the water poverty line of 1000 m^3/person/year

The water shortage in MENA may be attributed mainly to the following:

-Geographical location of the region in arid and semi arid area .

-The high population growth rate in the region, averaging 2.8% which is one of the highest rates in the world .

-The current management of water resources relies heavily on the supply side.

Generally, water resources in MENA are characterized by the following:

- Water is scarce and expensive to exploit.
- Municipal and industrial water requirements are increasing sharply, as the population growth rate is one of the highest in the world.(87% in Agricu)
- The technical basis for regional cooperation is not yet established.
- The institutions managing the resources are highly centralized and designed to work almost entirely on the supply side .

Potential of WDM options in MENA

-There is an increase in the use of non-conventional sources of water, such as treated wastewater in agriculture.

-The interest in grey water reuse is gaining more attention in the region.

-Several countries are applying the increasing block tariff system in pricing water.

-Many public awareness and educational programs are being implemented in many countries of the region.

WDM Programs :

One of the pioneer programs in the region **is** the Water Efficiency and Public Information for Action (WEPIA), which is implemented in Jordan by the Ministry of Water and Irrigation in collaboration with the Academy of Education in Washington and supported by the USAID.

Obstacles to WDM implementation in the MENA

- Perceptions by all stakeholders that water resources are sufficient.
- Lack of needed knowledge and appropriate technology for WDM.
- Economic and institutional structures still encourage inefficient use of water.
- Prevalence of old thinking among water planners and decision makers.

- Free water culture (perception within various communities of the region that the government must provide abundant water cheaply or for free).

- Great social importance attached to agriculture and food production, regardless of economical viability

Water Demand Management Forum

Forums are organized with regional decision makers to encourage WDM in the following areas :

- - wastewater reuse
- - water valuation
- - Public-Private Partnerships

-decentralization at the local level

Conclusions and Recommendations

-Integrated water demand management presents an alternative to infrastructure solutions for meeting additional water supply needs.

-Water demand management holds tremendous potential to help the region to bridge the increasing gap between water demand and supply.

-Currently, water in MENA is under-valued. This has led to inefficient use, as there is little incentives to save water.

-Redesigning the water tariff systems is necessary to achieve the efficiency.

-There is also an inadequate legal basis to promote WDM in the MENA region.

-When implementing water demand management programs, public education and awareness is key to addressing the concerns of water users and wining support for the new policies.