ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA (ESCWA)

SUSTAINABLE WATER SUPPLY AND SANITATION FOR ALL

REGIONAL ASSESSMENT REPORT ON THE STATUS AND ACHIEVEMENTS OF ESCWA MEMBER COUNTRIES TOWARDS IMPROVED WATER SUPPLY AND SANITATION

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ملخص تنفيذي

عندما تبنى المجتمع الدولي الأهداف الإنمائية للألفية في مؤتمر قمة الألفية عام 2000، تعهد بتخفيض نسبة الأشخاص الذين لا يمكنهم الحصول على مياه الشرب المأمونة والصرف الصحي إلى النصف بحلول عام 2015، حسبما نصت عليه الغاية 10 من الهدف 7 من الأهداف الإنمائية للألفية. ولكن التقدم المحرز في تحقيق هذه الغاية في بعض البلدان الأعضاء في اللجنة الاقتصادية والاجتماعية لغربي آسيا (الإسكوا) يعتبر بطيئاً ومتعثراً، وبالتالي لا بد من إجراء تغيير جذري واتخاذ إجراءات حازمة من أجل تسريع التقدم المطلوب تحقيقه في هذا المجال.

وفي هذا الإطار، أجرت الإسكوا، بالتعاون مع الوكالة الألمانية للتعاون الفني، مسحاً إقليمياً لتقييم قطاع إمدادات المياه والصرف الصحي في جميع البلدان الأعضاء واقتراح الإصلاحات اللازمة على مستوى السياسات والمؤسسات بغية تمكين هذه البلدان من تحقيق الغاية المتعلقة بإمدادات المياه والصرف الصحي. وشمل التقييم الهياكل المؤسسية القائمة والإصلاحات الجارية في قطاع إمدادات المياه والصرف الصحي، والجهود الرامية إلى تحقيق اللامركزية وزيادة دور القطاع الخاص والمستثمرين والجهات المانحة في تقديم الخدمات وإدارة تمويل هذا القطاع. كما شمل التقييم التشريعات القائمة والنظام الرقابي ومدى إدراج المسائل المتعلقة بإمدادات المياه والصرف الصحي ضمن إطار الإدارة المتكاملة للموارد المائية.

ويعرض هذا التقرير نتائج المسح الإقليمي التي تتضمن تحليلاً للوضع القائم فيما يتعلق بتوفير إمدادات المياه والصرف الصحي، وتحديداً للصعوبات والتحديات الرئيسية التي تعوق إحراز التقدم في هذا المجال. ويختتم التقرير بمقترحات بشأن الخيارات الممكن اعتمادها على صعيد السياسات والإصلاحات المؤسسية اللازمة لتحسين قطاع إمدادات المياه والصرف الصحي وتسريع عملية تخفيض نسبة الأشخاص الذين لا يمكنهم الحصول على مياه الشرب المأمونة والصرف الصحي إلى النصف بحلول عام 2015.

1- الوضع الإقليمي فيما يتعلق بتوفير إمدادات المياه والصرف الصحي

لغرض المقارنة، قسمت البلدان الأعضاء في الإسكوا إلى أربع مجموعات مختلفة من أجل تحديد الاختلافات بين المناطق. ولكل مجموعة سماتها الخاصة من حيث القدرات المالية والبنية الاقتصادية والاجتماعية، ومستوى الإنجازات في تحقيق الغاية المتعلقة بإمدادات المياه والصرف الصحي ضمن الأهداف الإنمائية للألفية. وفيما يلي عرض للمجموعات الأربع ومستوى توفير إمدادات المياه والصرف الصحي في كل منها:

(أ) المجموعة ألف: وتتضمن دول مجلس التعاون الخليجي، أي الإمارات العربية المتحدة، ومملكة البحرين، وسلطنة عمان، وقطر، والكويت، والمملكة العربية السعودية، التي تتميز بارتفاع نسبي لنصيب الفرد من الناتج المحلي الإجمالي، وارتفاع معدلات نمو الناتج المحلي الإجمالي، وارتفاع نسبة المناطق الحضرية. وقد حققت هذه البلدان، فيما عدا سلطنة عمان، الغاية المتعلقة بإمدادات المياه والصرف الصحي على نحو شبه كامل. ويقدر المعدل العام لتوفير إمدادات المياه بنسبة 93 في المائة، والصرف الصحي بنسبة 98 في المائة في بلدان هذه المجموعة. أما سلطنة عمان فما زالت متأخرة في تحقيق هذه الغاية لأسباب منها أن عدد سكان الأرياف فيها هو الأكبر بين كل دول مجلس التعاون الخليجي؛

(ب) المجموعة باء: وتتكون من البلدان التي تسير على الطريق الصحيح لتحقيق الغاية المتعلقة بإمدادات المياه والصرف الصحي، وهي الأردن، والجمهورية العربية السورية، ومصر، ولبنان. ويقدر المعدل العام لتوفير إمدادات المياه بنسبة 96 في المائة، والصرف الصحي بنسبة 89 في المائة في بلدان هذه المجموعة. وتعتبر معدلات التحضر معتدلة، ومستوى الدخل متوسطاً بصفة عامة في هذه البلدان. وقد تمكنت هذه البلدان من توسيع نطاق توفير خدمات إمدادات المياه والصرف الصحي لجزء كبير من السكان، ولا سيما في المناطق الريفية، وذلك بفضل مساعدة المجتمع الدولي في توفير التمويل اللازم للاستثمار في البنية الأساسية لقطاع المياه؛

(ج) المجموعة جيم: وتتكون من اليمن فقط، الذي يعتبر البلد الوحيد الأقل نمواً في منطقة الإسكوا. ويقدر المعدل العام لتوفير إمدادات المياه في اليمن بنسبة 66 في المائة، والصرف الصحي بنسبة 46 في المائة، وبالتالي لا يمكن اعتبار هذا البلد على الطريق الصحيح لبلوغ الغاية المتعلقة بإمدادات المياه والصرف الصحي في الوقت الراهن، ولكن لديه بالتأكيد فرصة لتحقيق هذه الغاية إذا تضاعفت الجهود المحلية والدولية في هذا المجال.

(د) المجموعة دال: وتتكون من العراق وفلسطين اللذين ليسا على الطريق الصحيح لتحقيق الأهداف الإنمائية للألفية لأنهما يعانيان من عدم الاستقرار السياسي، والحروب، والاحتلال، والنزاعات الداخلية. وقد تدهورت فيهما البنية التحتية لإمدادات المياه والصرف الصحي نتيجة لهذه الصراعات. ويقدر المعدل العام لتوفير إمدادات المياه والصرف الصحي بنسبة 78 في المائة.

2- تقييم الأنظمة القائمة لإدارة إمدادات المياه والصرف الصحي

يبين تحليل الوضع الراهن لهياكل إدارة قطاع إمدادات المياه والصرف الصحي أن حكومات المنطقة تبذل جهوداً متواضعة لوضع أسس البنية الملائمة لإدارة الموارد المائية. كما يبين أن كلاً من البلدان الأعضاء في الإسكوا يعتمد نهجاً مختلفاً للإدارة المتكاملة للموارد المائية في إصلاح قطاع المياه، مما يعكس تبايناً كبيراً في الأوضاع الاجتماعية والاقتصادية والثقافية والقدرات التشريعية والإدارية لهذه البلدان. غير أن هناك تشابهاً في ما تواجهه هذه البلدان من تحديات وقضايا متعلقة بالسياسات.

وقد بين المسح أن جميع البلدان الأعضاء في الإسكوا اتخذت إجراءات لإصلاح مؤسساتها المعنية بإمدادات المياه والصرف الصحي، ومنها تطبيق اللامركزية التي أدت إلى نقل المسؤوليات إلى المستويات المحلية. إلا أن ضعف آليات التنسيق يجعل من الصعب على الجهات المحلية الحفاظ على المرافق وصيانتها، واجتذاب التمويل اللازم أو الفنيين ذوي الكفاءة، كما يجعلها مقيدة بالحكومات المتغيرة لتمويل الاستثمارات الجديدة. ولا بد من تفعيل التنسيق فيما بين أصحاب المصلحة المعنيين بقطاع المياه، وذلك من خلال المجالس المشتركة لإدارة الموارد المائية، والأنشطة والاستثمارات المشتركة، بالإضافة إلى المساهمة في جمع الموارد المالية على الصعيدين الوطني والمحلي.

وفيما يتعلق بالتشريعات، تعتبر القواعد المنظمة للموارد المائية، إلى جانب التشريعات، أدوات أساسية وفاعلة لصياغة وتنفيذ خطط فعالة لتوفير إمدادات المياه والصرف الصحي. ولا تزال المنطقة بحاجة إلى إنشاء آليات فعالة لضمان التقيد بالقوانين المتعلقة بالمياه وإنفاذها، وتوفير الدعم المالي والتقني اللازم من المؤسسات المعنية إلى مسؤولي الضبط القضائي والمفتشين في قطاع المياه.

وقد سجل تقدم في تفعيل دور أصحاب المصلحة في التخطيط والتوزيع في مجال المياه والصرف الصحي في معظم البلدان الأعضاء في الإسكوا، لكن هذا الدور بحاجة إلى مزيد من التفعيل من أجل إدارة الموارد المائية على نحو أكثر فعالية وإحراز مزيد من التقدم في تحقيق الهدف 7 من الأهداف الإنمائية للألفية. كذلك، ينبغي مضاعفة الجهود لتشجيع مشاركة المستخدمين في المجالس المحلية، وللتوعية العامة بضرورة المحافظة على المياه وحمايتها من التلوث، وإرساء العادات المدنية التي تقضي باحترام القوانين والأنظمة والتشريعات العامة.

ويسود اتجاه في معظم البلدان الأعضاء في الإسكوا نحو زيادة إشراك القطاع الخاص في المشاريع المتعلقة بإمدادات المياه والصرف الصحي. ومن أبرز عناصر الإصلاح إشراك القطاع الخاص في بناء وتشغيل المرافق الخاصة بتوفير إمدادات المياه والصرف الصحي، وذلك من خلال إقامة الشراكات بين القطاعين العام والخاص. وقد اختار صانعو السياسات في البلدان الأعضاء في السنوات الأخيرة الماضية إقامة الشراكات بين القطاعين العام والخاص باعتبارها خياراً استراتيجياً يقضي بإجراء إصلاحات قطاعية شاملة ويتناسب مع مجمل البرامج الخاصة بالتكيف الهيكلي. ونجحت هذه الشراكات بشق منافذ جديدة وتحقيق ابتكارات في مجالات كانت فيها التجارب السابقة إما ضئيلة أو منعدمة. ورغم أن حصيلة الخبرات والنتائج المحققة حتى الآن لا تزال أولية في بلدان عدة، إلا أنها قد تشكل دروساً قيمة لحقيبة المشاريع المتنامية بسرعة والتي تدعم الشراكات بين القطاعين العام والخاص. لذلك، لا بد من رصد تلك الأنشطة من أجل تقييمها في المستقبل بغية وضع مفاهيم جديدة قائمة على استراتيجيات وخطط معدلة.

3- الخيارات المقترحة بشأن السياسات والإصلاحات المؤسسية والتشريعية

استناداً إلى استعراض التقدم المحرز منذ عام 1990 (سنة مرجعية تستخدم كمقياس للمقارنة)، يبدو أن بلوغ الغاية المتعلقة بإمدادات المياه والصرف الصحي بحلول عام 2015 لن يكون ممكناً في العديد من البلدان الأعضاء. ولكن قد يكون من الممكن تحقيق تلك الغاية الطموحة في حال أجرت هذه البلدان تحسينات في خدمات إمدادات المياه والصرف الصحي، وقامت بتوسيع نطاق التوزيع إلى المناطق التي تفتقر إلى هذه الخدمات، وحققت الاستقلالية في إدارتها. كما ينبغي تعزيز دور المجتمع المدني، ولا سيما النساء، لضمان تقديم الخدمات على نحو كفؤ ومستدام.

ويتطلب دمج الأهداف الإنمائية للألفية في خطط التنمية الوطنية، التوسع في الشراكات لتشمل المجتمعات المحلية، ومؤسسات التمويل، وجمعيات المستهلكين، وقطاعات الأعمال، وصانعي القرار، وذلك لتعزيز الثقة وضمان التعاون الفعال بين أصحاب المصلحة. لا بد من تشجيع البلدان الأعضاء خاصة على اعتماد مبادئ الإدارة المتكاملة للموارد المائية، ولا سيما استراتيجيات إدارة الطلب على المياه، كعنصر أساسي في خطط إمدادات المياه والصرف الصحي. وفي هذا الخصوص، وبعد استعراض وتقييم حالة إمدادات المياه والصرف الصحي في البلدان الأعضاء، تقترح الدراسة عدداً من الخيارات بشأن السياسات والإصلاحات المؤسسية والتشريعية من أجل ضمان تحقيق الغاية المتعلقة بتوفير إمدادات المياه والصرف الصحي بحلول عام 2015.

1- إدراج الحصول على إمدادات المياه والصرف الصحي ضمن الخطط الوطنية للإدارة المتكاملة للموارد المائية.

2- إعطاء الأولوية لإمدادات مياه الشرب بين القطاعات المتنافسة على موارد المياه.

3- تحسين معالجة مياه الصرف الصحي وإعادة استخدامها.

4- الحد من هدر المياه.

5- حماية نوعية مياه الشرب.

6- توسيع نطاق توفير إمدادات المياه والصرف الصحي في المناطق الحضرية والمناطق المحيطة بها.

7- توسيع نطاق توفير إمدادات المياه والصرف الصحي في المناطق الريفية.

8- تحسين نظم رصد قطاع إمدادات المياه والصرف الصحي.

9- تعزيز القدرات المالية لمرافق إمدادات المياه والصرف الصحي.

Executive summary

In adopting the Millennium Development Goals (MDGs), the international community pledged to halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation. However, progress in meeting the water and sanitation target of the MDGs has so far been fitful and slow. Radical change and resolute actions are needed in member countries of the Economic and Social Commission for Western Asia (ESCWA) in order to reach these goals. This regional assessment report was prepared to assess the prevailing situation in the ESCWA region with respect to water supply and sanitation (WSS), and evaluate the policies and strategies that have been formulated and adopted to develop and manage this sector. This report also assesses the achievements and progress made in ESCWA member countries towards improved WSS service provision in order to identify the major constraints and challenges impeding the progress of implementation. The report concludes with proposals and recommendations on the policy options and institutional reforms that are needed to expedite and improve the performance of WSS sectors in service delivery in a holistic integrated approach to meet Goal 7 of the MDGs, and particularly Target 10 of Goal 7, "to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation".

1. *Regional status with respect to WSS coverage*

For comparative purposes, ESCWA member countries are clustered into four distinctive groups or categories in order to map interregional variations. Each group has its own financial capabilities, socio-economic structure and level of achievement with respect to meeting the WSS target contained in the MDGs. The WSS coverage in these groups of countries is as follows:

Group A: This group contains the six countries of the Gulf Cooperation Council (GCC) – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. These countries are characterized by relatively high gross domestic product (GDP) per capita, high GDP growth rates and high levels of urbanization. The countries in group A have almost entirely achieved their WSS targets, with the exception of Oman. Overall water supply coverage is estimated to be 93 per cent. Sanitation coverage is estimated to be 98 per cent. Oman lags behind the other GCC countries in terms of WSS coverage, partly due to the fact that it has the largest rural population in the GCC.

Group B: This group is comprised of countries that are on track to achieve WSS targets. This group comprises four countries – Egypt, Jordan, Lebanon and the Syrian Arab Republic. Overall WSS coverage is estimated to stand at 96 and 89 per cent respectively. These countries have moderate levels of urbanization and are generally classified as middle-income countries. With the assistance of the international community, which provides investments in water sector infrastructure, these countries have been able to extend WSS services to a large portion of the population, especially in rural areas.

Group C: This group is comprised of Yemen, the only least developed country (LDC) in the ESCWA region. Overall WSS coverage is estimated to stand at 66 and 46 per cent respectively. Yemen is not currently on track to reach its WSS MDG target, but certainly has a chance to reach the target if domestic and international efforts are redoubled.

Group D: This group is comprised of two countries that are not on track to meet the WSS target of the MDGs – Iraq and Palestine. These two countries are currently experiencing political instability, hostilities, occupation and internal strife and face uncertain prospects. Overall WSS coverage is estimated to stand at 78 per cent. The water and sanitation infrastructure of these countries have deteriorated as a direct result of conflict.

2. *Assessment of existing WSS management systems*

Governments in the region are exerting modest efforts considering the inherent constraints, to establish the foundations of adequate structure of water management disciplines. Analysis of the current status of

WSS sector management structures shows that ESCWA member countries are adopting different integrated water resources management approaches to national water sector reform, reflecting important differences in their respective socio-economic and cultural situations and legal and administrative capacities. However, all these countries face some similar policy issues and challenges.

The survey shows that all ESCWA member countries took steps to reform their WSS-related institutions. Decentralization, which is a worthy aim in a sector of this kind, has led to a devolution of responsibilities to sub-national levels; however, poor coordination mechanisms makes it impossible to properly maintain assets, attract necessary finance or skilled personnel, and leaves them dependent on the Governments to fund their new investments. Coordination among water sector stakeholders through joint councils for water resources management, joint activities and shared investments still needs to be activated, in addition to the pooling of financial resources on the national and local levels.

As for legislation, in addition to water laws, regulatory instruments are essential and powerful tools for the formulation and implementation of effective WSS plans. In the region, there is a need to establish effective legal compliance and enforcement mechanisms on WSS issues, and to provide the necessary financial and technical support required by water institutions to the water police officers and inspectors.

The role of stakeholders in water planning and distribution is improving in most of the ESCWA member countries, but still needs to be strengthened in order to achieve more effective management of water resources and to enhance progress towards achieving Goal 7 of the MDGs. Greater efforts need to be made to encourage participation of users through local councils, raising public awareness on the need to conserve water and prevent pollution, and developing civic habits of abiding by Government rules, regulation and legislation.

There is a trend, in most of ESCWA member countries, to increase the involvement of the private sector in water and sanitation projects. One of the key features of the reform is to engage the private sector in the construction and operation of WSS facilities through public-private partnerships (PPPs). In recent years, policymakers in most ESCWA member countries have opted for PPPs as a strategic choice involving sector-wide reforms, in line with overall structural adjustment programmes. These partnerships are breaking new grounds and innovating in areas where prior experience is scant or non-existent. The experiences and results gained thus far, although in many countries preliminary, may provide valuable lessons, for good or worse, for a rapidly growing portfolio of projects that support private sector partnerships. It is therefore worth monitoring these activities for future assessment in order to build on new concepts based on modified strategies and plans.

3. *Proposed policy options and institutional and legislative reforms*

After reviewing progress achieved since 1990, the baseline year, it is likely that the agreed goals and target for WSS will not be attained by 2015 in some ESCWA member countries. However, these ambitious targets may be brought to a favourable outcome, if countries of the region improve service delivery, extend coverage to underserved communities and achieve self-reliance in managing their WSS services. The role of civil society, particularly women, should be strengthened to ensure efficient and sustained performance of the services.

If the MDGs are to be integrated into national development plans, partnerships need to be broadened to encompass communities, financing institutions, consumer associations, businesses and decision makers to foster trust and to ensure effective collaboration among stakeholders. In particular, ESCWA member countries are encouraged to adopt principles of integrated water resources management, especially water demand management strategies as a key approach for the implementation of WSS plans. In this respect, after reviewing and assessing the situation, the following policy options and institutional and legislative measures are proposed in order to expedite achievement of the WSS target of the MDGs by 2015:

1. Mainstreaming access to WSS into national integrated water resources management plans.
2. Prioritizing domestic drinking water among competing uses.
3. Improving wastewater treatment and reuse.
4. Reducing water losses.
5. Protecting drinking water quality.
6. Upscaling WSS delivery in urban and peri-urban areas.
7. Upscaling WSS delivery in rural areas.
8. Strengthening WSS monitoring systems.
9. Strengthening the financial positions of WSS utilities.

I. INTRODUCTION

A. GENERAL

Water is a scarce commodity in the Western Asia region, one of the most arid areas in the world. This natural aridity poses many challenges to supplying the populations in the region with adequate water supply and sanitation (WSS). Water supply provisions under water scarce conditions are often economically costly (for example, augmenting limited natural resources with expensive desalinated water), environmentally sensitive (for example, overdrafting of limited groundwater can impact water quality), and socially significant (for example, providing farmers with a means to support sustainable livelihood).

The availability of adequate water resources and its rational utilization is emerging as a major issue in the development activities of the ESCWA region. Many countries are approaching the limit of water resources development, while others are already experiencing a water deficit that is met by desalination and increasing dependence on groundwater resources.[1]

The difficulties posed by limited water resources has been compounded in recent years by a sharp increase in overall water demand, primarily due to the fast population growth in most of ESCWA member countries.

Furthermore, supplying adequate water supplies is made more difficult by the fact that most water resources in the region originate from outside the region. Cooperation on the shared use of this water has been limited, generally to the detriment of downstream ESCWA member countries. Conflict in some countries has also seriously impacted the level of water supply. Electricity and water infrastructure in these countries have been damaged or destroyed, leading to reductions in water supply and wastewater treatment.

In addition to water supply, sanitation provision is fast emerging as a major issue in the region. The need for proper sanitation is most acute in urban areas, where wastewater must be removed from dense human settlements in order to avoid an outbreak of diseases. Rural settlements also need to be served by proper sanitation facilities, often of a type different from that used in urban areas, to ensure healthy disposal of waste and to protect natural resources that could otherwise be fouled by waste contamination. Sanitation provision can be expensive, but offers an opportunity to recycle and reuse wastewater for agricultural, industrial, or amenity uses, thereby augmenting available water resources in the region.

Managing competing uses of water supply and the various needs of sanitation requires consideration of the numerous economic, social and environmental impacts these service make on a diverse range of stakeholders. Member countries must balance these factors to make the most out of the services they provide. It is under these circumstances that the ESCWA region is working to achieve the Millennium Development Goals (MDGs).

B. FACING THE CHALLENGE

At the United Nations Millennium Summit in September 2000, Member States adopted the Millennium Declaration. One of the outcomes of this declaration are the MDGs, a set of political commitments aimed at tackling the major development issues faced by the developing world. While almost all the MDGs can be indirectly linked to WSS issues, Goal 7 on environmental sustainability addresses them directly: one of its targets, target 10, is "to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation". The baseline year was established as 1990. Moreover, Governments and Heads of States, at the World Summit on Sustainable Development in 2002, agreed to develop Integrated Water Resources Management (IWRM) and water efficiency plans by 2005. They also

[1] ESCWA. 1999. *Current water policies and practices in selected ESCWA member countries.* (E/ESCWA/SDPD/1999/15).

added an additional target “to halve, by 2015, the proportion of people lacking improved sanitation”. The MDG commitments call on all countries to set realistic targets, develop achievable action plans, and allocate the financial and human resources needed to bring safe drinking water and basic sanitation to their populations in a sustainable manner, while protecting the basic needs of poor and vulnerable people.

The pledges made by world leaders are to be commended, but progress in promoting WSS services has been slow. According to the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, the world is still on track to reach the MDG water target, but progress has been slowing. At the current pace, the world will miss the sanitation targets by more than half a billion people. The progress that has been achieved since 2002 is unsatisfactory, far below the level of commitments pledged by the world leaders in their summits and conferences. Major efforts are needed in the years to come to extend the required services to those still underserved.

To shore up efforts of WSS provision, world leaders met again at the 2005 World Summit, also known as the Opportunity Summit, in part to review progress and follow-up measures to achieve the MDGs. They declared the period from 2005-2015 as the “Water for Life Decade”. The Water for Life Decade aims to promote efforts to fulfill international commitments made on water related issues by 2015, placing special emphasis on the involvement of women in these efforts.

The challenge for the Water for Life decade is threefold: to maintain the gains already achieved; to push ahead quickly to provide drinking water and sanitation services to people in rural areas; and to accelerate the successful efforts in urban areas to keep pace with increasing urbanization, particularly by focusing on low income and disadvantaged groups.

C. FROM VISION TO ACTION

To bolster progress in meeting the MDG WSS target, an Advisory Board on Water and Sanitation was formed to guide the Secretary-General of the United Nations on how to achieve the WSS target of Goal 7 of the MDGs. In March 2004, the Advisory Board produced a Compendium of Actions, entitled the “Hashimoto Action Plan”. The Compendium of Actions is a work plan on a global scale to help ensure that the water and sanitation target is met.

The Compendium found that, without radical change, the MDG sanitation target will not be achieved, and that greater awareness and political will, along with more capacity, is needed. At the global level, the key is advocacy. At the regional level, the Advisory Board on Water and Sanitation called upon regional organizations to undertake concerted campaigns to support the provision of financing, marketing, technology, organizational assistance and guidance. The Advisory Board also decided that the Water for Life Decade should be used to build political will to reach sanitation targets.

Several actions were highlighted by the Advisory Board towards this common goal; those of relevance and interest to the ESCWA region comprise the following:

1. The United Nations regional commissions should organize regional high-level meetings, especially in the International Year of Sanitation, to review and promote policy and organizational changes.

2. These regional workshops will be followed up by a Global Sanitation Conference toward the end of the Water for Life Decade (2005-2015).

3. Special focus should be given to strengthening the profile of sustainable reuse-oriented sanitation in international debates and promoting its integration into relevant sector policies, such as health and agriculture.

D. Objectives of the regional survey

In response to the Hashimoto Action Plan and at the request of the Secretary-General, ESCWA carried out the present survey and organized a regional high-level meeting to review and promote current policies and organizational reforms needed to achieve Goal 7 of the MDGs. The main objective of the survey is to assess the WSS sector in ESCWA member countries and propose policy reforms and institutional changes needed to enable these countries to achieve WSS targets.

The survey provides a regional overview and analysis of progress made by ESCWA member countries in promoting improved access to drinking water and sanitation service delivery. It analyses the performance of the WSS sector in light of existing and planned WSS strategies, policies, institutional arrangements adopted in the provision of WSS services, the role of public-private partnership (PPP) in service delivery and the integration of WSS planning and policies within the Integrated Water Resources Management (IWRM) national plans. The survey also assesses the status and achievements of member countries towards improved WSS and identifies the constraints and challenges impeding the progress of implementation. The survey concludes with proposals for strengthening water sector performance to expedite the progress of member countries towards meeting the WSS target of Goal 7 of the MDGs by 2015, through the promotion of WSS policies and proposing the needed institutional reforms.

Recommendations on policy options and organizational reforms necessary to strengthen national mechanisms are made in order to accelerate the improvements of WSS service provision in a comprehensive, holistic manner and within context of IWRM.

E. Methodology

Information and analysis for this survey was informed by a questionnaire, developed by ESCWA and submitted to national consultants in each country, and by a review of the relevant publicly available literature.

The questionnaire consisted of two parts (attached in the annex). Part I requested information pertaining to the general status of demand for water and sanitation services. This part included subsections on population figures and projections, water resources available, WSS metrics (such as water coverage, hours of available water, tariff rates, wastewater treatment, etc.), and water quality data. Part II of the questionnaire requested information on national water policies and programmes for managing water resources. This section focused on IWRM and national strategies for achieving the WSS goal spelled out in the MDG. An additional task was requested consisting of an open-ended three pages response that outlined, in narrative form, an analysis of current situations, policies and trends towards achieving the MDG goals, in the light of the responses in parts I and II of the questionnaire.

The consultants chosen to provide responses to the questionnaire were principally from Government ministries. This was done in our best attempt to obtain official, representative figures. In cases where a consultant from within the Government was not available, due to time or capacity constraints, an individual was retained from a well-respected university in the country in question.

In some cases, a completed questionnaire was not obtained due to unforeseen circumstances. Some questionnaires had unfilled fields in parts I and II. Other questionnaires omitted the narrative in part III. A small number of questionnaires were not completed at all.

In order to further enhance our understanding of the topic and add other relevant topics to the survey, a public literature review was done. Journals, academic papers and documents published by various Government agencies in the region. Often, specific information on individual countries was hard to obtain via the available literature, especially on specific governmental policies and institutional structures.

The policy options recommended in this survey were made with full consideration of the context of the region. The region faces many challenges and constraints in working towards achieving Goal 7 of the MDGs. The challenges and constraints are delineated in the survey. In addition, the cultural, political and economic situations of the region were considered when making policy recommendations. Where possible, the recommendations are tailored to individual countries.

The survey recommendations also take into account worldwide experiences with WSS management and provision. Global best practices and lessons learned are applied where applicable and when they are relevant to the region. Regional best practice and lessons emanating from regional workshops and meetings, held by ESCWA and many other regional bodies, are incorporated where applicable.

II. REGIONAL STATUS AND ACHIEVEMENTS

The MDGs are a broad set of priority areas for global development. This chapter provides an overview of the progress made in the ESCWA region towards the achievement of Goal 7 of the MDGs, and specifically target 10, which aims to halve the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015. The estimated percentage of the population in ESCWA member countries with access to an improved water source and improved sanitation is presented in section A below.[2]

In addition to the WSS achievements made so far, most countries identified intermediate steps that indicate progress towards achieving the MDGs. The steps generally reflect an IWRM approach towards the water sector. These steps include the following:

1. Introducing some reforms in existing policies, strategies, institutional arrangements and legal and regulatory frameworks.

2. Embarking upon intensive capacity-building programmes to improve institutional and legal regimes.

3. Engaging the private sector in the investment, construction and operation of water facilities through public-private partnerships (PPPs).

4. Launching public awareness and community involvement programmes with a focus on the participation of women in the planning, developing and management of water resources.

5. Securing investment funds from donors for WSS infrastructure and various water projects.

A. WSS COVERAGE

1. *Classification*

For comparative purposes, the ESCWA region is clustered into four distinctive groups or categories in order to map interregional variations. Each group has its own special characteristics, in terms of financial capabilities, socio-economic structure, and achievement of the WSS target of the MDGs. The WSS coverage in these groups of countries is as follows:

Group A: This group contains the six countries of the Gulf Cooperation Council (GCC) – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. These countries are characterized by relatively high gross domestic product (GDP) per capita, high GDP growth rates and high levels of urbanization. GDP per capita (PPP US$) in these countries ranges from US$ 15,000 to $28,000 per capita.[3] GDP growth predictions range from 4.0 to 9.7 per cent,[4] and urbanization levels range from 72 to 96 per cent.[5]

The countries in group A have almost entirely achieved their WSS targets. Bahrain, Kuwait, Qatar and the United Arab Emirates, as small, highly urbanized countries, have entirely achieved their MDG goals.

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[2] The Joint Monitoring Programme (2008), established by WHO and UNICEF, defines access to water supply and sanitation in terms of the types of technologies and levels of services afforded. Definitions of "improved" access to water supply and sanitation can be found at: http://www.wssinfo.org/en/122_definitions.html.

[3] UNDP. 2007. *Human Development Report 2007/2008: Fighting climate change: Human solidarity in a divided world*. Available at: http://hdrstats.undp.org/indicators/5.html.

[4] ESCWA. 2008. *Estimates and forecasts for GDP growth in the ESCWA region in 2007-2008*. (E/ESCWA/EAD/2008/Technical Material.1).

[5] UNDP. 2007/2008. Ibid.

Saudi Arabia, a much larger country than the other GCC countries, has achieved total sanitation coverage in urban and rural areas, but it falls behind in water supply to rural populations.

Oman lags behind the other GCC countries in terms of WSS coverage, partly due to the fact that it has the largest rural population in the GCC. However, as the per capita GDP of Oman is growing quickly and as the country is becoming increasingly urbanized, 93 per cent of the population are expected to live in urban areas by 2015,[6] Oman is expected to dramatically increase its WSS coverage as it invests earnings from oil exports into infrastructure.

Group B: This group is comprised of those countries that are on track to achieve WSS MDG targets. This group contains four countries – Egypt, Lebanon, Jordan and the Syrian Arab Republic. These countries have moderate levels of urbanization, from 50 per cent urbanized (Egypt and the Syrian Arab Republic) to 88 per cent urbanized (Lebanon).[7] The countries represented in this group are middle-income countries, with Lebanon being the richest country (US$ 5,600 GDP/capita PPP) and the Syrian Arab Republic being the poorest (US$ 3,800 GDP/capita PPP).[8]

With the assistance of the global community, who provide funds for investments in water sector infrastructure, funds have been allocated in the national budget to extend WSS service delivery to rural areas, and comprehensive national development plans that incorporate the WSS sector have been adopted. As a result, these countries have been able to extend WSS services to a large portion of the population, especially in rural areas.

Group C: This group is comprised of Yemen, the only least developed country (LDC) in the ESCWA region, with a GDP per capita of US$ 930 PPP.[9] Yemen is not currently on track to reach its MDG targets on WSS, but certainly has a chance to reach the targets if domestic and international efforts are doubled. Yemen has a large, mostly rural population (72 per cent of total population), and low levels of economic development. The rural population lives in remote areas that are difficult to supply with water and sanitation services, partly a result of the mountainous terrain in Yemen.

Group D: This group is comprised of two countries that are not on track to meet the MDG goals – Iraq and Palestine. These countries are both conflict-countries, and are experiencing political instability, hostilities, occupation, internal strife and face uncertain prospects. Water and sanitation infrastructure have deteriorated as a direct result of conflict. Meeting the MDG targets under the current conditions will be challenging. Normalization of life in either country would contribute greatly to the improved chances of achieving the MDG goals.

Consecutive wars and years of sanctions in Iraq have left devastating impacts on the water supply situation, disruption of electricity and water supplies and destruction of wastewater treatment plants. Large investments, estimated at US$ 15 billion, are needed to repair the damaged water systems. Palestine is faced with similarly harsh living conditions as a result of years of Israeli border closures and control of water resources. The prevailing tension is exacerbated by the inequity in accessing safe drinking water between the Israelis and the Palestinians. The situation is further aggravated by repeated disruptions in water and wastewater services and demolition of infrastructure.

[6] ESCWA survey questionnaires.

[7] Joint Monitoring Programme. 2008. Ibid.

[8] UNDP. 2007/2008. Op. cit.

[9] UNDP. 2007/2008. Op. cit.

2. *Water supply coverage*

According to the figures provided by the Joint Monitoring Programme (JMP),[10] the percentage of water supply coverage varies among the four identified groups. An average value of 93 per cent is attained for group A, 96 per cent for group B, 66 per cent for group C, and 78 per cent for group D.

All ESCWA member countries have high levels of urban access to water supply. The regional urban population with access to drinking water is estimated at 91 per cent, as compared to about 80 per cent for the rural population. Rural areas lag far behind urban areas; up to 45 per cent of the population in some rural areas in the region do not have access to drinking water.

TABLE 1. ESTIMATED ACCESS TO IMPROVED WATER SOURCES IN THE ESCWA REGION (2006)

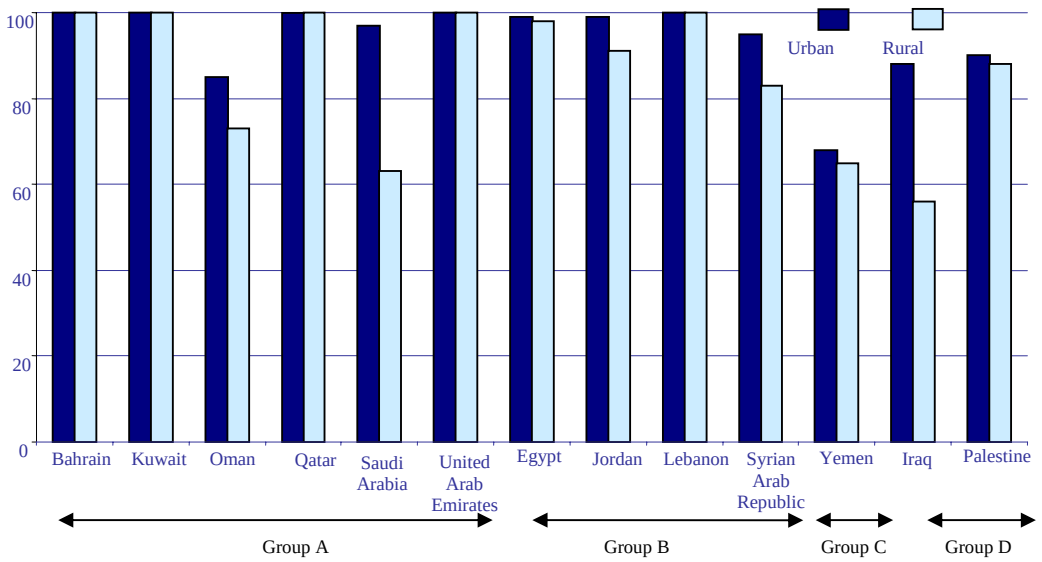
Total	Urban	Rural
88 per cent	91 per cent	80 per cent

Source: Joint Monitoring Programme, 2008

According to responses received from the ESCWA questionnaire, 100 per cent of the urban population in four GCC countries (Bahrain, Kuwait, Qatar and United Arab Emirates) have access to improved drinking water. Oman is the only GCC member country where less than 82 per cent of the urban population is still without improved drinking water supply. Accessibility by urban populations to improved drinking water in the remaining ESCWA member countries ranges from 100 per cent in Lebanon, 99 per cent in Jordan and Egypt, 98 per cent in the Syrian Arab Republic, 94 per cent in Palestine, 97 per cent in Iraq and 71 per cent in Yemen.

The situation is somewhat different for rural populations. Coverage in rural areas averages from 81 per cent for group A, 92 per cent for group B, 65 per cent for group C, and 71 per cent for group D. The ESCWA member countries where 100 per cent of the rural population has access to improved drinking water include Bahrain, Kuwait, Lebanon, Qatar and the United Arab Emirates, all countries with very small rural populations. For the remaining countries, the values range from 97 and 91 per cent in Egypt and Jordan to 50 per cent in Iraq. These figures suggest that in order to achieve MDGs by 2015 nearly 20 million people will need access to water services.

Figure I. Water supply coverage (2006)



[10] Joint Monitoring Programme. 2008. Op. cit.

(a) *Bottled water*

Bottled water consumption is an emerging trend in the water supply issue in the region, and it must be followed closely. Despite the availability of piped water in many ESCWA member countries, there is an increasing demand for bottled water in the region. This may be due to perceptions that it is of better quality and is more convenient to use, or is due to disruptions in water distribution (Egypt, Jordan, Lebanon and Palestine).

Globally, the expenditure on bottled water has now reached some US$ 100 billion per year and consumption is growing at a rate of 10 per cent per annum.[11] The largest consumers in the region are the countries from Group A and B, with consumption in the United Arab Emirates growing the fastest in the period 1999-2004. Although wealthy consumers account for the majority of bottled water purchases, the underserved urban poor often have to spend a considerable percentage of their income securing bottled water because they have no recourse to municipal supplies of water.

The amounts now being spent on bottled water worldwide could pay for piped supplies to most of the countries currently lacking these facilities. In ESCWA member countries, manufacturers continue to over-abstract from aquifers to produce expensive bottled water, thereby compromising local groundwater supplies.

TABLE 2. PER CAPITA BOTTLED WATER CONSUMPTION BY COUNTRY BETWEEN 1999 AND 2004
(*In litres per person*)

Countries	1999	2000	2001	2002	2003	2004
Bahrain	51	54	57	60	63	67
Egypt	3	3	3	3	4	4
Jordan	7	8	9	9	10	10
Kuwait	50	57	63	68	73	76
Lebanon	68	77	85	94	96	102
Oman	8	9	10	11	12	13
Qatar	60	63	67	71	74	78
Saudi Arabia	76	80	85	90	88	88
United Arab Emirates	110	114	119	133	145	164
Total world	16	18	19	21	23	24

Source: Gleick, P.H. et al. 2007. *The world's water 2006-2007: The biennial report on freshwater resources*. Island Press, Washington, D.C.

(b) *Common challenges to water supply coverage*

(i) *Unaccounted for water/non-revenue water*[12]

Another significant water supply issue in the region is unaccounted for water (UFW). Leaky piping systems usually account for a significant portion of UFW, losing water into groundwater, or into city streets and sewers. Such losses are due to inadequate maintenance of pipes and other physical assets, which in turn is caused by institutional and financial weaknesses that are common in many public urban water utilities. Illegal connections, malfunctioning meters, incorrect meter reading and faulty billing also account for a portion of UFW, where such occurrences are found mainly in peri-urban and rural areas, according to the ESCWA 2007 questionnaire. Table 3 shows the percentage of UFW in selected ESCWA member countries.

[11] Gleick, P.H. et al. 2007. *The world's water 2006-2007: The biennial report on freshwater resources*. Island Press, Washington, D.C.

[12] Non-revenue water is the preferred term for water that is lost either through physical losses (for example, leaky pipes), or apparent losses (for example, inaccurate metering). However, since many ESCWA member countries impose little or no tariff for domestic water consumption, UFW has been retained for clarity.

TABLE 3. UNACCOUNTED FOR WATER IN SELECTED ESCWA MEMBER COUNTRIES
(*Percentage*)

Country	1995	2000	2005	2010	2015
Egypt			27-34		
Jordan		14	14		
Lebanon	55	52	50	40	25
Oman	39	34	20	20	20
Palestine	46	42	37	34	30
Syrian Arab Republic	n/a	29	33	22	20

Source: ESCWA survey questionnaires, 2008.

(ii) *Water quality*

The deterioration of water quality has become a critical issue throughout the ESCWA region. The continuous degradation of water quality has persisted because of poor maintenance of water infrastructure and mismanagement of water resources. Water quality degradation decreases the available water supply as polluted water has little consumable use.

The rate of water pollution is very high in the ESCWA region. Untreated sewage, industrial effluents and agricultural runoff are the main sources of pollution. Untreated sewage is dumped into many rivers and seas in the region. Industrial wastewater is often dumped untreated into rivers or municipal water supplies. Recycled agricultural runoff, containing fertilizers and pesticides, contaminates surface waters and shallow groundwater sources.

Water quality and quantity are intimately linked. For example, excessive abstraction of groundwater has increased salinity and reduced the overall quality of available water. Sewage infiltration of water supply networks can also occur because of intermittent water supply and low-pressure in the network. When service is interrupted, some service customers attach suction pumps to the network, thereby creating negative pressure in the system. As a result, nearby leaked sewage can infiltrate the network due to the low pressure. The infiltration of wastewater from septic tanks into springs and groundwater is also a major cause of water pollution.

In Jordan, a domestic wastewater disposal method consists of discharging wastewater into wadis. There are indications that wastewater discharged in this manner can rapidly make its way to surface waters and shallow groundwater, where it may contribute to water quality deterioration.

Waterborne disease outbreaks, such as typhoid, paratyphoid, dysentery, or even cholera, occur when untreated sewage contaminates a drinking water supply. Table 4 lists the frequency of waterborne diseases in some ESCWA member countries.

TABLE 4. FREQUENCY OF WATERBORNE DISEASE OUTBREAKS IN SELECTED ESCWA MEMBER COUNTRIES

Country	
Egypt	Estimates of diseases or morbidity caused by polluted water reached US$ 800 million on annual basis
Iraq	Mostly waterborne diseases are under control in Iraq, but some rural areas are affected by cases of dysentery and hepatitis. There have not been any outbreaks of cholera in recent years, although some outbreaks occurred in northern Iraq and are now under control. The Health and Nutrition cluster of the United Nations Country Team in Iraq has reported a sustained reduction in the prevalence of communicable diseases and that no major disease outbreaks have occurred over the past three years in Iraq.
Lebanon	45/100,000 inhabitants/year
Palestine	Waterborne disease outbreaks are not adequately monitored. Minor outbreaks of waterborne diseases have been registered in the West Bank; in the Gaza Strip some cases of blue babies have been registered. Only 5 per cent of the available water in the Gaza Strip are within WHO standards for drinking water.
Syrian Arab Republic	Exact numbers are not available, but it is quite frequent in rural areas and peri-urban areas where sewage networks are old or non-existent. This occurs mainly as a result of contamination by domestic wastewater.
Oman	8.3 per cent of drinking water samples failed to comply with chemical quality standards, and 26.8 per cent of drinking water samples failed to comply with bacteriological quality standards, which increases the risk for waterborne disease outbreaks.

Source: ESCWA survey questionnaires, 2008.

There is a need to protect all sources of water supplies from pollution and further quality degradation and depletion. Alleviating water shortage and quality deterioration is a difficult, long-term process.

(iii) *Lack of peace and security*

Instability, occupation, and conflicts have affected the water supply sector in a number of countries in the ESCWA region. In Iraq, the potable water network was negatively affected by the air raids that took place in 2003. Electricity cut-offs halted sewage treatment plants and drinking water distribution, resulting in acute shortages of water supply and pollution. Some people were forced to break into the water supply network to retrieve adequate water supplies. In such situations, the level of pressure in the water network is lowered and water cannot normally reach water tanks at residential homes. This has exposed the network to contamination from damaged sewers, polluted groundwater and stagnant sewage.

Data from the Palestinian Central Bureau of Statistics show that the number of Palestinian households directly connected to water networks increased between 1998 and 2004. In 1998, 86 per cent of Palestinian households were connected to drinking water networks. As a result, supply could not keep up with demand as newly constructed buildings were connected to water networks. In the first two years of the second Intifada, there was an imbalance between water supply and demand, but water supply increased shortly thereafter. By 2004, almost 89 per cent of dwellings became connected to piped water. However, further hostilities in the region, including the incursion into Gaza in December 2008, resulted in the damage and destruction of water infrastructure and a fallback in WSS achievements.

3. *Sanitation coverage*

The Joint Monitoring Programme defines "improved" sanitation facilities as those which "are more likely to prevent human contact with human excreta than unimproved facilities", and lists these as including any of the following: "Flush or pour-flush to a piped sewer system, septic tank, or pit latrine; ventilated improved pit latrine – pit latrine with slab, or composting toilet", but only if these facilities "are not shared or are not public".

Sanitation coverage varies among the four groups previously mentioned. Group A countries have achieved sanitation coverage of 98 per cent, group B countries registered coverage levels of 85 per cent, 46 per cent had sanitation coverage in group C, and 78 per cent of group D countries benefited from sanitation coverage.

Disparities in sanitation coverage also exist with regard to urban/rural sanitation coverage. Urban access to basic sanitation in the region as a whole is estimated at 88 per cent, whereas rural access stands at about 64 per cent (table 5). Such a large disparity highlights the need for ESCWA member countries to focus on rural sanitation. while maintaining and increasing urban access. An urban average value of 99 per cent is attained for group A, an average value of 92 per cent for group B, a value of 88 per cent for group C, and an average value of 82 per cent for group D. In rural areas, sanitation coverage reached 94 per cent for group A, 74 per cent for group B, 30 per cent for group C and 69 per cent for group D.

TABLE 5. ESTIMATED ACCESS TO BASIC SANITATION IN THE ESCWA REGION (2006)

Total	Urban	Rural
74 per cent	88 per cent	64 per cent

Source: Joint Monitoring Programme (2008).

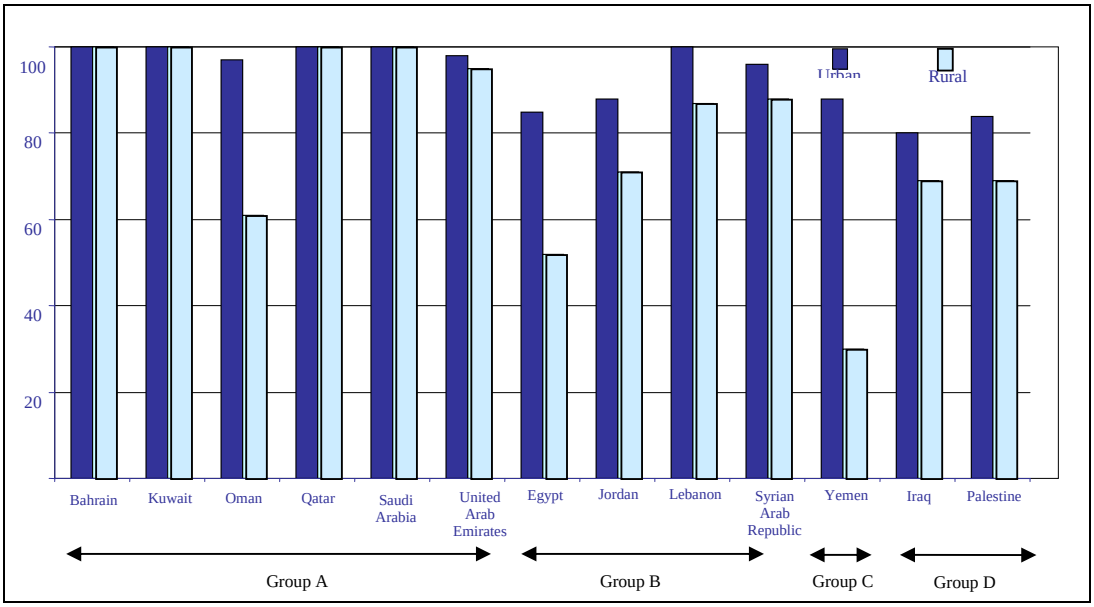
(a) *Common challenges to sanitation coverage*

(i) *Urban and rural access to sanitation*

In both urban and rural areas, people can benefit from proper sewerage systems. However, urban populations suffer more when sanitation is not provided for several reasons. First, urban populations are growing fast. Secondly, a significant proportion of urban dwellers live in slums, where diarrhoeal diseases are most acute and the benefits of sewerage systems are potentially greatest. Thirdly, sewerage connections are especially needed in cities because safe collection and disposal of domestic wastewater is much harder in densely populated areas without easy access to the sewerage networks. In an urban context the benefits of toilets and hygienic practices are much more limited without a sewerage system to ensure safe disposal of excreta. Attempting to dispose of human waste without sewers, through the use of soak-pits or septic tanks for example, does not remove the waste from the urban environment.

In rural areas, cheaper sanitation solutions exist, such as low-water toilets, multi-house septic tanks and waste stabilization ponds. Such solutions can be deployed more quickly than solutions based on piped sewage systems and have the advantage of being able to take advantage of local knowledge.[13]

Figure II. Sanitation coverage in ESCWA member countries (2006)



Source: Joint Monitoring Programme (2008).

(ii) *Wastewater treatment and reuse*

In addition to urban/rural issues and sanitation access, the attention given to wastewater treatment has also not been sufficient in the region. Many countries in the region have just started to invest in wastewater treatment plants, such as Lebanon. However, in those countries that have existing facilities, half of the wastewater treatment plants are either not functioning properly due to lack of maintenance, or were not designed to cope with increasing amounts of wastewater associated with population growth. According to the World Bank, this situation will lead to negative environmental impacts and health hazards from the

[13] Hamza A. 2003. *State of implementation of sanitation in the Arab region.* Arab Regional Implementation Forum, CSD 12. 19-21 October 2003.

agricultural reuse of insufficiently treated wastewater, or to the unavailability of this increasingly important water resource for irrigation. If the issue of sanitation is not adequately addressed by policymakers, there is a danger that high costs will be incurred with dismal results, as increasing quantities of wastewater are unable to be used in agriculture, or, if they are used, an increase of disease incidence may occur, as is the case in countries of Group D where the prevailing security situation renders the proper functioning of wastewater treatment plants impossible or very poor.

In some ESCWA member countries, municipal wastewater is discharged into agricultural drains from treatment plant outfalls, raw sewage outfalls or vacuum trucks. Cross-connections between agricultural drains and irrigation canals are not uncommon. Drain water and freshwater is sometimes mixed to increase overall water-use efficiency, and many farmers use drain water to supplement their irrigation supplies. Both these practices impair water quality for downstream users and drinking water utilities. Data collected by Ministry of Water Resources and Irrigation (MWRI) in Egypt show elevated levels of fecal coliform in the Nile and its major tributaries. In recent years, operations at six of the 29 drainage water reuse mixing stations managed by the MWRI were suspended due to excessive levels of drain water pollution. Groundwater pollution from cesspits and drain water inflows also pose a threat to households that rely on shallow wells and hand pumps for their supply of drinking water.

Practically all countries of the region reuse some of their wastewater. In some countries, especially in the GCC, a substantial share of the wastewater supplied for municipal use is reused in agriculture, horticulture, public parks and golf courses after adequate treatment. However, in some countries the share of reused wastewater is still low because of inadequate level of wastewater treatment. In group D countries, treated wastewater is only partially reused because of the low cost of alternative sources of water supply for irrigation. For example, groundwater can be pumped at very low cost from a shallow aquifer in the Gaza Strip, and the tariff for surface water provided by the public irrigation system in the Jordan valley is only US$ 0.02/m^3.[14]

(b) *Individual country experiences*

The overall sanitation ratio in Egypt reached 50 per cent in 2006. However, a number of serious environmental and public health challenges underpin the relatively high levels of "formal" sanitation. Municipal wastewater treatment capacity is limited, and wastewater treatment plants only serve some 60-65 per cent of 200 Egyptian cities and approximately 12 per cent of 5,600 Egyptian villages.[15] In some cities in rural governorates, the wastewater conveyance system covers only part of the city, and some of Greater Cairo's largest wastewater treatment plants only provide primary treatment.

In Iraq, about 20 per cent of the population is served with proper sewerage systems, mainly in parts of the Baghdad governorate, as well as some parts of Salah Al-Deen, Mosul, Basra and Kirkuk governorates. Many other governorates use septic tanks to dispose of sewage. About 40 per cent of the sewerage network of Iraq was damaged during the war. Sewage treatment facilities are not operating due to the breakdown of fuel supply lines and lack of maintenance. A large amount of sewage is discharged directly into rivers, and about 300,000-500,000 tons of sewage are estimated to be dumped into the Tigris and Euphrates every day.[16] In rural areas, large amounts of untreated sewage are discharged directly to the nearest local drains, leading to increasing levels of environmental pollution. Serious damage to parts of the network has led to the collapse of the sewerage network on many sites, which resulted in sewage flooding and deposition of solids, which has lead to further blockages of sewage flow.

[14] World Bank. 2000. *Urban water and sanitation in the Middle East and North Africa region: The way forward*.

[15] Personal communication with former Water Ministry official.

[16] ESCWA survey questionnaires.

In Palestine, sanitation services remain unsatisfactorily low, despite the fact that the percentage of housing units connected to a sewage public network increased from 33.7 per cent in 1995 to over 52 per cent in 2004. In the Gaza Strip, access to sewerage facilities varies from areas where more than 80 per cent of households are served by sewerage systems, to areas where there is no sewerage system at all. On average, it is estimated that about 60 per cent of the population is connected to a sewerage network. In the West Bank, only 30-35 per cent of the population is connected to sewerage networks, but 70 per cent of households in the main cities are connected.

Access to sanitary sewer networks in the Syrian Arab Republic was reported in 2006 at 72 per cent in both urban and rural areas; but only 25 per cent of households have their wastewater treated prior to discharge. As a result, waterborne diseases have become quite common, especially in rural and peri-urban areas. Treatment processes do not often meet international standards and discharged wastewater in rural areas is rarely treated.

B. CONSTRAINING FACTORS

Many natural, social and economic factors in the region have impeded achievement of Goal 7 of the MDGs. One of these factors is that the ESCWA region is one of the driest regions in the world. The low quantity of water resources in the region renders WSS provision difficult. Social factors such as population growth and urbanization are further constraints to maintaining or increasing WSS access. Many countries in the region also face economic constraints such as available financial resources for the extension and maintenance of infrastructure, and this even affects the relatively wealthy countries in the GCC. Cost recovery of services is also an economic constraint, especially when WSS access for the poorest segments of society is taken into account.

1. *Water resources constraining factor*

The balance between water supply and demand is difficult to maintain in a region where water is in short supply and the rate of consumption is rising. The state of water resources and their availability for development depends not only on the supply of freshwater, but also on the rate of its consumption. The share of freshwater resources in the ESCWA region is the lowest of all other regions in the world, with an average water supply of less than 800 cubic metres per capita per year. This is already below the internationally accepted water poverty threshold of 1,000 cubic metres per capita per year and significantly less than the world average of 7,243 cubic metres per capita per year.

The vulnerability of ESCWA member countries to drought has intensified due to the region's demographic and economic growth, increasing water scarcity and existing land use patterns. Poor land use practices, such as overgrazing, over-cultivation and poor irrigation, have degraded and changed land characteristics. Climate change has led to reduced rainfall and environmental degradation in the region, which in turn is causing desertification and increasing episodes of drought. In addition, over-exploitation and water pollution in the region is increasing the rate at which water resources are lost.[17]

The region is also suffering from a serious and persistent inadequacy of environmental information related to water resources management. The lack of such information hinders the preparation of effective IWRM policies, enforcement of water-related legislation and the capacity to raise public awareness. Most environmental data of relevance to water resources management are based on short-term, ad hoc data, with little proof of reliability and comparability. The data is also often ineffectively disseminated.[18]

The problem of insufficient or unavailable data is also present in a number of sub-sectors. Natural resources are generally ineffectively and insufficiently monitored, environmental health records are incomplete, and ecological and health risk assessment systems are deficient.[19]

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[17] ESCWA. 2006. *Water resources issues in the Western Asia region*. 4th World Water Forum. (E/ESCWA/SDPD/2005/WG.1/6).

[18] Ibid.

[19] Ibid.

TABLE 6. COMPARISON OF PER CAPITA ANNUAL SHARE FROM RENEWABLE AND NON-CONVENTIONAL WATER RESOURCES

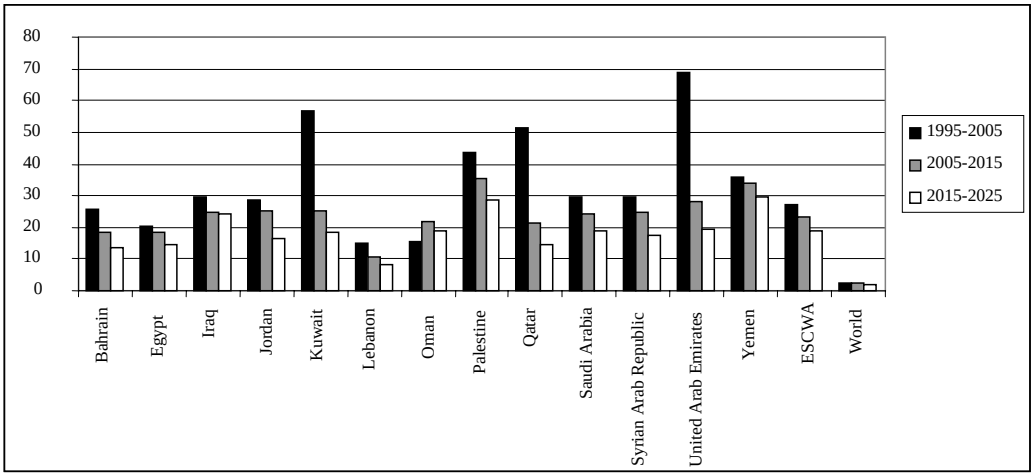
Country	Per capita annual share from renewable water resources	Per capita annual share from non-conventional water resources	Total per capita annual share from available water resources
Unit	$m^3/p/y$	$m^3/p/y$	$m^3/p/y$
Bahrain	181.9	192.3	374.2
Egypt	851.0	133.2	984.3
Iraq	2 578.0	70.6	2 648.6
Jordan	234.0	14.8	248.8
Kuwait	71.7	162.5	234.2
Lebanon	594.5	1.1	595.5
Oman	598.9	44.5	643.4
Palestine	192.5	0.0	192.5
Qatar	139.8	257.3	396.3
Saudi Arabia	354.0	62.7	415.4
Syrian Arab Republic	1 056.7	190.7	1 247.4
United Arab Emirates	78.7	306.5	385.2
Yemen	145.7	5.6	151.3

Source: ESCWA. 2007. *Water Development Report 2: State of water resources in the ESCWA Region*. (E/ESCWA/SDPD/2007/6).

2. *Social constraining factors*

In addition to limited water resources, the ESCWA region is experiencing a rapid population growth and urbanization. The average population growth rate in the region is estimated at 2.8 per cent per year. The total population in the region has increased by almost 30 per cent since 1995, from about 150 million in 1995 to about 190 million in 2005, as shown in the figure below. Growth rates vary from country to country: Bahrain, Kuwait and Oman have experienced a significant drop in their growth rates, while Qatar and the United Arab Emirates have experienced increased growth rates since 1995. The emerging trend, however, is a general slow decrease in the population growth rate in all ESCWA member countries, as shown in figure III.

Figure III. Population growth rate for ESCWA member countries during the period 1995-2005, projected to 2025
(*Percentage*)



Source: United Nations Department of Economic and Social Affairs Population Division, *World Population Prospects: The 2006 Revision*.

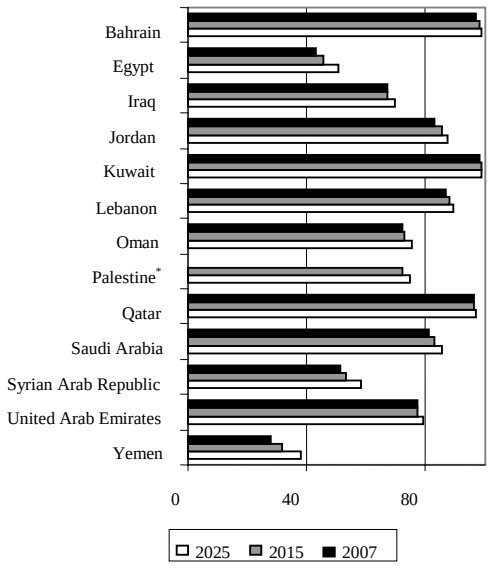
While settlement pattern vary in the ESCWA region, populations are increasingly concentrated around urban areas and larger villages in rural areas. Domestic water demand has been rising, in parallel, as population, living standards and urban migration increase and water delivery services expand. The urban population of the ESCWA region grew to nearly 55 per cent of the total population in 2007, and ten cities in the region now have more than 1 million people living in them.

Given the relatively better water infrastructure in these cities, people who have access to piped water tend to use it more frequently than in cases where they do not have piped access and need to fetch the scarce resource.[20]

The impact of more rapid urbanization in itself is not the issue; rather, it is how this relates to economic growth and the redistribution of income across society. More rapid urbanization with commensurate economic growth could, in fact, be preferable to slower rates of urbanization with piecemeal development of accompanying infrastructure. Urbanization creates problems of water shortage, related to both quantity and quality, as the absence of adequate wastewater collection and treatment leads to environmental pollution and deteriorating water quality, thus affecting availability.[21]

Figure IV. Urbanization in the ESCWA member countries, 2007 projected to 2025
(*Percentage*)

Country	Urban population (*percentage*)		
	2007	2015	2025
Bahrain	97	98.2	98.6
Egypt	43	45.4	50.7
Iraq	67	66.9	69.4
Jordan	83	85.3	87.6
Kuwait	98	98.5	98.6
Lebanon	87	87.9	89.3
Palestine*		72.3	74.7
Oman	72	72.9	75.6
Qatar	96	96.2	96.7
Saudi Arabia	81	83.2	85.2
Syrian Arab Republic	51	53.4	58.1
United Arab Emirates	77	77.4	79.3
Yemen	28	31.9	38.1
ESCWA region	55.3		



Source: United Nations Population Division. 2008. *World Population Policies 2007* and ESCWA. 2007. *Water Development Report 2: The state of water resources in the ESCWA region*. (E/ESCWA/SDPD/2007/6).

* Data provided by UNDP/Palestine.

Rapid population growth and increased urbanization will put pressure on existing water and sewage networks. Simply extending current levels of service, individual dwelling taps and sewers, will be

[20] Khatri, K.B. and Vairavamoorthy K. 2007. *Challenges for urban water supply and sanitation in developing countries*.

[21] World Bank. 2000, Ibid.

expensive. In addition, network leakage, which is already a problem in many urban networks, could be further exacerbated by putting additional pressures on the network in order to provide more services to more people.[22] Increased amounts of untreated sewage concentrated in urban areas also poses environmental and health issues, which may lead to deteriorating water quality. Therefore, alternate types of WSS services must be considered, such as water supply to a group of homes rather than individual homes and on-site sewage treatment and reuse.[23] In this way, the challenge of providing WSS to growing urban areas can be met. Figure IV above illustrates urbanization expected trends in ESCWA member countries from 2007 to 2025, and highlights countries where urbanization is expected to increase rapidly (Egypt, Syrian Arab Republic and Yemen).

(a) *Affordability for the poor*

Access to water is a human right and the basic needs for drinking, hygiene, cleaning and sanitation must be affordable for even the poorest sections of society. Pro-poor policies must thus be adopted in order to provide these vulnerable groups with acceptable WSS services. Sharp disparities among WSS coverage exist between urban and rural areas, and the poorest segments of society are often found in rural areas. In spite of severe water scarcity in most countries of the region, the wealthy segments of the population have access to ample quantities of safe water. The poor, however, are often underserved and struggle to obtain the minimum requirements needed to ensure health and hygiene.

In most instances, Governments finance the construction and operation of water supply systems, but maintain water tariffs at a minimum or charge in lump sums, irrespective of the amount of water used. This subsidizes heavy water users. Progressively increasing tariff rates are an effective way of stemming consumption while ensuring access to the poor. In such a system, tariff rates are low or zero for a minimum amount of water per person. As water consumption increases, tariffs gradually increase to reduce unreasonable water usage and recover costs.

Such a structure, however, requires fairly accurate demographic surveys and water metering at the household level. An alternative would be to charge a uniform tariff and provide financial subsidies to the poor. The disadvantage of this system is that it requires a fairly high quality administrative system, which would be difficult to implement in some ESCWA member countries. Furthermore, disconnection from the water services due to lack of payment or inability to pay must be an absolute last resort in terms of enforcement.

TABLE 7. EFFECT OF UTILITY SUBSIDIES ON ACHIEVEMENT OF SECTORAL GOALS

	Access to network	Connection to network	Consumption of service
Consumption subsidy	Possible negative effect, if consumption subsidy dilutes incentive to serve corresponding communities	No direct effect, but may make connection more attractive	Positive effect, decreasing unit price of water for qualifying households
Connection subsidy	Possible negative effect, if subsidy leaves utility under funded to finance expansion	Positive effect, decreasing price of connection for qualifying households but may not address other constraints	No effect

Source: World Bank. 2005. *Water, electricity, and the poor: Who benefits from utility subsidies?*

National Governments and local authorities are urged to adopt the necessary policies, water tariff structure and technical provision to promote and realize equity of supply. It must be underlined that

[22] Hamza, A. 2003. Ibid.

[23] Mara, D. and Alabaster, G. 2006. *A new paradigm for low-cost urban water supplies and sanitation in developing countries.*

improvements of services to the poor in peri-urban, urban slums and rural areas is the best way to reduce by half the proportion of population without access to adequate, safe drinking water supply and basic sanitation services by 2015.

(b) *Cultural constraints*

Cultural factors particular to the region must be considered for any water supply and management strategy. Some of the cultural traditions in the region constitute a constraint on management options. Common attitudes in the region include the idea that water is a "common good", and as such, should be free to consume and exploit. A result of this attitude is a reluctance by policymakers to utilize economic and financial instruments for water conservation and protection, such as tariff systems, service cost recovery, or polluter pays principles. This must be taken into account so as to understand the choices that ESCWA member countries have taken as policy options.[24]

3. *Economic constraining factors*

The major economic challenges facing WSS coverage are financing for infrastructure improvements and maintenance, revenue generation (e.g., water tariffs), and affordability of water for the poor. Despite growing demand for WSS services, the cost of investment in water projects and their operation and maintenance is getting so high that many governmental budgets can no longer afford them.

(a) *Financing*[25]

Financial resources in the water sector are used for service delivery (for example, potable water, irrigation and sanitation), overall resource management, conservation and protection of water resources, and projects to balance out water supply and demand over time and space. Satisfying these needs requires significant financial resources and access to various funding mechanisms. Sustainable financing is linked to the need for cost recovery and improved charging policies to support the operation and maintenance of water systems and provide for new investments. Ideally, all investment and operational costs of service delivery are recovered through user tariffs.

The WSS needs of ESCWA member countries are presented in table 8. It is estimated that a minimum of US$ 30 billion will need to be invested in the water and sanitation sector in the ESCWA region until 2025; this amount may need to be doubled or tripled if additional costs related to operation and maintenance of new investments and the rehabilitation of existing facilities are to be considered. However, the amount of financing that will be needed may be higher as the World Bank estimates that up to US$ 40 billion will need to be invested in water and sanitation projects between 2000 and 2010 alone in the countries in the Middle East and North Africa region.[26]

Given the vast amount of investment needed, ESCWA member countries are trying to obtain financing from different channels to support new investments in WSS. Apart from national budget allocations, loans and grants have been secured from Official Development Assistance (ODA) (table 9), multilateral financial institutions and regional development funds in many ESCWA member countries, except for GCC countries that rely primarily on their national budget to invest in new water and sanitation infrastructures.

[24] ESCWA. 2006. Ibid.

[25] This section adapted from ESCWA. 2005. *Module 5: Economic dimensions of IWRM*, pp. 20-22. (E/ESCWA/SDPD/2005/WG.1/6).

[26] Note that Saghir (2000) estimates that 45 million and 80 million lack access to safe water and sanitation, respectively, in the MENA region, which includes Algeria, the Islamic Republic of Iran, Morocco and Tunisia, in addition to ESCWA member countries.

For example, Oman funds WSS projects through the Government budget. According to their National Water Resources Master Plan, a total of US$ 3.8 billion has been allocated for the period 2000 to 2020. This amount of financing will extend water services, maintain infrastructure and on projects related to water quality. In Kuwait, 80 per cent of water supply and 99 per cent of sanitation funding is provided from the public purse.

Indeed, bilateral donors (Japan, Germany and the United States) and global and regional institutions, such as the World Bank and the Arab Fund for Economic and Social Development (AFESD), have provided significant support for water and sanitation projects in the ESCWA region. Egypt has traditionally been among the top ten largest recipients of water and sanitation-related ODA from the Organisation for Economic Co-operation and Development (OECD) countries. The number of PPPs in the water sector has also significantly increased in recent years. The private sector has invested in water projects in the Gulf countries, and Governments are also actively pursuing partnerships in the area of water desalinization.

TABLE 8. WATER SUPPLY AND SANITATION NEEDS FOR ESCWA MEMBER COUNTRIES UNTIL 2025

	Total number of people requiring access to an improved water source by 2025 (in thousands)	Water investment needs (2000-2025) (in US$ millions)	Total number of people requiring access to sanitation by 2025 (in thousands)	Sanitation investment needs (2000-2025) (in US$ millions)
Bahrain	247	19.3	247	33.8
Egypt	28 930	2 260.1	28 251	3 862.4
Iraq	20 794	1 624.5	22 171	3 031.1
Jordan	3 950	308.6	3 802	519.8
Kuwait	1 305	102.0	1 343	183.7
Lebanon	1 084	84.7	1 119	153.0
Oman	4 421	345.4	3 076	420.6
Palestine	4 401	343.8	3 954	540.6
Qatar	189	14.8	206	28.2
Saudi Arabia	21 144	1 651.9	20 127	2 751.7
Syrian Arab Republic	14 460	1 129.7	12 841	1 755.6
United Arab Emirates	862	67.3	940	128.5
Yemen	35 545	2 777	41 233	5 637.4
Total	137 331	10 729	139 310	19 046.3

Source: ESCWA. 2003. *Assessment of the role of the private sector in the development and management of water supply in selected ESCWA member countries*. (E/ESCWA/SDPD/2003/14).

TABLE 9. ODA FOR SELECTED ESCWA MEMBER COUNTRIES

	Population in 2004 (thousands)	ODA for water annual average (1990-2004) (millions of US$)	Average ODA for water ($/capita/yr)
Least developed countries			
Yemen	19 174	41.80	2.18
Lower middle-income countries			
Egypt	67 560	167.99	2.49
Iraq	24 700	61.27	2.48
Jordan	5 308	65.95	12.42
Palestinian	3 367	71.47	21.23
Syrian Arab Republic	17 385	6.74	0.39
Upper middle-income countries			
Lebanon	4 498	21.89	4.87
Oman	2 660	0.01	0.003
Saudi Arabia	23 215	0.01	0.0003

Source: Gleick, et al. 2007. *The world's water 2006-2007: The biennial report on freshwater resources.*

(b) *Revenue generation*

Appropriate tariff structures are also a major economic factor affecting water and sanitation projects in the region. Inadequate and poorly developed rule-setting tariff procedures have been among the main causes of the poor financial situation in the public services sector. The situation remains unsatisfactory in a number of countries with, for instance, an absence of regular tariff reviews and an inadequate definition of cost items to be considered for tariff calculation. Upon review, current water tariffs in the ESCWA region are found to be substantially less than the water production costs and do not encourage water conservation, nor do they assure the economic viability of the utilities providing these services. Table 10 indicates cost-recovery level tariffs.

The availability of good quality desalinated water at a very low tariff rates in most GCC countries has resulted in increased per capita water consumption for domestic uses. Per capita consumption (litres/capita/day [l/c/d]) ranges from 653 in the United Arab Emirates to 571 in Bahrain and 441 in Kuwait, the three highest domestic water consumers in the ESCWA region. These values can be compared to consumption rates in Jordan, Palestine and Yemen, the three lowest domestic water users in the region, where domestic water consumption ranges from 143 l/c/d in Jordan to less than 50 l/c/d in Palestine, the water scarcity threshold being 500 1/c/d.[27]

TABLE 10. INDICATIVE COST-RECOVERY TARRIFS FOR WATER SERVICES

Developing countries		Industrialized countries
US$ 0.20/m^3	Tariff *insufficient* to cover basic operation and maintenance (O&M) costs	Tariff *insufficient* to cover basic operation and maintenance (O&M) costs
US$ 0.20 - 0.40/m^3	Tariff *sufficient* to cover operation and some maintenance costs	Tariff *insufficient* to cover basic O&M costs
US$ 0.40 - 1.00/m^3	Tariff *sufficient* to cover operation, maintenance, and most investment needs	Tariff *insufficient* to cover basic O&M costs
US$ 1.00/m^3	Tariff *sufficient* to cover operation, maintenance and most investment needs in the face of extreme supply shortages	Tariff *sufficient* to cover O&M costs

Source: Global Water Intelligence (GWI). 2004. *Desalination Markets 2005-2015: A Global Assessment and Forecast*.

[27] ESCWA. 2007. Op. cit.

III. ASSESSMENT OF WATER SUPPLY AND SANITATION MANAGEMENT IN THE ESCWA REGION

To be successful in managing limited water resources, and to face the challenges arising from water scarcity in the ESCWA region, where domestic water supply accounts for less than 7 per cent of total available water resources in most countries, Governments in the ESCWA region are exerting modest efforts, considering the inherent constraints, to move forward towards placing cornerstones to the proper structure of water management disciplines. The main objective of Governments in the region is to ensure that people have access to a safe water supply and basic sanitation services at an affordable cost. Lack of access to adequate basic services, such as water and sanitation, is a key indicator of poverty and underdevelopment.

Analysis of the current status of the WSS sector management in the region reveals that ESCWA member countries are adopting different integrated water resources management approaches to national water sector reform. These various approaches reflect important differences in their respective socio-economic and cultural conditions and legal and administrative resources. However, similarities exist among the policy issues and challenges faced by the countries in the region.

A. WATER POLICIES AND STRATEGIES

Increasing Government awareness of water-related problems is reflected in the formulation of national development plans and attempts to reform existing water policies. As shown in the previous chapter, more than 48 million people will need to have access to an adequate supply of potable water in 2015, and nearly 56 million will need access to basic sanitation services. In addition to supply management, demand management is now considered to form the core objective of new policies and strategies that seek to:

(a) Improve water use efficiency by introducing new technical and institutional measures;

(b) Improve water allocation efficiency by enhancing productivity and maximizing benefits and formulating special economic measures;

(c) Reduce water deterioration in quantity and quality through utilization of efficient legislation, regulation, monitoring, enforcement and economic measures;

(d) Control the growing demand for water by regulatory, technical and economic measures.

Present national development strategies include plans to expand WSS infrastructure to ensure the provision of water to people living in the region. The sanitation-related strategies will include provisions to increase access, collection and primary treatment. These concrete actions will help decrease water pollution, make available new sources of water for agriculture, or other water consuming sectors and improve standards of living. Treating municipal wastewater will help to ensure that the discharge of the effluent does not pose any health and environmental risks.

1. *Selected individual country experiences*

In Iraq, the National Development Strategy (NDS) has prioritized the provision of potable water to all sections of the population in order to enhance Iraq's prosperity and ensure that urgent humanitarian interventions, including basic public services, are provided.

In the National Water Sector Strategy and Investment Programme of Yemen (NWSSIP) 2005-2009, WSS has been identified as one of the five main themes. The urban WSS theme aims at: (a) increasing coverage; (b) ensuring financial sustainability; (c) establishing a separation between regulatory and executive functions; (d) promoting knowledge and skills development; and (e) enhancing community participation. These objectives will be achieved through: (a) expanding coverage and continuing and deepening the reform

programme after evaluation; (b) developing regulation, monitoring, support and policy function; (c) promoting private sector investment and PPP; and (d) ensuring sufficient water resources for drinking purposes. In order to reach the MDG targets, the NWSSIP plans to: (a) formulate a sector strategy and ensure greater coordination through restructuring, decentralization, involvement of non-governmental partners, and adopting a uniform approach to prioritization of rural water investments; (b) broadening and adopting low-cost technology choices; (c) ensuring adequate water resources and good quality; and (d) adopting a bottom-up management approach.

The Syrian Arab Republic has adopted a similar approach to reshape and improve water policy context and orientation, and has formulated a vision to the year 2025. In its five-year plan (2006-2010), a full chapter is dedicated to WSS services, specifying a set of targets to be achieved by the year 2020, towards achieving this vision namely:

(a) Provision of safe drinking water for 99 per cent of the population of urban areas and 92 per cent for rural areas;

(b) Provision of sewage networks for 98 per cent of the population of urban areas and 65 per cent for rural areas;

(c) Provision of sewage treatment for 80 per cent of the population of urban areas and 15 per cent for rural areas;

(d) Reduction of water losses in water networks to 22 per cent in urban areas and 27 per cent in rural areas;

(e) Achieving a cost recovery ratio of 90 per cent for operation and maintenance for water supply services by 2010;

(f) Achieving a cost recovery ratio of 50 per cent for operation and maintenance for sewage collection and treatment services by 2010;

(g) Training 100 per cent of workers in upper administrative levels;

(h) Training 20 per cent of technical workers;

(i) Achieving 80 litres daily consumption of water per capita.

In Egypt, WSS forms an integral part in the National Water Resource Plan (NWRP) entitled “Water for the Future”. The NWRP is implemented by the Ministry of Water Resources and Irrigation and seeks to:

(a) Increase the number of water treatments plants and to increase the capacity of existing plants;
(b) Increase the number of water treatment plants and to reuse treated wastewater;
(c) Use the potential of groundwater for municipal water supply;
(d) Minimize losses in the distribution system through leak detection and network upgrading.

The water strategy of the Government of Jordan stresses the need to improve water resource management and the need for sustainability. The construction, operation and maintenance of water and wastewater projects associated with regional peace processes are accorded special attention in this water strategy. The Water Authority in Jordan (WAJ) developed a strategic plan for water supply for 2007-2012 and another strategic plan for the Sewerage Sector for the years 2007-2012.

In Lebanon, the Government of Lebanon has adopted several measures in order to modernize the water sector and redefine the management practices of the water authorities, and prepared a National Water

Plan to build up the water infrastructure in the country. However, due to local conditions and conflicts experienced in the country, the Ten-year Strategic Plan for the water sector for 2000-2009 was renewed and extended from 2008 to 2018, with some initiatives pending completion. As shown in table 11 below, a clear action plan was prepared with proposed timeliness and responsibilities for different agencies in the Plan.

TABLE 11. LEBANESE NATIONAL WATER DEVELOPMENT PLAN

Sector reform objective	Actions proposed for completion by end of 2007	Actions proposed for completion by end of 2008	Reform outcome proposed by end of 2008	Major stakeholders
Integrated Water Sector Strategy and Policy.	- Preparation of the national water sector strategy and a Water Master Plan that takes into account the availability of water resources (for irrigation, domestic and industrial purposes), and institutional, regulatory, financial and environmental aspects. - Public expenditure review of the water sector. - Benchmarking study and performance indicators (Unaccounted for Water, cost recovery, collection rate, etc.). - Complete a study, in collaboration with the Ministry of Agriculture, aimed at examining how irrigation systems can be modernized.	Government approval of Integrated Water Sector Strategy and Policy.	- National Water Master Plan. - "Water Code".	Ministry of Energy and Water resources (MOEW) in association with CDR/Regional Water Establishments/ Ministry of Agriculture/Ministry of Environment/ Donors

Source: Lebanese Council of Development and Reconstruction. 2006. *CDR 15-year vision.*

2. *Integrated Water Resources Management*

Even though all ESCWA member countries, in the course of preparing their national IWRM strategies, began planning for a series of organizational, institutional and legislative measures, only a small number of these countries have adopted these plans at the highest levels and included them within the framework of their economic and social development plans for achieving sustainable development. Adopting IWRM entails shifting the focus from development to the management of water resources. It also entails recognizing that there are many competing interests in how water is used and allocated, and that various stakeholders should be active participants in water management.

Review and analysis of the current status of WSS management strategies reveals weak coordination among concerned ministries. Coordination is still below the required level and the enabling environment for implementing integrated WSS management strategies is not yet in place in many cases. Many countries have achieved some progress of implementing IWRM principles, although results were below expectations in other areas, particularly with regard to participation, cost recovery, and attracting investment in water projects from the private sector. There is a pressing need to intensify and strengthen capacity-building programmes, especially managerial capacities. Further elaboration on the expected roles played by stakeholders in the implementation of IWRM is also needed, especially the role of the supervisory, coordinating and enabling role of the public sector. This will allow concerned parties, for example local authorities, water authorities, consumer organizations, civil society and the private sector, to better manage and enhance participatory mechanisms in an efficient and transparent manner.

3. *Political will and commitment*

World leaders have committed themselves to fulfill pledges to achieve the WSS targets of Goal 7 of the MDGs. Political will at the highest level is the most essential element to ensure a sustained process of reform in the water sector. Any reform process entails the mobilization of resources and a commitment to change, regardless of whether these changes yield immediate benefits. Groups with vested interests that may have to relinquish some of their privileges as a result of the reform process often resist change; bureaucratic inertia may be a factor as well. Political will can overcome these obstacles.[28] Furthermore, commitment is needed to develop water strategies that consider the re-allocation of available water resources among sectors, based on relevant prioritization criteria and sound socio-economic objectives.

4. *Lack of information*

There is an absence of quantitative and qualitative monitoring and evaluation systems on water resources in general and WSS in particular, in most of ESCWA member countries. Periodic assessments on the progress of implementation of provision of WSS services on the ground are needed, particularly as such mechanisms provide a means to detect any defaults, identify problems and provide timely solutions. Lack of accurate data and information on issues, such as water resources, quantity and quality, is another constraint that negates the validity of making projections about the future, or entering into any sound long-term planning of water resources.

Projected estimates of future water demand and supply is one of the basic components in shaping the general structure of any policy and strategy on the management of water resources. These estimates depend on adequate and sufficient data and information. The available data and information on water supply and demand in most ESCWA member countries do not provide an adequate statistical framework to adequately manage water resources. This deficiency renders decision makers reliant on unrealistic assumptions that do not reflect actual conditions in the water sector.

5. *Political instability*

Mounting political instability, compounded by stresses owing to institutional development, has further discouraged individuals from participating in the development process. Conflicts, particularly in Iraq and Palestine, are obstacles to infrastructural investments and create social rifts that set back social development for a long time. Moreover, political instability shifts the focus of development to stabilization efforts and limits public participation in the decision-making process. Conflicts also draw resources away from social and economic projects into the process of reinforcing political capital. Consequently, fewer investments are allocated to WSS infrastructures and projects.

In sum, provision of WSS must form part of a coherent water development strategy if it is to be successful. IWRM principles must be integrated in all strategies developed for WSS; another important requirement is to prepare a clear quantitative and qualitative assessment of available resources and integrate expected future needs in these strategies in order to bridge the demand-supply gap in water resources. The absence of a clear policy framework is also of particular concern since it is widely agreed that service provision should, wherever possible, be implemented at the local level. For this to occur, a clear framework is needed to enable local-level organizations to play their role with full knowledge of the support they can expect from Government.

B. INSTITUTIONAL SET-UP

In recent years, almost all ESCWA member countries have introduced changes to the manner in which their respective water sectors are managed. These changes have affected various water-related institutions,

[28] ESCWA. 2003. Op. cit.

such as public corporations, authorities, utilities, companies and municipalities. However, these new institutions are still characterized by the following features in some countries of the region:

(a) Lack of integration among important sub-sectors;

(b) Poor institutional arrangements;

(c) Centralization of authority and weak delegation of authority;

(d) Modest, but inadequate, public participation in the planning, developing and management of the water sector;

(e) Some participation of the private sector to enhance the water sector service delivery;

(1) Lack of intersectoral coordination mechanism and managerial skills.

Contacts with local, regional or international networking organizations in the water and waste water sector also appear to be quite limited in the ESCWA region.

1. *Selected individual country experiences*

Gulf Cooperation Council countries have introduced institutional reforms and now have ministries whose sole responsibility is the management of water resources. This type of institutional setting separates the management of water resources from its sectoral use. Planning, management and enforcing legislation now falls under the responsibility of a single ministry that in turn will serve all sectors and not bias any particular sector. Such an arrangement also facilitates PPPs in the provision of water and sanitation services; GCC countries have a good record of establishing PPPs. Furthermore, measures have been implemented to ensure that customer services are more transparent and efforts have been made to introduce more efficient information technology (IT) solutions, this is particularly the case in the United Arab Emirates, Qatar and Bahrain, although coordination among various concerned departments still need to be improved and speeded-up.

Iraq also established a new Ministry for Water Resources to integrate all water consuming sectors, while the Ministry of Municipalities and Public Works is responsible for WSS, in coordination with water directorates in each of the 15 governorates of Iraq, including the Greater Baghdad area and the Ministry of Municipalities in three governorates located in the Kurdistan region.

In the Syrian Arab Republic, the Ministry of Housing and Construction, through Water Supply and Sanitation establishments, is responsible for WSS. All establishments are public sector establishments are located in each of the 13 governorates of the Syrian Arab Republic. As for sanitation coverage, the General Sewage Companies come under the jurisdiction of the water supply and sanitation establishments. These generally manage wastewater treatment plants (WWTP) and the main sewage lines connecting to them, and all sewage networks in urban areas where WWTP have been built. In rural areas and small cities where there are no WWTPs, the local sewage networks are managed by the Ministry of Local Administration and Environment, through local municipalities.

In Lebanon, new responsibilities were given to the reformed ministry and to four water authorities to manage the water sector, including the formulation of water policies and project implementation.

The Ministry of Regional Municipalities and Water Resources in Oman promotes the decentralization of the management in its work, and have empowered regional departments and local authorities with some executive and planning responsibilities. Capacity-building programmes for technical personnel have also

been intensified; however, there is a need to further strengthen national capacity in management skills and coordination.

In Yemen, reform activities started in 1995 with the consolidation of water resources management functions under the National Water Resources Authority (NWRA) and introduction of basin-planning approaches. The National Water Resources Authority received a powerful boost through the creation of the Ministry of Water and Environment (MWE) in 2003. The MWE includes four independent authorities: the National Water Resources Authority; the National Water and Sanitation Authority; the General Authority for Rural Water Supply Projects; and the General Authority for Environmental Protection.

In Egypt, MWRI established the Institutional Reform Unit (IRU) which was charged with developing an institutional reform strategy.[29] The institutional reform strategy prepared by IRU recommended the establishment of water boards at the district level, the launch of the Integrated Irrigation Improvement and Management Project (IIIMP), the establishment of water consumer organizations at the Mesqa/field level, the establishment of Integrated Water Management Directorates, and the creation of two holding companies for the South Valley and North Sinai projects.

In Egypt, water supply and sanitation falls under the jurisdiction of the Ministry of Housing, Utilities and Urban Development. Sixteen public sector companies were created to manage WSS in the different governorate of Egypt; these companies all fall under the jurisdiction of an overall holding company which reports to the Minister of Housing, Utility and New Communities. All the operating companies concurrently manage water and sanitation, with the exception of two companies that only deal with sanitation. Presidential decree no. 135/2004 established a regulatory body to monitor the WSS activities of the operating companies. The regulatory body, the Holding Company for Drinking Water and Wastewater, handles the economic and technical aspects of WSS. The National Organization for Potable Water and Sanitary Drainage (NOPWASD) is responsible for all issues related to water and wastewater infrastructure projects for the whole country, with the exception of Cairo and Alexandria. An executive organization for Cairo and Alexandria Potable Water and Sanitary Drainage Executive Organization have the same responsibilities as NOPWASD, but are confined to Cairo and Alexandria respectively. The Suez Canal Authority is responsible for water and infrastructure in the Suez Canal governorates.

The Palestinian Water Authority (PWA) decided to create a sustainable and more efficient water sector by adopting a three-level strategy consisting of a first level with the PWA as the regulator and overall supervisor of the water sector; a second level is the creation of an entity that provides services at the bulk level; and a third level consisting of regional utilities that oversee customer service.

2. *Decentralization*

All countries in the ESCWA region rely extensively on their Governments for water allocation, treatment, conveyance, distribution and disposal. As a result, central water agencies have become overburdened by the size of their administrative and financial responsibilities. Consequently, the quality of water services has been deteriorating steadily in many countries in the region, as decision-making and implementation is concentrated at the higher echelons.

Delegation of authorities and devolution of powers have proved to be an effective policy option in planning, developing and managing WSS services. The decentralization of service provision and the establishment of autonomous WSS corporations and authorities for rural water supply have proved to be a good experience. It is worth considering these experiences in neighbouring countries that have similar characteristics. Decision makers in national institutions are still not in favour of decentralized options and public participation due to genuine concerns about losing power and authority, experiencing public pressure and risk that proposed national policies may be rejected.

[29] Egyptian Ministry of Water Resources and Irrigation. 2005. *The national water resources plan 2017: Water for the future*.

Another major challenge is the lack of horizontal coordination and cooperation between water institutions at the national and local levels. Water management responsibilities are usually dispersed among several actors, this makes it more difficult to devise effective mechanism and to establish a common ground for consultation and achieving action plans far from conflicts and disputes.

3. *Capacity-building and awareness raising among WSS operators*

Development and management of scarce water resources requires qualified and highly motivated and skilled staff. In a region where the scarcity of water resources is increasing, there is an urgent need for professionals who are well trained to work in the multi-sectoral environment of IWRM.

Building capacity to enforce new or reformed institutional roles has sometimes proved to be the weakest link and often hindered the effective application of national IWRM strategies. Training workshops for this purpose are held on ad hoc basis and instigated by donors and international agencies. The shortcomings in capacity-building programmes are not due to shortage of funds, but to the lack of sustainability of these programmes and the need to match them with the actual institutional reforms needed to ensure that trained personnel are retained in the public sector institutions.

Raising public awareness on the importance of water resources management is essential to enable Governments to implement water development and management programmes. The best solution is thus to continuously build public awareness and understanding of water efficiency through continuous contacts and debates.

4. *Networking and experience sharing*

Local, regional and international networking organizations in the water and wastewater sector are limited in the ESCWA region. The Arab Countries Water Utilities Association (ACWUA) was established to assist countries in the region to improve their performance in the delivery of WSS services, in accordance with the Hashimoto Action Plan of 2006 that called for the cooperation between water operators, or Water Operators Partnerships (WOPs). This association provides a regional platform to its members to interact effectively, not only with each other but also with Governments, the private sector, regional experts, donors and international organizations, to the mutual benefit of all concerned.

In general, the events and meetings organized by international or regional organizations in the water sector are mostly attended by representatives from ministries of irrigation or water resources, with service provided responsible for potable water and wastewater sector represented. Organizations, such as the Arab Water Council and networks such as Arab Integrated Water Resources Management Network (AWARENET), primarily focus their activities on water resources management. The water supply and wastewater sector is therefore rarely targeted, particularly in the ESCWA region, due to the predominance of the use of water for irrigation. Jordan is the only ESCWA member country listed among participating countries in the International Benchmarking Network for Water and Sanitation Utilities (IBNET), and the data provided is extremely scarce.

As a result, the technical assistance provided by consultants mandated by international and/or bilateral donor agencies, or the experience of international contractors is limited to the source of international and regional exposure on potable water and wastewater-related issues. In addition to this limited exposure, there are also indications that there is limited experience in the functions of networking organizations in the region, particularly in respect of limited benchmarking or comparison among the different facilities within a region or within a specific country. This is due to the fact that most of the countries do not have independent water utilities, but national authorities, ministry departments and/or Government corporations that are responsible for the provision of services through several plants/facilities. Consequently, it appears inevitable that there is some comparison and exchange of experiences between and among the different facilities, even if it is extremely limited.

In sum, all ESCWA member countries are engaged in reforming their WSS-related institutions. These reforms have consisted of restructuring the role of water institutions whereby a single ministry or entity is responsible for WSS at the national level. Decentralization, which is a worthy aim in a sector of this kind, has led to a devolution of responsibilities to subnational levels; however, poor coordination mechanisms make it impossible to properly maintain assets, attract necessary finance or skilled personnel, and leaves them dependent on the fickleness of Governments to fund their new investments. Coordination among water sector stakeholders through joint councils for water resources management, joint activities and shared investments still needs to be realized, in addition to the pooling of financial resources on the national and local levels.

C. LEGAL AND REGULATORY MECHANISMS

Many ESCWA member countries updated their water laws following institutional developments and reforms in the water sector. These efforts were aimed at supporting proposed institutional reform measures; assisting decentralization and participatory water resources management; assisting in the involvement of the private sector in the water infrastructure projects; and protecting scarce water resources from pollution. With respect to the legal framework, even though significant progress has been achieved in enacting new water laws, application decrees and standards, there is still a considerable lack of water quality standards and guidelines. In addition, a number of the developed standards are not in line with the realistic needs, requirements and financial capabilities of the countries concerned. As a consequence, it has been very difficult to enforce regulatory frameworks.

Review of the evolution of water legislation in the ESCWA region reveals that countries depending largely on surface water have enacted individual laws designed to regulate river flow diversion, and establish water quality standards for drinking and reuse purposes and control pollution; to some extent, water allocation guidelines have been provided as well. Countries that rely mainly on groundwater have tended to issue directives or separate laws aimed at regulating groundwater development and extraction through the use of well drilling permits in order to prevent groundwater mining, and enacted laws aimed at limited pollution control.

1. *The experience of selected countries*

In Jordan, water laws were enacted to provide a legal framework for institutional reform initiatives, such as law 30/2001 which defines the roles and responsibilities of the Jordan Valley Authority; law 54/2002 on public health; law 85/2002 which regulates groundwater usage; and law 1/2003 on environmental protection. Amendments to some laws regulating the Water Authority of Jordan (WAJ) have recently been adopted to enhance enforcement measures, such as the establishment of an Environmental Police force and the removal of violations and contraventions pertaining to the illegal use of water resources. Wastewater by-laws have also been amended to allow for the smooth implementation of wastewater networks through private lands and plots.

In Yemen laws have been enacted to provide appropriate legal frameworks, for example law 4/2000 which facilitates participation at the decentralized level and the water law in 2002 that aims at controlling groundwater abstraction and regulating well licensing.

In Saudi Arabia, Decree No. 225 of 1978 calls for the protection of water infrastructure systems, and Decree No. 62 of 1978 protects water from various sources of pollution and determines penalties for it. Decree No. 1409 of 1982 sets environmental standards to protect the quality of air and water from emissions. Royal Decree No. 34 of 1980 is a landmark legal instrument as it is used to regulate the development of groundwater, and management and use of water resources in the country.

TABLE 12. LEGISLATIVE EFFORTS IN THE WATER SECTOR IN SELECTED ESCWA MEMBER COUNTRIES

Country	Status of legislation		Ownership	Use
	Past	Present		
Jordan	Residual of Majalla and a few laws (1937-1988)	- Law No. 30 (2001) for the establishment of Jordan Valley Authority. - Law No. 85 (2002) for the control of the use of groundwater. - Provisional Law No. 1 (2003) for the protection of the environment.	Explicit State property	Regulation by permit for both surface and groundwater
Lebanon	Residual of Majalla, French code and a few laws and decrees (1925-1985)	- Law 221 (2000) to organize and identify role of four water authorities. - Laws to establish water consumption tariffs in industrial and domestic sectors.	Implicit public domain	Regulation by permit and old irrigation code
Oman	Sharia law, customary practices; wells and *aflaj* registration laws (1975-1988)	- Law for privatization of the electricity sector (2004): refers production of electricity and desalinated waters to the private sector while the State retains the authority to distributing water and electricity.	Explicit State property	Extensive regulation by permit for development of groundwater and *aflaj*
Saudi Arabia	Sharia and customary laws, water conservation regulations and many decrees (1932-1988)	- Supreme Economic Council Resolution 5/23: defines the Government's role in the execution of four independent projects for electricity and water production by private companies. - 2001 Law: establishes the Directorate of Meteorology and Environment.	Implicit State property	Regulation by permit system; mainly groundwater
United Arab Emirates	Sharia, customary laws and a few decrees (1980-1994)	- Law No. 2 of 1998: for the establishment of Abu Dhabi Water and Electricity Company towards the privatization of the water and electricity sector. - Law No. 17 of 2005 for wastewater.	Implicit State property	Limited regulation by permit system for groundwater
Yemen	Sharia, customary laws and decrees	- Water Law No. 2002 for the organization, development and guidance in exploiting water resources. - Law 4 (2000) for establishing local and decentralized councils and monitoring policies related to the water sector.	Explicit State property	Regulation by permit system and traditional practices

Source: Expands upon ESCWA. 1997. *Water legislation in selected ESCWA member countries*. (E/ESCWA/ENR/1997/2) and survey results from Member States.

In Oman, Royal Decree No. 115/2001 was enacted to protect drinking water sources from pollution. Efforts also made towards regulating the water sector and protecting its quality resulted in issuing in 2004, 9,410 licences to deepen existing wells (69.5 per cent), drilling of new wells (5.8 per cent), mining replacement wells (6.6 per cent), and maintenance of wells and *aflaj* (4.7 per cent). The Ministry of Regional Municipalities and Water Resources aims to ensure: (a) secure sources of potable water and achieve a balance between water use and renewable resources; (b) water resources development and conservation of attrition and pollution; (c) increased awareness of the importance of rational use of water resources and establish the principles of water conservation.[30]

[30] ESCWA, "water quality management in the ESCWA region", (E/ESCWA/SDPD/2007/2).

2. *Water rights*[31]

Public water rights are defined as the right to use water, subject to Government authorization through permits, licences or concessions. These allowances should determine the quantity of water to be used, as well as the intended purpose. Most of the countries in the region have enacted laws which explicitly state that water resources are public property, as is the case in Jordan, Oman and Yemen, while laws in other countries imply that water is either State or publicly-owned, as is the case in Bahrain, Kuwait, Lebanon, Qatar, Saudi Arabia, Syrian Arab Republic and United Arab Emirates.

Water rights within most of the ESCWA member countries are still governed by sharia principles (Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen), or a combination of sharia law, the Ottoman Majalla code (Lebanon and the Syrian Arab Republic), and some elements of a modern water code. This situation has caused the authorities to delay or avoid the implementation of regulations and water-pricing schemes which may be considered socially unacceptable. In practice however, the allocation of water rights valorizes its use, and allows for its distribution for domestic, agriculture and industrial use based on sound socio-economic and environmental principles. It can also encourage conservation and protection of natural resources.

3. *Priorities for water allocation*

Priority setting is very important when dealing with water allocation. Water laws should give priority to water use for domestic purposes, with the emphasis on adequate water quantity and quality. Management of water resources may require that water laws establish policies and procedures for the assessment and collection of water charges and fees. In this regard, the water code should consider market forces, social needs, religious motives, the public interest, the availability of water, political requirements and reimbursement policies. However, the setting of water use priorities may cause some drawbacks with regard to the difficulty of changing these priorities, especially when it is expected that social, economic and technological change may take place. This consideration should be carefully assessed and provisions should be made for future amendments, if required.

4. *Water protection and pollution control*

The problems of water pollution and deterioration of water quality in the ESCWA region are growing in complexity. The deterioration of this vital resource is mainly caused by inadequate systems for sewerage disposal and inadequate irrigation and drainage systems. Water is polluted by effluents from industrial areas, which are discharged either directly to the sea or into rivers and wadis. Agriculture drainage water carries salts fertilizer waste or insecticide residues, and is often discharged to water courses without prior treatment. The main issues stem from the lack or inadequacy of laws and regulations governing wastewater discharge and protection of surface and groundwater resources. A common system used for pollution control is the setting of standards that define the maximum limits for pollution load in effluents. Water pollution has many adverse impacts, the most important of which is its effect on public health or productive sectors.

Even though many countries in the region have reviewed their water and environmental legislation and are in the process of amending them, or establishing a body of legislation on water quality preservation and pollution control, many countries still lack such legislation. New laws need to have provisions that include treatment requirements, water quality standards, or other measures. Pollution caused by users without permits or concessions should also be controlled and enforced by legal measures.

5. *Enforcement mechanisms*

Enforcement of existing or planned water legislation has not received proper consideration in the region. Non-compliance with existing water laws, and the inability to enforce such laws are mainly due to

[31] ESCWA. 1997. *Water legislation in selected ESCWA member countries.* (E/ESCWA/ENR/1997/2).

the fact that concerned authorities do not have the means to monitor illegal activities, that there are insufficient procedures and rules for investigating violations and assessing penalties, and that water and environmental inspectors lack the powers to prosecute violations through the courts.

Lack of cohesive and effective systems for enforcement of environmental legislation in many ESCWA member countries has led to a limited degree of compliance with existing regulations. The problem, which has emerged from enactment of environmental legislation on water contamination, is the overlapping of responsibilities among public institutions for the enforcement of water legislation.

In sum, water laws and legislative instruments are essential and powerful tools for the formulation and implementation of effective WSS plans. The legislative regulatory framework, comprised of laws, by-laws, rules, decrees and agreements, needs to cover all the different types of water uses, monitoring of water quantity and quality, water allocation and water rights, etc. There is also a need to establish an effective compliance and enforcement system for water issues and to provide the necessary financial and technical support required by water institutions to water police officers and inspectors. Well-conceived water legislation facilitates the rational utilization of water resources, while inadequate water legislation can act as a hindrance to their optimal utilization.

Likewise, inappropriate regulations represent a major constraint to enforcement. Enforcement provisions of legal instruments need to specify the penalties associated with certain violations. Sanctions can be specified in terms of fines, imprisonment, changes in permit conditions, or combinations of the above. The right to use water, which differs from water ownership, can be successfully controlled through permits. A permit system should apply to all types of water utilization, including municipal, industrial and agricultural permitting effluents. Different types of water use permits need to be specified in the water law or code, with a distinction made according to the type of water use, for example for domestic water supply, sewerage, agriculture, industry, irrigation, or reuse of drainage effluent.

D. STAKEHOLDER PARTICIPATION

Stakeholder participation in water planning and distribution is improving, and participation levels are now higher than ever before in most of ESCWA member countries. However, participation levels still need to be strengthened in order to achieve more effective management of the water resources and greater progress towards achieving Goal 7 of the MDGs. More emphasis is now being given to encouraging stakeholder participation through local councils, raising public awareness on the need to conserve water and protect it from pollution, and developing civic habits of abiding by rules and regulations.

1. *Individual country experiences*

Egypt, Jordan, Palestine and Yemen have followed a participatory approach in developing their national water plans, including related WSS plans, by ensuring the participation of Government agencies, ministries, civil society, water user organizations, in meetings, workshops and national conferences. Donors have played a supportive role in consolidating these strategies, by providing technical and financial support to undertake necessary studies, training and plan formulation, which allowed a better understanding of IWRM concepts and policy implications on WSS sectors. They have also encouraged the countries concerned to develop implementation and investment plans to identify existing and potential resources, and available means to mobilize funds from the private sector and international agencies.

In Egypt, the NWRP tried to address this problem by identifying the different stakeholders, and by making a distinction between external and domestic stakeholders. External stakeholders include the Nile Basin countries and domestic stakeholders include seven different ministries, as shown in table 13 below. No information is available on the extent of cooperation among these different stakeholders; however, the Ministry of Water Resources and Irrigation, and the Ministry of Housing, Utilities and Urban Communities

have been working together to ensure that different stakeholders are included in the process of providing water and waste water in the most efficient manner possible.

TABLE 13. STAKEHOLDERS IN EGYPT

Ministries	Non-ministerial stakeholders
The Ministry of Water Resources and Irrigation	Governorates
Ministry of Economic Development (Planning)	Local units/local councils
Ministry of Agriculture and Land Reclamation	Economic authorities
Ministry of Foreign Trade and Industry	Private sector, including investor associations
Ministry of State for Environmental Affairs	Farmers' cooperatives
Ministry of Housing, Utilities and Urban Communities	Non-governmental organizations
Ministry of State for Local Development	The general public
	Donors

2. *Participation*

Participation is an instrument that can be used to pursue an appropriate balance between top-down and bottom-up approaches to water and sanitation management. For some decisions the lowest appropriate decision unit is the household or the farm; participation thus depends on the provision of mechanisms and information to allow individuals and communities to make water-sensitive choices. At the other end of the spatial scale, the management of international river basins requires some form of cross-national coordinating committees and mechanisms for conflict resolution.[32] Governments at the regional, national and local levels have the responsibility for making participation possible by creating the necessary consultative mechanisms, but also by creating participatory capacity, particularly among women and other marginalized social groups. This may not only involve awareness-raising, confidence-building and education, but also the provision of the economic resources needed to facilitate participation and the establishment of good and transparent sources of information. It has to be recognized that simply creating participatory opportunities will do nothing for currently disadvantaged groups unless their capacity to participate is enhanced.

3. *Water users associations in rural areas*

One aspect of water management being experimented in rural areas is that of water user associations. The establishment of water user associations may contribute to enhancing the welfare of farmers and improving the development of irrigation and drainage services. Many ESCWA member countries have recently adopted this type of participatory approach in dealing with the issue of water supply. Examples of this in the region include the *faggar* system, which consists of small wells and canals in the Syrian Arab Republic and Jordan, and the system of *falaj* in Oman and the United Arab Emirates, the canal system in Egypt and the irrigation and agricultural drainage water authorities in the Saudi Arabia. In recent years, an increasing number of water societies have been created in Egypt in order to share common benefits. Water user societies and administrative boards have also been formed in Yemen, Jordan and Egypt.

4. *Gender mainstreaming*[33]

In many ESCWA member countries, water resource management decisions dominate the lives of women, especially in countries where water is scarce. At the household level, due to cultural and societal customs, women have the primary responsibility for cooking, cleaning, and sanitation, thus ensuring that enough water is available in the household. Water gathering responsibilities leave many women and girls without the time or energy to engage in income-generating activities, or even to pursue an education. The

[32] Global Water Partnership. 2000. *Towards water security: a framework for action.*

[33] IRIN. 2006. *The gender dimensions of water access*. 20 September. Available at: http://www.irinnews.org/InDepthMain.aspx?InDepthId=13&ReportId=61125.

responsibilities of men with regard to water is to provide sufficient quantities of water for agricultural production and irrigation, whereas women's relationship is usually confined to the domestic sphere, therefore as men are decision makers in some communities, there may be infrastructure for irrigation whereas none for drinking water.

5. *Water and poverty reduction*

Water supply and sanitation are critical factors in the day-to-day problems faced by the poor in ESCWA member countries. National efforts at addressing poverty reduction in low-income countries are increasingly focused on the process of developing poverty reduction strategies. The interconnections between water and poverty extend far beyond the need for drinking and washing water. Availability and access to water determines the range of productive water use options available to the poor. For example, opportunities to generate income from the agriculture, livestock and fisheries sectors as well as from small-scale industries. Water supply and sanitation issues are also intimately linked to water resource management, and vice versa. Strategies for water and sanitation need to be linked with strategies for water resource management, and the priorities for achieving sustainable water resource management should be reflected in poverty reduction strategies.

Box 1. Case study: Grey water reuse in urban agriculture for poverty alleviation: A case study in Jordan

Although Jordan has a human development index higher than most developing countries, about 7 per cent of its population earns less than one US dollar a day. Furthermore, because of its scarce water resources and rapidly growing population, the poor, who are increasingly moving to cities, face growing food and water insecurity.

A pilot project in Tufileh, Jordan allowed the poor to reuse untreated household grey water in home gardens. The women of the community used small revolving loans to implement simple grey water recovery systems and set up vegetable gardens. The project allowed the community to offset food purchases and generate income by selling surplus production, which allowed community members to save or earn an average of 10 per cent of its income. If the households had used municipal sources for this additional irrigation water, they would have, on average, used 15 per cent more water and their water bills would have been 27 per cent higher.

The project also helped community members gain valuable gardening, irrigation, and food preservation skills. Women on the project report feeling more independent and proud because of the income they generated, the skills that they gained, and their enhanced ability to feed their families. An environmental impact assessment demonstrated that the quality of the untreated grey water was adequate, and the negative impacts on soil and crops were negligible. Nevertheless, this could change if greater volumes of grey water are reused. A follow-up project is expected to increase grey water recovery, pilot simple water treatment devices, and improve gardening practices and production.

Source: Faruqui, N.I. and Al Jayyousi, O. 2002. Greywater reuse in urban agriculture for poverty alleviation: a case study in Jordan. *Water International* 27(3), 387-394.

Access levels to safe drinking water are low in those areas of the ESCWA region where people live in extreme poverty. In the absence of public or private investment, solutions lie in empowering the poor to define their own needs, and in strengthening incentives to provide water services to them. Subsidies to connect low income communities to networks and support to small independent providers (generally water vendors) can help in avoiding alienating the most vulnerable from the benefits of reform. Targets for the extension of service coverage in poor areas should also be an important performance criterion for utilities, regardless of whether the utilities companies belong to the public or private sector.

In sum, IWRM emphasizes a participatory approach to WSS management. National water plans should be translated into decentralized plans that will be more action-oriented. The development of those local plans and their implementation requires engaging local stakeholders, including non-governmental organizations (NGOs) and individual citizens. Stakeholders' participation ensures that the views of all those who have interest in water, for example, water users, suppliers, developers, operators, researchers, decision

makers, politicians, and others, are taken into account in relevant activities. In this process special attention should also be given to vulnerable sectors of the society, particularly women, children and the poor. Many WSS schemes fail to achieve their targets because the real beneficiaries are not involved and do not participate in the early stages of project formulation, or during the planning, developing, implementation and monitoring stages of service delivery.

E. PRIVATE SECTOR PARTICIPATION

Public-private participation has emerged as a way to address mounting pressure for expanded services and improved utility performance. Substantial capital investments are needed for the expansion, rehabilitation, operation and maintenance of these services; these investments are beyond the capabilities of many ESCWA member countries, with the exception of GCC countries.

Many Governments in the region have found that the participation of the private sector in the water sector and in WSS service delivery, could help to lighten the high financial burdens they have to shoulder. The role of the private sector is thus growing. Increasing the role of the private sector in investment, operation and maintenance through different engagement contracts can support efforts to extend WSS services to a greater share of the population.

1. *Individual country experiences*

There is a trend, in most of ESCWA member countries, to increase the involvement of the private sector in water and sanitation projects. One of the key features of the reform is to engage the private sector in the investment, construction, and operation of WSS facilities through PPP projects.

In Egypt, two flagship projects to build two water and wastewater treatment plants were identified, and pre-qualification documents were issued in 2007. The Government separated service provision from regulation by creating a holding company for water and wastewater in 2004 to manage water services in 14 cities. The holding company has to achieve progress against a series of performance indicators which are monitored on a monthly basis. The indicators include quality of drinking water, response to public complaints, and improvements in revenue collection. The company has set up performance incentives for staff involved in bill collection. It has also helped improve consumer trust in the accuracy of the water bills by overhauling domestic water meters. Most of the affiliated companies are now recovering 90 per cent of their operations and maintenance costs, with 150 per cent cost recovery in Alexandria.[34]

Lebanon has a clearly defined legislation on privatization, but not with specific reference to water. This management tool is critical as it allows the private sector to recruit experienced personnel to quickly allocate necessary funds and make timely decisions. Trends indicate that the public sector is improving water management performance and is set to reach the targets set in Goal 7 of the MDGs.

Although the role of the private sector in wastewater sector development and management is not clearly defined in Palestine, it is expected that the private sector will be more encouraged to participate in the development of the water and wastewater sectors if local security conditions improve. The development strategy of the Palestinian Water Authority states that it intends to invite private companies to participate in the water sector, as a means to improve its services.

Gulf Cooperation Council (GCC) countries have a good record of partnership with the private sector, particularly in terms of water desalination and water reuse treatments. The United Arab Emirates, for example, has begun to formulate a long-term privatization plan through build-operate-own (BOO) projects involving various international companies and water authorities, to provide water; the projects will be

[34] World Bank. 2007. Making the most of scarcity: Accountability for better water management results in the Middle East and North Africa.

overseen by the Regulation and Supervision Bureau. In Saudi Arabia, several attempts have been made to enhance the participation of the private sector.

In Jordan, the Ministry of Water and Irrigation manages water resources and regulates services provided by WAJ. The country has implemented several projects/models to promote efficiency: (a) a build-operate-transfer contract in force for the Kherbit Al-Samra wastewater treatment plant near Zarqa; (b) a commercially run public utility in Aqaba on the Red Sea; and (c) a management contract for the city of Amman that began in 1999.

TABLE 14. PRIVATE SECTOR PARTICIPATION IN WATER TREATMENT, SUPPLY AND SANITATION IN SELECTED ESCWA MEMBER COUNTRIES

Country	Location	Sector	Type of contract	Date	Private contractor
Egypt	Cairo	WWT	Management contract	1992-1996	Biwater (UK)/ECD (Egypt)
Jordan	Amman	WSD	Management contract	1999-2006	LEMA Consortium (Suez)
Jordan	Al-Samra	WWT	Build-Operate-Transfer	2002-2027	Consortium Degremont (Suez)/Morganti
Lebanon	Chekka, Batroun, Jbeil	WWT	Design-Build-Operate	2003-2008	Ondeo (Suez)
Lebanon	Nabatieh	WWT	Design-Build-Operate	2003-2008	Veolia
Lebanon	Tripoli	WSD	Management contract	2003-2005	Suez
Palestine	Bethlehem and Hebron	WSD	Management contract	1999-2003	GEKA (Veolia)
Palestine	Gaza Strip	WSD	Management contract	1996-2000	LEKA (Ondeo-Suez)

Source: Edouard Perard. Based on data from Pinsent Masons Water Yearbook 2005-2006, PSIRU, Grover 2002, Institutional Communication of Suez, Degremont, Veolia, Societe Des Eaux de Marseilles, Press Releases.

WSD: Water Supply Distribution; WWT: Wastewater Treatment.

In Amman, under the terms of the contract, a private company, LEMA, is responsible for providing water, for customer service, for dealing with complaints, and for maintaining the network (pipes within 500 metres of housing). LEMA does not set prices, but is empowered to discontinue service to non-paying customers. The company can reduce staff, by transferring them to the Ministry of Water and Irrigation. LEMA has delivered positive results and now covers 125 per cent of its operations and maintenance costs, in contrast with utilities in other cities. Service has improved, and service hours have increased from 32 hours per week before the contract to 40-45 hours per week in 2003. LEMA also reduced unaccounted for water from 55 per cent in 1999 to 43 per cent in 2004, although improvements has been slower than expected. Customer satisfaction has also increased.[35]

2. *Matching challenges to PPP*

There is a growing opportunity for the private sector to partner with local Governments, community associations, or water utilities to develop and operate WSS services. However, Governments first need to adapt and undertake corrective measures before they can engage the private sector and encourage and develop local private sector capacity. Governments also need to regulate PPPs to prevent abuses, ensure provision to poor communities and block attempts to create a monopoly. In recent years, policymakers in most ESCWA member countries have opted for privatization as a strategic choice, but have often done so in tandem with sector-wide reforms conducted within the framework of structural adjustment programmes. Contracts blending various features of management, lease, and concession contracts, could be introduced to formalize working arrangements with the private sector in order to develop and/or operate WSS services. These partnerships, in sharing responsibilities, are breaking new ground in areas where prior experience is

[35] World Bank. 2007. Op. cit.

scant or non-existent. The experiences and results gained thus far, although in many countries preliminary, may provide valuable lessons, for a rapidly growing portfolio of projects that support private sector partnership.

Box 2. Gulf region: US$ 40 billion spent on desalination in the last 25 years

Drinking water demand in the GCC States – the United Arab Emirates, Bahrain, Saudi Arabia, Oman, Qatar and Kuwait is expected to increase from 3.9 billion cubic metres in 1999 to 8.8 billion cubic metres by 2010. In order to meet this challenge, Governments in the region are turning towards desalination. Over the past 25 years, the six GCC States have collectively spent more than US$ 40 billion on building around 550 seawater desalination plants that provide nearly 85 per cent of the Gulf region's drinking water.

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Source: Inter Press Service News Agency (IPS). Water conservation reaches the mosque. World Business Council for Sustainable Development website (accessed 24 May 2005).

3. *Cost recovery*

Considerable investments have been made to implement WSS projects, but many new water systems failed because of inadequate maintenance and ineffective management. It has become clear that Governments and donors can only provide part of the resources that are needed and that the communities themselves need to carry most of the costs of service provision. Moreover, the need to empower communities to take responsibility for their own service provision is one of the lessons that needs to be learned, as is the need to involve communities in decisions related to the planning, design, financing, construction and maintenance of improved water supplies.

Pricing water services is often seen as an unpopular action, but this need not to be the case. Currently, the poor, who often receives no public water and sanitation services, pay much more to private vendors for these very services, such as in Yemen, Palestine, Jordan and Lebanon. Formal water pricing schemes, whether for irrigation or municipal water, should thus be considered:

(a) To maintain and operate the water networks and distribution facilities;
(b) To provide incentives for conservation and the adoption of water-saving technologies;
(c) To be based on a progressive, but simple tariff structure;
(d) To be transparent and equitable.

In the ESCWA region, it is also particularly important to inform users that the water bill does not charge for the quantity of water consumed, but for services related to its storage, delivery and treatment.

4. *Suitable tariffs*

Domestic capital markets, with their small size and low performance levels, have difficulty attracting large capital inflows for the sale of water utilities. The most constraining factors are the low rates of return resulting from artificially low water tariffs. Reforming the sector requires functional institutions, clear and enforceable laws, and a policy environment that attracts foreign direct investment. The economic situation of most countries in the region, with the exception of the GCC countries, has forced them to resort to foreign loans or grants to finance their water sector programmes.

The economic situation of most countries in the region and the lack of adequate financial resources needed to provide reliable and economic services calls for greater participation of the private sector in WSS services. Encouraging the private sector to invest in the provision of WSS services, provides a good opportunity to improve the level of services provided and the performance of the WSS sector.

To sum up, the question of whether the private sector is better placed and able to mobilize the required resources and provide the technical know-how needed to bring about changes than the public sector has been the source of debate in the region. Raising adequate funds for financing WSS projects is a heavy burden on the public budget of ESCWA member countries, who are experiencing financial constraints. Politicians also often burden the sector with financial arrangements that are ad hoc, unpredictable and not sustainable, rather than charging customers through transparent, informed and accountable systems that incorporate pro-poor policies. Serious consideration must thus be given to attracting private investments in the water sector as a means to improve service delivery. To encourage such participation, incentives, regulations and guarantees could be granted.

IV. PROPOSED POLICY OPTIONS AND LEGISLATIVE AND ORGANIZATIONAL REFORMS

The WSS infrastructure of many ESCWA member countries has come under intense pressure in recent years as a result of increased demand for potable water and water for industrial and agricultural uses, uncontrolled discharge of pollutants into waterways, scarcity of financial resources, and weak management and operational capacities. Target 10 of the MDGs will only be achieved if the present gap between municipal water supply coverage and provision of sanitation services can be narrowed, particularly in peri-urban and rural communities, and if existing utilities are expanded and new projects implemented in order to cope with the anticipated increase in population, and the vast expansion of industrial and service sectors.

The poor and under-privileged are the first to feel the social and economic effects of not having access to safe water supply and adequate sanitation. The provision of WSS facilities should therefore form an essential part of poverty reduction initiatives and programmes. In spite of severe water scarcity in most countries of the region, wealthy segments of the population have access to ample quantities of safe water and an acceptable level of sanitation. The poor, however, have to struggle to obtain sufficient quantities of quality water. In most instances, Governments finance the construction and operation of water supply systems, thus subsidizing the rich at the expense of the poor. Pro-poor WSS policies must thus become central components of natural development plans.

The major obstacles to achieving the WSS MDG Targets are: inadequate institutional structure and regulatory and legislative instruments; insufficient financial resources and weak political commitment; and lack of legislation and regulation mechanisms. After reviewing the progress achieved since 1990, it is likely that the agreed targets for WSS will not be attained by 2015 in many ESCWA member countries. However, these ambitious targets may be brought to a favourable outcome if member countries improve service delivery, extend coverage to underserved communities, and achieve self-reliance in managing their water supply and sanitation services. The role of civil society, particularly women, should also be strengthened in order to ensure efficient and sustained performance of the services.

If the MDGs are to be integrated into national development plans, partnerships need to be broadened to encompass communities, financing institutions, consumer associations, businesses and decision makers in order to foster trust and effective collaboration among stakeholders. In particular, ESCWA member countries are encouraged to adopt IWRM principles, especially water demand management strategies, in their WSS plans. In this respect, after reviewing and assessing the current situation, several policy and institutional and legislative measures are proposed to expedite achievement of WSS goals by 2015.

A. MAINSTREAMING ACCESS TO WSS INTO NATIONAL IWRM PLANS

Water supply and sanitation must form part of national IWRM plans in order to achieve the WSS provisions set out in Goal 7 of the MDGs. Achieving this goal requires the formulation of integrated WSS policies, new laws, regulations and new financing systems. However, a number of challenges stand in the way of achieving this objective, including: (a) existing water scarcity in the region, which is compounded by rapid population growth, accelerated economic development and increased drinking water demand; (b) inefficient management of competing water claims; (c) inadequate institutional, regulatory and enforcement capacity; (d) weak stakeholder involvement; (e) insufficient meaningful data for informed decision-making; and (f) financing shortfalls. In addition to these challenges facing the water supply sector, the sanitation sector suffers from: (a) inadequate visibility and appreciation of sanitation needs; and (b) unclear definitions of exact mandates and legal powers of various actors in meeting sanitation goals.

The following practical measures and institutional reforms are proposed to overcome the challenges faced by the WSS sector in many ESCWA member countries with an IWRM framework.

1. *Water supply*

(a) Organize policy dialogue between water professionals and policymakers on legal and financial aspects of water supply;

(b) Enhance information exchange mechanisms between the drinking water sector and sanitation providers to achieve complementarities;

(c) Improve monitoring of resources, services and data collection;

(d) Improve public participation in planning and decision-making, especially with a view to adapting local knowledge and solutions. These efforts should include the establishment of water supply user groups, taking account gender, and managing relationships and defining roles between the public and private sectors;

(e) Enhance and maintain existing technical, institutional and local capacity in water supply;

(f) Fill the finance gap, possibly by ensuring greater participation by the private sector, international institutions and other international partners through partnerships ensuring stakeholder involvement and accountability, based on clear rules and responsibilities;

(g) Encourage more sustainable consumption and production of drinking water through a variety of regulatory, economic and voluntary instruments.

2. *Sanitation sector*

(a) Integrate sanitation into national development strategies;

(b) Raise the visibility of the sanitation sector and its significant economic and social benefits, as reflected in the averted annual public expenditure per household, resulting from the elimination of waterborne and sanitation-related illness;

(c) Issue laws and regulations that define the shared responsibilities of ministries responsible for public health and sanitation and stakeholders, such as environmental councils, ministries of water, national water and wastewater supply utilities and local sanitation councils, etc.;

(d) Develop coordination mechanisms in the sanitation sector in order to exchange ideas and build consensus to promote greater harmonization on key principles and approaches among concerned Government agencies;

(e) Adopt a planning exercise to set future resource requirements for sanitation services, within the context of projections for the total resource envelope available to Governments from domestic and external resources.

B. PRIORITIZING DOMESTIC DRINKING WATER AMONG COMPETING USES

Water demand management requires, among other measures, moving from water utilization in areas with limited economic activity, such as irrigated agriculture, to areas where the need is greater and more urgent, such as providing water for domestic purposes. The principle of economic returns is not usually the sole criteria in such cases. There are other important factors to balance, such as the recent global food crisis, the creation of job opportunities, the settlement and development of water areas and geographical distribution of inhabitants. It is also important to reduce loss in water utilization, and allocate water according to technical, social and economic circumstances.

One of the main challenges is the diversification of the economy of the region, which has introduced intense competitive pressures for water resources from domestic, commercial, industrial and agricultural sectors. In their efforts to overcome this obstacle, Governments have increased withdrawals from groundwater and surface water sources at a cost that is clearly unsustainable, particularly on an environmental level.

In order to improve demand management practices, domestic drinking water should be the first priority for allocation. The following practical measures and institutional reforms are proposed to meet this challenge:

(a) Develop approaches to bridge the drinking water supply-demand gap in order to sustain quality of life and future economic development;

(b) Sustainably expand use of renewable water supplies and develop new and additional ones from non-conventional sources, such as desalination, rainwater harvesting and water reuse in order to bridge the gap between current supply and anticipated future demands;

(c) Support water management, conservation and efficiency through public awareness campaigns focused on the problem of water scarcity in the region, and on appropriate and efficient methods for water resources utilization;

(d) Develop a computerized information system for drinking water and wastewater-related issues as a tool for researchers in the region to improve decision making and enhance regional cooperation;

(e) Strengthen water demand management in order to achieve an efficient and sustainable use of scarce water resources and reduce the load on wastewater networks;

(f) Support user charges so that the cost of drinking water reflects the actual cost of the service rendered and the water that has been used. These charges must include cost recovery, demand management charges and incentives to encourage certain consumption patterns;

(g) Issue economic incentives in the form of grants and tax allowances, etc., to stimulate drinking water allocation to certain preferred uses, and to render undesirable behaviours less attractive (gardening, cleaning cars, etc.);

(h) Adopt a system of financial and legal incentives in the form of fines and premiums;

(i) Strengthen drinking water supply management by: incorporating engineering advances in managing water supply, such as new water treatment methods and supply and distribution systems; increasing water use efficiency and maintenance, in order to avoid high rates of water losses; and ensuring that Governments prepare and control contracts with water supply utilities when public-private investors are involved by defining a clear scope of work, clear water service cost-recovery policies, and enforceability of commercial and customer obligations.

C. IMPROVING WASTEWATER TREATMENT, REUSE AND HYGIENIC PRACTICES

Wastewater treatment and reuse can contribute to promoting the prioritization of domestic drinking water among competing uses. The amount of freshwater used for agriculture or urban amenities can be reduced if treated wastewater is reused, thereby increasing the amount of freshwater available for domestic drinking purposes. Promoting hygiene awareness can complement efforts to increase wastewater treatment. Greater public awareness on hygiene can increase demand for proper water treatment and promote a greater understanding of optimal methods of wastewater reuse.

Some of the obstacles to achieving this challenge are: (a) inadequate wastewater treatment facilities and methods; (b) insufficient wastewater reuse; and (c) insufficient hygiene education and awareness. The following practical measures and institutional reforms are proposed to overcome these obstacles:

Improve adequacy of wastewater treatment facilities

(a) Construct or upgrade treatment plants to comply with the effluent quality design criteria and with wastewater treatment standards;

(b) Improve compliance of wastewater treatment standards, more cost-effective wastewater treatment services, and greater accountability in the design, construction, and operation of facilities.

Support sound wastewater treatment methods

(a) Set guidelines that give technical criteria for the selection of appropriate wastewater treatment methods, keeping in mind water conservation, use of sludge generated by treatment plants, wastewater reuse, and supplementary treatment using ecologically engineered technologies;

(b) Establish and enforce cost-recovery schemes for offsetting costs related to treating industrial wastewater discharges based on the polluter-pays principle.

Support water reuse

(a) Enhance wastewater reuse in areas where cultural norms allow the reuse of treated sewage water;

(b) Install and utilize monitoring equipment, develop training modules, deliver courses, and develop fact sheets on wastewater reuse.

Promote hygiene education

(a) Design educational programmes to demonstrate the link between sanitation, hygiene, health and economic development, which would contribute to increasing demand for improved sanitation;

(b) Include hygiene education in school curricula and create incentives for schools and teachers who improve sanitation access or deliver effective hygiene promotion; allocate funds to sanitation and hygiene education and ensure their inclusion in poverty alleviation strategies and budgetary allocations;

(c) Raise awareness on hygiene and sanitation by encouraging journalists to develop a complete understanding of these issues so that they can raise awareness among the general public and provide the public with guidelines on hygiene and sanitation practices, and identify their preferences for certain management options.

D. REDUCING WATER LOSSES

Water losses constitute a significant portion of water use in many countries. Unaccounted for water is a major component, consisting of water leaks from pipes, water evaporation in open canals, water theft and legalized, free water consumption by elites.

Some of the obstacles to reducing water losses are: (a) damaged networks; and (b) inadequate collection and enforcement of tariffs. The following practical measures and institutional reforms are proposed to overcome these challenges:

(a) Adopt solutions to the large amount of unaccounted for water in the region. These solutions could include modifying water authorities to be more assertive in dealing with violations and illegal connections to water networks;

(b) undertaking repair work and refurbishment of water networks to avoid leakage via worn-out pipes and evaporation from open channels and ducts;

(c) Promote domestic water-saving technologies to minimize water losses during storage, conveyance and use.

E. PROTECTING DRINKING WATER QUALITY

National capacities for the enactment and reinforcement of environmental regulation should be developed in order to protect drinking water quality and reduce pollution resulting from inadequate sanitation.

The main obstacles to improving drinking water quality are: (a) inadequate, fragmented, technically inappropriate drinking water quality regulations, and the lack of effective systems for the enforcement of environmental legislation; (b) poor agricultural practices that overspill chemicals and pathogens into the aquatic ecosystem; (c) inadequately treated effluent from municipal and industrial wastewater treatment plants; (d) inappropriate disposal of solid and hazardous wastes; and (e) recharging river systems with agriculture drainage mixed with domestic and industrial wastes.

The following practical measures and institutional reforms are proposed to overcome existing challenges:

Strengthen enforcement of relevant regulations

(a) Ensure that regulations are enforceable, that their requirements are clear and practical, and that they do not overlap or contradict other existing regulations;

(b) Establish the institutional framework required for enforcement of WSS regulations;

(c) Raise awareness on compliance mechanisms and establish sanctions in case of violation.

Control water quality degradation from discharge of wastewater

(a) Ensure that the infrastructure of public sewage pipelines do not allow unplanned or uncontrolled discharge of raw sewage without restriction;

(b) Construct or upgrade treatment plants to comply with the effluent quality design criteria and with wastewater treatment standards;

(c) Enhance self-monitoring and State supervision of the treated wastewater quality, and the specification of sampling analysis methods;

(d) Avoid interruption of drinking water services and prevent creation of negative pressure in drinking water distribution systems.

Minimize the effects of agriculture on water quality

(a) Enforce proper management practices so as to minimize diffusive sources of water pollution caused by the addition of soil amendments, such as fertilizers;

(b) Utilize agronomic practices, such as cover crops and residue management in order to avoid soil evasion that results into water quality degradation;

(c) Adopt an integrated pest management system, including crop rotations, biological pest control, scouting, and selecting pesticides that are more environmentally friendly to avoid contamination of water sources;

(d) Minimize surface runoff, detachment and transport, and ensure proper disposal of barn waste and dead animals in order to minimize the presence of pathogens in waterways.

F. UPSCALING WSS DELIVERY IN URBAN AND PERI-URBAN AREAS

Access to WSS in urban areas is generally very widespread. However, efforts must be made to maintain and expand existing services into underserved peri-urban areas where poverty is most pronounced. Maintaining and expanding service is especially important as urbanization rates increase. Obstacles include: (a) limited institutional capacities and management of public utilities; (b) technological concerns; (c) financial constraints; and (d) pressure on existing WSS infrastructure.

The following practical measures and institutional reforms are proposed to overcome these obstacles:

Improve institutional and regulatory frameworks

(a) Enhance cooperation among public authorities at the national and local levels that are responsible for the management of urban WSS;

(b) Decentralize water supplies services sector management, while clearly defining the exact mandates and legal powers of various actors;

(c) Remove regulatory obstacles preventing improvements in the management of water utilities and transform them into autonomous entities operating on a commercial basis;

(d) Allocate clear property rights and decision-making responsibilities among the key regulatory obstacles.

Adopt a technological outlook to scale up WSS services in urban and peri-urban areas

(a) Adopt technological advances that identify new sources and improve the quality of those already in use;

(b) Encourage and support continuous research into technological solutions to discover better and more sustainable ways to increasingly use scarce supplies of water.

Allocate financial resources to rehabilitate, develop, and upgrade WSS infrastructure

(a) Mobilize bilateral and multilateral donor support;

(b) Enhance PPPs that can play an important and sustainable role in financing and developing the required infrastructure;

(c) Identify alternative modes of urban WSS infrastructure financing including local financing mechanisms, lending and credit schemes for local authorities and international lending mechanisms for utilities.

Decrease pressure on existing drinking WSS infrastructures

(a) Ensure good operation and maintenance in order to enhance the quality of drinking water delivery and sanitation services and extend the useful lives of WSS facilities;

(b) Improve organizational structures and institutional performances in order to avoid poor allocation and/or duplication of responsibilities among ministries and different levels of Government, particularly with regard to the operation and maintenance of WSS infrastructure;

(c) Increase training or recruitment in order to improve the skills and expertise of relevant staff.

G. UPSCALING WSS DELIVERY IN RURAL AREAS

Scaling up drinking water and sanitation services in rural areas is a serious challenge as they are less well served than urban ones. Rural areas face a number of obstacles, including: (a) resource constraints; (b) inadequate community involvement; and (c) insufficient technological options.

The following practical measures and institutional reforms are proposed to overcome these challenges:

Overcome resource constraints to water supply services to rural areas

(a) Ensure adequate funding;
(b) Build capacity of relevant institutions and technical staff;
(c) Strengthen the will to change the political economy of resource allocation.

Enhance community involvement in WSS services to rural areas

(a) Prepare situation analysis of community water supply services;

(b) Carry out broad stakeholder consultations on key issues affecting or imparting negatively on community water supply coverage and sustainability;

(c) Present and widely discuss strategy proposals and implementation plans at different levels;

(d) Support non-official providers of sanitation services to the rural poor, which include small-scale entrepreneurs and community-based organizations by providing incentives;

(e) Strengthen community capacity and raise their awareness of hygiene and decentralization issues, in order to stimulate demand for sanitation facilities;

(f) Organize participatory training on community based-management of water supply schemes in rural areas;

(g) Mobilize groups of women to tap their existing skills and knowledge to expand sanitation services in rural areas.

Enhance technological options to scale up WSS services to rural areas

(a) Develop appropriate technological options for services that are technically feasible and financially affordable to the beneficiaries;

(b) Extend basic levels of water supply services through application of appropriate technological options to the uncovered population in remote and rural areas.

H. STRENGTHENING WSS MONITORING SYSTEMS

Monitoring systems are needed to ensure that water quality is appropriate for consumption purposes and that wastewater is properly treated and discharged for various uses. The main obstacles to achieving this challenge include: (a) limited capacities and financial constraints; and (b) ad-hoc data collection initiatives, resulting in inadequate quality, no comparability, poor dissemination and little coordination.

The following practical measures and institutional reforms are proposed to overcome these challenges:

Establish adequate environmental monitoring systems, and increase the capacities of existing monitoring systems

(a) Ensure that the establishment of new water and wastewater monitoring centres are not restricted to urban centres, so as to produce comprehensive data at a national level;

(b) Build capacity of personnel to compile and structure data collected into computerized information databases for the generation of practical information (indicators, analyses and reports);

(c) Develop regional or national accreditation schemes for water and wastewater laboratories and ensure that quality assurance and quality control practices are fully built into all monitoring laboratories, with accepted performance standards in light of international guidelines;

(d) Improve the comparability and exchange of water and wastewater information within and between countries of the region, in compatibility with the existing international frameworks;

(e) Secure adequate funding to upgrade technology and equipment used to provide meaningful and valid water and wastewater data;

(f) Improve coordination among institutions responsible for monitoring systems both nationally and regionally.

Develop time-series data and enhance coordination

(a) Decrease dependence on ad-hoc sample surveys for WSS data collection, which are not driven by policy objectives and partially influenced by the availability of donor funds;

(b) Generate time-series data that are crucial to assit decision makers to monitor, follow-up and understand WSS trends and challenges;

(c) Ensure that WSS data are readily available; are adequately documented and of known quality; and are updated at regular intervals in accordance with standardized procedures;

(d) Enhance coordination between various institutions dealing with WSS data collection and analysis.

I. STRENGTHENING THE FINANCIAL SITUATION OF WSS UTILITIES

The sustainability of WSS can only be ultimately ensured by WSS providers whose financial situation is sound. Some of the obstacles that prevent WSS providers from enjoying solid financial situations are poor resource mobilization capacities and inadequate donor coordination. The following practical measures and institutional reforms are proposed to improve access to funding:

Ensure sufficient funding to formulate proper plans and programmes for the development and management of freshwater resources, and to ensure their implementation

(a) Seek new avenues besides the traditional sources of financing from domestic and external resources, particularly through the promotion of PPPs;

(b) Forge partnerships with donors and ensure that these partnerships translate into concrete actions at the national level;

(c) Mobilize investments from the private sector and adopt innovative financing schemes, including market-based financing models for small and medium enterprises that provide WSS services;

(d) Ensure effective governance and an enabling environment for mobilizing resources;

(e) Create an Arab fund to prepare WSS development projects at both the national and regional levels, and seek financial commitments to their implementation from Arab and international funds and banks, as well as the private sector.

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Annex

REGIONAL SURVEY ON THE STATUS AND ACHIEVEMENTS OF ESCWA MEMBER COUNTRIES TOWARDS IMPROVED WATER SUPPLY AND SANITATION

Country:

PART I. GENERAL STATUS OF DEMAND FOR WATER AND SANITATION SERVICES

Please provide all available data for the years mentioned. If no data is available for the indicated year, please provide the most recently available data, and mention the year it was collected.

A. SOCIAL FACTORS

		1995	2000	2005	2010	2015
1	Total population					
2	Rate of population growth					
3	Urban population (percentage)					
4	Rural population (percentage)					
5	Urbanization rate					

B. DEMAND FOR WATER

		1995	2000	2005	2010	2015
1	Total renewable water resources					
2	Type of renewable resources and percentage of renewable resources to total	Surface water: Groundwater:				
3	Total non-renewable water resources					
4	Type of non-renewable resources and percentage of non-renewable resources to total	Desalination: Treated wastewater Other (specify)				
5	Water availability/capita					
6	Water use by sector:					
	Domestic					
	Agriculture					
	Industry					

C. WATER SUPPLY AND SANITATION

		1995	2000	2005	2010	2015
1	Urban water coverage					
2	Rural water coverage					
3	Urban sewerage coverage					
4	Rural sewerage coverage					
5	Household connection number					
6	Unaccounted for water					
7	Number of illegal connection					
8	Main areas of illegal connections (percentage)	Urban: Rural: Peri-urban:				
9	Employees/1,000 sewerage accounts					
10	Employees/1,000 water accounts					
11	Hours of access to tap water	Urban: Rural:				

12	Water tariffs	Urban: Rural:
13	Operation cost coverage	Urban: Rural:
14	Operating cost/operating revenue	
15	Type of wastewater treatment *(secondary/tertiary treatment and its quality)*	
16	Ratio of vended water to utility water	
17	Ratio of cost of vended water to utility water	
18	Frequency of maintenance operation on supply network	Urban: Rural:
19	Frequency of maintenance operation on sewerage network	Urban: Rural:

D. WATER QUALITY SITUATION

- Describe main water quality challenges.
- Indicate frequency of monitoring drinking water (physical/chemical/microbiological).
- Indicate recurrence of water pollution/contamination in drinking water.
- Indicate (a) number of parameters required by legislation to be monitored in drinking water; and (b) percentage of actual parameters monitored.
- Indicate frequency of waterborne disease outbreaks.
- Indicate number of non-compliance reported in drinking water quality monitoring.
- Indicate frequency of monitoring treated wastewater (physical/chemical/microbiological).
- Indicate: (a) number of parameters required by legislation to be monitored in treated wastewater; and (b) percentage of actual parameters monitored.
- Indicate number of non-compliance reported in treated wastewater quality monitoring.

PART II. NATIONAL WATER POLICIES AND PROGRAMMES FOR MANAGING WATER RESOURCES

A. INTEGRATED WATER RESOURCES MANAGEMENT PLANS

1. Has your country already developed an IWRM plan?

If yes, please provide the name of plan and year of approval.

Name:
Year:

2. Has your country developed IWRM plans?

☐ Yes, an IWRM plan has been developed, and is waiting for formal approval.

- An IWRM plan is under development.
- No, an IWRM plan has not been developed yet but is under consideration.
- No, we do not plan to develop an IWRM plan.

3. Do you have any national body designated to implement an IWRM plan?

- Yes
- No

Please indicate the year this body began its work and its composition.

B. WATER SUPPLY AND SANITATION STRATEGIES TO ATTAIN THE MDGS

1. Do you have any national water supply strategy plans?
   Please provide title of strategy and timeframe for implementation.

2. Do you have any national sanitation strategy plans?
   Please provide title of strategy and timeframe for implementation.

3. What are the institutions responsible for water supply? And if public, private or combination and where?

4. What are the institutions responsible for sanitation? And if public, private or combination and where?

5. What are the main sources of funding for water supply projects?

6. What is the percentage of funding sources from:

   a. User charges
   b. The public budget
   c. Other sources (please specify)

7. What are the main sources of funding for sanitation projects?

8. What is the percentage of funding sources from:

   a. User charges
   b. The public budget
   c. Other sources (please specify)

9. What are the major water supply laws passed by your country?
   (Please provide exact title and date)

10. What are the major sanitation laws passed by your country?
    (Please provide exact title and date)

11. Please list any major achievements/or proposed reforms in the water supply and sanitation sector in your country?

12. What are the main challenges/bottlenecks faced in the water supply and sanitation sector in your country?

13. What institution/agency is responsible for monitoring the progress made towards the achievement of Goal 7 of the MDGs?