

Local Water Supply, Sanitation and Sewage

Mediterranean Partner
Countries

Analysis

2005

MEDA Water



SOGESID
SOCIETÀ GESTIONE IMPIANTI IDRICI



"This report has been produced with the assistance of the European Union. The contents of this document is the sole responsibility of Sogesid mandated by the EMWIS Technical Unit in the framework of EMWIS Phase II contract ref ME8/AIDCO/2003/004763/069442 and can in no way be taken to reflect the views of the European Union."

EXECUTIVE SUMMARY

It is by now widely recognized that improved water supply and sanitation services are important means for reducing poverty. The explicit goals regarding water and sanitation of the Millennium Declaration, adopted in 2000, also show how important these services are considered by the international community.

Managing water services in a sound and sustainable manner and providing access to everyone, is a complex task. Many factors have to be taken into consideration; environmental sustainability, institutional settings and legal framework, water scarcity and financial means for operating, maintaining and developing water infrastructure. Many governments have come to realize that with conventional water sector strategies they will not be able to extend local water services to all residents, especially in poor urban areas, and that innovative approaches have to be introduced, not only with respect to technical solutions and infrastructure works but also regarding governance strategy.

The situation of local water supply and sanitation services in the Mediterranean Partner Countries varies. All countries in the region have limited water resources with population growth and rising living standards, increasing the pressure on the already stressed aquifers. Water scarcity and access to local water services is a well recognized problem for local governments and international financing bodies, and there is a long list of projects aiming to improve the performance of the sector.

This study has been commissioned by EMWIS/SEMIDE, Phase II, following a decision taken during the EMWIS Steering Committee meeting on Malta 2004, to work on four themes with the overall objective of providing a synthesis analysis on subjects of interest to the Euro-Med water community. The aim of this study is to overview the current policies for Local water supply, sanitation and sewage in 8 of the 10 Mediterranean EMWIS Partner Countries¹, namely Algeria, Israel, Jordan, Lebanon, Morocco, Palestine, Tunisia and Turkey, including Malta and Cyprus.²

This paper is based on public documents and sources of information consulted mainly through internet. For each country was created a separate overview report of policies and practices, successively validated through the National Focal Points. A special acknowledgement is addressed to all National Focal points of the MPC, for the invaluable support received during the validation and integration of the collected information that made it possible to complete the study.

The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and do not represent the general view of the EMWIS project and the member countries. The study cannot in any case be considered comprehensive and definitive, but only another step in the process of integrating the information between the MPC in the water sector with the overall aim of improving the partnership ties and giving a contribution to the process for a shared improvement of water supply and sanitation governance.

¹ Regarding Syria and Egypt, the study did try to collect information relevant to the local water supply and sanitation services in these two countries, but due to the scarce availability of data and the impossibility of confirming their reliability it has been decided to not publicise this information. Reports of Algeria and Palestine has not been validated by the Countries.

² In the text all countries will be referred to as Member Partner Countries (MPC).

The topics and main findings of the study can be synthesized as follows:

(a) *Shifting strategy focus for local water supply and sanitation*

An important strategy shift has taken place in the world to secure supply of local water supply and sanitation. At the core of major problems encountered are the management and performance of the water utilities and large efforts have been undertaken to improve the situation. The general trend has been to focus strategies on supply side measures like large infrastructure works and increased water exploitation. Service coverage has generally increased, but also led to severe over-abstraction in many countries and depletion of already scarce freshwater resources. The strategy has also proved to be hard to support economically as the exploitation of new sources of supply is expensive and the investment need is large, especially for poor countries.

By now it is widely accepted that a broader strategic approach to improve the sector performance is needed, supported by an institutional framework and incentive system for economical efficiency and environmental protection. The new water strategies focus on demand management, socially sustainable tariffs and economical efficiency of services. Potential actions are many and range from optimisation of renewable water resources, re-utilisation of treated wastewater, reduction of unaccounted for water (UFW), improving the water conveyance systems and distribution networks, rehabilitation of sewage systems. All the above actions must be accompanied by the improvement of the operational and management capacity in order to meet the new requirements of efficiency and transparency of operation and economical performance.

The study shows that all MPC have followed this general strategy for local water supply and sanitation. Although the level of implementation and measures differs, all have initiated reforms of institutional settings and legislative framework, applied to alternative forms of management.

The importance of sewage and wastewater treatment seems also to have come more into focus in the MPC strategies, not only in order to protect the environment from pollution but also because it is considered a strategic alternative resource to substitute freshwater used for irrigation.

(b) *Alternative forms of management*

Regarding alternative forms of management, private sector involvement is considered by most countries a strategic choice to improve and secure water supply and sanitation services. It is expected to bring new investment capital to the sector and operational and financial efficiency to the water utilities.

The level of private sector involvement in the MPC varies. Most of them have already taken the necessary steps to change the legal framework and the institutional settings in order to open up the water sector for private interests, but the examples of private companies actually managing the integrated water service utilities are still few. The study shows how four countries have examples of management contracts for providing local water supply and sanitation, while one country is in the process of awarding the management of two large municipalities.

Based on the study result, it is not possible to claim that private sector involvement in managing water utilities has, or has not, actually improved service. In the cases where the utility performance was available for analysing, the service coverage has increased and economical performance improved, but it is at the same time debated that the tariffs have increased uncontrollably, compromising the poor population's possibility to pay for and access to water services.

The process of establishing management contracts is a complex procedure that often spans over several years. An alternative to large management contracts can be to outsource operational activities partially. In the other countries, the private sector involvement is still limited to infrastructure works under arrangements like BOT or BOOT, especially regarding the construction and management of desalination plants and wastewater treatment plants.

(c) *Institutional settings and legal framework*

Fragmented institutional settings with consequent complex coordination mechanisms and inefficiency are a major hindrance for sustainable water management in the MPC. The problem can only be solved through a more effective institutional structure and an appropriate legislative framework supporting it.

In all countries it is possible to distinguish between a policy setting unit - normally a ministry or an executive or regulatory body under the ministry governance - and a local level utility company responsible for the retail supply, often under the responsibility of the municipality, although the complexity and number of bodies involved vary largely. The trend for the institutional reforms, in order to overcome the complex and inefficient institutional set up, is to strengthen the water management structure by consolidating responsibilities for different activities into one single unit, improving the overall governance of the sector. Most of the countries have already created, or are expressing the intention of starting the procedure of establishing a separate regulating unit, with the overall responsibility for water resources and local water services. In three countries the consolidation of water utilities companies into larger units is under way.

In two countries only it has been possible to find a clear statement distinguishing between the responsibility for operations and the monitoring of efficiency and performance, protecting the end users' interests, although the analysis shows that several of the other countries are aiming for the same policy.

Four countries have strongly regulated water market with a natural monopolist body at governmental level, responsible for the water supply, while two are in the process of decentralizing.

Except for the BOT and BOOT, there is no example of local water supply and sanitation infrastructure that has been sold to private operator. The overall water infrastructure remain public property and under the responsibility of a central public body. The responsibility for local water supply infrastructure varies. In most cases is it the municipality responsibility to operate and maintain the infrastructure, while investments and construction works are the responsibility of a central public body. Also in the case of private sector involvement, like in Jordan, the operator is responsible for operation and maintenance but the infrastructure remains public property.

Regarding the responsibility for sanitation and sewage services and the level of integration with water supply services, the organisational set up varies. Generally in countries where municipalities are in charge of sanitation and sewage services, the same are managed by separate boards. One country has separate central public institutions, one responsible for water and one for sanitation services. Two countries have already applied the strategy of concentrating all responsibilities within one public utility.

The information regarding legal framework for the water supply services is very limited. The result of the study shows that all countries have started to reform their water sectors and legal framework. The legislative regulations regarding wastewater treatment are often connected to the laws regarding water quality and protection of water resources with an environmental perspective. This might explain the growing focus on sewage services and wastewater treatment in management strategies and investments initiatives.

(d) *Water sector performance*

Recent estimates of population and renewable water resources per capita (2005), show how half of the countries in the study fall within the definition of being affected by water scarcity (less than 1000 m³ renewable water resources per capita per year)³ and some of them have already less than 500 m³ per capita. Based on the population growth rates and declining availability of renewable fresh water, all MPC, except Turkey and Cyprus, are forecasted to face similar conditions of water scarcity by 2025.

³ PAI 2005 Population Action International - 2005

The rate of total available water resources actually allocated to domestic uses is, in most countries, around 30% or less and not in the direct governance of the local water bodies. The core of many problems regarding local water supply and sanitation services is the poor performance of the water utilities caused by high rates of physical and commercial losses, low level of service and in many areas insufficient service coverage (access to drinking water and sanitation).

The supply of water varies largely between not only the MPC but also between the different regions within the countries. In average the drinking water supply range between 125 litres and 200 litres per capita per day. Consumed volumes are even less considering the level of unaccounted for water (UFW), still around 40 to 50 percent for more than half of the MPC.

Comparing the rate of population with access to improved drinking water supply, with reference to the Millennium Development Goals, regarding water supply and sanitation, the situation seems satisfactory, at least regarding the supply to urban population, estimated to approximately 90 percent, and for several countries even 100 percent.⁴ The access rate of the rural population is somewhat lower but the trend seems to be positive.

The rate of population with access to improved sanitation is between 70 to 90 percent but with a rural population in some countries with under 50 percent coverage.

These performance indicators show the average access to improved service, but do not take into consideration service continuity. There are not enough data for all MPC to draw any overall conclusion regarding service continuity, but the study shows that the access rate could change significantly if this factor should be considered too. In some countries water supply service is being suspended during night time or only provided during a couple of days per week. The problem seems to affect mostly large cities, and in some countries only during dry summer months.

Although the overall strategies seem, also if limited, to gradually give more attention to sewage services and wastewater treatment, there is not much evidence in the result of the research. The official statistics of the countries are also scarce regarding the performance of sewage services. The study showed that Israel have come far in the collection and treatment of wastewater, about 96 percent of total volume is collected and 64 percent of wastewater adequately treated. In the other countries, where data is available, the rate of treatment varies and falls within the range of 30 to 40 percent, with some of them treating less than 10 percent.

(e) *Tariffs and cost coverage*

The information and data regarding total investments in the water sector and for water supply and sanitation services is scarce for all countries. Several of the water sector strategies clearly state that water services must be provided in an economically sustainable manner and subsidies gradually abolished. The economical performance of the water utilities is therefore becoming more and more in focus.

The tariffs and metering are critical aspects for sustainable service supply and a prerequisite for reaching the objectives of access to improved water supply and sanitation. It is also a major challenge as tariff structures and subsidies should be set at levels that do not compromise the poorest possibilities to satisfy basic need for water and sanitation services.

Most of the MPC have laws that define water as an economic good, establishing that costs connected to the service production, operation and maintenance as well as capital costs, should be covered through tariffs. The analysis indicates that there is still a long way to go before it will be possible to implement total cost coverage, mainly due to the fact that the investment needs are so large in some countries that a tariff comprising recover of capital costs, would become unacceptably high, but also because there is not sufficient financial control of the activity of the water utility companies, to actually be able to measure all costs involved.

⁴ UNICEF Statistics, 2002

Almost all MPC are applying a progressive tariff policy. Sanitation and sewerage services are generally charged in proportion to domestic water consumption.

Regarding subsidies the set-up varies between the countries. Some of them subsidize the bulk water delivered to the municipalities or other entities in charge of local water supply. Tariffs are then set on local level with the consequence that they can vary between different localities in the country. In other countries water tariffs are established at governmental level and it is the same all over the

Metering practice varies a lot and, in the countries that have come furthest in the implementation of more economical and efficient service, the meters are read every 2 months. Most countries apply a fixed part on the tariff that must be paid even if there is no water consumption.

**LOCAL WATER SUPPLY, SANITATION
AND SEWAGE IN THE
MEDITERRANEAN PARTNER
COUNTRIES**



Fausto Melli
Silvia Carecchio
Maria Ljung

Rome, November 2005

ACKNOWLEDGEMENT

This study is commissioned by EMWIS/SEMIDE, Phase II, after a decision taken during the EMWIS Steering Committee meeting on Malta 2004, to work on four themes with the overall objective to provide synthesis on subjects of interest to the Euro-Med water community. The specific objective of the study is to provide a synthesis over local drinking supply, sanitation and sewage in 8 of the 10 Mediterranean Partner Countries and Cyprus and Malta.⁵

This paper is based on public documents and sources of information consulted through internet. The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and do not represent the general view of the EMWIS project and the member countries. The study cannot in any case be considered comprehensive and definitive, but only another step in the process of integrating and sharing information between the MPC in the water sector with the overall aim of improving the partnership ties and contribute to the process for improving water supply and sanitation governance.

A special acknowledgement is addressed to all National Focal Points of the MPC, for the invaluable support received during the validation and integration of the collected information, which made it possible to complete the study.

⁵ Regarding Syria and Egypt, the study did try to collect information relevant to the local water supply and sanitation services in this two countries, but due to the scarce availability of data and the impossibility of confirming their reliability, it has been decided to not publicise this information. Reports of Algeria and Palestine has not been validated by the Countries.

ACRONYMS

BOOT	Build-Own-Operate-Transfer
BOT	Build-Operate-Transfer
EU	European Union
EMWIS	Euro-Mediterranean Information System on the know-how in the Water Sector
NFP	National Focal Points
MDG	Millennium Development Goals
MPC	Member Partner Countries. In the context of this study “Member Partner Countries “ include 8 Mediterranean Partner Countries - Algeria, Israel, Jordan, Lebanon, Morocco, Tunisia, Turkey and Palestine - of the of the Euro-Mediterranean Partnership, together with Cyprus and Malta.
MRA	Malta Resource Authority (Malta)
PWA	The Palestinian Water Authority
SEMIDE	Système Euro-Méditerranéen d'Information sur le savoir-faire dans le Domaine de l'Eau.
WDD	Water Development Department (Cyprus)
WFD	Water Framework Directive
WSC	Water Service Corporation (Malta)

SCIENTIFIC TERMS

m ³	Cubic Meter
Mm ³	Million Cubic Meters
Km ³	Cubic Kilometre

TABLE OF CONTENTS

1. Introduction.....	12
1.1. Background	12
1.2. Method	12
1.3. Data relevance and actuality	12
1.4. Study outline.....	13
2. Water Sector Strategy	14
3. Private Sector Involvement.....	16
4. Institutional settings and legal framework.....	20
4.1. Legislative Framework	22
5. Water sector performance	25
5.1. Water Resources.....	25
5.2. Water Supply, Sanitation and Sewage	27
6. Tariffs	32
7. Conclusions.....	35
8. Definitions.....	36
8.1. Millennium Goals.....	36
8.2. Unaccounted for Water	37

1. Introduction

1.1. Background

The water crisis in the world is defined by insufficient access to safe drinking water for over a billion people and inadequate sanitation for half the world's population. The Millennium Development Goals specifically dedicated to the access to water supply and sanitation, also prove the importance of these services. Population growth, improving living standards and progressing industrialisation continue to increase demand for water in developing countries and it is forecasted that more than 3 billion people in the world will face water scarcity⁶ by 2025.

Managing water services in a sustainable manner and provide access to everyone, is a complex task, but necessary in order to mitigate the negative effects of water scarcity. Many factors have to be taken into consideration; environmental sustainability, institutional settings and legal framework, and financial resources for operating, maintaining and developing water infrastructure. Many governments have come to realize that they will not be able to extend local water services to all residents, especially in poor urban areas, through conventional water sector strategies and that an innovative approach is needed, not only with respect to technical solutions and infrastructure works but also regarding governance strategy.

During the EMWIS Steering Committee meeting on Malta 2004, it was decided to work on different themes in order to provide synthesis on subjects of interest to the Euro-Med water community. One theme selected was Integrated management of local drinking water supply, sanitation and sewage, theme of the Turin Action Plan of 1999. The main objective of this study is to overview current policies for Local water supply, sanitation and sewage in Mediterranean Partner Countries. The Mediterranean Partner Countries included in the study are Algeria, Israel, Jordan, Lebanon, Morocco, Palestine, Tunisia and Turkey, together with Malta and Cyprus.⁷

1.2. Method

In order to provide an overview and analysis on integrated management of local drinking, water supply and sanitation in the MPC, the study has been divided into the following main activities:

- Bibliographic research. Information was obtained from different sources, accessed mainly through the EMWIS information system and other sources of information through internet. Data has also been taken from official web pages and studies produced by international organisations such as the World Bank, UNDP, FAO etc.
- Analysis of the available information regarding forms of management for local drinking water supply, sanitation and sewage, focusing on private sector involvement.
- Definition of different factors considered significant for the analysis of policies and practices for local drinking water supply and sanitation.
- Creation of separate country reports in order to overview policies and practices for each country.
- Validation of the country reports through the EMWIS National Focal Points of each country and integration of missing data in order to complete the country specific information.
- Integrated analysis of country reports and editing of synthesis paper.

1.3. Data relevance and actuality

The method applied in this study made it possible to collect data for the selected countries water sector policies, service governance, utility performance and tariff policies, summarising and, to some extent, comparing the different countries practices.

It is important to note that the data included in the study have been taken from documents and web sources with different aims, for different years and in some cases created in other contexts that the

⁶ Occur when annual water supplies drop below 1,000 cubic metres per person.

⁷ In the text all countries will be referred to as Member Partner Countries (MPC).

local water supply and sanitation. In order to reach an acceptable level of data relevance and actuality, priority has been given to official sources like Ministries and other public bodies in the water sector, for example Water Utilities and Statistical Units. In many cases has it not been possible to find all information needed from public sources, not only due to the fact that the information is not available or updated, but also because the data from different sources are not coherent.

In order to increase reliability of the information and data included in the study, the National Focal Points of each country have validated and, when possible, integrated missing data.

It is important to note that although the objective of the study is to synthesise and to some extent compare the different countries practices and policies, the conclusions are not to be perceived as a tentative to compare and validate the effectiveness of the different countries water sector performances or to define which is the best country or best practice. Although all countries included in the study are facing more or less the same challenge – provide sustainable water services to all inhabitants - each country has specific constraints, different priorities and possible measures to apply.

1.4. Study outline

Based on the initial research, the study was concentrated in analysing water sector strategies, private sector involvement, institutional settings, legal framework, financial considerations and tariffs, together with an assessment of the water sector performance and critical aspects for service providers.

The study starts with a section with a general overview of water strategies and general trends for local water services governance in the studied countries. The next section is dedicated to alternative forms of management like private sector involvement followed by an overview of the institutional settings and legal framework.

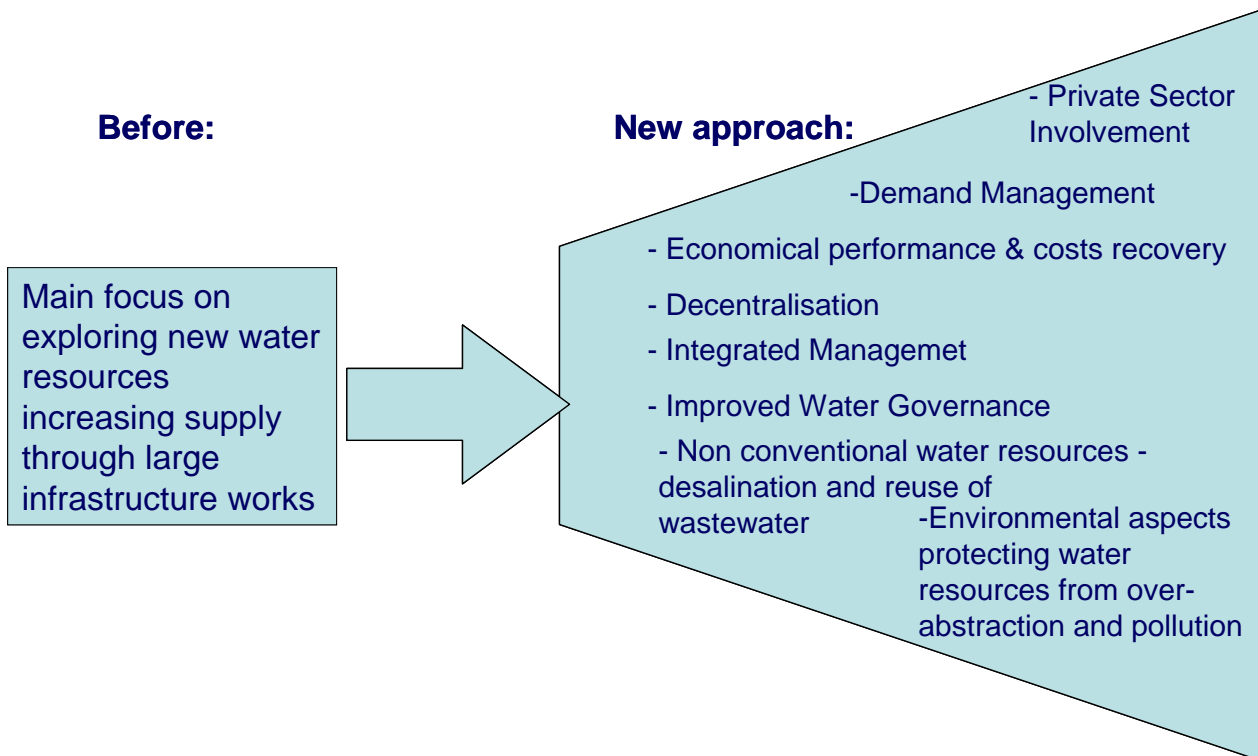
The forth section is dedicated to an assessment of the water sector performance in the MPC. The assessment is divided into two subsections; Available water resources and Water supply, sanitation and sewage services. The last section analyses the cost coverage and tariff policies.

2. Water Sector Strategy

The study showed that all MPC more or less seem to have followed a general trend regarding their strategies for local water supply and sanitation. Earlier the water sector strategies mainly focused on supply side measures like large infrastructure works and to increased water exploitation. Service coverage has generally improved, but the increased exploitation has also caused severe over-abstraction and depletion of already scarce freshwater resources in many countries. The supply side strategy has also proved to be hard to support economically as the exploitation of new sources of supply is expensive and large investments are needed, especially in poor countries. The importance of treating and reusing wastewater was seldom considered, nor from a pollution perspective nor from an economical perspective.

It is by now widely accepted that a broader strategic approach must be applied, supported by an institutional framework and incentive system for economical efficiency and environmental protection. The new water strategies also include measures like demand management, wastewater reuse, tariff policy and improved economical efficiency of services.

Although the level of implementation and measures differs between the MPC, all of them have initiated reforms of institutional settings and legal framework.



Some observations regarding Water Sector Strategies in the MPC:

- **Integrated management and decentralisation**

Within most of the strategies for improving water sector governance are integrated management of water services and private sector involvement strongly promoted. Regarding decentralisation of responsibilities, the study shows that several countries already have come far in their reforms to decentralise, as other countries still seem to prefer a centralized setup, with all responsibilities in one public controlled utility. There are also examples of countries that apply a mixed set-up, where tariff settings and operational & maintenance responsibilities are given to local utilities (or municipalities), while large investments works and water resources are still managed centrally. The

strategies also give a lot of attention to the financial aspects of the water sector in order to meet the new requirements of efficiency and transparency of operations and economical performance.

- **Non conventional water resources**

Several countries have chosen desalinated water as an alternative resource to secure drinking water supply. For Cyprus and Malta desalinated water already represent around 50 percent of total drinking water supply. In Tunisia the desalinated water only represent 1.5 percent of total drinking water supply but the plans are to develop this resource further.

Another important non conventional resource is treated wastewater that is more and more considered strategic within the water sector strategies. Treatment of wastewater is not only beneficial from an environmental point of view in order to reduce negative effects from pollution, but also as a strategic alternative resource, to substitute freshwater used for irrigation.

- **Demand Management**

Potential actions for reducing demand for water are many and can range from optimisation of reservoir management, rehabilitation of water conveyance and distribution networks and sewage systems. Other measures are tariff structures that limit demand and waste, as well as awareness campaigns in order increase the engagement of end users.

How far the countries have come in the implementation of the different reforms are presented more in detail in the following chapters of this study regarding private sector involvement, institutional settings and tariffs.

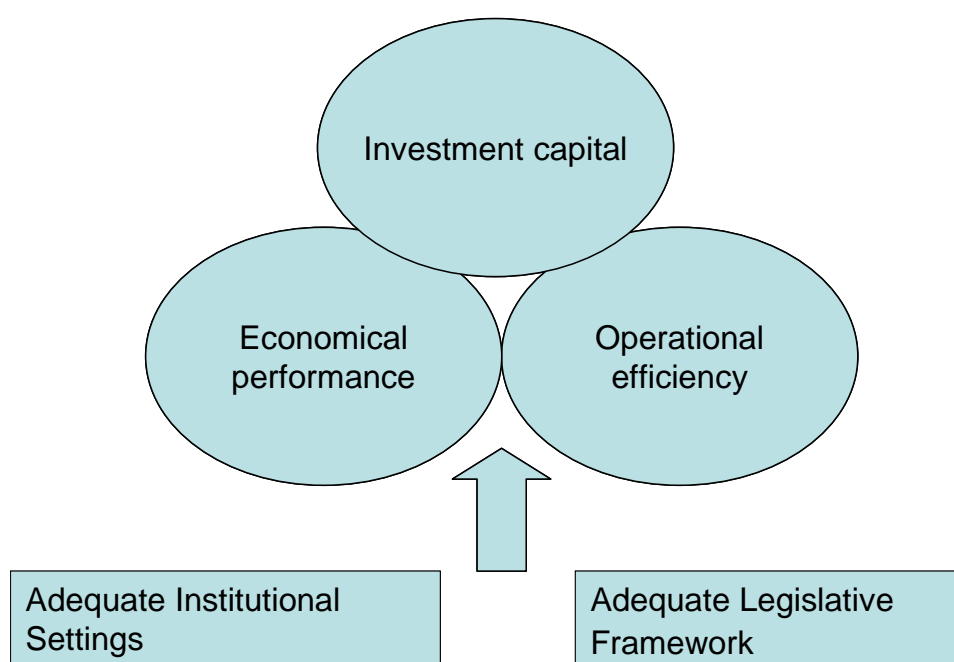
3. Private Sector Involvement

Several of the strategies in the MPC for improving the water sector performance, state indispensability of involving the private sector to be able to reach set objectives. The importance of private sector involvement is also stated by several international institutions and based on the disappointing performance of many countries public utilities local water supply and sanitation services, characterized by low coverage rates, high loss rates, low levels of cost recovery and the poor quality of water provided.

*“The difficulty of improving the performance of public utilities without such fundamental changes has been shown by four decades of experience with donor-assisted efforts including substantial financial support to expand and rehabilitate systems, extensive technical assistance and innumerable covenants stipulating tariff increases. These efforts have helped to expand the coverage of water and sanitation infrastructure but they have largely failed at making urban utilities financially sustainable and at improving the technical efficiency of their operations”.*⁸

It is particularly from a financial perspective that private sector involvement is considered strategic. It is a way to attract investment capital, necessary to maintain and extend infrastructure. It is also a way to make the water utilities financially sustainable through the private companies objective to make profits through more effective operations with less and but more qualified employees.

*“The private sector can contribute to increasing the operating efficiency of utilities and thus alleviate the need for tariff increases. It can also inject private capital and thus help to defer the need for tariff increases but ultimately the return on the private capital injection will have to be earned through higher tariff revenues”*⁹



Private sector involvement, as service providers and investors in infrastructure, can be implemented to different degrees:

⁸ 'Urban water and sanitation in the Middle East and North Africa Region: The Way Forward' Jamal Saghir, Manuel Schiffler, Mathewos Woldu, World Bank, January 2000

⁹ 'Urban water and sanitation in the Middle East and North Africa Region: The Way Forward' Jamal Saghir, Manuel Schiffler, Mathewos Woldu, World Bank, January 2000

- **Management agreements** – operation and maintenance of a service are contracted out through a management contract to a private company for a predetermined period. The private company or consortium is not financing the asset. Instead, the public sector finances both fixed assets and working capital.
- **Lease agreements** - Through a lease agreement, a private company leases, operates and maintains a State-owned asset for a prescribed period. The public sector retains the responsibility of financing the investments in fixed assets.
- **Concessions** - Through a concession agreement, a private operator is responsible for developing or rehabilitating and operating a State-owned asset or service for a prescribed period. Concessions include agreements such as a build-operate-transfer (BOT) or rehabilitate-operate-transfer (ROT) scheme.
- **Privatisation.** Through privatisation, State-owned assets are sold to a private company or consortium and these assets are owned and managed by the private operation in perpetuity.




Although private sector involvement in local water services is strongly promoted, privatisation of these basic services is at the same time highly debated, especially among stakeholders representing the poor population. The debate is not whether or not the private sector should be involved, but to what extent they should be involved as the actual providers of services. It is claimed that private sector involvement lead to increasing water tariffs, too high for the poor population to sustain.

While governments are promoting private sector participation, many factors hinder this participation, such as lack of written policies and action plans, an inadequate legal framework and unclear procedures for creating and sustaining public-private partnerships.

Regarding private sector involvement in the studied countries focus was given to analyse to what extent the countries are open to private sector involvement and give some examples of private sector involvement.

• **Open to Private Sector Involvement**

The study showed that all MPC have taken steps to reform their legal framework and institutional settings in order to open up the water sector for private interests. Although the examples of management contracts and private companies actually managing the water services utilities are still few, most of the strategies clearly state the importance of involving the private sector.

-  Private sector involvement considered strategic - example of management contract
-  Private sector involvement considered strategic – example of BOT and BOOT
-  No example of private sector involvement

Opening to private involvement	
Algeria	
Cyprus	
Israel	
Jordan	
Lebanon	
Malta	
Morocco	
Palestine	
Tunisia	
Turkey	

In the table above are countries marked green if they have a strategy that clearly states the intention to involve the private sector and there are examples of management contracts. Yellow represents an opening to private sector involvement and that the first steps to reform legislation an institutional set-up have been taken. No country has been marked red, representing no private sector involvement at all.

The degree of private sector involvement in the MPC can be distinguished as follows:

- Private involvement through concession contracts like Build-Operate-Transfer (BOT) and Build-Own-Operate-Transfer (BOOT).
- Leasing different parts of the management process, for example the billing process.
- Management Contracts.

The study showed that Morocco has embraced privatisation of the water sector and there are several examples of private sector involvement, both in construction of infrastructure and in service operations. The most significant are the Casablanca Concession for serving 3.5 million inhabitants by operating water, wastewater and electricity services. Other examples are the Rabat, Tangier and Tetouan Concessions, all for Operation and Maintaining the Water, Wastewater and Electricity systems of the municipalities.

Jordan has also come far in the implementation of a management contract for water and wastewater services in the Amman Governorate, awarded to LEMA in 1999. The contract has been extended until 2006.

There are also some examples of management contracts for local water supply and sanitation in Lebanon and Palestine, and Turkey has started the process to award the management of water utilities of two large municipalities. Israel is restructuring the water industry to open the sector to private investments, but there are still no examples of private water utilities. private sector involvement is so far limited to BOT of a desalination water plant with a consortium including "Vivendi", Ashkelon.¹⁰

Whereas Tunisia has been privatising state companies under a large privatisation programme since 1987, water supply and sanitation services are still provided fully by the government. A recent amendment to the water law has allowed private sector participation in the supply of non-conventional water, including desalination.

- **Outsource operational activities partially**

The process of establishing management contracts is a complex procedure that often spans over several years. An alternative to large management contracts is to outsource operational activities partially. Jordan has applied this model for the Northern Governorates, as a way to increase efficiency before the overall management contract is implemented.

- **BOT and BOOT**

The overall conclusion regarding the private sector involvement is that it is still to large extent limited to infrastructure works under arrangements like BOT or BOOT, especially regarding the construction and management of desalination plants and wastewater treatment plants. Algeria has taken the first steps towards privatisation establishing an integrated water utility and also started several private desalination projects.

In Cyprus private sector involvement is limited to the management of desalination plants, for which private companies have been given 10 years contracts and the most significant example of private sector involvement in Malta is the contract to a private company for operating the Sant' Antnin Sewage Treatment Plant (SASTP).

¹⁰ "The urban water sector is expected to undergo a profound reform, stemming from the introduction of the new law of corporation, under which the municipalities are to transfer the management of the municipal water supply to private sources. The aim is to ensure that activities in the municipal water sector will be carried out through independent, profit-making enterprises" - Israel Ministry of National Infrastructures – The Water Sector - Privatisation and Institutional Reform

Except for the BOT and BOOT, there are no examples of local water supply and sanitation infrastructure that actually have been sold to a private operator. The overall water infrastructure remains public property and the responsibility of a central public body.

Based on the study result, it is not possible to claim that private sector involvement in managing water utilities improves water services. In the cases where the utility performance was available for analysing, the service coverage has increased and economical performance improved, but it is at the same time debated that the tariffs have increased uncontrollable, compromising the poor population's possibility to pay and access water services. The fact remains that independent of the approach chosen; governments still have the overall responsibility for water services and must provide an effective and efficient regulatory framework within which the service providers, public or private, can operate.

4. Institutional settings and legal framework

Fragmented institutional settings with consequently complex coordination mechanisms and inefficiency are a major challenge for sustainable water management. More effective institutional structures and an appropriate legal framework supporting it are necessary in order to improve water services governance and reach set objectives. In the analysis of the MPC institutional settings and water sector reforms, particular attention was given to following aspects:

1. If the country had defined and implemented a regulatory body with overall responsibility for water services, clearly distinguishing between responsibilities for operational activities and supervising activities.
2. To what extent the responsibilities for water services were decentralized to local utilities.
3. Integrated management of water supply, sanitation and sewerage services.

• Institutional Settings

The complexity of the institutional settings in the studied countries varies largely. In all countries it is possible to distinguish between a policy setting levels, normally a ministry; an executive or regulatory level, normally represented by a department within a ministry and a user level represented by one or several water utilities, responsible for the service supply to the end users. It was not possible to draw any general conclusions regarding the number of institutions involved, the complexity and assigned responsibilities to each institution.

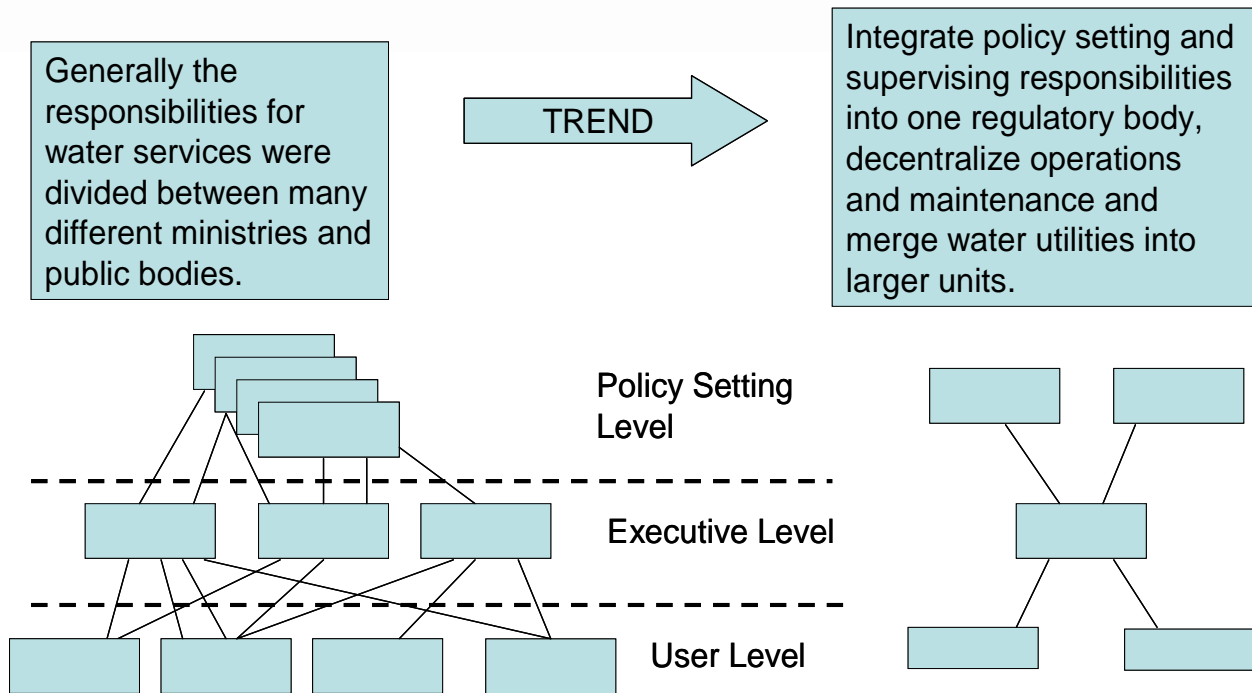
The responsibility for the water resources and water supply normally lies within one ministry while the responsibilities to set policies regarding drinking water quality and pollution control falls within other ministries as the Ministry of Health and the Ministry of Environment. Investments are also in several cases the responsibility of a separate public body.

• Regulatory body

Performance of public utilities can sometimes be improved - interdependently - increasing the autonomy and ensuring adequate accountability mechanisms. This is done through separation of various functions into separate entities. Policy making remains with the local or central government while an autonomous entity with a separate corporate oversight board becomes responsible for service delivery. This can either be a statutory body (functioning under public law) or a government owned company (functioning under commercial law, which in many countries offers more flexibility in operations). (World Bank)

The study shows that the general trend for the institutional reforms regarding local water services in the MPC, in order to overcome the complex and inefficiency caused by the institutional set-up, is to strengthen the water management structure by consolidating responsibilities into separate units or as expressed in the water policy of Palestine: *“The water sector should be regulated by one responsible body, with the separation of the institutional responsibility for policy and regulatory functions from those of services delivery.”* The separation between policy and supervising functions and operational functions and the responsibility given to different bodies, is seen as a way to improve performance of the water utilities.

Jordan, like Palestine, is also clearly distinguishing between the responsibility for operations and the activities to supervise operations and performance in its water utility policy. In Malta is the regulatory body represented by the Malta Resource Authority (MRA) with the defined responsibility to supervise utilities operations and to protect the end-consumers.



The conclusion regarding the other countries is that the majority of them already have, or seems to be in the process to apply a similar set-up. Israel has a central body in the Water Commission with the overall responsibility to implement policy and ensuring sufficient water supply of the required quality and reliability, while conserving and preserving water resources. Through the planned reform of the institutional settings in Israel the responsibilities for bulkwater supply and retail supply will be separated and the responsibility for local supply given to private operators.

In Law 337 from 2001, Lebanon clearly state the regulation to separate between “*the macro and micro management of water*”, and to strengthen the policy of the decentralization by granting more autonomy to regional authorities involved in the day to day management of the water services.

In Cyprus a law is proposed for establishing one central regulatory body, overall responsible for the water resources, which will formulate the water resources management police and undertake the implementation and execution of water development works and provide water for domestic and other uses. It should also control the abstraction and allocate the water available to the different users according to Government approved policy. It will also be responsible to plan and construct sewage collection and water treatment plants and distribution systems for the re-use of the treated effluents and provide technical assistance to other organizations on water development and water management.

- **Grade of Decentralisation**

“A sound institutional framework includes clear division of responsibilities and lines of accountability among sector and central institutions. Well-functioning utilities have considerable autonomy, including substantial control to generate and retain revenue, and in the use of these revenues in day-to-day operations.”(World Bank)

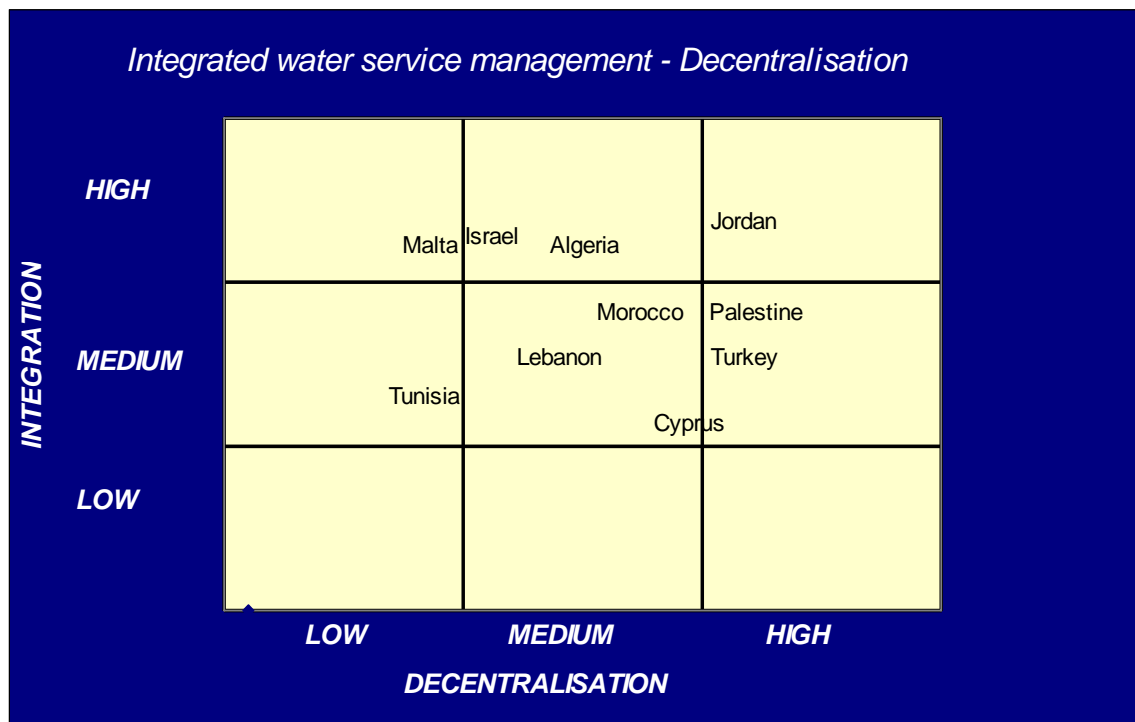
With decentralisation in the context of this study is meant to what extent the local water utilities operates autonomously regarding allocation of water resources, for operation & maintenance cost, in setting water tariffs and managing revenues and investments.

The study shows that Cyprus, Malta and Tunisia, have strongly regulated water markets with a natural monopolist on governmental level responsible for the water supply. Jordan and Morocco are instead decentralizing and use the rule of the market for more efficient water management. Lebanon is by law stating the rule to decentralise, but it is not enough information to evaluate to what extent it has been implemented. Turkey also seem to be applying a decentralised approach as the

responsibility of such works as constructing, operating, and maintaining water supply and treatment facilities, and responsible for networks of industrial establishments, fall within the boundaries of metropolitan municipalities.

- **Grade of Integration**

Regarding the responsibility for sanitation and sewage services and level of integration of water supply services, the organisational set-up varies. Tunisia for example has 2 separate public units, one responsible for water and one for sanitation services. In other countries, where municipalities are in charge of sanitation and sewage services, (for example Cyprus) the services are managed by separate boards. In Jordan are the services, both public and private, managed integrated by the same utility and in both Israel and Turkey are the municipalities responsible for all water services. Malta is also applying an integrated approach although with a strategy to concentrate all responsibilities within one public utility.



- **Larger Water Utilities**

Another trend that can be observed in for example Jordan, Lebanon and Palestine is the consolidation of local water utilities into larger units. In Lebanon for example have 21 local water utilities been merged into 4. In Palestine, in order to mitigate insufficient water supply, deterioration of water quality and inadequate level of services, caused by fragmented management, has a strategy of creating four integrated Regional Water Utilities been adopted. The Regional Water Utilities are going to be responsible for the provision of water supply and sewerage services divided geographically into four areas.

4.1. Legislative Framework

In order to reform the water sector successfully and be able to govern water services in an effective and sustainable manner it is very important that the country have a legislative framework that support institutional settings and sector strategies. A part of the study has therefore been dedicated to analyse the legal framework related to the water sector in the MPC. The information regarding the legal framework differed largely between the studied countries and it was difficult to draw some general conclusions based on the findings.

The main observations through the analysis were:

- **Water laws**

For almost all countries has it been possible to identify a specific water law. The legal framework over issues regarding water has been updated recently in several countries indicating that the need to reform the sector is not only stated but actually under way. The Lebanese government passed a new water law, Law 221, in 2000, and in Tunisia was the Water Code, created in 1975 updated in November 2001. Malta have also adopted new regulations, more precisely the *Sewerage Discharge Control Regulations LN 139/2002* and the *Water Policy Framework Regulations, 2004¹¹ - a Water Policy for the Future*.

In Morocco is the “Water Code of 1995” the basis for water policy. It state several basic principles regarding water resources and the protection of the resources. Act 10-95 allow for a more efficient, decentralized governance of water resources that is jointly established at all levels, administration, users and elected politicians. The basin agencies were created based on this law in order to manage the water coherently, considering the watershed as a whole.

The Water Code of Tunisia, created in 1975 but last updated in November 2001, state the importance of water for the country's economy and development. The benefits provided by the Water Code are numerous and the result of the increased awareness that politicians and decision makers acquired for the water importance in the country's economy and development, the need to manage the demand for water according to the availability and having as objective the sustainability of the natural resources, where water is coming on the head. The Water Code prioritizes drinking water supply.

- **Water a resource of the state**

The Jordanian “Water Authority Law No. 18 of 1988” state that “*All water resources within the boundaries of the Kingdom, whether they are surface or groundwater, river or internal seas, are considered to be state-owned property and shall not be used or transported except in compliance with law*”.

In Cyprus the *Government Waterworks Law* state that “*All ground water and all surface water and wastewater resources are vested to the state*”. The basic legislation in the water sector in Turkey is represented by the Turkish Constitution, which state that water resources are a natural wealth of the country and under the authority of the State.

- **Laws regarding water and environmental protection**

Concerning environmental issues and water, Cyprus has *Law no 69/91- "Water pollution control"*, that provides for the reduction, control and abolition of water pollution for the best protection of the natural water resources and the health and well being of the population, together with the *Control of Water Pollution (Prohibition of Discharge) Regulations (52/93)* and *The Control of Water Pollution (Measures for the Protection of Underground Waters) - Orders (45/96)*.

In Jordan the environmental law for water is represented by the *Environmental Health Legislation, Law 12 of 1995*, Environmental and Public Health and Safety Legislation.

Malta has in place a comprehensive environmental legislation with an Environmental Protection Act, issued in 2001, and further 74 associated legal notices. Enforcement of this legislation is under progress.

Turkey has a law of Environment from 1983, based on the principle of "polluter pays". The law deals with the issue of environment in a very broad scope. The aim of the law, which considers the environment as a whole, is not only to prevent and eliminate environmental pollution, but also to

¹¹Source: L.N. 194 of 2004, Malta Resources Authority Act, 2000, (Act No. XXV of 2000) Environment Protection Act, 2001 (Act No. XX of 2001) Water policy Framework Regulations, 2004

allow for the management of natural and historical values and land in such a way as to utilize and preserve such richness with concern for future generations as well.¹²

- **Water Sector Laws for local water supply**

In Cyprus is it the *Government Waterworks Law (Cap. 341)* that empowers the government to plan, design, construct, operate and maintain, any waterworks, to sell water, to buy water rights, to assess water rights, to fix water tariffs and to collect water bills. The *Water Supply (Municipal and Other Areas) Law (Cap 350)* regulate the creation of Water Boards and define their responsibilities. There is also a specific law for *Water (Domestic Purposes) Village Supplies Law (Cap 349)*. Furthermore is a law under evaluation that provides for the creation of a Water Entity within the Government to undertake the management of the water resources of Cyprus.

In Lebanon Law 221, the new water law passed on May 29th 2000, amended by Law 337 issued on December 14th 2001, regulates the new institutional set-up where the 21 water authorities, formerly responsible for water, were consolidated into four authorities, overseen by the federal Ministry of Energy and Water. The spirit of this law is to separate clearly between the macro and micro management of water, and to strengthen the policy of the decentralization by granting more autonomy to regional authorities involved by day to day management of the water supply.

The most important laws regulating local water supply and sanitation in Malta are the Water Services Cooperation Act, XXV -1991. Chapter 355¹³, "Water Policy Framework Regulations 2004¹⁴ - a Water Policy for the Future" and Sewerage Discharge Control Regulations LN 139/2002.

¹² Source: Turkey Water Report, Prepared for the 3rd World Water Forum, March 2003, Republic of Turkey; World Water Council;

¹³ Source: Water Services Cooperation - Legal Matters - Water Services Cooperation Act, 1991 - WSC Web Page

¹⁴Source: L.N. 194 of 2004, Malta Resources Authority Act, 2000, (Act No. XXV of 2000) Environment Protection Act, 2001 (Act No. XX of 2001) Water policy Framework Regulations, 2004

5. Water sector performance

The assessment of the Water Sector¹⁵ Performance is important in order to guide national water sector reforms and to achieve sustainable water management. The effectiveness of different measures in improving water governance can be analyzed and further opportunities for improving service performance can be indicated. Using specific indicators and standards also make it possible to identify the national water sectors development trend and to compare the performance between different geographical areas and different service providers.

The assessment of the MPC Water Sectors included in this study does not intend to cover all aspects of local water supply and sanitation services but to present some basic indicators to offer a general overview of the state of the sector. The synthesis and comparisons must be considered indicative, mainly due to the difficulty to find reliable data regarding the MPC water sectors and water utilities performance, and also due to the fact that the data for the different countries in some cases origin from different years and sources, and some numbers are estimates, based on other data.

5.1. Water Resources

- **Water Scarcity**

There are several indicators to study regarding the water resources availability. In the table below are summarised the most important results from the study.

<i>Water Scarcity Indicators</i>		<i>Average</i>
Population Growth Rate	0,7% - 3,5%	1,8%
Average Annual Rainfall	25 mm/yr - 850 mm/yr	375 mm/yr
Average Annual Renewable Water Resources Mm ³	1 country with more than 220 000 Mm ³ /yr, 2 countries with more than 14 000 Mm ³ /yr 7 countries with less than 5 000 Mm ³ /yr	34 000 Mm ³
N. of countries 2005 with less than 1000 m ³ / capita / yr renewable water resources [1]	7 countries out of 10	888 m ³ /cap/yr
N. of countries 2025 with less than 1000 m ³ per capita / yr renewable water resources - Medium Projection [1]	8 countries out of 10	726 m ³ /cap/yr

[1] Population Action International (PAI : Resources (2005))

One important factor is the average population growth rate as it indicates the level of growing demand for water. The average growth rate in the MPC is 1.7%, varying between 0.7% (Malta) and 3.5% (Palestine). Average annual rainfall is also important for the countries included in the study for the availability of water resources. The information regarding annual precipitation must be considered indicative as it varies largely from one year to another and also from one region and another. The average rainfall in the studied region is very low in almost all of the studied countries and varies approximately between 25 mm/yr (Israel) and 850 mm/yr (Lebanon).

Regarding the average available annual renewable water resources, Turkey is by far the most water rich country with around 229 000 Mm³ renewable water resources per year. Malta, together with Cyprus, Jordan and Palestine, are those with less than 1000 Mm³ per year.

¹⁵ Water Sector normally refers to the whole of a country's policies, planning, implementation, and supporting activities to develop and manage its water resources and deliver water services to all users in its society. The scope of the sector assessment in the context of this study of local drinking water supply and sanitation is to analyze the aspects of management of water supply and sanitation, sewage services and to some extent water resources, leaving out pollution control and aspects regarding irrigation, drainage, hydropower development etc.

Another important indicator on water scarcity is the recent estimates of renewable water resources per capita (2005). The estimates show that 7 of the studied MPC fall within the definition of being affected by water scarcity (less than 1000 m³ renewable water resources per capita per year)¹⁶ and some of them, like Israel, Malta and Palestine, have already less than 500 m³ per capita and year. The average rate of renewable fresh water resources per capita for all countries included in the study is 888 m³/cap/yr and for the countries with less than 1000 m³/cap/yr, in average only 430 m³/cap/yr. Based on the population growth rates and declining availability of renewable fresh water, all MPC, except Turkey and Cyprus, are forecasted to face water scarcity by 2025, with an average rate of renewable fresh water resources per capita of only 355 m³/cap/yr.

	Population Growth	Average Annual Rainfall mm/yr	Average Annual Renewable Water Resources Mm ³ [1]	Renewable Water per Capita 2005 m ³ [1]	Renewable Water Per Capita 2025 - Medium Projection m ³ [1]	Total Water withdrawals, All Uses Mm ³ [2]
Algeria	1,22%	89	14.000	426	330	6.074
Cyprus	1,40%	470	1.000	1.230	1.121	266
Israel	1,20%	25	2.000	299	233	1.830
Jordan	2,80%	92	1.000	174	123	866
Lebanon	2,60%	822	4.000	1.064	878	
Malta	0,73%	530				
Morocco	1,54%	346	29.000	919	712	12.607
Palestine	3,45%	500	1.000	262	145	225
Tunisia	0,99%	230	5.000	498	415	3.030
Turkey	1,30%	643	229.000	3.124	2.573	40.000

[1] Population Action International (PAI : Resources (2005))

[2] The data refers to different years (2000 to 2004)

- **Rate of total water supply assigned to domestic sector and sources of supply**

The rate of water allocated to domestic uses varies between the MPC. Israel has the highest allocation with 38% of total water resources dedicated to the domestic sector, closely followed by Jordan and Palestine with more than 30%. Morocco, Turkey and Tunisia are dedicating less than 15% of total water withdrawal to the domestic sector.

Domestic Water Supply		Average
Rate of total water produced allocated to domestic supply	3 countries allocate less than 15% 5 countries allocate around 30%	23%
Rate of total domestic supply from Groundwater [1]	No country less than 23% 1 country with more than 70%	43%
Rate of total domestic supply from Surface Waters [1]	No country less than 21% 1 country with more than 65%	46%
Rate of total domestic supply from Desalination [1]	2 countries cover domestic supply by 50%	n/a

[1] Average based on data for 6 countries out of 10

The table below lists the findings regarding water allocated to the domestic sector and its sources of supply. The values of total water withdrawal vary greatly between the countries and should be set in relation to daily supply per capita in order to compare them. Regarding the source of supply, some of the countries still rely greatly on groundwater while Morocco, Tunisia and Turkey take more than half from surface waters. "Other resources" than groundwater, surface water and desalination is in the case of Cyprus spring water and in the case of Turkey water withdrawn from artificial lakes.

¹⁶ PAI Population Action International - 2005

	<i>Rate of total water produced allocated to domestic supply</i>	<i>Rate of total domestic supply from Groundwater</i>	<i>Rate of total domestic supply from Surface Waters</i>	<i>Rate of total domestic supply from Desalination</i>	<i>Rate of total domestic supply from other Sources</i>
Algeria	22,0%				
Cyprus	25,4%	23,7%	21,5%	49,6%	5,2%
Israel	37,6%				
Jordan	32,4%	76,4%	23,6%		
Lebanon					
Malta		44,7%		55,3%	
Morocco	6,8%	39,0%	60,5%	0,5%	
Palestine	34,0%				
Tunisia	13,0%	44,7%	54,0%	1,3%	
Turkey	12,5%	29,0%	70,0%		1,0%

- **Non traditional water resources**

The use of desalinated water as a resource for securing water supply is greatly developed in Cyprus, where desalinated water represent 50% of total supply, and Malta, where it provide 55% of total domestic water supply. Israel is also relying on desalination to secure drinking water supply (rate of total supply represented by desalination is not known). In Tunisia is the rate of desalinated water still modest, only 1.3% of total domestic water supply, but in total volume, the resource already corresponds to more than 5 Mm³/year. Morocco also produces approximately 4 Mm³ of desalinated water for drinking water supply each year (0.5% of total drinking water supply).

5.2. Water Supply, Sanitation and Sewage

The core of many problems regarding local water supply, sanitation and sewage services is the poor performance of the water utilities caused by high rates of physical and commercial losses, low level of service and in many areas insufficient service coverage (access to drinking water and sanitation).

The values of “Good Practice” in the tables below are World Bank data.¹⁷

- **Access to improved Drinking Water Supply**¹⁸

Comparing the average rate of population with access to improved drinking water supply with reference to the Millennium Development Goals for water supply and sanitation, the situation seems satisfactory, at least regarding the supply to urban population, estimated to approximately 90 percent, and for several countries even estimated to 100 percent.¹⁹ The access rate of the rural population is somewhat lower but the trend seems to be positive.

¹⁷ Note that the World Bank data regarding “Good Practices” refer to utilities performance, while the result from this study refers to an average valid for the country as a whole.
<http://wbln0018.worldbank.org/mna/mena.nsf/0/BB37100F8EABA7B78525694A00527E47?OpenDocument>

¹⁸ For the definition of “Improved drinking water supply” see chapter “Definitions”.

¹⁹ WHO / UNICEF, Joint Monitoring Programme for Water Supply and Sanitation, 2002

<i>Water Supply Service Coverage</i>		<i>Average</i>
Access to improved water resources (MDG) WHO / UNICEF, Joint Monitoring Programme for Water Supply and Sanitation (updated 2004)	Urban: 98% Rural: 88%	93,0%
Population served by public networks (Household connections) WHO / UNICEF, Joint Monitoring Programme for Water Supply and Sanitation (Updated 2004)	Urban: 95% Rural: 68%	83%
Potable Water Supplied (l/cap/day)	No country with average less than 100 l/cap/day	168 l/cap/day
Potable Water Consumed (l/cap/day)	(data available only for four countries)	85 l/cap/day
Average Unaccounted For Water (UFW) %	4 countries with more than 45% UFW	36%
Service Continuity	Only 2 countries resulted having continuous water supply to the entire population	n/a

- **Population served by public networks**

The percentage of total population connected through a household connection is as expected, less than the total access to improved water supply. It is mainly the rural areas that lack household connections, with example of countries with connection rates less than 20%. The data in the table are estimates for 2002, updated in 2004 and vary in some cases from the official national statistics.

	<i>Access to improved water resources</i>	<i>Population served by public networks (Household connections)</i>				
		<i>Urban</i>	<i>Rural</i>		<i>Urban</i>	<i>Rural</i>
Algeria	88%	93%	82%	73%	87%	58%
Cyprus	100%	100%	100%	100%	100%	100%
Israel	100%	100%	100%	100%	100%	98%
Jordan	93%	95%	91%	85%	89%	81%
Lebanon	100%	100%	100%	93%	100%	85%
Malta	100%	100%	100%	98%	100%	96%
Morocco	78%	100%	56%	52%	92%	12%
Palestine	92%	97%	86%	77%	91%	63%
Tunisia	89%	98%	80%	77%	98%	36%
Turkey	89%	95%	82%	75%	95%	55%
Average	93%	98%	88%	83%	95%	68%
Good Practice	100%	100%	100%	100%	100%	100%

Source: WHO / UNICEF, Joint Monitoring Programme for Water Supply and Sanitation – Last updated in 2004

- **Potable Water Supplied**

In average the drinking water supply range between 100 litres and 250 litres per capita and day. Consumed volumes are even less considering the level of Unaccounted for Water (UFW). The information over potable water consumed was so scarce that no general conclusion could be drawn from these data. The average potable water consumed per day for the four countries where data was found resulted in 85 l/cap/day.

- **Unaccounted For Water**

The rate of Unaccounted for Water (UFW) is still high and for more than half of the countries 40 to 50 percent, much higher than the level of good practice. Based on the data found, only Cyprus, Tunisia and Malta seem close to reach target of 20% UFW or less.

- **Service Continuity**

The average access to improved service is an important indicator for level of service, but it should be noted that it does not take into consideration the continuity of service supply. The result of the study regarding service continuity is not complete and there are not enough data for all MPC to draw any overall conclusion regarding service continuity. It is probable that the estimated access rate to water supply services would change significantly if this factor were taken into consideration in the evaluations of average access rate. In some countries water supply service is being suspended during night time or only provided during a couple of days per week. The problem of interrupted supply seems to affect mostly large cities, and in some countries only during dry summer months.

	Total Potable Water Supplied <i>Mm³</i>	Potable Water Supplied <i>(l/cap/day)</i>	Average Unaccounted For Water <i>(UFW) %</i>	Potable Water Consumed <i>(l/cap/day)</i>
Algeria	1.335		40%	
Cyprus	67,5	200	20%	
Israel	688	250		
Jordan	281	125	52%	86
Lebanon	1.261	160	50%	
Malta	34	223	25%	
Morocco	860	150	30%	
Palestine	76,6	100	45%	70
Tunisia	394	104	22%	75
Turkey	5.000	198	41%	110
Average		168	36%	85
Good Practice			< 20%	>100

Source: National Statistics of each country, studies and National Focal Points. The data are not referring to the same year but are the most recent data available.

- **Access to Sanitation Services**

Although the water sector strategies of the MPC seem, also if limited, to gradually give more and more attention to sewage services and wastewater treatment, there is still low evidence in research reports. The official statistics of the countries regarding sanitation coverage and wastewater treatment are also scarce and it is difficult to establish levels of "good practice" regarding these services.

<i>Sanitation Service Coverage</i>		<i>Average</i>
Estimated Access to Improved Sanitation 2002(MDG) [1]	Urban: 94% Rural: 76%	86%
Population served by public networks (Household connections) [1]	Urban: 80% Rural: 28%	58%
Access to sanitation services from more recent national statistics	Trend seem positive	88%
Rate of wastewater treated (4 countries out of 10)	1 country treat more than 63%	33%

[1] All data taken from - WHO / UNICEF, Joint Monitoring Programme for Water Supply and Sanitation – Last updated in 2004

Based on the estimated values from 2002 the average rate of population with access to improved sanitation²⁰ is between 70 to 90 percent in the studies countries although there are still countries with less than 50 percent coverage to rural population.

More recent national statistics²¹ (2002 and 2005) indicate a positive trend in increasing service coverage, although at least 3 countries still cover less than 80 percent of the population.

	<i>Access to sanitation services from national statistics</i>	<i>Estimated Access to Improved Sanitation 2002(MDG)</i>	<i>Estimated Access to Improved Sanitation 2002(MDG)</i>		<i>Population served by public sewers 2002 (Household connections)</i>	<i>Population served by public sewers 2002 (Household connections)</i>	
			<i>Urban</i>	<i>Rural</i>		<i>Urban</i>	<i>Rural</i>
<i>Algeria</i>	92%	91%	99%	82%	65%	85%	44%
<i>Cyprus</i>	100%	100%	100%	100%	33%	49%	16%
<i>Israel</i>	100%	100%	100%	100%	81%	91%	70%
<i>Jordan</i>	93%	90%	95%	85%	40%	73%	6%
<i>Lebanon</i>	98%	94%	100%	87%	61%	100%	22%
<i>Malta</i>	100%	100%	100%		95%	95%	
<i>Morocco</i>	61%	57%	83%	31%	49%	81%	16%
<i>Palestine</i>	76%	74%	78%	70%			
<i>Tunisia</i>	80%	76%	90%	62%	50%	64%	35%
<i>Turkey</i>	83%	79%	94%	63%	48%	83%	12%
Average	88%	86%	94%	76%	58%	80%	28%

Source: WHO / UNICEF, Joint Monitoring Programme for Water Supply and Sanitation – Last updated in 2004

• Wastewater

The study showed that Israel has come furthest in the collection and treatment of wastewater, with about 96 percent of total volume of wastewater collected and 64 percent of wastewater adequately treated. This advanced position can probably be explained by the many years of intensive water supply strategies, due to the emergency to mitigate the overdraft and depletion of water resources in the country. The ultimate objective is to treat 100% of Israel's wastewater to a level enabling unrestricted irrigation in accordance with soil sensitivity and without risk to soil and water sources.²²

Turkey treat around 47% (1.38 billion m³) of total volume 2.91 billion m³ of wastewater (2002). The Turkish State Institute of Statistics has been collecting data on the current status of wastewater services and wastewater treatment plants of all municipalities in Turkey within the scope of Environmental Statistics since 1994. In 2002, 2060 of 3215 municipalities were served by

²⁰ For the definition of "Improved Sanitation" see chapter "Definitions".

²¹ The national statistic are mainly taken from official statistics of the years 2002 to 2004

²² Source: Israel Ministry of the Environment - Environmental Topics - Wastewater

wastewater networks with 2.91 billion m³ of wastewater discharged by network systems. 49,9 % of total municipal population is connected to wastewater treatment plants.

In Cyprus there is a growing interest for recycled wastewater and the possibility to use it as an additional source of supply. The first sewage treatment plant in operation produces 5 Mm³ of tertiary treated water and the new plants under construction and planned will produce 13 Mm³ by the year 2005 and 30 Mm³ by the year 2012. About 3 Mm³ of treated sewage effluent is used for agriculture and irrigation.

In Jordan about 61 Mm³ was indirectly reused for irrigation in 2001 in the Jordan Valley. It is expected that the volume of treated wastewater for reuse in irrigation only, will amount to 220 MCM/year by the year 2020 and will constitute a significant portion of the total irrigation water and hence supplement the demand for renewable groundwater resources.

In Malta is the Sant' Antnin Sewage Treatment Plant (SASTP) currently the only sewage treatment plant.²³ Two other sewage treatment plants are in the pipeline, one in Malta near Cumnija and the other in Gozo. These are projected to be completed by 2007. WSC Annual Report 2004 state that 3,035,011 m³ of wastewater was channelled to the SASTP for treatment, 2,128,976 m³ of which were delivered for reuse. Approximately 75% is provided to the agricultural sector and the remaining 25% to the industrial sector.

In Tunisia has the number of wastewater treatment plants (WWTPs) gradually risen in the last decade and is expected to reach 83 by 2006. The volume of water treated, was 169 Mm³ and corresponds to an equivalent of 5.5 million inhabitants (2001).

In the other countries, where it has been possible to find data, the rate of treatment varies with some of them treating less than 20 percent.

²³ Source: Ministry for the Environment, 2001, EIE Web Page

6. Tariffs

The tariff policy and metering procedures are critical aspects for sustainable service supply and a prerequisite for reaching the objectives of access to improved water supply and sanitation. It is also a major challenge as tariff structures and subsidies should be set to secure economical sustainability but at the same time not compromise the poorest possibilities to satisfy basic need for water and sanitation services.

The result from the study show that most of the MPC have laws that define water as an economic good, establishing that costs connected to the service production, operations and maintenance as well as capital costs, should be covered through tariffs. The intention to reduce and finally stop subsidises of water services and to apply a user pay principle to reduce water demand is also states in most tariff policies.

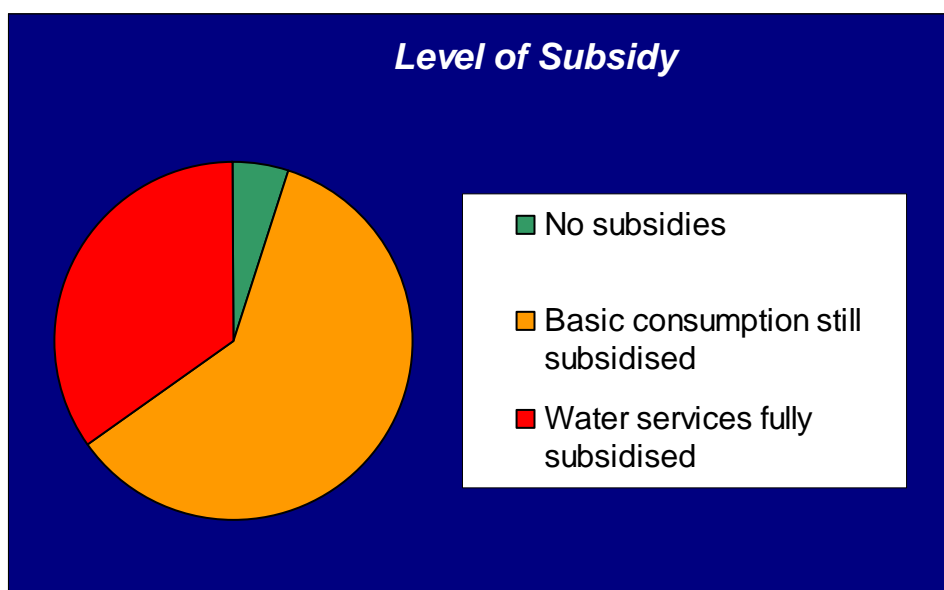
- **Progressive Block Tariffs**

Most MPC are applying a progressive block tariff structure. Tunisia for example has a five block tariff based on cubic meters consumed per quarter, each block corresponding to a different tariff per m³. Cyprus, Palestine, Morocco and Israel have similar structures with a fixed rental cost per month combined with a variable cost depending on m³ consumed. Jordan also applies a block tariff structure although 20m³ is considered minimum consumption rate per quarter. Malta applies a 2 level block tariff for domestic supply where the cost per m³ increases significantly if the level of minimum supply is exceeded. Lebanon does not apply block tariffs but has a system of an annual subscription fees based on daily supply, for example 1 m³/ day.

- **Subsidies**

The study indicates that most countries still subsidise their tariffs to some extent. The trend is though to reduce the subsidies and ultimately let water tariffs cover all costs connected to production and supply of local water services.

A model applied in several MPC is to subsidise water tariffs partially. The subsidies mainly serve to secure the basic need for water. In Tunisia for example are the subsidises only applied on the first block of consumption, available exclusively for low income users whose consumption does not exceed 20m³ per quarter. In some countries does the tariff levels depend on the type of use. Full cost recovery is applied on water used in the industry and for tourist purposes, while the domestic supply is still subsidised.



In Cyprus are the Local Water Boards and the water authorities responsible to set progressive block tariffs, seasonal prices and over-consumption penalties for the purpose of promoting efficiency and conservation objectives in water use. The Water Boards and local water authorities are run without any subsidy although it should be noted that the bulkwater, sold by the public institution WDD to the service providers, is still subsidised.

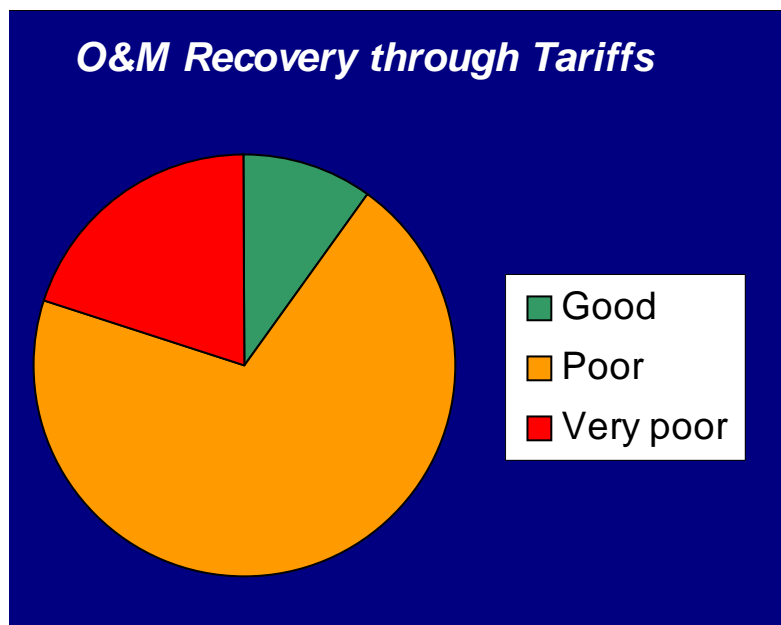
Israel replaced in 1994 the cost plus method with a business oriented method in which the fixed cost (capital and labour) and variable costs (energy and materials) were defined, and a 2.5% efficiency factor was imposed on the Company's performance. A substantial increase in water prices coupled with improved performance (saving in energy cost and other variable and fixed costs) have resulted in a significant reduction in the Government's subsidy from 40% to 20% over the last four years and domestic water supply to urban areas is not subsidised any longer.

In Lebanon does the water tariffs cover maintenance and renewal costs for existing network and equipment, but does not take into consideration future investment needs. Turkey seems to have come far in the process to eliminate subsidies. The O&M costs, amortization, rehabilitation and expanding costs are considered in establishing drinking water and wastewater tariffs.

Malta still applies subsidies to cover financial deficit of the public water utility although the rate is decreasing every year and the objective is to reach financial independence as soon as possible.

- **Rate of Operations and Maintenance (O&M) covered through tariffs**

Covering O&M costs through water tariffs is a major challenge and an important measure of economic performance in the water sector. Although there is not enough information to estimate the rate of O&M that is actually covered through tariffs in the studied countries, the general conclusion is that all countries are aiming to cover O&M costs through tariffs and some countries have also come far in the implementation of a more cost effective management of their water services.



- **Meter reading interval**

The meter reading practices varies a lot between the studied countries. The trend is to reduce the intervals between the readings and implement a system with water bills based on effective, instead of estimated, consumption. The countries that have come furthest in their implementation of more economical efficiency, the meters are read every 2 months and invoices are based on real consumption instead of estimates.

- **Comparison of the tariffs for m3 of water**

In the tentative to compare the level of tariffs for water services between the MPC, an average of the most recent tariff levels of the reference literature is presented here. Note that the tariffs in the table below should be considered indicative and in no circumstance as real tariffs actually applied in the countries. An average tariff for domestic supply has been calculated in the countries where block tariffs have been applied. In Cyprus has the tariff for bulkwater been included in the comparison, as it has not been possible to find data over local water tariffs. The average tariff in Lebanon is based on the subscription fees for 1 m³ /day in 2001.

<i>Average tariff for m3 Water €</i>	
<i>Algeria</i>	
<i>Cyprus</i>	58 cent
<i>Israel</i>	
<i>Jordan</i>	53 cent
<i>Lebanon</i>	22 cent
<i>Malta</i>	34 cent
<i>Morocco</i>	52 cent
<i>Palestine</i>	55 cent
<i>Tunisia</i>	
<i>Turkey</i>	

- **Tariffs for Sanitation and Sewage services**

In the MPC where it was possible to find information, the study shows that Sanitation and Sewerage services are still charged in proportion to domestic water consumption and not based on the actual cost for providing the services.

- **Responsible institution for setting tariffs**

Although the set-up varies between the studied countries the study shows that it is the responsibility of a public institution to define the water tariffs. In Malta and Jordan are the tariffs set on governmental level and vary only slightly between different areas. In Cyprus, for example, is the bulkwater tariff established centrally and local water tariffs by the municipalities or water utilities, taking into consideration the costs to deliver the water to the end-user. The tariffs vary therefore between the different regions or even cities of the same region. In Palestine and Israel are the tariffs regulated centrally but varies between different areas. In Lebanon has the responsibility for setting water tariffs been decentralized to the local water authorities.

7. Conclusions

The main conclusions regarding water sector strategies and institutional settings are that all countries have followed a general trend of applying a broader strategic approach for securing water services including measures like for example demand management, economical sustainability and wastewater reuse. Although the level of implementation and measures differs, all MPC have initiated reforms of institutional settings and legislative framework, applied to alternative forms of management in order to support the water sector strategies and implement an incentive system for economical efficiency and environmental protection.

Most MPC strategies include private sector involvement, considering it strategic in order to reach set objectives. Almost all countries have already taken the necessary steps to change their legal framework and the institutional settings in order to open up the water sector for private interests. On the other hand, there are still few examples of private companies actually managing the integrated water service utilities in the MPC. Only four countries have implemented management contracts to some extent for providing local water supply and sanitation. In the other countries is the private sector involvement still limited to infrastructure works under arrangements like BOT or BOOT, in particular for the construction and management of desalination and wastewater treatment plants.

Regarding Water Supply, Sanitation and Sewage the study showed that the proportion of population with sustainable access to improved water supply in the MPC can be considered overall sufficient. Recent data (2004) also show an improvement since 2002. The access rate of water supply through a household connection is less but still to be considered sufficient, except for rural areas of some countries, covered by less than 20%. The access rate to sanitation services is also generally satisfactory except for rural areas of a majority of the studied countries. The rate of wastewater undergoing treatment is on the other hand low and in some countries even very low. Furthermore should be noted that the information regarding sewage services is scarce and often unreliably.

The study also underlines some critical aspects regarding tariffs and the economical sustainability of water services in the MPC. Almost all countries, except Lebanon, apply progressive block tariffs. Sanitation and sewerage services are generally charged in proportion to domestic water consumption. Almost all countries apply a fixed part of the tariff independent of the total consumption. The majority of the countries still subsidies local water services to some extent. Although most MPC have the objective to recover at least O&M cost and further on, also capital costs, is the costs recovery of water services still generally low.

8. Definitions

8.1. Millennium Goals

At the 2002 World Summit for Sustainable Development in Johannesburg (WSSD), the EU launched a Water Initiative (EUWI) designed to contribute to the achievement of the Millennium Development Goals (MDGs) and WSSD targets for drinking water and sanitation, within the context of an integrated approach to water resources management. The EUWI is conceived as a catalyst and a foundation on which future action can be built to contribute to meeting the water and sanitation MDGs.

“The MDGs critically highlight the link among improved water supply, safe sanitation, better hygiene, and poverty reduction. With the strong political process backing the initiative, the MDGs represent a once-in-a-generation opportunity to make significant progress in the sector.”

This thematic study is relevant in the context of the Millennium Development Goal 7, which aims to “Ensure Environmental Sustainability “. Below follows a brief description of the goal and target 10 of the MGDs.

- **Goal 7. Ensure environmental sustainability.**

Target 10. Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

Target 10²⁴

Halve, by 2015, the proportion of people without sustainable access to safe drinking water and hygienic sanitation;

Indicator: proportion of the population with sustainable access to an improved water source. At the World Summit on Sustainable Development held in Johannesburg in 2002, this target was amended to halving, by 2015, the proportion of people who do not have access to basic sanitation.

Water, access to improved drinking supply [code 248]

"Improved" water supply technologies are: household connection, public standpipe, borehole, protected dug well, protected spring, rainwater collection.

"Not improved" are: unprotected well, unprotected spring, vendor-provided water, bottled water (based on concerns about the quantity of supplied water, not concerns over the water quality), tanker truck-provided water.

It is assumed that if the user has access to an "improved source" then such source would be likely to provide 20 litres per capita per day at a distance no longer than 1000 metres. This hypothesis is being tested through National Health Surveys which are being conducted by WHO in 70 countries. (Communication of 25 March 2003 from the WHO Water, Sanitation and Health Programme)

Proportion of the urban and rural population with access to improved sanitation

Proportion of the population with access to improved sanitation refers to the percentage of the population with access to facilities that hygienically separate human excreta from human, animal and insect contact. Facilities such as sewers or septic tanks, pour-flush latrines and simple pit or ventilated improved pit latrines are assumed to be adequate, provided that they are not public, according to the World Health Organization (WHO) and United Nations Children's Fund's (UNICEF) Global Water Supply and Sanitation Assessment 2000 Report. To be effective, facilities must be correctly constructed and properly maintained.

²⁴ Water and sanitation program - http://www.wsp.org/03_Millennium.asp

Definition of Access to Sanitary Means of Excreta Disposal

Access to sanitary means of excreta disposal is estimated by the percentage of the population using improved sanitation facilities. Improved sanitation facilities are those more likely to ensure privacy and hygienic use. Improved Sanitation Facilities include Connection to a public sewer Connection to a septic system Pour-flush latrine Simple pit latrine Ventilated improved pit latrine. Unimproved Sanitation Facilities are public or shared latrine, open pit latrine and bucket latrine.

8.2. Unaccounted for Water

The amount of the distribution Input that cannot be accounted for by legitimate use. UFW can be comprised of trunk main and reservoir losses, distribution network losses and user supply pipe leakage, as well as water taken illegally and water used for such operational purposes as system flushing and fire-fighting.