REGIONAL REVIEW OF NATIONAL WATER PLANS AND/OR STRATEGIES

Final document validated during the Expert Regional Workshop on Planning of Water Resources in the SWIM Countries (13-14 June, Athens, Greece)

Version	Document Title	Author	Review and Clearance
1	Regional Review of National Water Plans and/or Strategies	Anthi Dionysia Brouma	Hosny Khordagui, Stavros Damianidis and Vangelis Konstantianos

The SWIM Programme (2010 – 2014)

Contributing to Sustainable Integrated Water Management in the Mediterranean

Funded by the European Commission with a total budget of approximately € 22 million, Sustainable Water Integrated Management (SWIM) is a Regional Technical Assistance Programme aiming to contribute to the effective implementation and extensive dissemination of sustainable water management policies and practices in the South-Eastern Mediterranean Region in view of increasing water scarcity, combined pressures on water resources from a wide range of users, desertification processes and in connection with climate change.

The SWIM Partner Countries (PCs) are: Algeria, Egypt, Israel, Jordan, Lebanon, Libya[1], Morocco, the occupied Palestinian territory, Syria and Tunisia.

SWIM aligns with the outcomes of the Euro-Mediterranean Ministerial Conferences on Environment (Cairo, 2006) and Water (Dead Sea, 2008) and also reflects on the four major themes of the draft Strategy for Water in the Mediterranean (SWM), mandated by the Union for the Mediterranean, namely: Water Governance; Water and Climate Change; Water Financing and; Water Demand Management and Efficiency, with particular focus on non-conventional water resources. Moreover, it is operationally linked to the objectives of the Mediterranean Component of the EU Water Initiative (MED EUWI) and complements the EC-financed Horizon 2020 Initiative to De-Pollute the Mediterranean Sea (Horizon 2020). Furthermore, SWIM links to other related regional processes, such as the Mediterranean Strategy for Sustainable Development (MSSD) and the Arab Water Strategy elaborated respectively in the framework of the Barcelona Convention and of the League of Arab States, and to on-going pertinent programmes, e.g. the UNEP/MAP GEF Strategic Partnership for the Mediterranean Large Marine Ecosystem (MedPartnership) and the World Bank GEF Sustainable Mediterranean.

The Programme consists of two Components, acting as a mutually strengthening unit that supports much needed reforms and new creative approaches in relation to water management in the Mediterranean region, aiming at their wide diffusion and replication.

The two SWIM Components are:

- A Support Mechanism (SWIM-SM) funded with a budget of € 6.7 million and
- Five (5) Demonstration Projects funded with a budget of approximately € 15 million

For more information please visit http://www.swim-sm.eu/ or contact info@swim-sm.eu

1 The situation in spring 2012 is that following formal EC decision activities have been stalled in Syria while Libya has officially become a Partner Country of the SWIM Programme

Acknowledgements:

For the regional part of the review special thanks need to be directed to the UNEP-DHI Centre for Water and Environment. The Centre prepared the figures of this section, based on analysis of data obtained from the global survey conducted by UN-Water for the preparation of the 2012 "Status Report on the Application of Integrated Approaches to Water Resources Management" that was launched in the Rio+20 Conference on Sustainable Development (Rio de Janeiro, 20-22 June 2012).

The section on the analyses of Jordan, Lebanon and Tunisia has been based on the invaluable contribution of different stakeholders during missions to the three countries.

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LIST OF ABBREVIATIONS

EU WFD	European Union Water Framework Directive
EUWI	European Union Water Initiative
IWRM	Integrated Water Resources Management
JPoI	Johannesburg Plan of Implementation
MDGs	Millennium Development Goals
MED EUWI	Mediterranean Component of the EU Water Initiative
MENA	Middle East and North Africa
MODFLOW	Modular Three-Dimensional Groundwater Flow Model
MYAS	Mycology Valuing and Sustainable Management Model
NGOs	Non-Governmental Organisations
PCs	Partner Countries
SWIM	Sustainable Water Integrated Management
SWIM-SM	Sustainable Water Integrated Management-Support Mechanism
SWM	Strategy for Water in the Mediterranean
UfM	Union for the Mediterranean
WEAP	Water Evaluation and Planning System
WSSD	World Summit on Sustainable Development
WUA	Water User Association

LIST OF FIGURES, BOXES, MAPS

1.Introduction – setting the background for the study

The prominent role of water and water resources management in the Mediterranean agenda is difficult to contest. A rich constellation of factors accounts for the severe pressure placed on renewable resources in the region that has resulted in exploitation indexes of almost 100 per cent in some cases (see map below). The scarcity conditions the region encounters represent a key constraint, with water distribution ranging from 72% in the North of the Mediterranean, to 23% in the Middle East and only 5% in North Africa. An increasing demand from different uses and users represents another element, with agriculture claiming the main bulk of the water budget (Figure 1). Intense demographic changes (population growth, urbanisation trends) coupled with potential climate change implications and plentiful geopolitical particularities have also assisted with placing water issues high on the policy agenda.

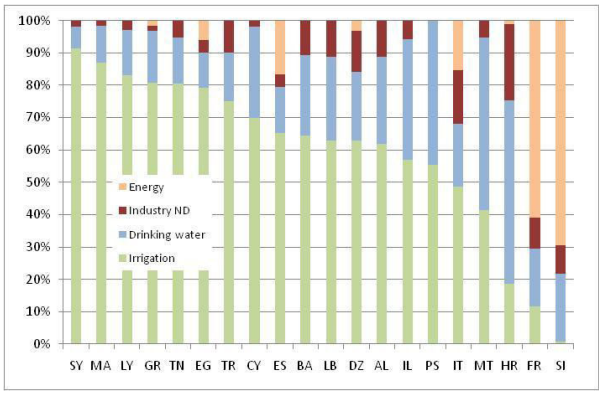
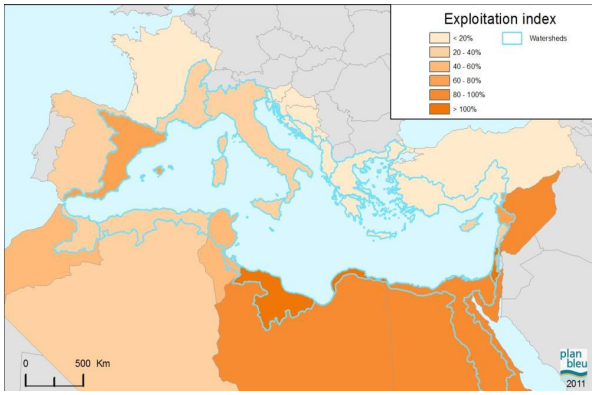


Figure 1: Water demand by sector 2005-2010 (Plan Bleu, 2011)



Map 1: Exploitation Index of renewable natural resources (countries and watersheds) along the period 2000-2010 in % (Plan Bleu, 2011)

More importantly, it is the planning and implementation of much-needed water governance reforms that render the management of water resources highly challenging. Inspired by internationally accepted IWRM (Integrated Water Resources Management) principles and practices, the need for sustainable governance approaches at local, national and transboundary levels has been clearly identified. Despite significant efforts by most Mediterranean countries towards water sector reform, many still suffer from the lack of planning and technical capabilities, effective operational strategies, fragmentation of responsibilities among authorities – including decentralisation concerns, weak policy implementation and limited law enforcement. Furthermore, water strategies and plans (where existing) often do not adequately address national development priorities, financing strategies, adaptation policies and transboundary considerations. In addition, the serious defects in the governance of the water sector have been recognised as hampering the ability to generate and attract the much needed finance, necessary for the implementation of such plans.

Despite the rather ominous picture portrayed, most Mediterranean countries have embarked upon or are well underway water sector reform processes through the elaboration and/or update/revision of IWRM Plans and Water Strategies, with governance firmly placed at the centrepiece and IWRM forming the guiding framework. Recent regional political (the Arab Spring) and economic (food and economic crisis) developments present challenges as well as opportunities for inducing further the ingredients necessary for effective water governance. More importantly, the recent socio-political developments have adequately portrayed the urgent need for informed, unrestrained and effective involvement and interaction of stakeholders - whether public or private, state or non-state- in dealing with issues of common interest like the development, (re) allocation and management of scarce water resources. The prescriptions for improved water management can achieve the proclaimed effects only when the water reform is planned in a holistic manner, including political, institutional, legal, social and economic changes, and with due cross-

sectoral considerations, involving agriculture, industry, energy, tourism, domestic use, nature conservation, etc.

Whether elaborating on an IWRM Plan, a Water Strategy and/or a Water Efficiency Plan, it is well recognised that there are no universal blueprints or one-solution-fits-all. Country particularities need to be taken into account along with proper consideration of the various competing –and often conflictual- water users and uses. At transboundary level, the implementation of plans becomes even more strenuous, as it involves different national sovereignties with differing needs and priorities. Having said that, it is also well acknowledged that there is a wealth of valuable experiences to be shared at the regional, sub-regional, national and local levels and a promising ground for coordinated strategic planning. Knowledge and experience sharing along with the potential replicability of good/best practices needs strengthening with emphasis on multi-stakeholder involvement in order to ensure transparency, accountability, ownership and eventual endorsement.

1.1 THE SWIM FRAMEWORK

Aiming to respond to the above challenges and take stock of the on-going country efforts with an emphasis on the regional perspective, the EC-funded SWIM programme endeavours to contribute to the effective implementation and extensive dissemination of sustainable water management policies and practices in the South-Eastern Mediterranean Region in view of increasing water scarcity, combined pressures on water resources from a wide range of users, desertification processes and in connection with climate change.

The specific objectives of the SWIM-SM component are to: (1) Raise the awareness of decision-makers and stakeholders in the Partner Countries on existing and upcoming threats on water resources, on the necessity to switch to more viable water consumption models as well as on possible solutions to face the challenges; (2) to support the Partner Countries in designing and implementing sustainable water management policies at the national and local levels, in liaison with on-going relevant international initiatives; and (3) Contribute to institutional strengthening, to the development of the necessary planning and management skills and to the transfer of know-how.

1.2 THE REPORT'S CONTEXT & OBJECTIVES

With the above in mind, the need to review the status of National Water Plans and/or Strategies and the progress towards Integrated Water Resources Management (IWRM) was identified as a concrete priority by the PCs during SWIM-SM's inception phase. The present Report responds to this call with the threefold objective to: i) provide a concise regional review on the topic based primarily on updated available sources, ii) conduct a more elaborate assessment of the overarching conditions in three PCs, namely Jordan, Lebanon and Tunisia, using also primary information gathered through country missions and iii) identify, based on the previous analysis, politically plausible, socially acceptable and financially implementable policy options and recommendations for advancing the preparation, implementation and monitoring of plans and/or strategies with replicability potential in the PCs and in the rest of the Mediterranean at large. This latter part is complemented by a series of existing and upcoming opportunities that can assist with the implementation of the identified policies.

More importantly, the Report aims to provide the analytical background for a structured and inclusive policy dialogue among the PCs, within the SWIM framework, in order to enhance the operationalisation of IWRM approaches with emphasis on mainstreaming water considerations in other sectors through experience sharing and exchange of good and bad lessons learnt. To this end, the dialogue will benefit from existing synergies and available discussion platforms, while the Report will duly take stock of and expand on ongoing related work (especially by GWP, MED EUWI, UN Water). Particularly, the context of the Report closely aligns with the development of the UN-Water, "Status Report on the Application of Integrated Approaches to the Development, Management and Use of Water Resources" prepared by UNEP-DHI Centre with partners for the UNCSD Summit in Rio de Janeiro (20-22 June 2012).

Methodologically, the Report is based on available secondary literature and primary information collected during the country missions. In this effort, important assistance has been offered through the collaboration with United Nations Environment Programme-Collaborating Centre on Water and Environment (UNEP-DHI Centre), responsible for the compilation of the UN-Water Report prepared for the Rio+20 Conference (20-22 June 2012). The graphs in the Regional Review section have been kindly provided by the Centre, in addition to selected background elements in

the country analyses. A point of attention concerns the conduct of the country analyses, which aims to move beyond a conventional IWRM-related assessment and instead strives to combine information from the three PCs in a juxtaposing and dynamic manner with the additional aim to also highlight emerging issues and challenges and thus, contribute towards an out-of-the-water-box approach. This effort runs in complementarity with the context of major regional and international events (e.g. 6th World Water Forum, Marseille, March 2012; Rio+20 Summit, 20-22 June 2012; World Water Week, August 2012, etc) in order to further validate the findings and seek updating where and when necessary. More importantly, the findings of the Report informed the discussions during a SWIM-SM Expert Regional Workshop (13-14 June 2012 in Athens) with targeted stakeholders from the PCs that endorsed the methodological approach, validated the findings, and provided insights on next steps and potential types of activities in the next implementation years of the project.

1.3 KEY ASSUMPTIONS & STRUCTURE OF THE REPORT

In the aftermath of the Arab Spring, the socio-political situation remains volatile in many of the PCs. A key assumption concerns some level of stability for the smooth completion of the overall activity (including the workshop), in order to secure the interest, engagement and commitment of stakeholders, especially with regard to the suggested policy options. A second assumption regards the availability of information and data, already a challenging issue in the PCs, as well as the disclosure of information/data gathered through interviews as well as through the UN-Water system.

The Report is structured around four main sections: i) a regional review covering all PCs, ii) a country-focused comparative analysis, covering Jordan, Lebanon and Tunisia (including an evaluation of progress, identification of shortcomings and a presentation of challenges), iii) an elaboration of potential policy options and recommendations and iv) an examination of existing opportunities. The Report is complemented by a list of references.

2.Regional review on the status of Water Plans and/or Strategies in the SWIM PCs

This section aims to conduct a concise regional review on the status of national water plans and/or strategies in the SWIM PCs in order to primarily shed light on the current situation in the countries and to try and address emerging challenges (e.g. climate change impacts, green economy model, water-food-energy nexus) and recent policy directions provided by regional and international fora (6th World Water Forum, Rio+20, etc). Before embarking onto this review, a succinct reminder is provided on the key elements of an Integrated Water Resources Management (IWRM) approach and the context of an IWRM plan and/or strategy in order to contextualise and structure the analysis that will follow. The section closes with a few conclusions that will be further fed into the last section of the Report on policy options and recommendations.

2.1 DECIPHERING THE IWRM FRAMEWORK

2.1.1 On concepts and key elements

Placing IWRM at the heart of water resources management has a rich and vibrant history. Setting off during the Dublin (Dublin Statement, 1992) and Rio Conferences in 1992, IWRM was introduced as a solid way to highlight both the complexity of water resources management and the need for a holistic, multi-stakeholder and cross-sectoral approach. Since then, IWRM has gradually become a reference point and has been reflected in various regional and international processes, documents and milestones [e.g. Millennium Development Goals (MDGs), European Union Water Framework Directive (EU WFD), Johannesburg Plan of Implementation (JPoI) during the World Summit on Sustainable Development (WSSD), European Union Water Initiative (EUWI), Mediterranean Strategy for Sustainable Development (MSSD), UN World Water Reports and the African Water Vision 2025, among others].

Particularly, in their response to the IWRM Target of the JPoI (which called for the development of national IWRM and water efficiency plans by 2005 as means towards MDGs' achievement), all countries have embarked on water sector

reform processes of different scales. This is most important also in view of the forthcoming Rio+20 Conference (June 2012) and the anticipated endorsement of the Sustainable Development Goals, where Water forms an explicit and stand-alone goal (Goal No. 6) along with a reinforced commitment from Governments and the international community to promote and implement IWRM, including time-bound deliverables and the set up of a monitoring mechanism.

The most widespread **definition of IWRM** describes it as an approach that "promotes the coordinated development and management of water, land, and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (GWP, 2000).

The approach calls for more coordinated development and management of: land and water; surface water and groundwater, national and shared; the river basin and its adjacent coastal and marine environment; and, upstream and downstream interests.

However, IWRM is not solely about managing natural resources; it is also about reforming human systems to enable people to benefit from those resources. For policy-making and planning, taking an IWRM approach requires that:

- policies and priorities take water resources implications into account, including the two-way relationship between macro-economic policies and water development, management, and use,
- there is cross-sectoral integration in policy development,
- stakeholders are given a voice in water planning and management, with particular attention to securing the participation of women and the poor,
- water-related decisions made at local and river basin levels are in-line with, or at least do not conflict with, the achievement of broader national objectives, and
- water planning and strategies are integrated into broader social, economic, and environmental goals.

In practice, this means giving water an appropriate place on the national agenda; creating greater "water awareness" among decision-makers responsible for economic policy and policy in water-related sectors; creating more effective channels for communication and shared decision-making between government agencies, organisations, interest groups and communities; and encouraging people to think "outside the box" of traditional sectoral definitions.

An IWRM approach focuses on **three basic pillars** and explicitly aims at avoiding a fragmented approach of water resources management by considering the following aspects, also with due reference to the 3Es of sustainable development (-social-**E**quity, **E**nvironmental sustainability and economic **E**fficiency). These pillars entail:

- an ***enabling environment*** of suitable policies, strategies and legislation for sustainable water resources development and management,
- putting in place the ***institutional framework*** through which policies, strategies and legislation are put into place, and
- setting up the ***management instruments*** required for operationalising the policies and implementing the plans and strategies.

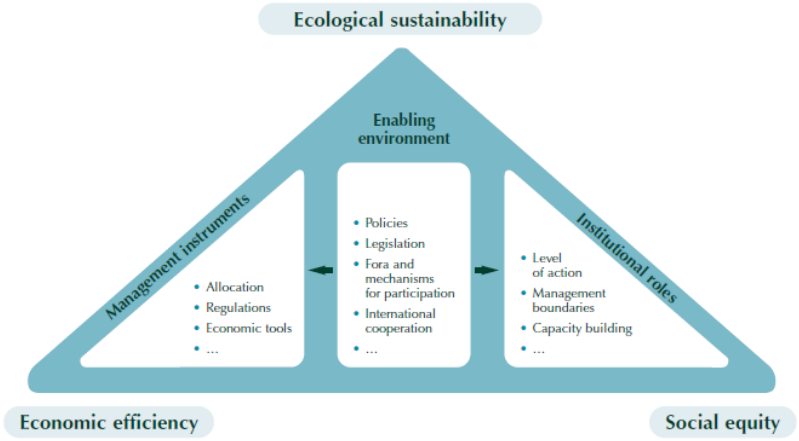


Figure 2: The "three pillars" of Integrated Water Resources Management within the sustainable development pyramid

In order to implement the IWRM approach, positive and action-oriented **change is needed** in a set of areas within these three pillars (see Box 1). Fundamentally however, it is about change(s) in **water governance**, understood as "*the range and various levels of political, social, economic and administrative systems and/or mechanisms that are in place to develop and manage water resources and deliver water services, at different levels of society*" (GWP, 2000; Rogers and Hall, 2003; GWP, 2004; UNDP, 2004).

The enabling environment

1. Policies – setting goals for water use, protection and conservation.
2. Legislative framework – the rules to follow to achieve policies and goals.
3. Financing and incentive structures – allocating financial resources to meet water needs.

Institutional framework

4. Creating an organisational framework – forms and functions.
5. Institutional capacity building – developing human resources.

Management instruments

6. Water resources assessment – understanding resources and needs.
7. Plans for IWRM – combining development options, resource use and human interaction.
8. Demand management – using water more efficiently.
9. Social change instruments – encouraging a water-oriented civil society.
10. Conflict resolution – managing disputes, ensuring sharing of water.
11. Regulatory instruments – allocation and water use limits.
12. Economic instruments – using value and prices for efficiency and equity.
13. Information management and exchange– improving knowledge for better water management.

Box 1: The thirteen key IWRM change areas

Whilst elaborating on the different change areas with a clear focus on issues of governance, maintaining a **cross-sectoral approach** is of paramount importance, given the interdependencies and reciprocal impacts between water resources and other sectors (i.e. agriculture, environment, tourism, industry or trade, etc – as seen in Figure 3). In practice, this needs to translate into operational linkages with actors and stakeholders dealing with such issues and

necessitates the establishment of solid coordination mechanisms.

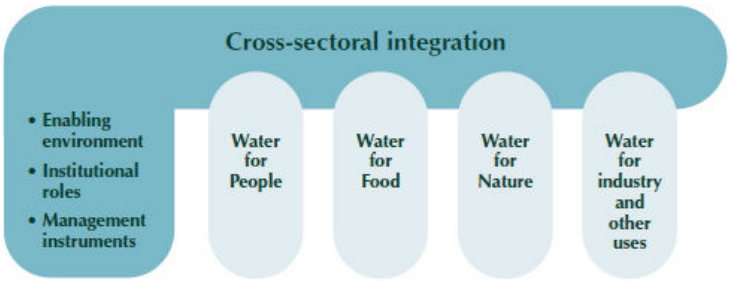


Figure 3: IWRM and its relation to sub sectors

Given that change is a fundamental part of the framework, IWRM needs to be viewed as a **dynamic process** rather than a one-shot approach. It is a long-term, forward-moving and action-oriented endeavour, **iterative and vibrant** in nature, as depicted in the below figure.

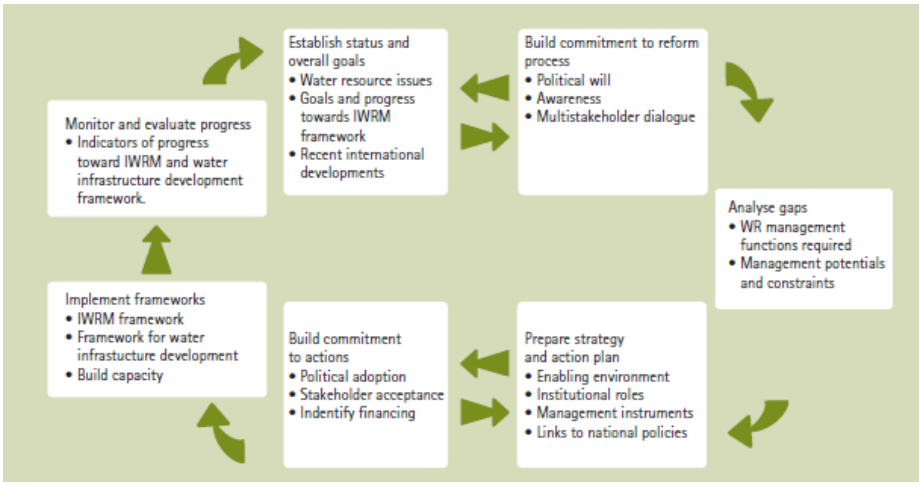


Figure 4: IWRM is a dynamic and ongoing process responding to changing situations and needs (adapted from GWP, 2004)

Inherent in this view is the need for an effective governance framework that fosters solid decision-making on an on-going basis in response to changing needs and scenarios. However, adopting IWRM does not mean throwing everything away and starting over. More often it means adapting and building on existing institutions and planning procedures to achieve a more integrated approach.

2.1.2 IWRM Plans and Strategies

Within the contextual background of IWRM, the process of creating an IWRM and water efficiency plan (better addressed as 'IWRM and water efficiency strategy' according to GWP) is an opportunity for countries to take a coherent approach to improving how they develop, manage and use water resources to further sustainable development goals and meet development challenges.

In general, planning and strategy development are closely related. However, planning usually is meant to identify concrete activities, while a strategy development is more concerned with defining future direction. A strategy defines goals and agrees on how goals could be pursued—perhaps even outlining a range of possibilities suited to different contingencies. Planning is then the translation of the chosen strategy into concrete objectives, activities and related means (see also below).

Creating an effective IWRM strategy requires a somewhat different process than that entailed in creating a one-off water resources planning document.

Key differences include:

Involvement from multiple sectors: While a water plan is usually designed and implemented by a water agency, an IWRM strategy requires input and buy-in from all sectors that impact and are impacted by water development and management—for example, health, energy, tourism, industry, agriculture, and environment.

Broader focus: Whereas water plans tend to be concerned exclusively with water supply and demand issues, an IWRM strategy looks at water in relation to other ingredients needed to achieve larger development goals.

Dynamic rather than static: Unlike a water plan, which lays out a definitive sequence of actions and decisions, an IWRM strategy aims at laying down a framework for a continuing and adaptive process of strategic and coordinated action.

Stakeholder participation: Because it calls for change—and therefore buy-in—at multiple levels, strategy development requires far broader and more extensive participation from stakeholders than a traditional planning process.

Box 2: IWRM Strategy: Not just another water plan

Some countries may choose to begin by considering the various ways in which water resources development and management have the potential to advance or hinder development goals. Others may choose a more targeted approach and focus on specific water related problems that are hampering development. Some countries may choose to create new strategies from scratch. Others may build on existing IWRM or water plans or incorporate water into current national development strategies.

Regardless of the initial approach, strategies should go beyond the actions needed to solve current problems or to achieve immediate objectives, and aim at institutionalising changes that will promote more strategic and coordinated decision-making on an ongoing basis. To do this, strategies need to encompass changes in the enabling environment, in institutional roles, and in management instruments, as described already. Fundamentally, creating a strategy is about catalysing change in water governance.

2.2 DELVING INTO THE STATUS OF IWRM PLANS AND/OR STRATEGIES IN THE SWIM PCS

This sub-section is dedicated to a regional review in the SWIM PCs. The analysis is done according to the different components of the IWRM framework and is largely based on diagram information provided by UNEP-DHI, at the request of the SWIM-SM programme, and deriving from the work on the 2012 UN Water Report that was prepared for the forthcoming Rio+20 Conference. The diagrams compile information from official country responses to a Questionnaire[2] that UN Water sent out for the purposes of the UN Water Report elaboration[3]. It should be noted that

2 The full text of the template Questionnaire is available in Annex 1

3 The UN Commission on Sustainable Development (CSD) at its 13th Session in 2005 decided to call on Governments and the UN System to take actions related to water resources management and decided to monitor and follow-up the implementation of decisions in both 2008 and 2012. At CSD-16 in 2008 UN-Water delivered a Status report on Integrated Water Resources Management (IWRM) and Water Efficiency Plans based on surveys carried out by UN-DESA, GWP and the UNEP-DHI Centre (http://www.unwater.org/downloads/UNW_Status_Report_IWRM.pdf) and it has provided input for the benchmark report for CSD-20 in 2012. CSD-20 marked 20 years after the Rio Earth Summit, 10 years after the Johannesburg Summit and 40 years after the Stockholm Conference. The UNCSD 2012 Summit thus provided a unique opportunity to strengthen the commitment from Governments and the international community to promote and implement integrated approaches to the sustainable management of water resources, as called for in Rio 1992 (Chapter 18 of Agenda 21) and in Johannesburg 2002 (Johannesburg Plan of

at the time of the survey (early 2011) Palestine was not an official UN member state and thus, did not receive the Questionnaire. As a result, the findings of this section do not include information on Palestine; the status of an IWRM plan in Palestine will be however presented in the document. Moreover, Syria did not respond to the Questionnaire and thus, information on the country is also not depicted in the diagrams and analysis. Therefore, the diagrams depict information provided by: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco and Tunisia. Given the non-disclosure clause according to which the Questionnaires were completed, it is not possible to name countries whilst analysing the diagrams, nor make explicit reference to the provided country replies. A summary on the context/findings of the different components will be provided in a compiled form at the end of the regional review.

2.2.1 The enabling environment

As explained, the enabling environment refers to the set of suitable policies, strategies and legislation for sustainable water resources development and management. In this section a schematic presentation on the status of these elements at regional level will be carried out.

The implementation of water policies is well underway in the SWIM PCs (as seen in Figure 5), with 3 countries having fully implemented them at national level and 2 at sub-national/federal level, while 3 countries have recorded advanced implementation for both levels. The same applies to national water laws where the recorded progress is more numerous. At sub-national level however the situation differs, particularly on the part of the legislation, which has not been considered relevant by 6 out of the 8 responding countries. Water sector reform processes, underway in most PCs, have significantly facilitated the adoption of related legislations and the set up of policies.

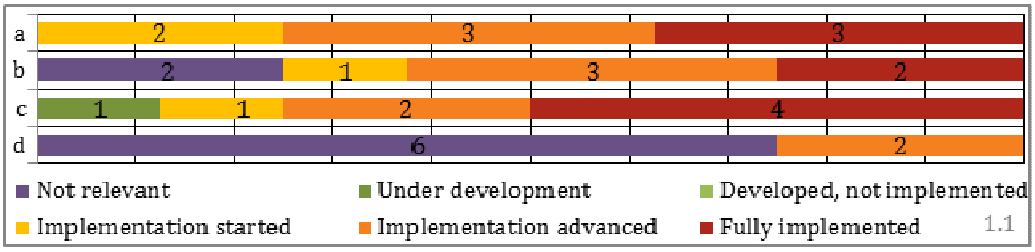


Figure 5: Status of national (a) and sub-national (b) water policies, as well as national (c) and sub-national (d) water legislation in the 8 SWIM countries

Further on the enabling environment and as depicted in Figure 6 below, the status of IWRM plans in most SWIM countries is well ahead, with 3 having fully implemented them, 2 in an advanced implementation stage, while 2 have started the implementation process and 1 has the plan under development. In Palestine, the legal framework includes the obligation to elaborate on an IWRM Action Plan and/or Water Strategy, while the 2003 Integrated Water Management Plan for the West Bank and the Gaza Strip corresponds –in principle- to an IWRM Plan given that the integrated approach is explicitly stated as the basis for water resource management. Moreover, there is a National Water Plan in place covering the period 2000-2020 and also a Water Governance Programme that has been under implementation by the Palestinian Water Authority since 2009. In Syria, a National Water Strategy was adopted in 2003 (following a water sector analysis that was completed in 2000) and it includes provisions for the elaboration of an IWRM Plan up to the year 2030. The advanced status of the SWIM PCs in the preparation of IWRM Plans can be also linked to the attempt for compliance with internationally set timelines and targets (including the MDGs and the JoI).

Implementation). The goal of the UNCSD 2012 Report is to support countries in the sustainable development and management of water resources. The Report is based on a global survey which will assess progress and outcomes on the application of integrated approaches to the development, management and use of water resources. This Report will form the basis for informed decision-making by the CSD and national governments. Moreover, knowledge gained will be used to develop a process for establishing a regular international monitoring and reporting framework to promote sustainable water resources management.

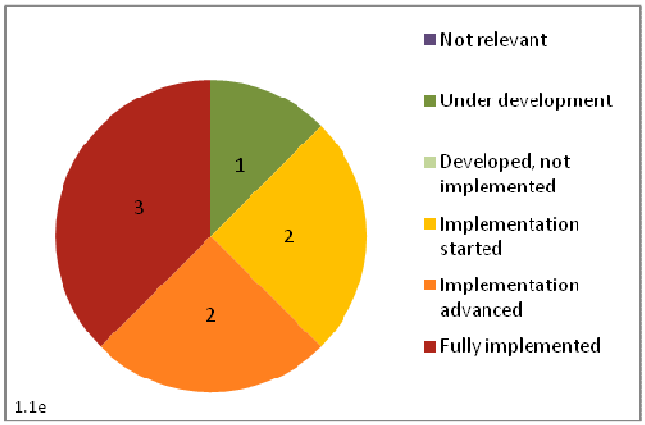


Figure 6: Status of national or federal integrated water resources management plan(s) or equivalent strategic plan document(s) in the 8 SWIM PCs

Of particular interest is a cross-regional comparison on the status of IWRM plan implementation. Figure 7 below depicts the reported situation among the SWIM PCs (considered as one group), the EU member states (where 20 out of the 27 countries responded), the Mediterranean EU member countries (where 4 out of the 7 countries responded), the South-Eastern Europe Non-EU member countries (where 5 out of the 7 countries responded), the Africa region (excluding the 5 SWIM PCs and where 35 countries responded) and the UN-ESCWA members (excluding the SWIM PCs and where 4 out of the 9 countries responded). For the EU countries (Med as well as the rest), the transposition of the Water Framework Directive (WFD) into national legislation and the obligatory implementation of its provisions have largely provided the rationale for the preparation and implementation of IWRM Plans. The 'under development' status of IWRM Plans in South-Eastern Europe has been the result of the voluntary agreement of these countries to comply with the WFD provisions (and given that all have association or pre-accession agreements with the EU). The situation in Africa is less advanced, as is also the status of the plans in the ESCWA countries. Comparatively, the SWIM PCs seem to be well advanced in this respect, with 7 out of the 8 countries within the implementation phase.

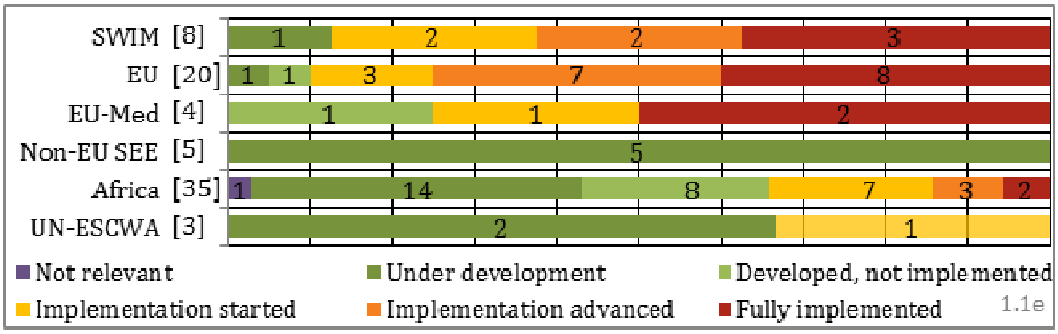


Figure 7: Selected cross-regional reporting on the status of IWRM plan implementation

As the IWRM approach views water in a holistic manner that cuts across users and uses, the below figure depicts the progress of mainstreaming water considerations into other sectors (namely environment, including climate change, agriculture and energy). From the diagram it seems that water mainstreaming is more advanced when it comes to agriculture (1 country has fully implemented this, 2 are under advanced implementation, 2 have developed the plan but not implemented it yet while 1 has it under development) with the environment following closely (2 countries are in advanced implementation, 4 have started the process and 2 have it developed but not yet implemented). The limited progress with regard to climate change policies/strategies is also related to the fact that such policies/strategies are currently under design and development in most of the SWIM countries. The little advancement on mainstreaming can be explained on the one hand by the fact that the concept is relatively recent and on the other

by the lack of cross-sectoral coordination in most PCs (as seen further below).

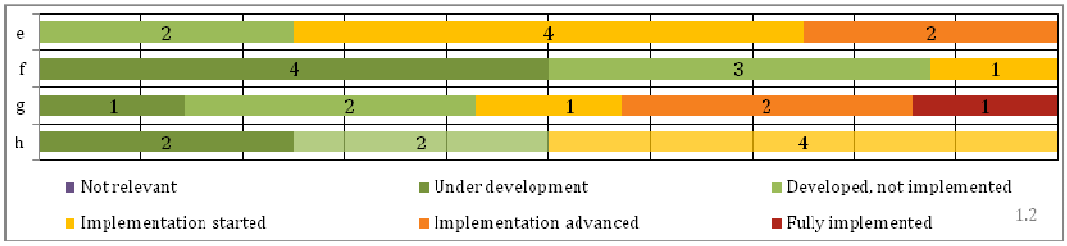


Figure 8: Status of: National Environmental Action Plan with water resources management component (e); National Climate Change Adaptation policy/strategy with water resources management component (f); National Agricultural Plan with water resources management component (g); National energy policy/strategy/plan with water resources management component (h) in the 8 SWIM PCs

2.2.2 Governance and institutional framework

The institutional framework concerns the setting in place of the necessary socio-economic, political and administrative systems in order to put into practice the policies, strategies and legislation. At the same time, and given the cross-sectoral nature of water within an integrated management approach by which all SWIM PCs abide, good coordination among authorities/agencies is needed along with decentralisation of responsibilities to the lowest level (principle of subsidiarity) and enhanced stakeholder participation to ensure ownership and accountability.

Cross-sectoral coordination represents a major challenge for most SWIM PCs, given the widespread institutional fragmentation and the overlap of roles and responsibilities among different line Ministries as well as among administrations/agencies/departments within the line Ministry in charge of water resources. Mechanisms for cross-ministerial cooperation (in the form of National Water Councils or Inter-Ministerial Committees on water for example) are usually lacking or have been under consideration for prolonged periods of time. The country replies to the UNCSD Questionnaire (as seen in Figure 9) demonstrate a more assuring picture with 2 countries having cross-sectoral coordination fully implemented, 3 being in an advanced implementation stage, and with one country respectively for having started the implementation, having developed but not operationalised the framework and having it under development.

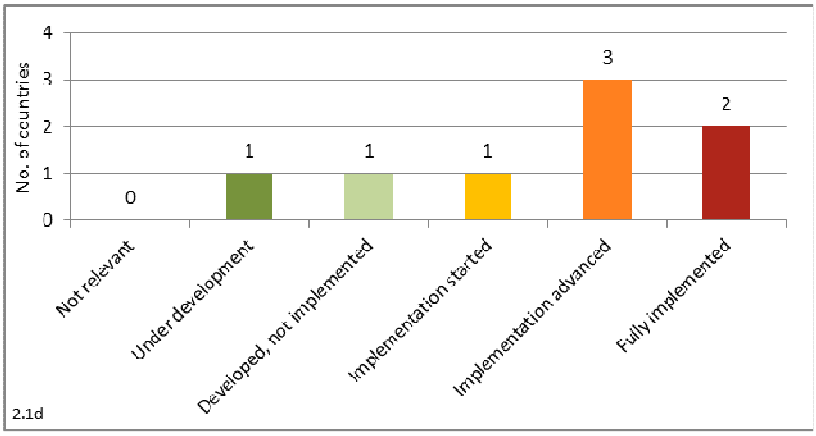


Figure 9: Status of mechanisms for cross-sector management of water resources in the 8 SWIM countries

In terms of stakeholder participation concerning different groups of actors the situation is also revealing on the additional effort needed in that respect. Based on the below figure, stakeholders' access to information is fairly

advanced with half of the SWIM PCs having such provisions either fully implemented or under advanced implementation. However, clarification is needed on what stakeholder access to information entails, given also the potential opening to the MENA region of the UNECE Aarhus Convention (on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters – in force since 2001). Moreover, the modalities concerning general public and civil society involvement in national water management may require further amplification, as in several countries the apposite legislative framework may be in place but the actual enforcement may be lagging behind. It is disconcerting that some countries have identified this element as non-relevant in addition to the gender mainstreaming component. Concerning private sector involvement, the responses show a significant differentiation among the SWIM PCs, with 2 countries having the related provisions fully implemented, 4 countries having started the implementation and 2 countries considering this aspect as not relevant to their particular national contexts.

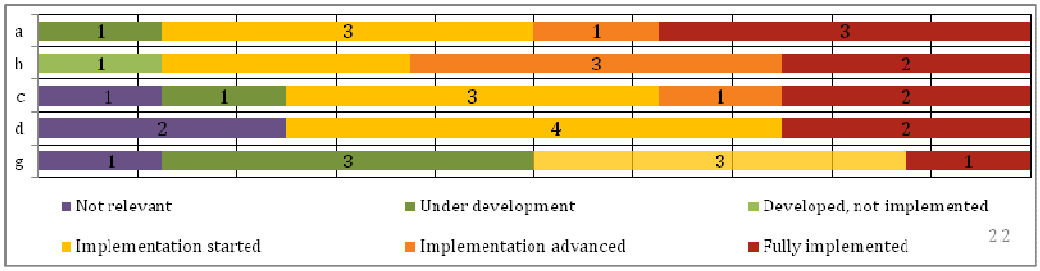


Figure 10: Status of: stakeholder having access to information on national water resources management and development (**a**); public awareness campaigns on water resources management and development (**b**); involvement of general public, civil society organisations and non-government organisations in water resources management and development at the national level (**c**); involvement of the private sector in water resources management and development at the national level (**d**); gender mainstreaming in water resources management and development (**g**) in the 8 SWIM PCs

Especially on stakeholders' access to information, interesting deductions can be made through a cross-regional depiction. In SWIM's vicinity, 3 out of the 4 EU Med countries have under full implementation this governance aspect, with the figure being 5 (out of 35) for Africa and 1 (out of 4) for the ESCWA region. For the EU members, the high ranking relates largely to the transposition of the related EU *acquis* and the deriving obligations as well as the enforcement of international agreements (like the Aarhus mentioned above). Despite the non-involvement in related international agreements and the challenging political regimes in many of the countries, the SWIM PCs seem to be at an encouraging stage with regard to stakeholder involvement.

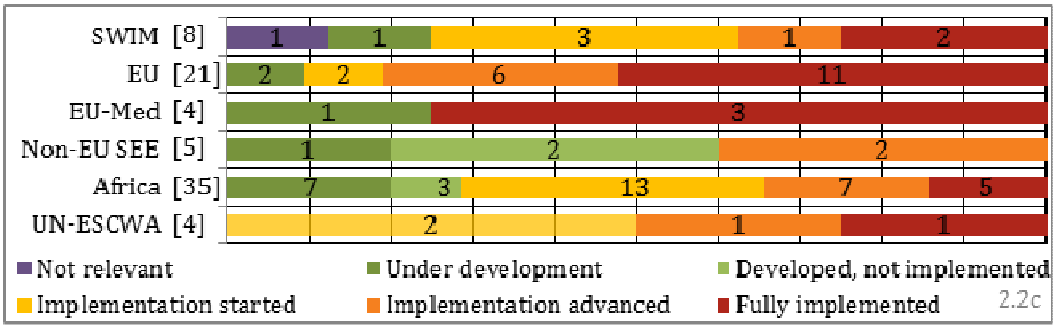


Figure 11: Selected cross-regional reporting on the status of stakeholder access to information on national water resources management and development

2.2.3 Management Instruments

Management instruments constitute the third pillar of the IWRM approach and refer to a range of tools and mechanisms that support informed decision-making and offer choices on alternatives actions for the development and

management of water resources. These instruments can include economic tools, regulation and (re)allocation mechanisms, demand management measures, information management and social change instruments, to name a few.

Based on the below figure, programmes for allocating water resources with due consideration to the environment are under development in 3 PCs, are under implementation in another 3 and 2 PCs are in advanced implementation. Demand management measures seem to be scattered across the spectrum with only 2 countries reporting full implementation of such measures. Similar is the picture with regard to programmes for the reuse of treated wastewater, with one country identifying such programmes as not relevant; further progress is anticipated in this field given the priority (through respective policies and measures) that most PCs attribute to this non-conventional water resource. On programmes to evaluate the environmental impacts of water projects, 6 out of the 8 PCs report being within the implementation stage (with numbers equally divided between early and advanced implementation). More progress concerns the implementation of programmes addressing water-related disasters where 1 country has fully implemented such programmes with 4 more being within the implementation phase. Concerning climate change adaptation programmes, half of the PCs are within the implementation phase (with 1 country having fully implemented them), while the other 4 countries have such programmes under development or about to commence implementation. The implementation of programmes such as the ones described, are intimately linked to the availability of financial resources and in the majority of the PCs they have been donor-driven within the timeframe of specific projects. Moreover, the appropriate legal and policy framework that would support the sustainability of such programmes is either lacking or under development.

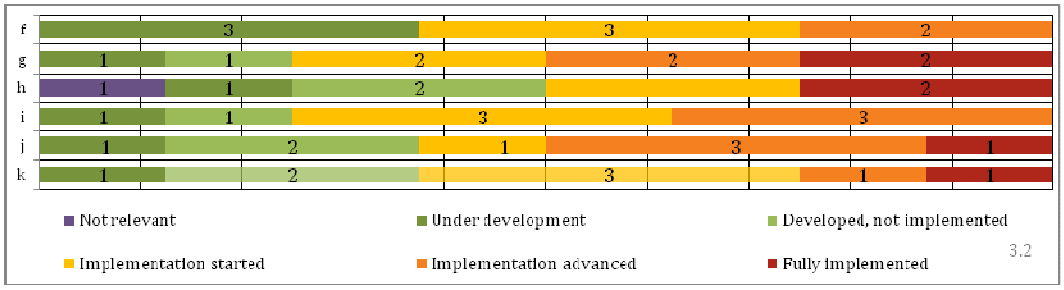


Figure 12: Status of: programmes for allocating water resources that include environmental considerations (**f**); demand management measures to improve water use efficiency in all sectors (**g**); programme for re-use or recycling of water (**h**); programmes to evaluate environmental impacts of water projects (**i**); programmes to address water-related disasters (e.g. floods and droughts) (**j**); programmes to address climate change adaptation through water resources management (**k**) in the 8 SWIM PCs

More promising is the picture concerning monitoring and information management instruments. More specifically, 2 countries report full implementation for monitoring of water quality and water use correspondingly, with 4 and 3 countries respectively being in an advanced implementation stage for the same. The forecasting and the use of early warning systems is more equally divided along the rating spectrum, with 2 PCs having such programmes fully in place. It is important to note that little progress is recorded with regard to information exchange and sharing of good practices with 6 out of the 8 countries reporting development or early implementation of such programmes. Again, a pivotal role in setting up these instruments has been played by donors; upon occasion however, this has resulted in a plethora of monitoring mechanisms that are project-specific, followed only by the authorities involved in the project and without a sustainable and country-wide application.

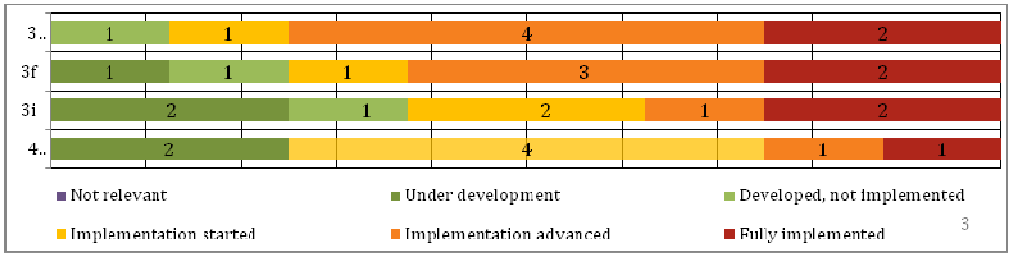


Figure 13: Status of: monitoring of water quality (3d); monitoring of water use (3f); forecasting and early warning systems (3i); programmes for information exchange and knowledge sharing of good practices (4a) in the 8 SWIM PCs

Economic tools represent a most important aspect of the management instruments and the picture of the SWIM PCs shows that there is significant way ahead in that direction. Only one country has fully in place cost recovery mechanisms, subsidies that promote water efficiency and different charges (like pollution charges) for water management. In terms of cost recovery, it is interesting that 6 out of the 8 countries are currently developing or have just started the implementation of such measures, while half of the PCs have in place (at different levels) subsidisation policies that promote water efficiency. Little progress is observed in terms of introducing various charges (polluter-pays, user-pays, etc) for water management, with half of the PCs having such provisions still under development.

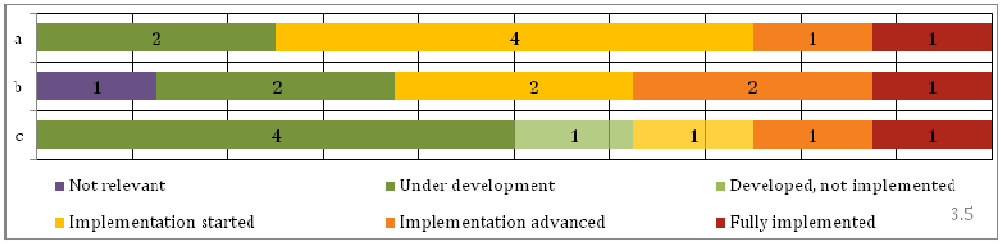


Figure 14: Status of: cost recovery mechanisms/progressive tariff structures for all water uses (a); subsidies for promoting water efficiency (b); charges for water resource management (e.g. pollution charges) (c) in the 8 SWIM PCs

2.2.4 Sources of Financing for water resources

The diagram included below reports the trends in financing for the development and management of water resources in the 8 SWIM PCs over the last 20 years. It should be noted that these results indicate the perception of the governments regarding the trends. It is interesting to note that whereas in the majority of the PCs (6 out of 8) the state budget has increased during the examined period, 2 PCs report a declining trend for the same. Regarding loans and grants, 3 PCs report that they've had no such funding allocations, while 2 others describe this source as highly variable with the remaining 3 recounting an increasing trend. On the role of IFIs, the situation is more spread across the different replies. Considering the global economic situation and based on information collected during SWIM-SM's inception phase, it is expected that the role of these two sources of financing will exhibit declining trends in the years to come (upon occasion this could include a pull out of donors from the water sector of PCs). The implications could be severe for some PCs who largely rely on donor assistance for financing their water sector.

Given the existing financing gap for the water sector that characterises most of the PCs, it is also expected that the role of the private sector will be strengthened, a trend supported also by the below responses according to which half of the PCs report an increasing trend in this type of involvement. On-going efforts in SWIM PCs to ameliorate the regulatory framework of the water sector (both in terms of laws and institutions) are expected to strengthen the enabling environment for enhanced private sector participation, though with an emphasis on infrastructure and management contracts for the delivery of water services. Internal revenues (through tariff collection) are also expected to increase as a result of the governments' intention to secure improved water supply and sanitation services to all segments of their populations. The current situation, as reported below, sees 3 out of the 8 countries

having an increasing trend to tariff collection, with 2 PCs describing the trend as highly variable and the remaining 2 countries recounting that such data are not available. Finally, the low priority attributed to ecosystem services is demonstrated by the fact that half of the PCs report not having available data for this, while only 2 PCs inform about an increasing trend for the same. This includes the low application of different payments (like polluter-pays, user-pays) that are important elements of IWRM and can prove significant tools for demand management, increased efficiency and a means towards cost recovery from those that benefit from the resource.

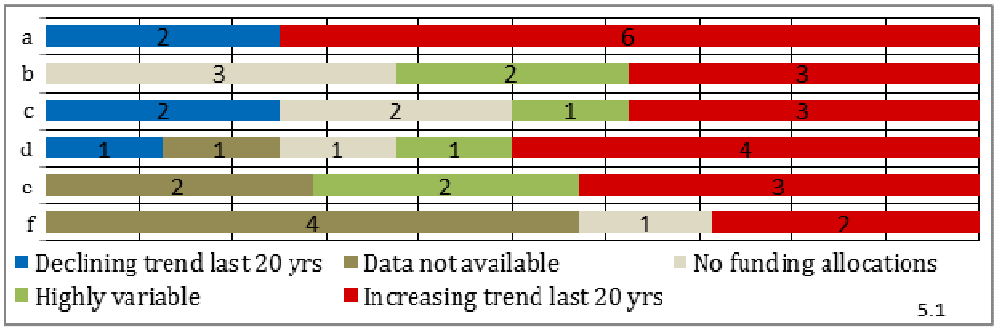


Figure 15: Financing trends for: government budget allocation (as % of GDP) for water resources development (a); grants and loans from aid agencies for water resources development (b); investments from International Financing Institutions (e.g. World Bank) for water resources development (c); investments from private sources (e.g. banks and private operators, non-profit) for water resources development (d); revenues (e.g. from water use charges/tariffs) used for water resources development (e); payments for ecosystem services and related benefit/cost transfer schemes (f) in the 8 SWIM PCs

An unequivocal indication of the priority ascribed to water resources development in a country can be detected through the examination of water and financing for water within national investment plans. The diagram below shows that 6 out of the 8 countries are advanced or have fully included water resources in national infrastructure investment plans, which signifies a clear priority on water. At the same time, 5 PCs report full or advanced implementation when it comes to including financing for water resources in national investment plans with the remaining 3 countries having started the process.

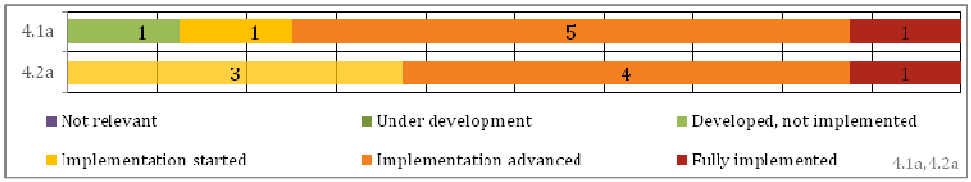


Figure 16: Status of: water resources included in national infrastructure investment plans (**4.1a**); financing for water resources included in national investment plans (**4.2a**) in the 8 SWIM PCs

2.2.5 Impacts and priority challenges

This last part of the regional review concerns the depiction of impacts from improved water resources management on development objectives in the SWIM PCs as well as the identification of key challenges and priorities for action.

With regard to the impacts the countries reported (as seen in Figure 17) that the greatest effect has been on meeting economic objectives (5 out of 8 countries) with social objectives following next (4 out of the 8 PCs). Achieving environmental objectives seems split, though with indication that progress has been made (3 out of 8 countries report significant impact). Low impact has been also reported by 1 country for each of the economic and environmental objectives. As expected, all PCs have identified (though at different levels) a positive impact to their overall development by implementing improved water resources management. It should be noted here that responding to

this question posed a significant challenge for the PCs, mainly due to the difficulty in assessing the contribution of water management to change and with regard to a diversity and level of objectives.

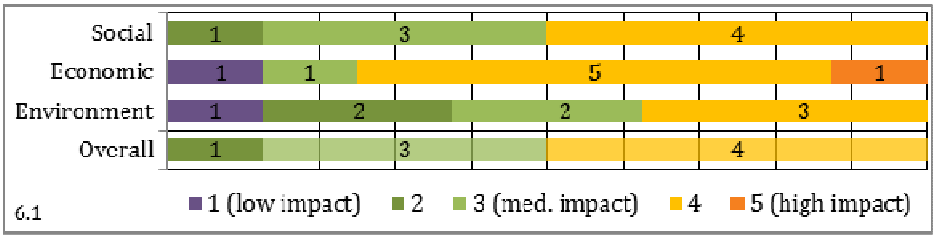


Figure 17: Impact of improved water resources management towards meeting social, economic, environmental development objectives in the past 20 years, as well as the overall impact on development in the same period[4]

Further to assessing the impacts from implementing an improved (integrated) water resources management in the PCs, the countries also reported on identified challenge areas with regard to water resources and water resources management. Concerning water resources, as depicted in Figure 18, highest priority is attributed by 5 out of the 8 PCs to water for domestic use, while highest priority is ascribed by 3 countries to water for growing cities. Water for agriculture is considered of high priority for half of the PCs with another half attaching the same level of priority to water for industry. The limited consideration of the environment/ecosystems can be seen in the responses identifying this aspect as medium (4 countries) and low (2 countries) priority. Moreover, it is interesting to note that water for industry and water for energy have been reported as areas posing no problem (1 and 2 PCs respectively reported on this), possibly due to the small quantities that the two uses require.

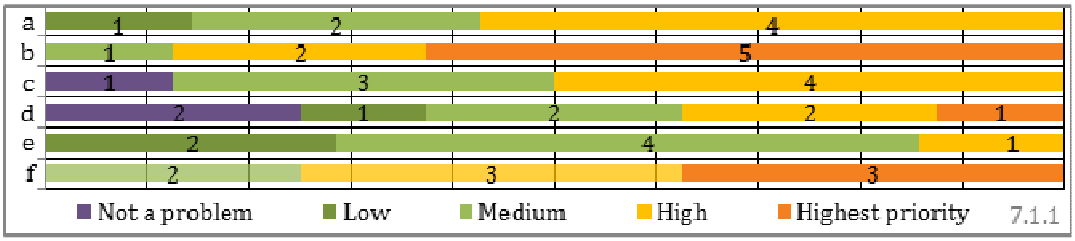


Figure 18: Priority water resources challenge areas - water uses: water for agriculture (**a**); water for domestic use (**b**); water for industry (**c**); water for energy (**d**); water for ecosystems/environment (**e**); water for growing cities (**f**) in the 8 SWIM PCs

The picture when it comes to threats to water resources appears a bit more homogeneous with droughts and groundwater quality being identified by all PCs as having high and highest priority. Water scarcity for surface water and for groundwater has received identical range of responses that vary across the priority levels, while another wide diversity of responses concerns floods and surface water quality with 2 PCs reporting the latter as not a problem and 1 PC reporting floods as not posing a problem.

4 Economic objectives relate to economic growth, wealth, management of monetary assets and economic sector development; social objectives relate to human development, gender considerations, poverty alleviation, health, education and job creation; environmental objectives relate to conservation and sustainable use of natural resources, such as water, pollution control, nature, agricultural land, forest and fisheries

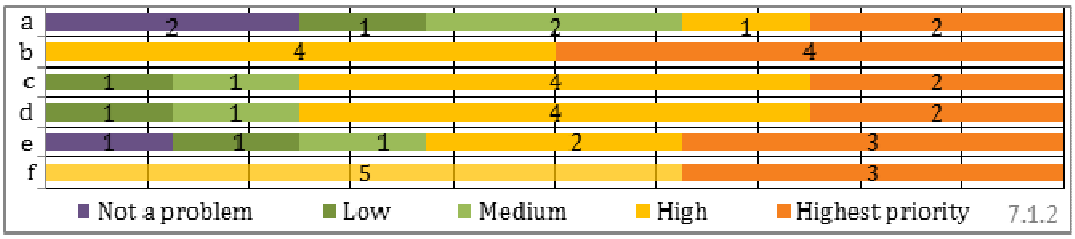


Figure 19: Priority water resources challenge areas – threats to the resources: floods (**a**); droughts (**b**); water scarcity (surface water) (**c**); water scarcity (groundwater) (**d**); water quality (surface water) (**e**); water quality (groundwater) (**f**) in the 8 SWIM PCs

A comprehensive picture of the priority attributed by the PCs to challenges in the area of water resources management is provided below. All countries have placed high priority on institutional capacity and cross-sectoral coordination at national level, while a large majority (6 out of 8 PCs) consider sub-national cross-sectoral coordination, legislation and water use efficiency as areas also of high priority. Some items (international and national/sub-national transboundary capacity, private enterprise management, coordination between levels and types of management, legislation, financing of infrastructure and of water resources management and knowledge sharing) have been identified as not posing a problem (with number of responding PCs ranging between 1 and 3).

The challenge areas formed a substantial part of and were complemented by discussions with experts from the PCs during a SWIM-SM Regional Workshop on National Planning on Water that took place on 13-14 June 2012 in Athens. The discussions elaborated on the identified challenge areas and verified the findings of the UN Survey regarding the priority of four themes, namely cross-sectoral coordination, decentralisation, stakeholder participation and capacity building at different management levels.

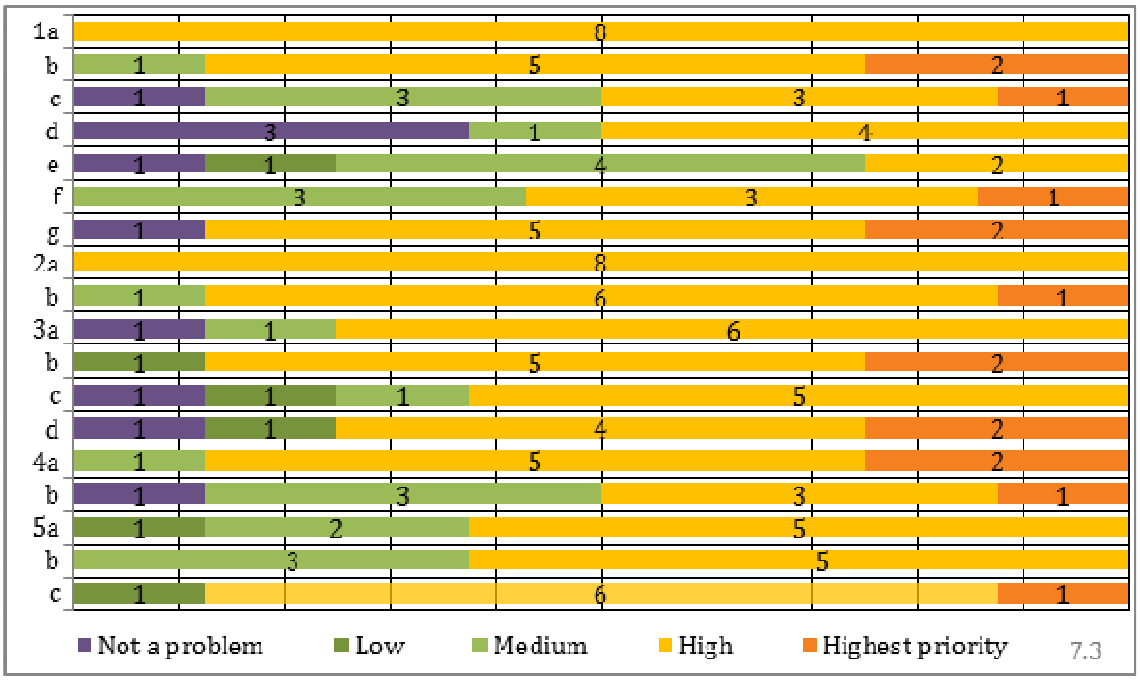


Figure 20: Priority water resources management challenge areas – institutional capacity at national level (**1a**); institutional capacity at sub-national level (**1b**); transboundary capacity at international level (**1c**); transboundary capacity at national/sub-national level (**1d**); management through private enterprise (**1e**); stakeholder participation (**1f**); coordination between levels and types of management (**1g**); coordination between sectors at national level (**2a**); coordination between sectors at sub-national level (**2b**); legislation (**3a**); infrastructure development (**3b**); financing of water resources management (**3c**); financing for infrastructure (**3d**); monitoring of resources (**4a**); knowledge sharing **4b**); disaster management (**5a**); climate change adaptation management (**5b**);

water use efficiency management (**5c**)

2.3 SOME CONCLUDING REMARKS FROM THE REGIONAL REVIEW

The overall impression from the analysis on the enabling environment is that good levels of progress have been accomplished by the SWIM PCs, but significant work remains to be done so as to further strengthen it towards IWRM approaches. Policies, laws and plans are in place in many of the countries, but several of them are within the early/moderately advanced implementation stages. A point of potential concern is the need for regular update and/or revision of existing plans and strategies that may be a challenging endeavour when the initially-compiled plan is under a prolonged implementation phase.

Given the integrated element of water plans, it could be anticipated that improvements in the enabling environment will result in improved performance and progress with other aspects of water resources management. Supporting this point, countries reporting progress with the enabling environment also report progress with the governance and institutional frameworks. There seems to be a positive correlation between these two IWRM components and countries recording higher levels of implementation with the enabling environment are likely to have made greater progress with governance and institutional systems. Nonetheless, further efforts are required in the national water reform processes given that institutional fragmentation and overlapping of roles and responsibilities are recognised by most PCs as most challenging areas in urgent need for action.

With regard to management instruments, the majority of SWIM PCs demonstrates significant progress concerning monitoring of water use and water quality and an effort towards programmes for supporting water resources management with an emphasis on environmental considerations and climate change adaptation. In terms of the economic tools (cost recovery, subsidies, tariffs), it is clear that there is a long way ahead, especially given the inherent social sensitivities that such measures entail.

At the same time, there is a steady and increasing trend of government support for the development of water resources, with the involvement of the private sector following next. The role of donors and IFIs entails some ambiguity as to its future trajectory, given that for both cases declining and increasing trends have been reported. As mentioned, tariffs represent a socially sensitive source of financing that requires a solid and fully operational regulatory framework along with awareness raising campaigns in order to be effectively implemented. Finally, little progress is recorded when it comes to ecosystem services and the introduction of different payment principles, also echoing the low priority attributed to the environment as both a water user and a part of the IWRM framework (also seen in the low ranking the environment received in the list of priority challenges).

Of particular interest is the schematic and comprehensive depiction of the challenge areas as these have been reported by the PCs, both regarding water resources and water resources management. There is a clear high(est) priority attributed to potable water and water for growing cities, with agriculture, industry and energy following next as areas of high priority for about half of the PCs. When it comes to management challenge areas, there is unanimity on the need to further focus on institutional capacity building and cross-sectoral coordination, both at national level. The challenge areas (regarding the management of water resources) form the core of the last section of this Report that elaborates on ideas for plausible policy options and recommendations towards the further implementation of the IWRM approach. The discussions during the SWIM-SM Regional Workshop on National Planning on Water (13-14 June 2012, Athens), besides elaborating on the challenge areas, provided guidance on policy options that better address the identified priorities and areas of concern for future actions. More specifically, the participants identified four key priority areas: cross-sectoral coordination, decentralisation, stakeholder participation and capacity building at different management levels.

Overall, and despite the inherent quantification difficulties, the assessment of change (or trend towards change) induced by improved /integrated water resources management is a most significant tool for reviewing the three components of sustainable development (as exemplified at the beginning of the section) and promoting the apposite

mechanisms for their further enhancement and their positive interrelation with the IWRM framework.

3.Survey on the status of water plans and/or strategies in Jordan, Lebanon and Tunisia

This third section has as its objective to conduct an assessment of the status of water plans and/or strategies in three PCs, namely Jordan, Lebanon and Tunisia. In order to add vigour to the analysis, a comparative and juxtaposing methodology has been opted for, thus refraining from the conventional country after country presentation and choosing instead the blending of selected information from the three countries according to theme. The section is divided into three sub-sections covering: a) progress and achievements, b) gaps, shortcomings and constraints and c) challenges. The key elements deriving from this analysis will be fed into the Report's last section on policy options and recommendations.

3.1 PROGRESS & ACHIEVEMENTS IN DEVELOPING AND/OR IMPLEMENTING WATER PLANS AND/OR STRATEGIES

As presented in the regional review, most PCs are either well advanced or have initiated the implementation of water plans/strategies; this includes Jordan, Lebanon and Tunisia, though with substantial differences among them regarding the status and stage of implementation. Following the logic of the regional analysis, the three countries will be examined against the key components of an IWRM approach complemented with reference to the level of overall awareness on integrated approaches.

3.1.1 The enabling environment: policy, strategic planning and legal framework

When discussing the enabling environment, Jordan is perhaps the most advanced country in the region as it has in place and under full implementation a National Water Master Plan (prepared in 2004 by the Ministry of Water and Irrigation) that corresponds to an IWRM Plan. The Master Plan addresses in a holistic manner all key challenges facing the water sector, including resource and demand management, socio-economic and environmental considerations as well as transboundary deliberations. Moreover, it is complemented by a Strategic Plan for Water Supply and Sewage, prepared by the Water Authority of Jordan and covering the period 2007-2012. The Master Plan is currently under revision in order to include improved data collection and depict the findings from the application of different models (e.g. the development of scenarios with due consideration to climate change using the Water Evaluation and Planning (WEAP) model, that has been calibrated for 90% of Jordan, and the more extended use of the MODFLOW and MYAS models. The most recent development in the field of policies and plans concerns the preparation and operationalisation of the Water Strategy 2008-2022. The Strategy entails a series of mega projects and seeks to achieve a clear set of objectives including the provision of sufficient and safe drinking water, maximising the benefits of surface water and bringing an end to the arbitrary pumping from underground wells, among others.

In Lebanon, on the other hand, there is no IWRM Plan as such in place, however, a set of documents represent clear steps in that direction. More specifically, a National 10-year Strategy Plan for the Water Sector was prepared by the General Directorate of Hydraulic and Electrical Resources of the Ministry of Energy and Water covering the period 2000-2009. The Strategy includes elements corresponding to an IWRM Plan and calls for a holistic consideration of water resources within a complete policy and planning cycle. Due to limited implementation of the Strategy within the set timeline, also as a result of internal and external politico-military turbulence, an updating of the Strategy was called for in 2007 in order to also incorporate the Reconstruction Process after the armed conflict during the summer of 2006. The revision effort of the Strategy was completed during Phase I of the national MED EUWI Policy Dialogue (2005-2009) and in alignment with the 2005-adopted water legislation. Phase II of the said Dialogue (2009-ongoing; assisted through the MED EUWI Service Contract) entails the launching of an IWRM Plan utilising decision-support tools like the WEAP model for building scenarios. A more recent and clear step towards IWRM concerns the elaboration of a National Water Sector Strategy, under the initiative of the Minister of Energy and Water, which was

approved by the Council of Ministers in March 2012. This Strategy follows closely the IWRM principles within a participatory framework and currently a Strategic Road Map for its implementation is being prepared.

Similar to Lebanon, Tunisia also doesn't have in place an IWRM Plan as such. Nonetheless, since the 1970s regional water planning schemes have been developed for each natural/hydrological region (far north, north, south and centre) laying the basis for the national water policy and defining mobilisation and transfer programs to satisfy all sectors' needs with priority given to drinking water. Starting from the 1990s and taking advantage of the mobilisation achievements, several sectoral and sub-sectoral strategies attempting a more integrated approach and aiming the optimisation of water resources use have been developed [including the Water Saving Strategy (1995), Natural Resources Management Strategy (1997), Water Sector Study (1997), EAU 21 or the Water Long Term Strategy for the Horizon 2030 (1998), National Strategy for Agriculture and Ecosystems Adaptation to Climate Change (2007), Sustainable Water Resources Management (2008)]. These documents demonstrate solid experience on the definition of water policies and the preparation of planning strategies, however, their multiplicity may signify limited ownership on behalf of the authorities and entail the potential for repetition and duplication of efforts. Aiming to address the water sector in a holistic manner, the Tunisian Government is currently preparing a National Water Strategy with a time horizon until 2050 that represents a comprehensive effort and aims to involve a wide consultation process for its elaboration.

In terms of water legislation, Lebanon carried out a revision of the legal framework in 2000 (Law 221, 241 including the amendment Law 337/2001 as well as a number of by-laws) so as to reflect the new vision on water resources management following the requirements of an IWRM approach. The framework was adopted in 2005 and resulted in amended water legislation and new institutional settings. Particularly Law 221 defines well the structure of the water sector and could be considered an example of legal text for the region. An additional effort concerns the Water Code, an on-going process since 2005 that aims to comprehensively tackle a series of governance, institutional and management issues and recommend provisions for the implementation of sustainable management of water resources. The Water Code, a cooperation programme between the Lebanese and the French Government, included a consultation process with different authorities and is soon to be submitted to the Council of Ministers for approval.

In Tunisia, the Water Code -adopted in 1975- constitutes the pillar of the water legislative framework in the country. Though it can be considered advanced and in alignment with modern principles, the Water Code requires revision so as to respond to the current state of water resources and socio-economic development. In 2001, the Water Code was amended (law 116/2001) to include mainly 2 principles: extend the water resources development concept to non conventional resources and introduce sustainable development and preservation obligations considering water resources as national wealth. In addition, several laws and regulations have been adopted, particularly during the last decade, to address new concerns including environmental issues (Decrees 1261 & 1262/87 for Water Users Associations (WUA) establishment and operation, Decree 1047/89 for treated water reuse in agriculture, etc). The reform of the Water Code, initiated recently by the Tunisian Government, aims to review and update the overall water legislation and ensure its coherence and integration with other legislations.

Until the establishment of the Ministry of Water and Irrigation in 1988, water legislation in Jordan was primarily based on residual Ottoman Majalla code complemented by a few other water laws. Since 1988 the water legislative framework has been rich (Law 18/1988, 54/1992, 30/2001, by-law 85/2002 to name a few) and has provided the basis for institutional reform actions in order to define the legal responsibilities on water resources monitoring and planning. Additional laws on public health (54/2002), control and use of groundwater (85/2002), including the most recent revision of the groundwater by-law, as well as environmental protection (12/2003) complement the legislative structure. However, it is interesting to note that passing laws in Jordan is integral to the establishment and/or restructuring of water institutions.

Finally in terms of the enabling environment, it is important to note that all three countries have concrete visions for the water sector, usually aligning with the wider socio-political and economic trajectory of the respective country. For example Tunisia, while facing water scarcity and unequal distribution of resources, which are mostly available in the north and far from the coastal areas where there is high demand, it developed a global vision for the water sector organised around the four regional long-term water planning schemes that have been adjusted over time through the

more recent national water strategies. With the aim to develop water resources so they do not constitute a constraint to the development trajectory of the country, the vision's basis progressed over time from supply management and large infrastructure development to demand management and the improved valuation and preservation of water resources. In Lebanon, the vision for the water sector was encapsulated in the legislative framework that set off in 2000 and was approved in 2005. In view of this restructuring of the sector, along with the post-2006 Reconstruction Process, a new vision has been in motion to take stock of the progress made and address existing challenges, centralised versus decentralised configurations, or emerging challenges including the modelling of climate change impacts nationally and regionally. Jordan, on the other hand, aligns all efforts in the water sector with its National Agenda, a comprehensive modernisation strategy launched in 2006 with a long-term vision on priorities and actions covering alike the political, social and economic fields. The expansion of the National Agenda into the Kulluna al Urdun document (a more comprehensive document to induce reform and include also concerns of national security and regional conflicts), directly influences the water sector particularly as the latter aims to be a multi-stakeholder consultation process on the nationally-set objectives.

3.1.2 Governance and Institutional Frameworks

The institutional setting of the water sector in Lebanon is primarily portrayed through the 2000 Laws 221, 241 and the amendment Law 337/2001. In addition to modifying the mission –as well as the title- of the Ministry of Energy and Water (the key authority in the water sector through its two General Directorates, the Directorate for Hydraulic and Electrical Resources and the Directorate for Exploitation) by reinforcing its competencies on planning, regulation and control, Laws 221 & 241 reorganised/merged the former 21 Water Boards into 4 Regional Water Establishments (North Lebanon, Beirut and Mount Lebanon, Bekaa, South Lebanon) under the Ministry. The legislation did not modify the mandate of the Litani River Authority, set up in 1954, which retains its independent status and scope of work. With regard to water infrastructure development, the Council of Reconstruction and Development was set up after the end of the Civil War in order to guarantee the financing of infrastructure projects and to supervise their execution. The Council is accountable to the Council of Ministers through the Prime Minister and at present water projects represent the largest bulk of its work along with road construction. Also due to the legislative vesting of Environmental Impact Assessments and Strategic Environmental Assessments with regard to infrastructure, the Ministry of Environment has progressively become more involved in the water sector, especially as it is responsible for the setting of standards and is at the forefront of climate change-related activities. The Ministry of Agriculture retains a focused role concerning the management of water at farmer level. Depending on the issue at stake, other Ministries may be involved (Public Health, Interior, Municipalities and Rural Affairs, etc) while at the decentralised level the role of the Municipalities as well as pre-2000 water committees remains active but in need of clarification. At cross-ministerial level, the discussion on establishing a National Water Council has been on-going for the last decade with the outcome yet to be seen.

Water management in Tunisia is highly centralised and characterised by the prevalence of public sector administration with the Ministry of Agriculture playing a central role. The organisation of the Ministry includes 3 technical departments: Water Resources Department in charge of water resources evaluation, monitoring and preservation, Dams and Large Hydraulic Works in charge of dams construction and exploitation, Rural and Water Resources Exploitation Department in charge the construction and exploitation of irrigated perimeter and the development drinking water systems in scattered rural settlements. In addition, a specialized department, attached to the cabinet, the Planning and Hydraulic Balance Department, is in charge of the coordination between the various actors, the planning for water development and the allocation of water resources. Two important establishments are also under the supervision of the ministry of agriculture: SONEDE in charge of drinking water supply and SECADENORD in charge of hydraulic transfer systems construction and operation. The Ministry of Agriculture is represented at regional by 24 regional agricultural development authorities. The Ministry of Environment is also involved directly in the water sector and is responsible of water resources pollution control and monitoring through the sanitation establishment, ONAS, responsible of wastewater treatment plants implementation and operation, and the National Agency for Environment Protection, responsible of pollution control. Other ministries intervene in the water sector according to their prerogatives mainly the ministry of transport for meteorological data collection, the ministry of equipment for urban floods control, the ministry of health for sanitary control. At local level, irrigation and rural drinking systems

management is transferred to water users associations. In 2007, the number of WUA was respectively 980 for irrigation systems and 1260 for drinking water systems.

Similarly, in Jordan the institutional setting is largely centralised, with the Ministry of Water and Irrigation being the official body responsible for the overall development, management and monitoring of the water sector, entrusted with the provision of centralised water-related data, the formulation of water strategies and policies and the preparation of the National Water Master Plan and other water-sector programmes (Law 18/1988). The Ministry is also responsible to the Council of Ministers for implementing related matters in the Jordanian-Israeli Joint Water Committee, the water working group in the multilaterals and the Jordan Rift Valley Steering Committee. The water structure includes the Jordan Valley Authority, established in 1977 and responsible for the socio-economic development of the Jordan Rift Valley including water development and water distribution for irrigation, and the Water Authority of Jordan, established in 1984 and in charge of the water and sewage systems. Both these entities function under the authority of the Ministry, complementing and reinforcing the work in the water sector though with examples of fragmentation and overlapping responsibilities. At central level, a number of other Ministries may be involved (Planning and International Cooperation, Finance, Environment, Agriculture, Health), while at local level there are 22 WUAs mostly in the Jordan Valley. With reference to the private sector, a Performance Management Unit was established in 1997 within the Ministry of Water and Irrigation with the mandate to monitor and audit the performance of private companies and promote private sector involvement also through the development of public-private-partnerships. Nonetheless, the Water Strategy 2008-2022 envisages a reform process up to the year 2022 in order to tackle the fragmentation of the institutional framework including the potential set up of a National Water Council. A recent and innovative structure includes the set up of the Highland Water Forum, supported by the Royal Water Committee (in charge of the Water Strategy 2008-2022), that work jointly with the Water Ministry to identify strategic options for the reduction of groundwater abstractions in the Highland irrigation areas using a stakeholder-based approach.

3.1.3 Management Instruments

As explained in the regional review, the management instruments may include a range of issues, from economic tools, regulation and allocation mechanisms to demand management measures, information management and social change instruments. Their use and implementation is usually country-specific and depends on the political, social and economic particularities.

In Tunisia, and since the 1990s, the water policy shifted towards water demand management and focused on the optimisation of water resources management taking into consideration quantity as well as quality of water resources including pollution issues and introducing new concepts such as non-conventional water resources and climate change impacts. A national program for water saving in agriculture was launched in 1995. The program had two components: (a) an investment component allowing farmers subsidies of 40% to 60% of the cost of water saving equipments, (b) an awareness and communication component. In this front, Jordan is considered a front-runner by having a Water Demand Management Unit within the Ministry of Water and Irrigation that coordinates all policies, regulations and other issues related to water-use efficiency. Additional examples in the country include the use of low-water-use fittings (faucets, showers, toilets, etc) provided also by Miyahuna, the water utility for the Greater Amman governorate. The inauguration of the first regional grey-water recycling plant in the Dead Sea also points towards the same direction, with further studies on this theme currently underway (by the Centre for the Study of the Built Environment). With the aim to raise awareness on water issues and particularly conservation, a UNDP-supported Centre for Water Management and Conservation was established in 2011 within the Lebanese Ministry of Energy and Water. Enhancing demand management measures was one of the priorities for action identified through the review of the 10-year Strategy Plan for the Water Sector that the MED EUWI Policy Dialogue carried out.

The reuse of treated wastewater represents a valuable, but usually underused, method for augmenting a country's water budget. In Jordan, treated wastewater is considered a true part of the water budget and had been used since 1980 with 24 operational plants (20 of them large) and high treatment standards (these were revisited in 2002 and again in 2006, are higher than those of WHO/FAO and foresee secondary as the minimum level of treatment). It is indicative that in 2011, 102 million m^3 of treated domestic effluent (out of a total of 110 million m^3) was reused in

agriculture and in industry (with 100 and 2 million m^3 respectively). The extensive use of this resource, necessitating also the close involvement of WUAs, can be attributed to a) the good nation-wide monitoring systems nationally-wide (covering water and wastewater quality, soil, plants and crops), b) the existence of separate canal providing it, c) its distribution as blended water to farmers (thus leaving no choice between freshwater and treated), d) the existence of guidelines determining which water can be used for which crop, e) the minimal cost for the farmers (at 10 fid/m^3 in 2011). To this add a recently-launched project for three treatment plants in the North to take the treated wastewater to the Jordan Valley. Similarly to Jordan, in Tunisia treated wastewater is considered part of the water budget with a potential of 244 Million m^3 produced by 111 treatment plants constructed over the country. A national strategy for the promotion of treated wastewater reuse has been developed and the legal framework reinforced (decree 2447/93 fixing the conditions for treated water reuse in agriculture and treatment standards NT 106.02) with the aim to encourage treated wastewater reuse. Currently, 68 million m^3/year representing about 28% of the total volume produced, are reused for irrigation supplying 8065 ha of agricultural perimeters, 1040 ha of golf courses and 450 ha of green areas. Because of legal restrictions, irrigation with treated wastewater is limited to arboriculture (45% of the surface), fodder plants (36% of the surface), cereals (15%) and industrial plants such as tobacco, sunflower, henna, etc. (4% of the surface). The objectives set for the sector in the future are high and aim to reach 50% of total volume reused by 2014 and 70% by 2021. For this purpose, 3 programmes are planned: creation of 8500 ha of irrigated perimeters, creation of 500 ha of golf courses and the reuse of 3,5 million m3/year in industry. Artificial aquifer recharge is still under experimentation. Two pilot cases were developed in the coastal area of Cap-Bon (Korba and Oued Souhil). National authorities are cautious regarding long term impacts of such use and detailed risk assessments are being conducted for planned new projects. Unlike Jordan and Tunisia, in Lebanon treated wastewater reuse is almost non-existing, with only one wastewater treatment plant being operational in the country. The recently-approved National Water Sector Strategy includes wastewater as one of its key components and an action plan for its implementation is under preparation (including the construction of a number of wastewater treatment facilities).

Regarding data and information management, the Water Information System within the Jordanian Ministry of Water and Irrigation has been fundamental towards comprehensive management of data through the establishment and operation of a national water data bank. The extensive use of this system has placed the country in a leading position in the region on the use of GIS-based digital tools for water management, monitoring and planning. For the current revision of the National Master Water Plan the Water Use Efficiency Forecasting Tool, developed with the support of USAID, will be used. In Lebanon, the most significant effort for integrating all available information concerns the set up of a National Information System for surface and groundwater. The objective is to constitute an organised and –at a later stage shared- database aiming at improving knowledge and feed the elaboration of a consistent policy for IWRM. Related are exploitation modules that make up a Utility Information System (integrating components like clients, equipment, accountancy, GIS services management, etc) to be used by the four Water Establishments and the Litani River Authority. Currently, an application of the WEAP model to selected basins and consequently at national level is underway and supported by the MED EUWI Service Contract. For Tunisia, a National Information System on Water (SINEAU) is under development. It aims to ensure the interconnection of available databases, GIS and modelling tools hosted by the different actors and organise and transform data into useful and exploitable information for decision making.

Regarding economic tools, water tariffs in Lebanon are set at different levels for each of the four Water Establishments, which are responsible for setting and collecting tariffs for domestic and agricultural use. However, due to limited capacity this is not operationalised efficiently and homogeneously across all Establishments, with the establishments of the North and the South lagging behind in terms of cost recovery. In Tunisia the government engaged in a process of tariff increases in order to emphasise the scarcity of the resource and the need to ameliorate its use in the best possible way. A steady increase in agricultural water tariffs was adopted at a rate of 9% per year since 1990 but was then stopped in 2002. For domestic use, a national increasing block tariff structure is applied to encourage water savings. The Council of Ministers approves tariffs increase and despite the social sensitivity of the issue and the political situation after the revolution, a 5% increase of tariffs was approved in 2011. A well-established tariff structure exists in Jordan for domestic water use including block tariffs and pro-poor provisions. The most recent tariff increase, in 2011, included pro-poor and energy-cost considerations. Further tariff increases (needed to cover by 40% the water sector's financial gap by 2020), along with other provisions, like water and wastewater pricing,

operation and maintenance cost recovery, polluter-pays, structured tariffs), are foreseen in the National Water Master Plan.

In terms of social change instruments, these can be introduced and operationalised over long periods of time. The spirit of inclusiveness and involvement are strongly supported in Jordan's National Agenda and the Kulluna al Urdun document, while stakeholder participation forms the core of the recently-established Highland Water Forum. Public sensitisation on the reality of water scarcity has been largely successful, but further awareness is needed regarding the reuse of treated wastewater. To this end assisted a USAID-GIZ funded pilot project run in the period 2002-2006 with the aim to familiarise people with wastewater reuse. The role of Universities and Research Centres in training farmers has also significant potential. In Lebanon, a few public information workshops were conducted at municipal level during the preparation of the National Water Sector Strategy with the twofold objective to inform the public about the Strategy's development as well as for the overall activities of the Ministry of Energy and Water. In Tunisia, the Arab Spring opened space for more effective civil society participation. Many donors and programs are supporting civil society structuring and empowerment in order to fulfil their role in the new changing political and development context. Several citizens' initiatives are being promoted in order to raise awareness among the population, politicians and decision makers on water related issues; for example two initiatives aiming to include respectively water rights and environment rights in the new constitution. The government is also using more and more participatory approaches for planning and programs preparation. For instance, the long term strategy 2050 preparation process intends to be conducted through intensive stakeholders' consultation.

3.1.4 Infrastructure Development and Financing

Jordan reports an advanced status with regard to the development and implementation of investment plans and programmes for water and sanitation as well as the mobilisation of financing for the related infrastructure. Exceptions to this are the investment plans for flood management, which are not considered relevant to the country's context, and the ones for natural systems (wetlands, catchment restoration, etc), which have been developed but are not yet implemented. Lebanon is also advanced with regard to the mobilisation of financing and the implementation of investment plans for groundwater, while it is well within an implementation trajectory for water supply, wastewater treatment, flood management and rainwater harvesting infrastructure. Investing in desalination and natural systems (wetlands, floodplains and catchment restoration) is not considered relevant for the country. In Tunisia the status of finance mobilisation and the implementation of investment plans for water supply, irrigation, groundwater, flood management, wastewater and natural systems are well advanced, with desalination being at an early implementation phase, while rural sanitation is lagging behind. In Tunisia the integration of water investments programs into the 5-year National Development Plans helped to secure funds for the water sector. Water expenditure represents around 1.7% of GDP and almost 36 % of the global budget of the Ministry of Agriculture. Official Development Assistance through bilateral and multilateral donors contributes by almost 50% to water investments. In Lebanon, there is an increasing trend in the government budget allocation for water resources development which is coupled with a declining trend in investments from International Financing Institutions and private sources, while the provision of grants and loans is characterised by high volatility. Public investment for the water and wastewater sector amounted to 0.4 percent of GDP in the late 90s and early 2000s (including 97 million$ for the former and 32 million$ for the latter on an annual basis) with the figures in 2008 (according to a World Bank study, see also next sub-section) not having differentiated. Developing water resources and upgrading their management efficiency is among the key objectives in the 2011-2013 Executive Programme of the Jordanian Ministry of Planning and International Cooperation. The foreseen Government expenditure for rehabilitation of existing infrastructure and the development of new for water and sanitation has been calculated at 1 billion Jordanian Dinars (JD) for the period 2011-2013, while the required budget for the planned projects amounts to 2.2 billion JD for the same period.

In terms of internal revenues, in Tunisia the tariff policies on drinking water were developed based on the user-pays principle, while recently, in 2010, the polluter-pays principle was introduced in the sanitation tariffs. The urban drinking water sector is self-financed through tariffs, while only the investment for rural drinking water is subsidised by the government. Although sanitation tariffs cover 100% of operation costs and 60% of investment costs, irrigation tariffs cover only 60% of the operation costs. Also, taxes aiming to the preservation of water resources are applied.

Water resources withdrawal taxes concern all users and pollution emission taxes concern industrial users not connected to sanitation networks. In Lebanon, cost recovery varies between utilities; for example the collection rate in Beirut-Mount Lebanon has been consistent at almost 90%, so that the utility had accumulated over US$170 million as cash surplus in 2010. In the three other Regional Water Establishments tariffs, and especially collection rates are lower with the lowest cost recovery recorded in the Bekaa Establishment. As a result not even operating costs are recovered and the Government often steps-in to cover this gap in addition to financing investments in water infrastructure. In terms of revenues from domestic tariffs, all utilities in Jordan cover 100% the operation and maintenance costs, with some additional revenues being available for capital investments. On the contrary, current water prices cover less than 60% of the operation and maintenance costs of water supply for irrigation and the heavily subsidised tariffs (with treated wastewater provided close to free of charge) leave little revenue potential.

Enhancing private sector involvement in the water sector forms a priority for Jordan, in alignment also with the country's National Agenda and the Kulluna al Urdun. This effort is supported mainly through incentive-based contracts on performance output, however BOT contracts are also in place, like the one for the Kherbit al-Samra wastewater treatment plant (the largest in the country treating 75% of the total) that has been operational since its upgrade in 2007 or for the planned Red-Dead Water Conveyance or the DISI Water Projects. Interesting is also the effort towards commercialisation of public water utilities, which are state owned (subsidiaries of the Water Authority of Jordan) but operate as private companies; the example of the Aqaba water utility is perhaps the most impressive in terms of achieving financial independence and improved performance and efficiency through management contract. Similar results were achieved for Greater Amman, where following a management contract for the water supply and sanitation of the governorate, the public utility Miyahuna has taken over since 2007. Overall, the government's intention is to serve 90% of the population through public utilities that have management contracts for improved performance. In Tunisia, private sector participation is still at its early stages and is limited to management contracts for wastewater networks and plants operation. The government is intending to extend this participation to more advanced contracts and BOT projects for desalination and waste water treatment plants are under examination. Similarly to Tunisia, private sector participation in water is limited to service contracts in Lebanon. The new water strategy considers private sector participation as a priority to fill the funding gap needs. In the framework of MED EUWI Policy Dialogue on IWRM, an assessment of the enabling environment for private sector participation supported by large stakeholders' consultation process has been conducted recently and highlighted institutional, legal, capacity and financial sustainability constraints for successful private sector involvement. The main constraints concern the incompleteness of the institutional and legal sector reform initiated in 2000 (through Law 221/2000 and its amendments Law 241 and Law 377), the limited capacity within the administration and the weak cost recovery rates. To follow-up the policy dialogue recommendations, the government is intending to prepare a business case study for a BOT pilot project.

3.1.5 Level of awareness on the necessity of IWRM plans and/or strategies for coping with water scarcity and as no-regret means for adapting to climate change

The progress recorded above with regard to the status of IWRM plans in the three countries demonstrates aptly that there is indeed awareness among the national authorities on both the context as well as the need for an IWRM approach. Although attributed to a series of different parameters in each country, the advocacy in favour of holistic frameworks with regard to water resources management was explicitly stated during the country missions. In Lebanon for example, and although the country doesn't face yet water scarcity conditions, the need for IWRM was introduced in the late 1990s and expressed the spirit of the legislative revision of 2000 (that foresaw division of responsibilities and clarified the roles of the Ministry of Energy and Water, mandated the Water Establishments essentially with the application of IWRM at the local level, etc). Further on, IWRM formed the guiding line for the 10-year Strategy Plan for the Water Sector that the Directorate of Hydraulic and Electrical Resources of the Ministry of Energy and Water elaborated. The revision process of the Strategy has followed the same path, particularly manifested through the work towards the preparation of a National IWRM Plan as such. Moreover, the recently-approved National Water Sector Strategy aligned with IWRM principles and the accompanying participatory framework. The progressively more active involvement of line Ministries in water plans/strategies (and especially that of the Ministry of Environment) points towards the same direction, also with regard to climate change adaptation and mitigation measures. It seems

adequately understood that improving water efficiency, expanding the use of non-conventional water resources or enhancing the capacity of the Water Establishments to respond effectively to their mandate, could act as no-regret measures towards climate change mitigation. Finally, in most cases the spirit of donor-funded activities falls within the IWRM framework (e.g. the AFD-supported Water Code, the GIZ support to Water Establishments, the USAID support the work of the Litani River Authority, the MED EUWI Policy Dialogue on IWRM, etc).

In Tunisia, the mobilization of water resources policy has been instrumental in controlling water scarcity limitations for socio-economic development and mitigating droughts impacts. However, this policy reached its limits both physically and economically. The remaining resources to be mobilised are less accessible and less profitable. The new challenges facing the water sector in Tunisia increased policy makers' awareness on the need to adopt IWRM approaches taking into account both surface and groundwater resources as well as non-conventional water resources from a quantitative as well as qualitative perspective and promoting users' participation. In the perspective of improving the implementation of IWRM approaches, the mandate and the resources of the Planning and Hydraulic Balance Department, BPEH, have been recently reinforced (Decree 1560/2011). Henceforth, BPEH is in charge of coordinating between the various actors in the water system and in particular the planning of conventional and non-conventional water resources mobilization, the annual allocation of available resources between uses, continuous monitoring of the hydraulic system functioning in particular during exceptional events of droughts and floods. Donor-funded activities support the government's effort towards IWRM implementation improvement (African Water Facility support the preparation of the National Water Strategy Eau 2050, EU delegation finance a budget support program to improve water governance, WB, AFD and AfDB support the investment program in water sector –PISEAU- and the development of a national information system). Finally, BPEH will lead the preparation of an annual sectoral review in order to optimize activities and donors funds according to a comprehensive approach

Similarly to Tunisia, awareness on the benefits of the IWRM framework has been primarily linked to the acute water scarcity conditions that prevail in Jordan. During interviews, it was eloquently stated that the need is the mother of invention as well as adaptation; the IWRM framework responds well to challenging conditions because of the multiplicity of alternatives that it offers. Putting theory into practice, Jordan seems to be the most advanced country in the MENA region with regard to designing, adopting and implementing an integrated approach with an operational IWRM Plan and a Water Strategy up to 2022, including steps for their revision/update and alignment with national development plans and policies. Although awareness on climate change impacts is not well-established, examples like the establishment of the Highland Water Forum, the set up of WUAs in the Jordan Valley, the use of marginal water and the expanding reuse of treated wastewater or the monitoring systems could be considered as no-regret measures towards climate change adaptation. It was interesting that given the grave water scarcity, indirect climate change mitigation measures have been also supported, like lowering emissions when replacing old cars or improving roads to reduce traffic. Alike Lebanon and Tunisia, most donor-funded activities/projects comply with IWRM considerations (especially as investments for water infrastructure is heavily supported through external sources), while additionally in Jordan the role of civil society (and the 14 environment-related NGOs in particular) is significant and increasing.

3.2 GAPS, SHORTCOMINGS AND CONSTRAINTS HINDERING THE PLANNING AND/OR IMPLEMENTATION OF WATER PLANS AND STRATEGIES IN JORDAN, LEBANON AND TUNISIA

The regional review demonstrated that a series of gaps and shortcomings may hinder the effective design and implementation of water plans and/or strategies in the PCs. Among the identified constraints, this section will examine in more detail issues of cross-sectoral coordination, coherence of the institutional and legal frameworks, data and information management, stakeholder participation and adequacy of financing.

3.2.1 Adequacy of horizontal and vertical coordination and/or mainstreaming of the water sector in other sectors (including cross-ministerial coordination)

Effective cross-sectoral coordination constitutes a key element of good governance, and thus lies at the heart of the IWRM framework. However, as it requires cooperation among different –and often competing- users/uses of water

resources (e.g. domestic use, agriculture, environment, tourism, industry, etc), it represents a most challenging component of IWRM. The examined PCs demonstrate low levels of cross-sectoral/cross-ministerial coordination with further effort needed in this direction.

In Jordan, mechanisms for cross-sectoral management are said to be at an advanced implementation stage especially after 2004 and the preparation of the National Agenda that has placed emphasis on the issue. However, the National Water Master Plan has not fully institutionalised cross-sectoral cooperation and the issue is expected to be tackled through the Plan's revision/update. At inter-ministerial level, and although inter-ministerial technical committees (bilateral or multilateral) exist with their operation being determined by by-laws, their effectiveness on the ground is limited and semi-functional since each Ministry eventually follows its own strategy/plan, thus rendering the implementation of joint decisions challenging. Moreover, the consensus modality under which many technical committees operate, renders decision-making problematic (for example in the Environmental Technical Committee that consists of 15 members from different Ministries). Inter-ministerial coordination on water issues has been steadily improving through the use of Memoranda of Understanding and the formation of technical committees between the Ministry of Water and Irrigation and other Ministries. Such cooperation has been reinforced through relative provisions within the National Agenda. Good examples of cross-sectoral cooperation represent the Royal Water Committee, responsible for the preparation and updating of the Water Strategy 2008-2022, and the Technical Committee in charge of updating the National Agenda, both of which include representatives from different national authorities. However, their mandate is time-bound and task-oriented and thus, does not represent a more permanent structure. A form of cross-ministerial coordination is also achieved in the Board meetings of both the Water Authority of Jordan and the Jordan Valley Authority (where all related ministries as well as other stakeholders are involved), while another successful example concerns the Highland Water Forum whose constituency includes farmer representatives as well as local communities.

The situation in Lebanon, based on input from different stakeholders, is said to be fairly developed, but with the implementation not having commenced yet. However, the opinion of most stakeholders is that cross-ministerial coordination is minimal and that it depends heavily on (inter) personal relations. An additional level of complexity relates to the highly politicised environment of the country where each government has (and therefore implements) a different approach towards coordination. There seems to be resistance from the side of the different Ministries to move towards more cooperation, as this could entail a shift in their responsibilities, while some level of coordination is secured only in the framework of specific donor-funded projects (both nationally and regionally) largely because it is a prerequisite for the projects' implementation. Having said that, theme-specific cooperation exists at bilateral level among Ministries (e.g. between Ministry of Energy and Water and Ministry of Environment or between the latter and the Ministry of Agriculture) or through sharing the Environmental Impact Assessments/Strategic Environmental Assessments for all new projects between the Council of Reconstruction and Development and the Ministry of Environment. A promising development on cross-ministerial coordination concerns the recent elaboration process of the National Water Sector Strategy that involved consultation with all line Ministries and aimed to mainstream into the Strategy the concerns of other sectors (especially environment and agriculture). In terms of mainstreaming water into other sectors, there are opportunities during the preparation of other Ministries' Strategies, like in the case of Ministry of Agriculture that circulated its latest Strategy to other Ministries for feedback and input on the final draft.

In Tunisia, the concentration of main water management responsibilities within the same Ministry, namely the Ministry of agriculture, is considered to have facilitated -to a certain extent- the sector coordination. However, explicit mechanisms for coordination are not institutionalised. In general, coordination is organised through ad-hoc project committees formed on the occasion of projects and lasting the duration of the projects. Members of these committees represent relevant stakeholders within the ministry and from other ministries. Project committees apply also to water related strategies and reform preparation (for example the water code reform study is led by the water resources department at the ministry of agriculture and its project committee includes all other technical departments in addition to the ministry of environment and the establishments under its supervision, the ministry of equipment, ministry of state property and land affairs, etc.). If projects committees help to take into consideration members' concerns during the project development, they do not help neither in project planning and phasing nor in increasing stakeholders' ownership. This leads to efforts duplication. Aware of this gap, the Tunisian government adopted in

September 2011 a Decree (n° 1560/2011) charging the Planning and Hydraulic Balance Department with the full responsibility of coordination among stakeholders; the same Department is in charge of the preparation of the Water Strategy Eau 2050.

The suggestion of setting up and/or operationalising a National Water Council so as to foster cross-ministerial cooperation has been scrutinised as an option in all three countries, notwithstanding the voices questioning the added value of setting up another structure amongst a plethora of already existing ones. In Jordan, the National Water Council suggestion was put forth by the USAID-funded Institutional Support and Strengthening Programme and the McKenzie Report regarding the restructure of the institutional setting and currently the idea of the Council's establishment is being refined and whether this body could play the future role for the Royal Water Committee. However, it needs to ensure that there is no contradiction with existing legislation or the Ministries' responsibilities and scope of work. In Lebanon this idea has been also discussed, mainly in order to secure involvement of civil society and through the National Water Council's annual meetings to provide concrete recommendations for implementation to the Ministry of Energy and Water. Some practical guidance on this may be offered through the operation of the newly-approved (March 2012) National Environment Council that includes seven different Ministries and representatives from another sever non-governmental bodies (civil society, order of engineers, order of lawyers, union of banks, etc). In Tunisia, the National Water Council was created in 2001 (Decree 2606/2001) replacing and expanding the interventions of the National Water Committee created in 1975 (Article 19-Water Code). The National Water Council is led by the Ministry of Agriculture and includes 20 members representing other ministries and users organisations. The Council is an advisory body assisting the Minister in formulating water policies, strategies and programs. According to the law, the Council is convened by the President whenever the need arises and at least once a year. In practice, the Council seems to play a limited role and its meetings were neither regular nor frequent. In 2011, in order to revitalise the role of the Council, the Planning and Hydraulic Balance Department was appointed to ensure the council secretariat. In addition, there is a political commitment to open the council to civil society and university representatives.

It is important to mention the role of the Donor Coordination Groups active in the water sector of the three countries. Although their status varies (more institutionalised in Lebanon, in close coordination with the Government in Jordan but necessarily meeting as a group, more on an *ad hoc* basis in Tunisia but with clear commitment on coordinating efforts), they contribute towards improved cross-ministerial coordination through the different projects they support.

3.2.2 Sufficiency of policy coherence and possible fragmentation of institutions and overlap of water legislations (including the existence or not of sub-sector plans/strategies)

As a result of having in place -and under implementation- water policies and plans, the governance and institutional set up in Jordan appears to be –at least on paper- within a fairly defined framework. However, as water management is primarily undertaken by three different agencies (Ministry of Water and Irrigation, Water Authority of Jordan and Jordan Valley Authority) at central level, a certain level of institutional fragmentation and overlapping of responsibilities is present, often inhibiting an effective and integrated management of water resources. Therefore, there is a need for establishing a consolidated institutional and legal framework with clearly delineated responsibilities, including the establishment of a regulatory body for operating the water and wastewater systems in the country. The regulatory role has been undertaken since its set up in 1997 within the Ministry of Water and Irrigation by the Programme Management Unit. However, as the mandate of the Unit had a timeframe until June 2011, its continuation or follow up arrangement is still to be seen. There seems to be lack of political commitment on this, as draft legislation has been in place already since 2009. The institutional restructuring forms the key recommendation of the USAID-funded Institutional Support and Strengthening Programme and the McKenzie Report along with suggestions on potential new arrangements (mainly separating the roles of the three key agencies), along with a Cabinet Decree (issued in May 2011) for a potential merging between the Ministry of Water and Irrigation and the Ministry of Agriculture. Given that the revision/update of the National Water Master Plan and the Water Strategy are currently ongoing, the new institutional set-up is yet to be seen. Changes in cross-ministerial coordination may be also expected if the new electoral law is approved, according to which the Cabinet would come from the Parliament (instead of being appointed by the Prime Minister) and thus could have a more political view on the matter.

At central level again, fragmentation of responsibilities is also present in Lebanon. Although the legislative framework reserves the lead role in the water sector to the Ministry of Energy and Water, significant overlap exists with regard to the construction of infrastructure projects where the key role is attributed to the Council for Development and Reconstruction (CDR). Indicative of the situation, though also relating to the available capacities of the different agencies, is the reality of completing the construction of plants but not operationalising them due to the non-construction of the network systems (as in the case of the Tripoli wastewater treatment plant). More importantly, significant overlap may occur in the course of the implementation of the National Water Sector Strategy, if coordination is not ensured with the workplan of the CDR or with the provisions of the Water Code (which is still to be approved). Particular attention may be needed with regard to the wastewater sector, where CDR has been implementing its own Master Plan since 1982 that currently stands at about 90% completion. An issue identified during the country mission was the dissolution of the Ministry of Planning in the late 1970s and the dispersion of its responsibilities across different Ministries, thus creating a gap in the water sector planning process. Given the legislative framework and the key role of the Ministry the update and operationalisation of the Ministry's organisation chart (pending for some time, with 10 drafts already having been proposed but not approved) would facilitate the implementation of laws and plans. Further ideas, suggested during the country mission, concern the potential splitting of the Ministry into two separate Ministries (one for Energy and one for Water) in order to attribute adequate attention to water issues.

In Tunisia several actors are involved in the water sector at central as well as at regional and local levels. The Ministry of Agriculture, with a large number of departments and public establishments under its supervision, plays the central role on water resources development and drinking water supply. The Ministry of Environment is in charge of sanitation and water quality monitoring and preservation. Other ministries are involved for specific tasks (meteorological data collection within the Ministry of Transport, urban flood protection within the Ministry of Equipment, sanitary protection within the Ministry of Health, to name a few). In addition, water users associations are in charge water exploitation and management in irrigation and rural drinking systems. The multiplicity of actors generates complexity and overlapping of water management tasks. For example, both the Water Resources Department and the Bureau de Recherches et des Inventaires Hydrauliques (BPEH) are in charge of the water resources monitoring and preservation. Coordination among the different water actors remains a major gap. With the recent law (Decree 1560/2011), BPEH is expected to be the governmental or administrative body in charge of coordinating and improving the sector efficiency as well as developing a comprehensive and coherent water policy.

At decentralised level, the situation in Lebanon is challenging due to lack of clarity, when it comes to on-the-ground implementation, of the roles of the Water Establishments and the confusion as to whether they constitute water utilities or water management bodies. This is very much linked to the limited capacity of the Establishments and the fact that even after 7 years of being set up issues like wages and personnel have not been resolved As a result the Ministry usually steps in to respond to the various challenges and consequently the mandate of the Establishments is effectively reduced while the Ministry has difficulty meeting its own role. The preparation of regional master plans (currently ongoing with two of them already completed) within the implementation framework of the National Water Sector Strategy is expected to contribute to the clarification of roles and responsibilities. Linked to this is the role of the municipalities as they are the closest to the people and could perform an important part with regard to local water governance. Furthermore, there is discussion on the value and modalities (concerning responsibilities and potential overlap with other agencies) of setting up river management agencies/organisations to enhance IWRM. In Jordan, although the institutional structure remains highly centralised, the existence of 22 WUAs signifies an intention to move towards more decentralised structures. However, further effort is needed for enhancing their capacity to respond to this role. This also entail complications with regard to the role of the Jordan Valley Authorities, if WUAs are expanded and further empowered to manage water resources in the Valley (at present they are in charge of distributing 70% of the irrigation water). To the same direction points the ongoing process of corporatisation of water utilities regarding water supply and sanitation. In Tunisia, although the Ministry of Agriculture is represented in each governorate by an agricultural development authority having similar organisation as the ministry, the decision making remains very centralised. The regional authorities are closer to execution bodies. On the other hand, local governance is more advanced with the presence of more than 2200 WUA over the country and the commitment of the government to strengthen these WUA through the implementation of National Strategy for the Sustainability of

Hydraulics Systems developed in 2010.

3.2.3 Data and Information on water resources quantities and qualities for decision making and policy formulation, including the use of models (also for climate change scenaria)

Data availability, for quantity and quality of water resources, as well as the issue of reliability of available data and access to them poses a serious constraint in most –if not all- SWIM PCs; the case in Jordan, Lebanon and Tunisia is no exception, though with some variations in terms of related on-going and planned activities.

In Tunisia, the Government has invested heavily in data collection. However, available data are scattered among different departments and agencies within the public administration (Water Resources Department for surface and groundwater resources data; Dams Department for data on large dams; Agricultural Lands Conservation and Planning for small dams data; Rural Department for water used in irrigated perimeters and rural drinking; ONAS for wastewater treatment plants discharge, etc). Moreover, information and data are not always structured and organised in a manner so as to facilitate their broad and optimal use and thus, are not capitalised for the benefit of policy formulation and decision making. With the view to overcome this constraint, a National Information System on Water (SINEAU) is currently under development. The System aims to ensure the interconnection of available databases, GIS and modelling tools held by different actors and to organise and transform data into useful and functional information to support informed decision making. However, the implementation process of this information system is recording important delays.

As mentioned in the previous sub-section, Jordan has a leading position in the region on this theme as it has established a Water Information System (WIS) within the Ministry of Water and Irrigation in order to support the planning and decision-making processes. As in the case of Tunisia, the collection of/responsibility for data is divided among different entities. For example, the major internal data source in this System is the water resources monitoring network operated by the Ministry's Water Resources Directorate. However, significant amount of data needed by the WIS is originating from outside the Ministry; mostly in the Jordan Valley Authority and the Water Authority. This, combined with the absence of structural arrangements for data provision and efficient coordination, in addition to conflicting interests, has resulted in unmaintained data flows. Nonetheless, the Water Information System has been fundamental towards comprehensive management of data through the establishment and operation of a national water data bank. Therefore, the country has a well-established experience on the use of GIS-based digital tools for water management, monitoring and planning. It is the Government's intention to expand on this experience by utilising the Water Use Efficiency Forecasting Tool for the current revision of the National Master Water Plan along with the application of different models (e.g. the development of scenarios with due consideration to climate change using the WEAP model and the more extended use of the MODFLOW and MYAS models. It is also recognised that the System requires some updating and could be enhanced with some no-regret measures. A major need, aptly recognised during the country mission, concerns the investment on a country-wide and regional model on climate change (a basin-wide model developed by the Ministry of Environment with the support of UN/GEF has limited extrapolation potential). Additional needs concern the installation of more telemetric stations (in addition to the ones in the Highland area), the expansion of the monitoring systems (e.g. to the northern part of the Jordan Valley) and the digitisation of data and their online monitoring, all of which are missing.

Unlike the other two countries, the situation in Lebanon is less advanced and there is agreement among different stakeholders that a key point for IWRM implementation is the need for accurate, reliable and formal data. A study of the Lebanese Ministry of the Environment stresses on the absence of updated data related to the status of water resources and asserts that today's surface water quantity data are based on old measurements (1960s and 1970s) and do not take into consideration the impact of changes in land use and deforestation on aquifer recharge and surface runoff nor account for the reduction in spring and river baseflows and in boreholes yields due to irrigation and other water uses. The most comprehensive studies for the characterisation of groundwater resources also date back to the 1970s, with an updating effort carried out by the UNDP Lebanese Centre for Water Management and Conservation since 2011. In that respect, effort has been placed by the Ministry of Energy and Water into setting up of a national water information system to integrate all available information and monitor the status of all resources (surface and groundwater) and uses. This system would constitute an organised and shared database among projects aiming at

improving knowledge and feeding the elaboration of a consistent policy for IWRM. Currently, a related proposal for the set up of a Centre with this mandate and with a sub-regional scope has been submitted to the Union for the Mediterranean. In terms of what is available, a Utility Information System, made up of exploitation modules and integrating components like clients, equipment, accountancy, GIS services management, etc, is at the service of the 4 Water Establishments. Significant work in terms of data collection is carried out by the Lebanese Agricultural Research Institute (affiliated with the Ministry of Agriculture) that has an extensive network of 61 meteorological stations in place (measuring humidity, temperature, etc) as well as stations checking the quality of both drinking and irrigation water. Substantial work on country-wide surface water data collection is conducted by the Litani River Authority, while also Italian Cooperation-funded project for the Orontes River has also installed meteorological stations for data collection. In terms of modelling for informed decision-making, also in relation to climate change, the MED EUWI Service Contract has advanced the application of the WEAP model to selected basins in the country (with nation-wide application expected by the end of 2012) to assist with collecting existing data related to demand-uses and other parameters under one system and build scenarios.

3.2.4 Adequacy of levels of stakeholder participation in planning and implementing national and local water resources management plans and/or strategies

In all three PCs the levels of stakeholder participation in the planning and implementing of water plans can be characterised as very modest, if not minimal.

In Jordan, although a law on civil society has been discussed with civil society representatives and approved by the Parliament (though with reduced scope in the end), the full and effective implementation of stakeholder participation in environmental/water affairs is strongly questioned by leading environmental NGOs. Participation of civil society representatives in the various technical inter-ministerial committees is open though not obligatory, and thus their involvement is not binding and does not have an effective role/impact in the process. More enhanced is the involvement of stakeholders in the boards of the water utilities. It is also said that local communities are involved in the decision-making process, as in the case of the Al-Samra wastewater treatment plant. Also the gender element in participation is lacking behind, as men are usually the owners of land and therefore have the first and final word on water resources, while women deal mainly with the household aspect of water management. An interesting effort is underway with the support of GIZ on setting up network of wise water women across the country with the aim to include this network as the spokesperson for domestic water use. Another positive step concerns the Highland Water Forum where the involvement of different stakeholders in the decision-making and implementation processes is explicitly foreseen. Nonetheless, official campaigns for awareness raising (especially on treated wastewater reuse) require strengthening as they are often not trusted by the people due to the inherent suspicion towards the government. In that respect, the role of NGOs could be significant as they tend to be independent and more trust-worthy.

In Tunisia, and although the participatory approach is relatively recognised through the implementation of water users associations, the effective participation in water management and decision making remains very weak. Also due to the highly centralised governing structure of the state, various consultative bodies (e.g. the National Water Council and the Commission of Hydraulic Public Domain) haven't materialised fully their roles and haven't ensured active and effective stakeholders' participation in water management. It is indicative that the National Water Council was almost non operational and didn't meet for long time periods (the last meeting held was in March 2010). More recently, there was an expression of political will to reactivate and reinforce the Council including its opening to civil society representatives.

Similarly to Jordan and Tunisia, stakeholder participation is minimal also in the case of Lebanon with mechanisms for active involvement at a premature implementation stage. The reality in Lebanon, dominated by sectarian divisions and highly politicised in all its manifestations, also poses obstacles in smooth stakeholder participation. Civil society involvement in particular, is not well-organised or directly linked to the water sector, and instead it involves mostly *ad hoc* participation (also through donor-supported projects). The idea for setting up River Basin Organisations is said to be able to assist with actively involving immediate stakeholders/users. Also, the potential establishment of a National Water Council is thought to serve the idea of wider stakeholder involvement. The most affirmative step in this

direction concerns the recently-approved National Environment Council that foresees by law the representation of civil society among its core members along with provisions for expanding the membership as needed. Stakeholders were not involved in the elaboration process of the National Water Sector Strategy, but it would be pursued for its implementation.

3.2.5 Adequacy of financing and investment in resources and infrastructure

As indicated both in the regional review and presented in the preceding section on progress made, inadequacy of financing is a major constraint common in all three countries. Despite official reporting that may insinuate that the mobilisation of financing and the development and implementation of investment plans and programmes for the water sector are well underway or fairly advanced, it is widely acknowledged that the water sector's financing gap represents one of the main shortcomings in implementing water plans/strategies. This theme concerns a key challenge for the countries and will be also covered in the following section of this report.

However, and in order to highlight the tenacity of the situation, some figures are provided indicatively with regard to water supply and sanitation. In Lebanon, a 2009 public expenditure review carried out by the World Bank, identified that the public expenditure has been inadequate to meet the development needs of the water supply and sanitation sector. More specifically, public investment in the water and wastewater sector amounted to about 0.5% of GDP, which is below the identified optimal of 0.8%. Due to limited fiscal space to increase public investment, the development needs of the sector cannot be met within a framework of fiscal responsibility unless spending efficiency is improved (for which there is significant scope). Moreover, the execution ratio of approved investments by the Council for Reconstruction and Development indicates that the sector's absorptive capacity is low, with 53% and 19% of the approved investment programme executed over the period 1992-2006 for water and wastewater respectively. Again for the water supply and sanitation sector and with regard to rehabilitation of existing infrastructure as well development of new, the public expenditure of the Jordanian Government is calculated to cover less than half of the required investment in the period 2011-2013 (1 billion JD against a required 2.2 billion JD). In Tunisia, water expenditure represents around 1.7% of GDP. For the period 2010-2014 public expenditure is estimated at 3302.4 million TD among which 999.4 million TD are dedicated for water supply and 921 million TD dedicated to sanitation.

It has also become clear that existing tariff systems cannot cover the water sector's financing gap, though they could contribute to covering the operation and maintenance costs of infrastructure particularly for rural drinking water. As explained for the case of Tunisia, the urban drinking water sector is self-financed through tariffs, while only the investment for rural drinking water is subsidised by the government. At the same time, sanitation tariffs cover 100% of operation costs and 60% of investment costs, while irrigation tariffs cover only 60% of the operation costs. In Lebanon due to the diversity of revenue regimes across the 4 Water Establishments regarding water supply (the tariff structure is the same for all while wastewater tariff has not been yet introduced), covering even the operation costs poses difficulty (with the exception of Beirut and Mount Lebanon Establishment), while in Jordan the water utilities cover 100% the operation and maintenance costs, with some additional revenues being available for capital investments. The situation regarding irrigation is more arduous, given the low tariffs and the signification subsidisation of the sector by the governments.

For all three countries, the financial support of donors, through loans and grants is significant. Particularly in Jordan, donor support is said to cover the largest part of infrastructure investments (both for new as well as for the rehabilitation of existing), however foreign funds and contributions may not be reflected in the budget as they may be provided directly to authorities. Indicatively, and according to information retrieved during the country mission, about 200-300 million $ are provided annually by the United States, while another 70-80 million $ by Germany. In Lebanon donor grants and technical assistance is provided directly to the Ministry of Energy and Water and to the Water Establishments, while loans and grants for capital expenditure go through the Council for Development and Reconstruction. In Tunisia, the financing sources in the water sector during the period 2007-2011 are shared as follows: 45% national budget, 45% external loans, 7% grants and 3% self-funding.

Another significant, yet not fully developed, option for bridging the water sector's financing gap concerns the involvement of the private sector. Among the 3 countries, only Jordan attracted private sector funds on water

infrastructure through the BOT contract for the Al-Samra Wastewater Treatment Plant. The project's total construction cost was 120.2 million JD. The financing plan included the contribution by 50 % of the Ministry of Water and Irrigation (92 Million US $ among which 78 US $ are a grant from the USAID) and 50 % by the Project Sponsors (minimum 20% of project costs in equity & 30% of project costs in commercial financing).

3.3 IDENTIFICATION, EXAMINATION AND ANALYSIS OF CHALLENGES ASSOCIATED WITH PLANNING, STRATEGISING AND IMPLEMENTING WATER RESOURCES MANAGEMENT IN JORDAN, LEBANON AND TUNISIA

Further to the examination on gaps and constrains, this section will explore a selected number of additional issues that represent challenges to the planning and operationalisation of water plans and/strategies; challenges that may be internally or externally induced, medium to longer-term and may also account for upcoming and emerging issues. This section, along with the following one on opportunities, stems primarily from the country missions and the conducted interviews, and aims to provide some food for thought for needed actions and the potential direction of plausible policy options for water resources management.

3.3.1 Political instability and public call for democracy, equity and participation

The wave of protests and demonstrations calling for in-depth reforms in socio-political settings, popularly known as the Arab Spring, have set the MENA region into an unprecedented and most challenging trajectory. Although the end result and long-term consequences are yet to be seen, the imprint on water resources management is already palpable. This impact has been primarily related to wider participation of stakeholders, more bottom-up planning and implementation processes and more transparency and accountability of the administrations; it could be claimed that this was a call for water governance that complies with the principles of good governance. With governance at the heart of the IWRM framework, it could be also claimed that the recent regional unrest pushes the IWRM approach even further to the forefront of water management. Moreover, it highlighted the urgent need for action in order to re-establish the trust and reinforce a constructive dialogue between citizens and administrations, with a special emphasis at the local level.

For the three PCs, both the context, as well as the effects, of the Arab Spring varies. In Tunisia, the frontrunner of the revolutions, the influence has been greater. The previous practice of implementing water-related public policies with limited involvement of the population and the lack of consultation created latent conflicts that surfaced during the revolution, particularly in relation to water transfers and the (re)allocation of water resources and infrastructure development among the different regions. Following the revolution, the call for social equity manifested in claims for charge-free water supply. Farmers refused to pay their water bills in many regions of the country. A huge effort is needed in order to raise awareness on the risks incurred by these calls and to better communicate the water tariff policy and its potential (usually increase-related) revision. Moreover, due to the absence of control and the inability/weakness of the administrations to resume responsibilities (pre- and post-revolution), illegal well-drilling increased considerably, thus aggravating the already alarming situation of groundwater aquifers.

In Lebanon, with its particular political setting in place, the influence of the Arab Spring has been very modest, if not nominal. Certainly the call for equity, transparency and inclusion has reinforced some already initiated reform processes, but only in a complementary way and not with the force that this was manifested in other countries. In Jordan, the impact has been more substantial with a number of protests taking place sporadically during the last 2 years. It is important to note that water shortage, along with rising energy costs, social strains and unemployment, is considered among the mains reasons for triggering the moderate and seemingly-contained social unrest.

However, the most important aspect for both Lebanon and Jordan concerns the lasting regional instability, and especially the on-going unrest in Syria. This links primarily to the displacement of people and the accompanying socio-economic implications for the host countries. According to the UN Refugee Agency, the officially registered Syrian refugees amount to a bit more than 10.000 and 8.000 in Lebanon and Jordan respectively. Estimates including the unrecorded refugees place the respective figures closer to 20.000 and 100.000, with the Bekaa Valley and Beirut in Lebanon and the Zarqa governorate in Jordan hosting the vast majority of unrecorded refugees. The strains that this

population influx may pose to both countries with regard to water supply and sanitation, as well as food provision, are evident, especially given their small-numbered total populations. The influx of refugees is also an issue for Tunisia from its neighbour Libya, although exact figures are not available by the UN Agency. Indicatively, the national company for water supply, SONEDE, with the support of the International Committee of Red Cross, constructed more than 15 km of drinking water networks in order to supply around 100 000 refugees present at the end of 2011 in the camps of Ben Guerdane and Remada. Also, the International Committee of the Red Cross implemented a desalination plant and distribution network in the camp of Choucha. Furthermore, conditions of socio-political unrest tend to encourage limited law enforcement, misuse/abuse of resources, mistrust towards aspects/manifestations of public authority and a general sense of unaccountability and uncertainty.

Having said that, it is interesting to note that the implications of the Arab Spring can be considered as a challenge, when examined through the called-for changes that touch upon well-established norms and vested interests, but at the same time they can be considered as an opportunity for positive change and much-needed reform.

3.3.2 Poor financing of the water sector

The issue of financing and finance mobilisation for the water sector has been discussed considerably in preceding sections. While recognising that the three countries have recorded progress in this field, especially with regard to the development of infrastructure and the implementation of investment plans, it is also important to stress the enduring constraints that continue to afflict this component of water management, thus rendering the implementation of water plans highly challenging. It is widely recognised that there is a substantial financing gap in the water sector, especially for water supply and sanitation.

And this financing gap is expected to increase, given the increasing cost of water resources development due to a number of factors (applicable to different degrees in the three countries) like: the economic cost of water resources degradation from pollution and overexploitation, the transfer of water resources over (often long) distances or the use of desalination to meet potable water demand. These are in addition to the costs of rehabilitating existing infrastructure and the capital needs for new investments (particularly for wastewater treatment). Moreover, given the gradually increasing awareness of the environmental component of water management, the cost of environmental and ecosystem preservation need to be also factored in. Furthermore, additional costs are required for putting in place measures for climate change adaption and mitigation, although the magnitude of climate change impacts in the region and in the three PCs is largely speculated (due to the absence of tested and reliable models).

As mentioned before, the challenged financing capacity of the sector is linked to the ability to generate internal revenue through tariffs and taxes. Especially for tariffs, their setting, structuring and regular revision have constituted a most arduous tasks for the governments of all three countries. Touching upon strong social and religious beliefs about the nature of water as a primarily social good to be offered free of charge, the clash with the economic aspect of the resource (and the involved coverage of costs for service delivery) is most eloquently depicted in the frequent tariffication debates. Attempts at raising the levels of tariffs are usually met with fervent social opposition and governments are highly reluctant to bear the relevant political cost. This is expected to worsen, given the more representational aspects of democracy that the Arab Spring has called for. In Tunisia for example, the effort of the government to emphasise the scarcity of water by adopting a 9% annual tariff increase for irrigation water, lasted only for about a decade (1990-2002), while the recent political situation due to the revolution will make the introduction of such policies more difficult due to the increased sensitivity of the issue. In Lebanon, the difficulty of a harmonised tariff policy among the four Water Establishments (differences in existence of meters, in reading the meters, in billing practices, in tariff collection, in accounting systems, etc) has been present through the Establishments' operation for the last seven years. In Jordan, although water utilities manage to cover the cost for the delivery of water services, the issue of irrigation tariffs that are low (in the case of treated wastewater close to nil) and complemented by significant subsidies for the farmers, poses a considerable challenge.

Finally, and as mentioned previously, significant part of the financing for the water sector is provided through donor assistance in the form of technical assistance, grants and loans. However, given the delicate global economic situation and the internal financial difficulties that several countries face, an ODA reduction (bilateral donor assistance) and

even a pull-out of the water sector could be anticipated.

3.3.3 Increase of demand as the outcome of demographic trends and socio-economic development

The anticipated increase of water demand poses one more challenge, despite on-going efforts towards wider implementation of demand management measures and further use of non-conventional water resources. With populations of approximately 4.2 million in Lebanon, 6.3 million in Jordan and 10.5 million in Tunisia, according to the UNDP Human Development Indicators, significant levels of urbanisation (67.7% for Tunisia, 78.6 for Jordan and 87.4% for Lebanon) and modest demographic and urbanisation trends, the demand for good quality service delivery of water supply and sanitation in the urban centres is an unquestionable objective for all three Governments. At the same time, a major challenge, that is common among the three PCs, concerns the water and sanitation service delivery in rural areas, which is yet to be fully materialised. In addition, the developmental paradigm followed by all three countries towards a steady and outward-looking socio-economic growth as well as the trend towards more western-induced lifestyles (involving higher consumption patterns) are expected to increase water demand and exercise further pressure on the available resources.

An important element concerns the expectation of service delivery of good-quality water and reliable sanitation, also as a result of the recent political developments and the call for equity and the accompanying prevalence of social issues on how/how much/what quality of water is being delivered to the different segments of society. This also links to the recognition of the access to water as a basic human right by the UN General Assembly in 2010. Moreover, and as mentioned previously, the influx of refugees from Syria and Libya, besides adding to the overall water demand, can be expected to add to the tenacity of the situation.

3.3.4 Governance Gap (cross-sectoral, mainstreaming, participation, transparency, accountability, equity, rule of law)

In the previous section on gaps and shortcomings, the governance setting in the three PCs (involving the institutional structure as well as the legislative framework) have been aptly recognised as areas in need of action and strengthening. The prevailing institutional fragmentation with significant overlap of responsibilities among different agencies render the implementation of water plans a most arduous endeavour. Re-structuring the water sector is not an easy task, as it touches upon well-established practices and the reluctance of governments to stir disconcert among authorities and public servants. The example of overlapping roles among the Ministry of Water and Irrigation, the Water Authority of Jordan and the Jordan Valley Authority demonstrates pertinently the challenge. The same applies in the case of Lebanon between the Ministry of Energy and Water and the Water Establishments, a situation that is further exacerbated by the limited capacity (financial but more importantly personnel-related) of the Establishment for an independent operation. In Tunisia, the merging and de-merging of water with different sectors (formerly it was Ministry of Agriculture, Hydraulic Resources and Fishery, then became Ministry of Agriculture and Environment and most recently Ministry of Agriculture) also poses a challenge to the smooth implementation of water plans.

A key challenge when it comes to water governance structures concerns the debate of centralisation versus decentralisation. The overruling centralised organisation of the water sector in the three PCs aimed to maximise water development and supply programmes to the vast majority of their respective populations. The trend towards decentralisation is also a spill-over effect of the recent political developments in the region calling for stakeholder participation and the strengthening of communal bodies and private operators. The challenge is to define the needed reforms through a consultative process and to implement the related tools (not only the ones related to institutional and legal mechanisms, but also the financial tools as well as the human resources). A key issue in the decentralisation trajectory is the regulation of water services, with the necessary benchmarking instruments for improved performance, as well as the set up of solid mechanisms for law enforcement, transparency of processes and accountability (for the public authorities as well as the private sector and last but not least the users when it comes to overconsumption and abuse of the resource. Of particular importance is the set up of the operational framework for civil society involvement (for example the registration of NGOs, the approval of their budget, the receipt of donor

funding, etc) that needs transparency so as to enhance trust in non-government structures.

When discussing governance, a central theme for the implementation of IWRM approaches relates to the mainstreaming of water considerations into other sectors and *vice versa*. Although there is clear trend towards mainstreaming in the three PCs (for example by sharing strategies among the ministries for the provision of feedback), this tends to be done on an *ad hoc* basis, largely depends on personal relations and there are no monitoring mechanisms in place. In Lebanon, the recent National Water Sector Strategy has contributed towards mainstreaming, with all line Ministries involved in the preparatory process though with different roles and provision of concerns/priorities (for example the Ministry of Environment was more heavily involved). Another example of the effort towards mainstreaming, concerns the national MED EUWI Policy Dialogue on IWRM that has wide stakeholder consultation and cross-sectoral coordination among its key objectives. The Water Strategy 2008-2022 in Jordan included a cross-ministerial committee for its elaboration, the work of which has been prolonged to conduct also the revision/update of the Strategy. Again however, the need for further action on this is widely recognised. As for Tunisia, the recently-launched elaboration process of the National Water Strategy 2050 includes related provisions towards mainstreaming, with the outcome of this effort yet to be seen.

3.3.5 Sociological reality and social structures

The social reality in the countries is an issue that is recognised as important, but is not often directly addressed when tackling aspects of integrated water resources management. The governance of water resources, and the debate on centralisation versus decentralisation, is intimately linked to the social parameters of a country and the operation of a specific society. When implementing policies, it is of added value to factor in the social context within which this takes place. In Lebanon for example, the fact that people are able to circumvent rules and legislation and proceed uninterrupted with their daily work, can pose a significant challenge when setting in place a plan or a policy. Such reality also encourages the flourishing of para-economy (or black market), which in Lebanon is most substantial. Moreover, the uncertainty due to the political instability and sectarianism that is inherent in the country, provide fertile ground for the development of individualist social elements and manifests with lack of teamwork and lack of a delegation mentality. On the other hand, the fact that Jordan is fundamentally a tribal society often goes unnoticed, while it could explain the deviation from rules and the limited compliance with legislation (as allegiance is with the tribe and not necessarily with the state). Interpersonal relations often determine the implementation of a policy, especially when this involves direct access to higher/highest levels of hierarchy. In Tunisia, individualistic behaviour and opportunism were cultivated by years of pushing away the population from participation and civil society activism. Personal interest prevails most often over community interest leading to lack of trust and cautious relations between the population itself and with the administration. In all three cases, there is an inherent mistrust demonstrated by the people when it comes to state structures, while at the very same time there is a strong belief in the responsibility of the state/government to provide for its people.

A message that came out rather strong during the country missions is the need to (re)establish trust between people and the state apparatus, starting off with a reliable provision of adequate and good quality water and sanitation services. In that respect further effort is needed on behalf of the service providers/water utilities in order to gain the confidence of the customers.

3.3.6 Emerging challenges like implication of climate change, the energy-food-water nexus, etc

A challenge that is more abstract and potentially vague in terms of context, is the need to address emerging issues like the implications of climate change, the links of water with energy and food or the requirements for the –recently favoured- framework of a green economy.

Climate change doesn't constitute a new topic and has been in the official water agenda for over a decade now, however the understanding of its implications and needed actions remains inadequately understood. The thematic and sectoral cross-cutting nature of climate change considerations renders enveloping it into a Strategy or Plan a difficult task. Linked to this is the difficulty in financing climate change activities, given the often blurred distinction among authorities that benefit from and/or support them. This is further accentuated by an inherent institutional fragmentation and the –at times- exigent enforcement of environmental legislation. Moreover, any such plan would

need to align with the international framework on climate change, which adds another layer of complexity. A primary reason for the lack of a Climate Change Adaptation Strategy or an efficient reflection in Water Plans has been identified in the three countries as the lack of data, models and comprehensive studies carried out at national scale and also for the wider MENA Region. Existing models are usually segmented in scope and coverage (i.e. focus on selected parts of a country) and are dispersed among different donor-supported projects/programmes. An additional reason includes the different agendas and the frequently problematic communication between technicians, who carry out the analytical work, and decision-makers, who define the policy directions. Furthermore, an apprehension towards admitting openly the climate change implications may be linked to the desire of governments not to discourage potential investors.

The water-food nexus has been around also for some time, given the desire of most countries for food self-sufficiency and more recently in view of the social unrest over the food prices. To this nexus, another parameter needs to be added: that of energy especially given the shift of several countries towards desalination for securing the potable water supply. There is a vicious circle in motion here: extensive use of conventional energy sources aggravates the CO2 emissions, which in turn increases the greenhouse emissions that result in reduced precipitation, thus affecting the renewable water resources availability. Although supported with imperfect data/models for the region, this situation intensifies climate change impacts (manifested through extensive period of droughts, desertification phenomena, coastal flooding, etc). Therefore, taking duly into account this nexus when designing and operationalising a water plan seems unavoidable.

In terms of emerging issues, a challenge for the three PCs (as well as for all SWIM PCs and the wider region) will be to effectively address the call for a green economy that foresees an integrated and holistic approach to several issues, including water, food and energy security. This links also with the intention to set up Sustainable Development Goals on these issues (with one of them explicitly on water), a debate that culminated in the Rio+20 United Nations Conference on Sustainable Development (Rio de Janeiro, 20-22 June 2012), although without reaching a concrete set of commitments at this stage.

4. Elaboration upon common challenges and possible solutions as well as proposals of a series of policy options/recommendations for advancing the preparation, implementation and monitoring of National Water Plans and/or Strategies

Following the preceding regional review on the status of IWRM plans/strategies across the SWIM PCs and the comprehensive national analysis of the situation in Jordan, Lebanon and Tunisia, this section aims to compile some of the key elements that came forth and present selected proposals for policy options and recommendations for action. The emphasis will be on challenges and priorities, as these have been identified and in line with the logic of an IWRM approach. As mentioned previously, these options were complemented during a structured dialogue and consultation with representatives of the SWIM PCs during an Expert Regional Workshop that took place in Athens on 13-14 June 2012. The purpose was to stir constructive discussion and exchange of ideas and conclude with a set of politically plausible, socially acceptable and financially implementable policy options and recommendations for advancing the preparation, implementation and monitoring of plans and/or strategies with replicability potential in the PCs and in the rest of the Mediterranean at large.

In terms of challenges, there is little doubt that the analysis on the 3 PCs is relevant and largely applicable to the rest of the SWIM countries. The recent political developments (i.e. the Arab Spring), in addition to the impact on the countries that underwent social unrest and/or a revolution, exhibit a spill-over effect in the rest of the region (including the northern shores) through the call for furthering social and political reforms and the operationalisation of core principles including participation, social equity, transparency and accountability. Likewise, emerging issues like climate change adaptation and mitigation, the water-food-energy nexus or the green economy are not confined within

the context of specific countries, but instead they are expected to significantly challenge all countries. The poor financing constitutes a common denominator and a well-recognised constraint to the implementation of water plans and strategies. The demographic trends are given and when coupled with increasing urbanisation and the adoption of a more consumption-centred developmental trajectory, they can only be expected to increase the pressure on already scarce water resources. The particularities of social realities at national and local levels, although usually well understood and acknowledged, they are seldom conceived as potentially determining factors for the effective implementation of specific policies/legislations/plans of action. Similarly to the challenges, the country-specific discussion on gaps, constraints and shortcomings echoes the situation –though at different levels and magnitudes- in the rest of the PCs. Several of these elements will be addresses in the suggested policy options and recommendations.

The analysis will follow the logic of the three pillars and the components of IWRM, taking duly into account the perspective on the results of the Survey for the 2012 UN Water Report. Therefore, the suggested options for action are relevant to the survey and are enhanced by the findings of the three PCs' country elaborations. The proposed policy options/priority actions are by no means intended to be exhaustive and all-encompassing, but rather to provide a selected number of guiding lines towards an enhanced integrated approach that needs to be adapted to each country's particular socio-economic and political context. It should be stressed that these ideas/proposals will be deliberated and discussed during the Athens Workshop (13-14 June 2012) in order to be verified as policy options, be modified as deemed appropriate and be enhanced with additional points that the countries recognise as priorities. Where possible, reference will be made to ongoing SWIM-SM activities and the intended lines of future work, with the aim to identify which items could be practically served through the work of the SWIM-SM programme.

4.1 ENABLING ENVIRONMENT

- Update/revisit existing IWRM Plans and/or Strategies

Obvious as it may seem, having in place a water plan that responds to the provisions of an IWRM Plan is pivotal for sustainable water resources management. The main reason is that it captures in a single document and in a holistic way the current status and the vision for the water sector as well as the roadmap for the plan's operationalisation (including a financial plan). SWIM-PCs are well advanced in that respect, with Egypt and Jordan having IWRM Plans as such, while the rest of the countries have water plans and/or strategies that correspond to the IWRM principles. In addition to that, there is current ongoing effort from countries, including Algeria, Lebanon, Syria and Tunisia, to prepare IWRM Plans.

Equally important to having in place an IWRM Plan is the need for provisions as to its regular update in order to account for changes and address emerging challenges. For example, both Jordan and Egypt have embarked on revisions of their respective plans. In that respect, including related clauses in the IWRM plans that are currently under preparation would be of utmost significance.

- Setting up, compliance and enforcement of water legislative frameworks

Legislation, as a water resources management challenge, scored high in the UN survey. The lack of an apposite legislation and/or the limited enforcement of legislative frameworks, poses obstacles to the sustainable management of the resource. In Jordan, Lebanon and Tunisia it was recognised that the primary concern is about the enforcement mechanisms as the legislation is in place but partially /ineffectively implemented.

A review/assessment on the adequacy of existing laws at national and sub-national levels (as applicable per country) and the streamlining with environmental, agricultural and other related legislations, could form a plausible way forward. To this end could assist examples of operational legislative frameworks from within and outside the region (Lebanon appears to have a most comprehensive legislative framework on the water sector for example). Of potential added value could be the context and provisions EU *acquis*, especially on cross-sectoral mainstreaming and in terms of enforcement mechanisms. Comparative analysis of the situation with regard to the legislative framework and related policy suggestions that UN ESCWA has conducted in the past could also provide a good basis and food for thought.

- Enhanced political will/commitment

Ensuring political will and commitment are perhaps among the determining factors for the successful implementation of a plan and/or a policy. Placing the plan under high level auspices seems to be catalytic, as seen for example in the case of Jordan (with the King mandating the preparation of the National Water Strategy) and Lebanon (where the current Minister has mandated and supported the preparation of the recently-launched National Water Sector Strategy). Placing the IWRM Plan within a wider national development context, as in Jordan with the National Agenda and the Kulluna al Urdun, certainly raises commitment for its implementation. At county level political commitment can be enhanced through the involvement of different Ministries in the preparation –and more importantly in the implementation – of an IWRM Plan.

Securing political commitment that moves beyond national politics can be also achieved by linking national plans and objectives with regional or international frameworks. For example the commitment made in 2002 in Johannesburg urged several countries towards the elaboration of IWRM Plans. Similarly meeting the targets set by the Millennium Development Goals, including the monitoring mechanisms, exercised some pressure for initiating/furthering water reforms. More importantly the anticipated endorsement of the Sustainable Development Goals during the Rio+20 Conference, where water is included as a stand-alone goal, could also assist, given the expected commitment of countries to meet the Goals' targets. Similarly, the anticipated Action Plans of both the (draft) Strategy for Water in the Mediterranean and the Arab Water Strategy could form a solid basis for reinforced political commitment and enhanced action.

- Promote integration of water management across sectors (water mainstreaming)

The mainstreaming process needs to be reciprocal in order to be effective. Therefore, including water considerations into other sectors' plans and strategies is fundamental to the IWRM framework. This can be promoted by institutionalising a communication and feedback-provision loop among the Ministries when different sectoral strategies are being developed or updated. To this end could assist the set up (or reinforcement where they already exist) of technical or activity-specific cross-Ministerial Committees that are result/outcome-oriented and with a clear view towards implementation.

4.2 GOVERNANCE AND INSTITUTIONAL FRAMEWORK

- Cross-sectoral/ministerial cooperation

According to the results of the UN Survey, SWIM PCs have recognised this aspect of water management as a most challenging one. Given the inherent difficulty in achieving this coordination, also due to institutional fragmentation and the often overlapping responsibilities among Ministries and among administrations/departments among the same Ministry, a solid legislative framework outlining clearly the roles and responsibilities is a most appropriate foundation. Capacity building and joint trainings could also assist in strengthening capacity and establishing a common knowledge base among the Ministries.

In the three PCs also the role of a National Water Council was deemed as a constructive way forward in this respect (in Tunisia existing but not fully operational, while in Lebanon and Jordan there is concrete discussion on setting up such a structure). Moreover, involving the different Ministries in the preparation of the various Ministries' Strategies is a way to ensure mainstreaming of water into other sectors. Two most promising examples come from the operation of the Highland Water Forum in Jordan (that includes among other stakeholders also the representatives of involved Ministries) and the recent (end of March 2012) set up of a National Environment Council in Lebanon.

- Institutional capacity building

The need to strengthen institutional capacity building at both national and sub-national levels was also recognised as a priority area in the UN Survey. This involves the extension of existing and the enhancement with initiating additional trainings and capacity building exercises. The work of the Horizon 2020 through the Capacity Building Component has been instrumental in this respect, while a series of training activities (on themes identified as needed by the PCs) are being implemented by the SWIM-SM programme. Additional training activities, to fit the particular needs of the

countries and with a regional added value could be included in SWIM-SM's next workplan.

- Consultation processes and mechanisms for stakeholder engagement at different management levels

Stakeholder participation was also recognised as a clear challenge in the UN Survey, though with different priority ratings allocated to them by the SWIM PCs. A starting point would be the inclusion of relevant provisions in the legislative framework along with mechanisms for their full and effective implementation. In Jordan for example, although a law on civil society has been discussed with civil society representatives and approved by the Parliament (though with reduced scope in the end), the implementation of stakeholder participation in environmental/water affairs remains a challenge (participation of civil society representatives in the various technical inter-ministerial committees is open though not obligatory, and thus their involvement is not binding and does not have an effective role/impact in the process). Having said that, the operation of the Highland Water Forum represents a good example of stakeholder participation and its potential replication (inside as well as outside the country) needs to be further explored. The work of the Lebanese National Environment Committee also represents a solid step towards this direction, though its operation remains to be seen (as it was set up only at the end of March 2012).

The emphasis on stakeholder involvement is expected to increase substantially, also as a result of the Arab Spring and the call for more participation.

- Decentralised structure and the subsidiarity principle

A challenge for the region concerns the centralisation versus decentralisation debate for water resources management. Regional trends point (including the legal provisions of the EU *acquis*) towards the promotion and strengthening of decentralised structures and resource management to the most appropriate level (principle of subsidiarity). In Lebanon, the set up of the 4 Water Establishments follows this logic, while more prominent is the work carried out in several of the countries by the Water Users Associations. On this latter part, SWIM-SM carried out a regional assessment on the status of water users' participation in the PCs, complemented with specific case studies coming from Egypt, Jordan, Lebanon and Tunisia. A list of priorities and future actions were also identified during a regional workshop that discussed the assessment.

4.3 MANAGEMENT INSTRUMENTS

- Programmes enhancing water resources management

In the UN Survey, the SWIM PCs have identified as priority the development or further support for programmes for water resources management. In their majority such programmes have been donor-supported and within the lifespan of specific projects. A positive step could include the institutionalisation of such programmes within the workplan of the respective line Ministries. These programmes could entail among others:

Water use efficiency mechanisms

The efficient allocation of water resources among competing uses

The allocation of water resources with emphasis on economic considerations

Forecasting and early warning systems to contribute to climate change adaptation

Disaster management and/or risk management

- Carry out realistic and solidly-based assessment of needs per sector and targets for the short, medium and long term

Although a plethora of studies (government-led as well as donor-supported) have been conducted on assessing water resources both in terms of supply and demand, there are still gaps on the reliability of the depicted picture for informed decision making. More importantly, besides portraying the existing situation, the setting of clear and SMART (Specific, Measurable, Agreed-upon, Realistic and Time-bound) targets could provide significant assistance in the

implementation process of water plans because they place them within specific and concrete context. For example, the setting of clearly marked objectives has been utilised in the preparation of the (draft) Strategy for Water in the Mediterranean and at a global scale it has been used in the JoI and is expected also to come out from the Rio+20 Conference.

- Develop a knowledge base along with mechanisms for knowledge/experience sharing

The need for having in place a knowledge base is widely recognised (as also portrayed as a priority challenge in the UN Survey). Information on water resources is often scattered across institutions with different agencies responsible for the collection of theme-specific data, thus potentially jeopardising the reliability of the provided information (given the multiplicity of collection and classification techniques). As seen in the analysis of the three PCs, significant effort has been attributed to the creation of water information systems and the more comprehensive collection and analysis of data. Having in place such a system, optimally at central level, could assist with the better management of data and the more informed policy and decision making.

More importantly, knowledge goes beyond the collection of data. It is linked to practices and the on-the-ground operationalisation of policies. Expanding and deepening on the knowledge base through solid and methodologically-sound analytical/technical work is one of the objectives. Setting up mechanisms for the identification of good/bad practices and success/failure experiences, would not only contribute to the compilation of knowledge but also form the basis for exchange and replication. To this end, one of SWIM-SM's activity areas concerns the collection of best practices in selected themes (like non-revenue water, increased efficiency and effectiveness of wastewater reuse, the operationalisation of WUAs) as well as the support towards the establishment of a replication mechanism at regional level (to be analysed further in the last section of the Report).

- Establish a suite of indicators

Setting up indicators for the monitoring of the different aspects of water resources management constitutes an ongoing effort for all countries. In addition to the inherent difficulties in choosing indicators that are relevant, appropriate and implementable, in some of the PCs the monitoring exercise has been carried out in the course of donor-funded projects. Moreover, the plethora of available indicators renders the monitoring task even more challenging. A proposal will be put forward to the Rio+20 Conference about the establishment of a permanent monitoring mechanism to assess the implementation and impact of integrated approaches to water resources development, management, financing and use. If considered relevant, this framework could provide a good basis for monitoring in the PCs.

4.4 FINANCING

- Build a knowledge base on water financing and explore the means to improve the collection, storage and analysis of financial data for water investment and water resources management. Indicatively, this could be facilitated by the conduct of:

Financing strategies for the water sector that would identify the magnitude of the financing gap and propose options based on alternative scenarios. Egypt offers a good example, where a financing strategy for the water supply and sanitation sector for Greater Cairo was completed in 2009 (within the MED EUWI County Policy Dialogue and in cooperation with OECD) and provided fruitful insight both on the financing status, but more importantly on alternative scenarios calculating contributions from the public budget as well as from revenues.

Introduction of water accounting systems, which constitute a systematic process of identifying, recognising, quantifying, reporting and assuring information about water

Economic valuation of water degradation that could provide useful insights as to the costing of different actions and the financial implication they have with regard to the environment. SWIM-SM has included a

related study for Tunisia and Morocco in its current line of work

- Private Sector Participation

In view of the financing gap of the water sector that most PCs encounter, the range of options for bridging this gap is given. Private sector participation has been applied in many of the PCs (primarily with regard to the construction of wastewater infrastructure and management contracts), however the understanding of the opportunities and constraints of such engagement remains largely limited. Enhancing this understanding and the determining factors for rendering it more effective, could add significantly to the effort to bridge the financing gap. Relevant work on assessing private sector participation in water infrastructure has been completed in both Egypt and Lebanon (within the respective MED EUWI Country Policy Dialogues and in cooperation with the OECD) with interesting findings. Similar line of work is currently ongoing in Tunisia. Private sector participation has a lot of potential also at the local level, in this respect SWIM-SM is currently implementing a related activity at regional level.

- Introduce –where it is not in place- legislation for the introduction of principles like polluter-pays and user-pays

- Improve performance, for example through the:

Introduction of output-based aid that can be applied both in financial support provided by donors (in support of the monitoring system) and in terms of subsidy provision (subsidies will be provided when the output is achieved (piped household connection for the poor) is confirmed by an independent verification agent.

Strengthening of water utilities as autonomous and accountable service providers

In sum, and while having started this section in an unconventional manner by depicting the challenge areas for sustainable and integrated water resources management, it ought to be properly highlighted and acknowledged that all PCs are well underway or are significantly advanced in the design and implementation of water sector reforms. The concluding part of the regional review (first section of the Report) adequately exemplified where the countries stand with regard to the implementation of the three IWRM pillars. In support to these efforts, the following (and final) section of this Report is dedicated to illustrating existing and upcoming opportunities that can further foster this process.

5. Opportunities to support the sustainable and integrated water resources management in SWIM PCs

This last section elaborates on existing and upcoming opportunities supporting the sustainable and integrated water resources management in the SWIM PCs. These opportunities emerge from developments in the regional and international scenery and advocate for concerted action that would respond to national priorities as well as to international calls for action in the related fields. In that context, the importance of synergies is well recognised, along with the need to bridge the gap between research/science/knowledge development and actual policy making. The need for transparency and corruption-fighting has gained clear momentum assisted also by the Arab Spring. Proliferation of info and communication technologies and tools, promotion of related networking opportunities, and dissemination of replicable cases, would assist in the way forward as supporting environment for the implementation of the policy options. While examining these opportunities, the potential role of SWIM –within its current and the overall workplan- is also indicated.

5.1 RECOGNITION OF THE NEED FOR SYNERGIES AMONG INITIATIVES AND PROGRAMMES

There is an obvious need to enhance synergies and act in a coherent and coordinated manner in order to meet water

challenges through IWRM planning. Currently, there are several processes, partnerships and organisations operating at regional, sub-regional and country level, which can be linked up strengthening each other, avoiding duplication and succeeding in cost-effective use of human and financial resources.

Such initiatives and programmes already promote actions on policy development, assessment, set up of data and information systems, capacity building, training, technology and knowledge transfer, as well as implementation of actions on the ground. These are implemented under a range of political and technical frameworks *inter alia* the Union for the Mediterranean (UfM), Barcelona Convention and the Mediterranean Commission for Sustainable Development serviced by MAP UNEP, Arab League, African Ministerial Council on Water, European Neighbourhood and Policy Instrument as well as initiatives and programmes like the Horizon 2020 Initiative to De-pollute the Mediterranean, Mediterranean Component of the EU Water Initiative, the GEF MedPartnership, the UNDP programmes including the Water Governance Programme for Arab States and several others including those supported by various multilateral and bilateral cooperation schemes and donor agencies.

Among others, a helpful guiding tool would be the UfM Strategy for Water in the Mediterranean which, when approved and complemented by its Action Plan, would further strengthen and support such cross-cutting processes, partnerships and organisations, by means of future specific projects as well as a coordination mechanism to review the progress of the different initiatives. The Arab Water Strategy is also important, providing prioritization, outlining common approaches and stimulating action. Furthermore, the EU water and environment-related *acquis,* including the Water Framework Directive and the Groundwater Directive, provides helpful background for possible replication after appropriate adaptation at country level.

Opportunities emerging from such closer and more operational links among processes, initiatives and programmes should not be missed as they aim to increase impact on the ground as well as efficiency in resources' utilisation. SWIM could play a positive role by assisting in linking further and operationally such processes and by having a focus on technical aspects that reflects the needs of its PCs.

5.1.1 Linking research, policy making and practice

The call for more effective integration of science and decision making is ubiquitous in the IWRM framework. Policy makers often note that critical information for their decision making is not readily available or accessible to them, or not presented in a usable form. At the same time, scientists often complain that their inputs are relevant and credible but not enough used by decision makers. Particularly for IWRM planning, policy makers are frequently confronted with the need to make major decisions in the face of high system complexity and uncertainty. Thus, linking research and science with policy making, using knowledge as a practical bridge towards action, is key for effective IWRM planning and application.

Science, research and knowledge development are advanced in most of the PCs. National institutions are offering a range of information and data (both raw and processed), decision support systems and tools (including early alert systems, models, etc), as well as specialised services in the field. Similar is with regional programmes implemented by a number of universities, research agencies and, often, stakeholders, the latter figuring both as generators of information and as receivers of the results. The Directorate General for Research of the European Commission is among the key contributor in that agenda in the Mediterranean through its Framework Programmes, where integrated management of water resources figures high.

Innovation is another important agenda that is linked with science and research, and its practical incorporation in national IWRM planning is an opportunity that should not be missed in the region. Innovative solutions include not just technology, but all aspects of water management like policy, governance, financing, etc. Among others, development of non-conventional water resources, particularly with use of renewable energy sources that are environmental friendly and cost-efficient, presents a focus field for innovation in the region. The agenda presents frontrunners among the PCs, particularly among those facing severe water scarcity and having the means for investment in the field. In that respect there is space for further use of non-conventional approaches like rainwater harvesting, grey-water reuse that are low-cost and carried out at the user level (and thus enhancing awareness and involvement). Prominence is gradually gaining ground also with regard to the advantages of water ecosystems as

natural infrastructure systems as well as the benefits from ecosystem services.

A key challenge remains the usability of research results for policy making. Improved communication is a helpful tool on the side of science; but that is not enough. Collaboration, in practical terms, between scientists, stakeholders and decision makers would further assist the needed change of culture towards better use of existing knowledge. And, since practice is often more applicable at local level, such informed IWRM planning could best apply in that level, making valid lessons and encouraging better use of related tools at national IWRM planning processes. Like for all learning processes, time, resources and commitment are necessary ingredients for making things happen.

SWIM can contribute as a 'translator/transformer' of knowledge for decision making as well as a facilitator of experience sharing, including innovation and best available solutions, among the PCs. This would contribute not only in making lessons learnt a common property, but also contributing in advancing with practical steps ahead, as prioritised by the PCs and within a regional approach.

5.1.2 Public awareness, democracy, civil society involvement, local level management

Effective IWRM planning requires appropriate mechanisms to enable consultation among and participation of a range of stakeholders, including marginalised and other vulnerable groups, through empowerment and ownership schemes, promotion of democratic and anti-corruption processes, and recognition of the particular role of civil society as well as of the local and regional authorities.

Partnerships are key for achieving these objectives. Currently, there is a growing number of stakeholder partnership and networking schemes, focusing on specialised groups as well as of more general audiences, at regional, national and local levels. Coordination among such partnerships would assist efficiency in reaching their objectives and utilising available resources. Among others, engaging media will assist in increasing volume and effectiveness of outreach to the wider public while it can act as a pressure tool towards more action by the policy and decision makers. Media-related activities are under implementation within SWIM-SM's current annual workplan and are expected to assist this process.

In an era of reform in most of the PCs, there is a strong call for integrity, transparency and accountability. To deliver these, combined anti-corruption and human right/equity action needs to be in the focus and materialize with support by the growing civil society movement. Mapping of potential corruption risks, publicizing water-related budgets and providing public information on water infrastructure plans and investment projects, are among action towards that direction.

5.1.3 Enhance replicability of good cases

Experiences on IWRM planning are many and concrete around the globe and in the region. At the same time, it is clear that there is no 'one-solution-for-all'. It is recognised that there is a need for taking stock of lessons learned in addressing related issues, for identifying those that best apply to the regional and national natural, socio-economic and cultural contexts, and for leveraging political commitment as well as new and additional funding in order to replicate such tested and validated cost-effective practices.

Among other instruments to promote these, a Mediterranean Environmental Replication Strategy (MEReS) is currently under development as a joint work of UNEP MAP and the EC, drawing on the methodology and on the experience gained so far by the GEF MedPartnership, the Horizon 2020 Initiative and SWIM. This mechanism, that is envisaged to develop further and become operational within 2013, should assist in promoting the screening, sharing and, hopefully, the application of replicable cases in the region.

5.1.4 Increased networking opportunities and access to information/knowledge regionally and internationally through fora, events, etc

Over more than two decades, progress on development of concepts, commitment to action and resource mobilisation for developmental issues, including water, is marked by summits (like the UN Summits on Sustainable Development), international fora (like the World Water Fora, the Stockholm Water Week, etc) and regional ministerial conferences

(like under the Euro-Mediterranean Partnership, the Arab League or the African Union and since 2008 under the Union for the Mediterranean) where most PCs are actively present.

Among these, as the most significant upcoming global summit, the Rio+20 United Nations Conference on Sustainable Development (Rio de Janeiro, 20-22 June 2012) will mark the anniversary of two international milestones: the 20th anniversary of the 1992 United Nations Conference on Environment and Development (UNCED), in Rio de Janeiro, and the 10th anniversary of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg. The conference will focus on two themes (i) green economy within the context of sustainable development and poverty eradication, and (ii) the institutional framework for sustainable development, aiming at resulting in a focused political document that is envisaged to guide the related agenda during the next decade; negotiations are on-going at the time of elaborating the present document.

It is recognised that the success of green economy depends on sustainable management of water resources and on safe and sustainable provisioning of water supply and adequate sanitation services. In pursue of these objectives, IWRM remains relevant and must be central in strategies towards green economy, tackling cross-sectoral integration and in particular the nexus/linkages among water, food and energy. Furthermore, the positive response to the call for IWRM and Water Efficiency Plans, as agreed at WSSD in 2002, needs to be further translated into implementation. This could be facilitated through the development by the countries, and where missing, of specific targets and timeframes for preparing and implementing a programme of action and financing strategy to implement IWRM plans, based on a realistic reflection of each country's natural, social-political and financial situation.

Overall, the Rio+20 decisions are expected to pave the way on a range of development aspects and SWIM PCs have the opportunity, through the discussed Sustainable Development Goals (with water forming one of these goals), to set priorities that will lead to a more water secure future. SWIM could assist by sharing information on the Rio+20 outcomes/next steps and by assisting PCs in screening and prioritising action in order to meet the agreed upon targets.

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7. Annexes

Annex 1: Template UN Water Questionnaire

Annex 1

Questionnaire to UN Member Countries

On Integrated Approaches in the Development, Management and Use of Water Resources for UNCSD 2012

While it is important that approaches to water resources management are suited to the individual circumstance of a country and a local region, it has been widely recognized that traditionally fragmented or purely sectoral approaches are no longer viable. This is due to the challenges created by increasing and often conflicting demands on water resources that are further complicated by climate change. The best management practices are those based on integrated approaches that try to combine and balance both societal and environmental needs.

The purpose of this survey is to generate input to a status report on integrated approaches in the development, management and use of water resources. The report will be used as the basis for informed decision-making by the United Nations Commission on Sustainable Development and national governments, and will include lessons learned and recommendations, as well as focus areas for action. Moreover, the knowledge gained will be used to help develop a process for establishing a regular international monitoring and reporting framework to promote sustainable water resources management.

Should you have any questions regarding the contents of the questionnaire, please contact:
Ms. Josephine Gustafsson
E-mail: UNWRio2012@siwi.org
Phone: +46 (0)8 522 139 60
Fax: +46 (0)8 522 139 61
Skype: siwi.josephine.gustafsson

Please send your completed questionnaire no later than April 18th 2011 to (in order of preference):

1) Online through http://www.surveymonkey.com/s/UNWaterReport2012
Or, if not possible,
2) Send the filled out questionnaire in word-format by email to UNWRio2012@siwi.org
Or, as a last option if the above are not possible,
3) Send the filled out questionnaire to:
Ms. Josephine Gustafsson
Stockholm International Water Institute
Drottninggatan 33
SE - 111 51 Stockholm
SWEDEN
Fax: +46(0)8 522 139 61

Please complete

Country	
Date	

1. Policy, Strategic Planning and Legal Framework

Please indicate the current status of key policy making, strategic planning and legal frameworks for the development, management and use of water resources in your country, by checking one of the six columns for each line.

1.1 Enabling environment for the development, management and use of water resources		Not relevant	Under development	Developed but implementation not yet started	Implementation started	Implementation advanced	Fully implemented
1.1.1 Main national/federal[5] instruments for water resources management							
a.	National/federal water resources policy						
b.	Sub-national/provincial/state water resources policy						
c.	National/federal water laws						
d.	Sub-national/provincial/state water law						
e.	National or federal integrated water resources management plan/s or equivalent strategic plan document/s						
f.	Separate national or federal water efficiency plan/s						
g.	Water efficiency in integrated water resources management plan or equivalent						
1.1.2 Other national/federal instruments that may incorporate water resources management							
a.	Integrated national policy/strategy/plan for land and water resources management						
b.	Poverty Reduction Strategy (PRS) with water resources management component						
c.	National Strategy for Sustainable Development						
d.	National Development Plan with water resources management component						
e.	National Environmental Action Plan water resources management component						
f.	National climate change adaptation policy/strategy/plan with water resources management component						
g.	National Agricultural Plan with water resources management component						
h.	National energy policy/strategy/plan with water resources management component						
i.	National desertification policy/strategy/plan with water resources management component						
j.	National wetland policy/strategy/plan with water resources management component						
k.	National biodiversity policy/strategy/plan with water resources management component						
1.1.3 International agreements on water resources management to which your country is party							
a.	Regional/sub-regional water resources management agreements						
b.	Transboundary water resources management agreements for specific river basins						

5 Federal states may complete the questions in this section from a state perspective

2. Governance and Institutional Frameworks

Please indicate the current status of governance and institutional frameworks for the development, management and use of water resources in your country, by checking one of the six columns for each line.

2.1 Governance systems for the development, management and use of water resources		Not relevant	Under development	Developed but implementation not yet started	Implementation started	Implementation advanced	Fully implemented
2.1.1 Institutional Frameworks							
a.	Mechanisms (e.g. commissions, councils) for river basin management						
b.	Mechanisms for management of groundwater						
c.	Mechanisms for management of lakes						
d.	Mechanisms for cross-sector management of water resources						
e.	Mechanisms for transboundary water resources management						
f.	Decentralized structures for water resources management (other than above)						
2.1.2 Stakeholder Participation							
a.	Stakeholders have access to information on national water resources management and development						
b.	Public awareness campaigns on water resources management and development						
c.	Involvement of general public, civil society organizations and non-government organizations in water resources management and development at the national level						
d.	Involvement of the private sector in water resources management and development at the national level						
e.	Involvement of general public, civil society organizations and non-government organizations in water resources management and development at the basin level						
f.	Involvement of the private sector in water resources management and development at the basin level						
g.	Gender mainstreaming in water resources management and development						
2.1.3 Capacity Building							
a.	Assessment of capacity needs in water resources management at national level						
b.	Assessment of capacity needs in water resources management at sub- national level						
c.	Programs for capacity development in water resources management institutions/organizations at national level						
d.	Programs for capacity development in water resources management institutions/organizations at sub-national levels						
e.	Programs for in-service training of staff/professionals in water resources management						
f.	Water resources management in the technical/higher education curriculum						
g.	Research programs in water resources management						

3. Management Instruments

Please indicate the current status of management instruments for the development, management and use of water resources in your country, by checking one of the six columns for each line.

3.1 Management instruments for the development, management and use of water resources		Not relevant	Under development	Developed but implementation not yet started	Implementation started	Implementation advanced	Fully implemented
3.1.1 Water Resources Development							
a.	Basin studies for long-term development and management of water resources						
b.	Periodical assessment of water resources						
c.	Regulatory norms and guidelines for sustainable development of water resources						
d.	Programs to value water-related or dependent ecosystem services						
3.1.2 Water Resources Management Programs							
a.	Groundwater management program						
b.	Surface water management program						
c.	Linked ground and surface water management program						
d.	Programs for efficient allocation of water resources among competing uses						
e.	Land/natural resources management programs that include water resources management components						
f.	Programs for allocating water resources that include environmental considerations						
g.	Demand management measures to improve water use efficiency in all sectors						
h.	Program for re-use or recycling of water						
i.	Programs to evaluate environmental impacts of water projects						
j.	Programs to address water-related disasters (e.g. floods and droughts)						
k.	Programs to address climate change adaptation through water resources management						
l.	Cooperative programs managing transboundary water resources						
m.	Programs to reverse environmental/ecosystem degradation						
3.1.3 Monitoring and Information Management							
a.	Government responsibility for hydro-meteorological monitoring adequately addressed in national legislation						
b.	Monitoring of surface water quantity						
c.	Monitoring of ground water quantity						
d.	Monitoring of water quality						
e.	Monitoring of aquatic ecosystems						
f.	Monitoring of water use						
g.	Monitoring of water use efficiency						
h.	Water resources information system						
i.	Forecasting and early warning systems						

3.1 Management instruments for the development, management and use of water resources		Not relevant	Under development	Developed but implementation not yet started	Implementation started	Implementation advanced	Fully implemented
3.1.4 Knowledge Sharing							
a.	Programs for information exchange and knowledge sharing of good practices						
b.	Programs for providing advisory (extension) services on water management issues to end users						
c.	Programs for transferring improved and cost effective water saving technologies						
d.	Mechanisms for exchanging information between countries						
3.1.5 Financing of Water Resources Management							
a.	Cost recovery mechanisms/progressive tariff structures for all water uses						
b.	Subsidies for promoting water efficiency						
c.	Charges for water resource management (e.g. pollution charges)						

4. Infrastructure Development and Financing

Please indicate the current status of infrastructure development and financing for the development, management and use of water resources in your country, by checking one of the six columns for each line.

4.1 Infrastructure development for the development, management and use of water resources		Not relevant	Under development	Developed but implementation not yet started	Implementation started	Implementation advanced	Fully implemented
4.1.1 Investment plans and programs							
a.	Water resources included in national infrastructure investment plans						
b.	Irrigation						
c.	Energy/hydropower						
d.	Groundwater (e.g. boreholes, pumps and treatment)						
e.	Flood management						
f.	Water supply (domestic and industrial)						
g.	Wastewater treatment						
h.	Desalination of seawater						
i.	Rainwater harvesting						
j.	Natural systems (e.g. wetlands, floodplains and catchment restoration)						
4.1.2 Mobilizing financing for water resources infrastructure							
a.	Financing for water resources included in national investment plans						
b.	Financing for irrigation						
c.	Financing for energy/hydropower						
d.	Financing for groundwater (e.g. boreholes, pumps and treatment)						
e.	Financing for flood management						

4.1 Infrastructure development for the development, management and use of water resources		Not relevant	Under development	Developed but implementation not yet started	Implementation started	Implementation advanced	Fully implemented
f.	Financing for water supply (domestic and industrial)						
g.	Financing for wastewater treatment						
h.	Financing for desalination of seawater						
i.	Financing for rainwater harvesting						
j.	Financing for natural systems (e.g. wetlands, floodplains and catchment restoration)						

5. Sources of Financing for the Development of Water Resources

Please indicate sources of financing as well as financing trends over the last 20 years for the development of water resources in your country, by checking one or more appropriate columns for each line.

5.1 Sources of financing for the <u>development</u> of water resources		Data not available or not recorded	No funding allocations made	Declining trend over last 20 years	Increasing trend over last 20 years	Highly variable and no clear trends
a.	Government budget allocation (as % of GDP) for water resources development					
b.	Grants and loans from aid agencies for water resources development					
c.	Investments from International Financing Institutions (e.g. World Bank) for water resources development					
d.	Investments from private sources (e.g. banks and private operators, non-profit) for water resources development					
e.	Revenues (e.g. from water use charges/tariffs) used for water resources development					
f.	Payments for ecosystem services and related benefit/cost transfer schemes					

6. Outcomes and Impacts

Please indicate to what extent improved water resources management has impacted economic, social, environmental and overall national objectives in the past 20 years in your country, by checking the appropriate columns for each line.

6.1 Improved Water Resources Management		Economic development objectives6 impact in past 20 years	Social development objectives7 impact in past 20 years	Environmental objectives8 impact in past 20 years	Overall national development impact in past 20 years
		1-5 Low to high	**1-5 Low to high**	**1-5 Low to high**	**1-5 Low to high**
a.	Improved policy, strategic planning and legal frameworks				
b.	Improved governance and institutional frameworks				
c.	Improved management instruments				
d.	Improved infrastructure development				

6.2 Key outcomes and impacts from water resources management measures

(a) List the outcomes and key results achieved as a result of implementing integrated approaches to the development, management and use of water resources.

Please provide text.

(b) Briefly list the constraints or obstacles that your country has experienced in implementing integrated approaches to water resources management.

Please provide text.

6 ***Economic development objectives*** relating to economic growth, wealth, management of monetary assets, and economic sector development.

7 ***Social development objectives*** relating to human development, gender considerations, such as poverty alleviation, health, education, and job creation.

8 ***Environmental objectives*** relating to the conservation and sustainable use of natural resources, such as water, pollution control, nature, agricultural land, forest, and fisheries.

7. Priority challenges

What are the priority water resources challenge areas in your country and how have they changed? Please indicate the level of importance of priority issues by checking one of the five columns for each challenge, and then indicating to what extent the challenge has changed in the past 20 years. Please add lines if necessary.

7.1 Priority water resources challenge areas		Current challenge level				
		Not a Problem	Low Priority	Medium Priority	High Priority	Highest Priority
7.1.1 Water Uses						
a.	Water for agriculture					
b.	Water for domestic use					
c.	Water for industry					
d.	Water for energy					
e.	Water for ecosystems / environment					
f.	Water for growing cities					
7.1.2 Threats to the resource						
a.	Floods					
b.	Droughts					
c.	Water scarcity (surface water)					
d.	Water scarcity (groundwater)					
e.	Water quality (surface water)					
f.	Water quality (groundwater)					

7.2 Priority water resources challenge changes		In the past 20 years, how has the challenge changed?				
		Significantly decreased	Slightly decreased	Unchanged	Slightly increased	Significantly increased
7.2.1 Water Uses						
a.	Water for agriculture					
b.	Water for domestic use					
c.	Water for industry					
d.	Water for energy					
e.	Water for ecosystems / environment					
f.	Water for growing cities					
7.2.2 Threats to the resource						

7.2 Priority water resources challenge changes		In the past 20 years, how has the challenge changed?				
		Significantly decreased	Slightly decreased	Unchanged	Slightly increased	Significantly increased
a.	Floods					
b.	Droughts					
c.	Water scarcity (surface water)					
d.	Water scarcity (groundwater)					
e.	Water quality (surface water)					
f.	Water quality (groundwater)					

What are the priority water management challenge areas in your country and how have they changed? Please indicate the level of importance of priority issues by checking one of the five columns for each challenge, and then indicating to what extent the challenge has changed in the past 20 years. Please add lines if necessary.

7.3 Priority water management challenge areas		Current challenge level				
		Not a Problem	Low Priority	Medium Priority	High Priority	Highest Priority
7.3.1 Levels of management						
a.	Institutional capacity at national level					
b.	Institutional capacity at sub-national level					
c.	Transboundary capacity at international level					
d.	Transboundary capacity at national/sub-national level					
e.	Management through private enterprise					
f.	Stakeholder participation					
g.	Coordination between levels and types of management					
7.3.2 Management between sectors						
a.	Coordination between sectors at national level					
b.	Coordination between sectors at sub-national level					
7.3.3 Other governance issues						
a.	Legislation					
b.	Infrastructure development					
c.	Financing of water resources management					
d.	Financing of infrastructure					
7.3.4 Managing resource information						
a.	Monitoring the resource					

7.3 Priority water management challenge areas		Current challenge level				
		Not a Problem	Low Priority	Medium Priority	High Priority	Highest Priority
b.	Knowledge sharing					
7.3.5 Specific types of management						
a.	Disaster management					
b.	Climate change adaptation management					
c.	Water use efficiency management					

7.4 Priority water management challenge areas		In the past 20 years, how has the challenge changed?				
		Significantly decreased	Slightly decreased	Unchanged	Slightly increased	Significantly increased
7.4.1 Levels of management						
a.	Institutional capacity at national level					
b.	Institutional capacity at sub-national level					
c.	Transboundary capacity at international level					
d.	Transboundary capacity at national/sub-national level					
e.	Management through private enterprise					
f.	Stakeholder participation					
g.	Coordination between levels and types of management					
7.4.2 Management between sectors						
a.	Coordination between sectors at national level					
b.	Coordination between sectors at sub-national level					
7.4.3 Other governance issues						
a.	Legislation					
b.	Infrastructure development					
c.	Financing of water resources management					
d.	Financing of infrastructure					
7.4.4 Managing resource information						
a.	Monitoring the resource					
b.	Knowledge sharing					
7.4.5 Specific types of management						
a.	Disaster management					
b.	Climate change adaptation management					
c.	Water use efficiency management					

Additional comments

If relevant, please list additional comments in relation to the survey instrument. Suggestions for improvements to the questionnaire and aspects not covered or considered less relevant are also most welcome.

Please provide text.		
	Respondent 1	**Respondent 2 (if necessary)**
Name		
Email address		
Job title		
Ministry/Department		
Telephone number		
Address		

Thank you for completing the questionnaire!