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A Concept Note on Water in the MENA-region¹

This Concept Note aims to summarise the key water-related problems and opportunities in the Middle East and Northern Africa (MENA) region, identify gaps and entry points for Swedish support to regional cooperation around water, and highlight some of the lessons learnt from other regions. The Concept Note should provide input to Sida's discussions on its future role in regional water cooperation in MENA, based on the objectives of Sweden's development cooperation, past experiences, and actual comparative advantages.

The assignment has been performed as a desk study. A number of interviews have been made with stakeholders in the region (a list of the interviewees is presented in the List of references).

Table of contents

1.	Introduction	2
2.	Key water problems and their causes in the MENA region	2
	2.1 Quantity and quality	3
	2.2 Water dependence	3
	2.3 Climate change	4
	2.4 Causes of water-related problems.....	5
	2.5 Security and power relations	6
3.	Impacts of the water-related problems	7
	3.1 Costs	8
	3.2 Other development impacts	8
4.	What are key actors doing to manage the problems?	9
	4.1 International legal framework	9
	4.2 Regional bodies and priorities	10
	4.3 Transboundary institutions	10
	4.5 Donors	11
	4.6 Gaps and overlaps.....	13
	4.7 Sweden in the MENA-region	15
5.	Lessons learnt from other regions	15
	5.1 General lessons learnt.....	16
	5.2 Lessons from Southern Africa, Mekong, and the Baltic Sea.....	16
6.	Implications for Sida	17
	6.1 Conclusions	17
	6.2 Issues for Sida to consider	18
	List of references.....	20
	Appendix 1: Table Water Availability in the MENA region	24
	Appendix 2: Parties to the UN Watercourses Convention	25
	Appendix 3: Lessons from other regions	26

¹ This Concept Note was written in February-March 2010, at the request of Sida (Att: Ingrid Sandström) by Gunilla Ölund Wingqvist at the Environmental Economics Unit (EEU), Department of Economics, University of Gothenburg, as part of Sida-EEU's institutional collaboration on environmental economics, with contributions from SEI (Ben Smith and Holger Hoff). The views expressed in this document are those of the authors and do not necessarily represent the views of Sida.

1. Introduction

The MENA region includes 18 countries², the Palestinian territories and West Sahara. According to the current Swedish Cooperation Strategy for MENA (2006-2010), the regional cooperation should mainly be targeted towards the countries with past bilateral support (Egypt, Jordan, Lebanon, Morocco, and Syria) but also other countries could be included in the regional support when that is deemed beneficial. Sweden is currently preparing a new regional Cooperation Strategy for the MENA region. It is expected that the regional cooperation will be focusing more on sub-regions and that the focus countries will change. The new Cooperation Strategy will enter into force in 2011.

The MENA region is in many ways a diverse region. It includes some of the world's largest reserves of oil and fossil gas, but is poor in water resources and arable land. The GDP per capita (PPP) ranges from \$2,500 in Yemen to a high of over \$41,800 in the United Arab Emirates.³ There are large income disparities in the region with many people living in poverty (less than \$2 per day). The HDI spans from a low ranking for Yemen (value 0.575; ranking 140), to Israel (value 0.935; ranking 27).⁴ MENA is currently home to over 320 million people and the population growth is steep with an average of over 2%. The urbanisation rate is high. As a whole, the population is expected to double in 40 years⁵.

After many years of political tensions and acute disputes (including violence) between and within countries in the region, regional cooperation is hesitant, especially regarding water resources.

Despite large differences, there are also some similarities between the countries: the MENA region has an arid to semi-arid climate. The region is considered one of the most arid in the world and most countries in the region are water stressed or water scarce. In fact, *the scarcity of water has been identified as the key environmental issue and one of the major constraints to development* by many of the interviewees. The water scarcity index is generally larger than 1, which means that the water use is larger than the minimum water recharge levels⁶. Furthermore, the MENA countries are projected to be among the first on the planet to experience the adverse impacts of climate change⁷.

2. Key water problems and their causes in the MENA region

Water related problems in the MENA-region are comprehensively described in various reports from *inter alia* SIWI (see list of references). This paper will therefore be quite brief in regards to the key water problems and their causes.

The overarching water-related problem in the MENA region is that of water quantity; water is a scarce resource. However, also water quality is emerging as an important issue and is of growing concern to the public. Other characteristic features in the region are that the water resources often are shared between two or more nations and a heavy reliance on groundwater resources. Besides posing threats of its own, climate change will act as a multiplier of already existing stresses and further affect water availability and quality.

² Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen.

³ CIA World Factbook.

⁴ Human Development Report 2009, HDI rankings. <http://hdr.undp.org/en/statistics/>

⁵ SIWI, 2009b.

⁶ UNEP GRID-Arendal, Water scarcity index.

⁷ Kjellen, 2007.

2.1 Quantity and quality

The MENA region is naturally water scarce and yet the water consumption is high. The countries are using more of their water resources than other regions; in fact, more than the region receives each year. The low water availability, in combination with a fast-growing population and inefficient water use – especially in the agricultural sector – leads in many places to an average amount of water per capita that is far below the scarcity level⁸. *Total water demand is forecast to increase by 50% between 2000 and 2025 and per capita water availability will fall by half by 2050*⁹. Water availability is expected to fall from an already low 977 m³/capita in 2001 to absolute water scarcity levels of 460 m³/capita by 2023.¹⁰ (For country-level information on water availability, see Appendix 1). The region's rivers are the most heavily dammed in the world in relation to the freshwater available; water supply and sanitation services are relatively widespread, and irrigation networks are extensive.

As water quantity is decreasing the water quality problems are becoming increasingly apparent for both surface and groundwater, for instance as lesser dilution of pollution and increasing levels of salinisation and alkalinity¹¹.

Regional dimension: Many aspects related to water quantity and quality are commonly dealt with at national or sub-national levels, for example: national water policies and strategies including allocation to water-using sectors, water quality standards, monitoring and enforcement, and investment decisions. *However, both water quantity and quality aspects have regional dimensions if the water resources are shared.* For instance is the downstream country affected by upstream activities, and the relatively weaker country's room to manoeuvre may be limited by regional power structures. In order to promote sustainable and equitable development of a shared watercourse, regional cooperation is vital. There are many issues that would benefit from regional cooperation, including (but not limited to): *agreeing on principles* relating to *i.a.* country water allocation, prior notification of projects that will affect neighbour countries, reasonable utilisation, and 'not to cause significant harm'; *sharing of information and data*; sharing of *experiences*; setting up and meeting *quality standards*; agreeing on *priority* water-using sectors (such as domestic use over industrial); implementing joint *research or monitoring* activities; implementing joint *investment* projects; developing joint *management plans*; or exploring opportunities for *benefit sharing*. In some regions these aspects are dealt with in a systematic way, for example through river basin organisations that are guided by international agreements.

2.2 Water dependence

Water resources that cross national borders place the countries sharing the resource in a state of interdependence. This interdependence is often asymmetric, due to the upstream-downstream divide, and due to regional power structures. Some 60% of the MENA region's water flows across international borders. The major international rivers are situated in the Middle East, while Northern Africa's shared waters are mainly groundwater resources. In general, water supply and sanitation are not considered to be transboundary issues, with the

⁸ An area is experiencing 'water stress' when annual water supplies drop below 1 700 m³ per person. When annual water supplies drop below 1 000 m³ per person, the population faces 'water scarcity', and below 500 m³ 'absolute scarcity'.

⁹ UN ESCWA, 2006; and WB, 2007.

¹⁰ AFED, 2008.

¹¹ Tropp et al., 2006.

exception of Gaza/West Bank where it is linked to transboundary ground and surface water resources.

*The water dependence of some countries in the MENA region is extremely high: Egypt (water dependence ratio 97%), Syria (80%) and Jordan (23%) rely almost exclusively on transboundary water resources emanating from outside its borders. The Palestinian Territories (75%) are almost entirely dependent on water transboundary with, and essentially controlled by, Israel.*¹²

2.3 Climate change

Even without climate change, the region will exceed the limits of their economically usable land-based water resources before 2025. Adding to already existing stresses, projections assess that the warming in the MENA region will be higher than the global mean warming and rainfall across the region is likely to decrease leading to a general decrease in water availability. *The main climate risk in the MENA region is thus related to increasing variability and extremes (in particular droughts), and resulting uncertainty in water availability.* Sea-level rise will affect the coastal areas (18,000 km of coastline) and may have negative effects on storm water drainage and sewage disposal, and adversely affect groundwater resources through saltwater intrusion into coastal freshwater aquifers. Increased temperature will lead to higher evapotranspiration and affect water availability and quality of both surface and groundwater resources.¹³

The high population-growth, weak resource base, and increasing stress from national development activities are factors which combine to render the region highly vulnerable to climate-related impacts¹⁴. The region is struggling to cope with current climatic conditions, and the longer term impacts associated with climate change will pose additional stress and new challenges.

Regional dimension: Although climate change is a truly global challenge, a lot of the climate change adaptation work must be done at the national or sub-national level. There are, however, opportunities for regional cooperation related to climate change adaptation, including supporting a *coordinated and integrated approach to water, land, agriculture, ecosystems, and climate change; supporting (joint) research, monitoring, and climate change modelling*, to name some.

Furthermore, international trade in food and other goods imply trade in water. The total amount of water that is used to produce a product is referred to as *virtual water*. The MENA region is more rapidly than any other region in the world becoming dependent on virtual water imports, due to the increasing water scarcity. For instance Jordan and Israel cover about 75% of their water demand from virtual water imports; Jordan's virtual water imports are 20 times higher than its virtual water exports. The virtual water imports have enabled the states of the region to "solve" their water problems without too much friction¹⁵. Virtual water is – and will be – the main climate change adaptation option for the region.

¹² Jägerskog, 2007.

¹³ IPCC, 2007; SIWI, 2008a, Wilk et al., 2009; and AFED, 2009.

¹⁴ Kjellen, 2007.

¹⁵ Tropp et al., 2006.

2.4 Causes of water-related problems

The large population growth, high urbanisation rate and national development activities lead to increased water demand. In a naturally water scarce region such as MENA, water should be used with care, as a precious resource. However, in general water is allocated to low-value uses even as higher-value needs remain unmet, the water is used inefficiently, and the water resource is not seen as an economic good.

Despite a growing population, an average of 88% of the region's water is *allocated* to the agricultural sectors, and only 7% to domestic use. 26% of the population is dependent upon the agricultural sector, which contributes with between 2.5-25% of the GDP. Although agriculture's contribution to GDP is relatively low in many countries (lowest for the oil-exporting countries), many people are dependent on agriculture. To improve allocation, *countries will have to decide how to make most efficient use of water, such as e.g. more "crop per drop", more "economic value per drop" or more "employment per drop"*¹⁶. For governments to be able to reallocate water from agriculture alternative employment options must be available.

The allocation of water to the agricultural sector can be linked with the policy of food security and self sufficiency in the region. This policy is, however, not realistic as there simply is not enough water available. Israel, for instance, became a net importer of food in 1970's and between 10% and 35% of all imports in the region is food related¹⁷.

Furthermore, the *water efficiency* is low: between 37-53%. For instance, water losses in the water-scarce Jordan and Palestine are 40-50%.¹⁸ One third of the domestic water use (in Jordan, Palestine, and Israel) is used for flushing toilets¹⁹.

Another important factor to inefficient water use and suboptimal water allocation concerns the pricing. In general *water for agriculture is heavily subsidised* in the region. In Jordan, for instance, the cost of water for agriculture is US\$0.01/m³, while water for domestic use in urban areas is one hundred times more expensive for the user: US\$ 1/ m³. Israel has the same size of subsidies. The subsidies provide disincentives for more efficient water use, allowing water intensive crops for export to be grown, e.g. cotton and citrus fruits, and distorting the local water economy.²⁰

Regional dimension: Aspects underpinning suboptimal water allocation, perverse economic incentives, and low water efficiency in a naturally water scarce environment, include: food-security policies, a fear that poor people will be affected by reallocating water from the agricultural sector, political difficulties to raise costs of water for irrigation in areas where farmers are powerful, and lack of knowledge of how water affects the economy. These are inherently issues that should be dealt with at a national level, but with obvious regional effects. Understanding the connections between water and the economy is crucial. Areas relevant for regional cooperation include: *(joint) research activities, and understanding impacts of policy instruments and sharing experiences with others.*

¹⁶ Tropp et al., 2006.

¹⁷ SIWI, 2008a

¹⁸ This can be compared with water leakages in water abundant Stockholm of around 25%, and in water scarce Windhoek of 4% (Klas Sandberg, personal communication 8 February, 2010).

¹⁹ Gidon Bromberg, personal communication, 31 January 2010.

²⁰ Gidon Bromberg, personal communication, 31 January 2010.

2.5 Security and power relations

Water governance in the Middle East is severely hampered by the instable political situation, a lack of coherent laws and incompatible political interests. *Cooperation around shared water resources is intimately linked to politics and issues of sovereignty*, and is in the Middle East mainly limited to bilateral agreements rather than on a watershed basis. In northern Africa, also cooperation around the Nile basin is heavily politicised.

Historically, water has more often been a subject of cooperation than violent disputes²¹. When disputes do occur they are mostly incidents at the sub-national level, and low water quality is often a cause. Although water is seldom the sole cause of disputes, it can act as both an irritant (make good relations bad and bad relations worse) and as a unifier (in basins with relatively strong institutions). *A great reliance on transboundary water resources translates into the potential for large-scale conflicts because changes in the amount of water that a country is receiving can significantly impact the viability of that country's economy, especially when the largest user of the country's water is agriculture*. Making the situation even more complicated is the presence of disputed lands and occupied territories. Since boundaries between sovereign nations e.g. in the Jordan river basin are not completely resolved, water-sharing agreements are relatively non-existent.²²

The hydrological interdependence may constitute a basis for cooperation, but there is a need to understand why and under what conditions such cooperation occurs. When *basin-wide cooperation is found it is usually done at the technical levels*, where benefits of cooperation are normally understood. However, other concerns than purely related to water play a pivotal role in determining water management decision: strategic concerns and security considerations are key ingredients. Therefore, there may be political reasons for hesitating or resisting cooperation.²³ Jägerskog (2009) states that in a politicised region (such as the Middle East), a thorough analysis of power structures must be performed before engaging into support in transboundary waters; if this is not done “there is a risk that investments may be misguided or that there is a risk that the results of the investments may be derailed by political conflicts not anticipated at the outset.”

Hydropolitical resilience in a basin is based on a positive response to change – *the institutional capacity of the basin to digest disturbance*. Hydropolitical vulnerability, on the other hand, is a gauge of the *risk of conflict if a change occurs*. This can be measured by analyzing the institutional capacity of the basin as well as by assessing whether historical events in the basin indicate a capacity for resilience.

According to Aaron T. Wolf (UNEP, 2009), the characteristics of a basin that would tend to enhance resilience to change include: international agreements and institutions, such as River Basin Organisations (RBOs); a history of collaborative projects; generally positive political relations; higher levels of economic development.

In contrast, facets that would tend towards vulnerability would include: rapid environmental change; rapid population growth or asymmetric economic growth; major unilateral development projects; the absence of institutional capacity; generally hostile relations; natural

²¹ The last 50 years has seen only 37 acute disputes (those involving violence); of those, 30 were between Israel and one or another of its neighbours, and the violence ended in 1970. Non-Mid East cases accounted for only five acute events, while, during the same period, 157 water treaties were negotiated and signed (UNEP, 2009).

²² UNEP, 2009.

²³ Jägerskog, 2005.

climatic variability— naturally variable rainfall patterns with frequent periods of floods and drought.

Water availability is already a key limiting factor to development in many countries of the MENA region, and climate change is expected to further limit the water availability. As many of the water resources are shared but the cooperation is ad-hoc and weak, there is a *risk that water will (continue to) be an irritant in the basins*. Increased water demand in combination with lower availability may lead to increased risks of conflict, and it *will* lead to increased competition between countries and water-using sectors. In the *Mid-East, most aspects point towards increased vulnerability rather than increased resilience in the basins*. For instance continue water issues to be a serious obstacle to the attainment of full peace between Israel and Syria and the Palestinians.

When it comes to cooperation over transboundary resources, trust will always be an important factor. If trust is lacking the so called “prisoners dilemma”²⁴ will lead the countries towards declining cooperation rather than embracing it.

3. Impacts of the water-related problems

The low water availability is a limiting factor for development in the MENA region, and it negatively affects household incomes, education, and nutrition and will have large social and economic consequences for the region. There are a number of links between human rights and “environmental security”. The human rights to food, work, shelter, health, and water, entitle everyone to adequate nutrition, livelihood opportunities such as secure tenure, and *sufficient, safe, accessible and affordable water for personal and domestic uses*. Fulfilment of these rights is challenged by water scarcity and climate change. A human rights approach to water in a regional context means, amongst others: identification of minimum water requirements and allocations for all; and catalysing international agreements on water issues thus contributing to resolutions of watershed disputes and conflicts between different users.

Water scarcity is linked to the right to work especially through the agricultural sector, but also through industry and services. When demand exceeds supply in this part of the world, it is mainly the agricultural sector that will feel the shortage. Climate change will reduce the amount of water available through higher evapotranspiration and reduced groundwater recharge, and it will further increase the need for water in the agricultural sector: A temperature increase of 1°C is likely to increase agricultural water demand by 10%.²⁵ In places where the agriculture is mostly on *subsistence* levels, the job opportunities provided are relatively large even if the sector’s contribution to GDP is low. Therefore, lower water availability for agriculture would affect the livelihood opportunities of the rural poor initially. On the other hand, as the withdrawal of water currently is unsustainable in some countries, and is expected to be even more so in the future, it is important for the households to diversify their economic activities, and for the countries to address the difficult issue of where to

²⁴ The “prisoners dilemma” is a fundamental problem in game theory that describes why two parties will not cooperate even if it is in their mutual interest to do so. Related to international agreements over shared natural resources, such as a transboundary river or aquifer, it relates to that riparian states will all benefit if the resource is managed well, if they can trust that all riparian states will act according to the agreement, for instance by limiting water withdrawal and pollution. However, if only one country limits its water use but the others don’t, this country will not be able to utilise the resource for economic development in the short term as the other countries will do, but the country will still suffer the long term consequences if the resource is unsustainably managed. If one party cannot trust that all other parties will apply to the rules, cooperation is unlikely.

²⁵ SIWI, 2008a.

allocate scarce water resources: greater economic value/litre; number of jobs/litre; or calorific value/litre? Education and training will be key to a successful transition to a more diversified economy. Food security could be better achieved by production of high-value crops (e.g. vegetables instead of rice or meat) with returns invested in food imports.²⁶ However, care should be taken *not to switch to high-value (but potentially risky) crops at the expense of increasing the vulnerability* of the agricultural sector to drought, etc.

3.1 Costs

According to AFED (2008), the *average annual cost of environmental degradation* in the Arab region is 5% of GDP. The World Bank (2007) estimates that *over-extraction of groundwater* is undermining national assets at rates equivalent to 1-2% of GDP every year in some countries, and that *environmental problems related to water* cost between 0.5 and 2.5% of GDP each year. Furthermore, it is estimated that the *costs of climate change* will be between 1.9% and 3.5% of GDP²⁷. If the MENA countries are not able to adapt their current water management practices to meet the combined challenges, the social, economic and budgetary consequences could be enormous.

3.2 Other development impacts

Water and climate change is related to many other developmental, environmental, security, and health aspects. Some examples of adverse impacts are given in Box 1 below:

- **Reduced water flows:** The Jordan River already shows a significant reduction of its natural flow (only 5-20% of the natural flow reaches the Dead Sea). With continued increased temperatures, water flow in the Jordan River may decrease by 80% and in the Euphrates by 30% before the turn of the century. This could have severe effects on the healthy functioning of these ecosystems, with additional negative effects for countries in the region.
- **Agricultural productivity:**
 - Subsistence farmers in the whole MENA region may come under significant additional risk as crop cycles and yields are negatively affected by reduced rainfall.
 - Reliance on irrigation leads to increased exposure to climate change impacts since crop production is directly threatened not only by rising temperature, increased evapotranspiration and decreased precipitation, but also by the availability of water supplies for irrigation. Reduced agricultural productivity will depress farmers' income and require diversification of household economies.
 - Euphrates River has been irrigated since 4,000 BC and played a crucial role in forming the 'Fertile Crescent' together with its sister Tigris. The 'Fertile Crescent', spanning from Iraq and Syria to Lebanon, Jordan and Palestine, would lose all traits of fertility and might disappear before the end of the century because of deteriorating water supply from the main rivers.
- **Human rights:** increased water scarcity will make it more difficult to fulfil human rights to water and sanitation, which will have an impact on the enjoyment of other human rights, such as the rights to education, health and work, which form an essential basis for poverty elimination and human development as well. On the other hand, recognizing water as a human right creates the political will to solve the water crisis, lowering poverty and raising health by establishing a partnership between the human rights and the water sector community
- **Health:** Climate change and population growth, coupled with rapid and informal urbanisation, will particularly affect hygiene and quality of drinking water, sewage, solid waste and air quality. Malaria will become more prevalent and enter new territories.
- **Land degradation:** Desertification is posing the most pressing threat to productive lands in the whole Arab region. Desertification is essentially a man-made phenomenon which is exacerbated by climate change.

²⁶ SIWI, 2008a.

²⁷ SIWI, 2008a.

- **Energy:** Water management and development is closely related to electricity generation, for instance from hydropower, transmission and distribution in the region. The electricity demand is growing fast, with 5-6%/year (about twice the world average of 2.7%), due to population growth, energy-intensive industry, and subsidised electricity tariffs and fuels, and lack of demand-side measures. Also desalination, irrigation, and water and wastewater treatment rely on power supply.
- **Sea-level rise:** Much of the region's infrastructure, economic activity and population centres are in the coastal zone and vulnerable to sea level rise, salt-water intrusion, and more frequent extreme weather events.
- **Migration:** Water deficits associated with higher incidence of extreme weather events such as heat waves and droughts could lead to broad consequences on migration flows within and between MENA countries, and from the region.
- **Tourism:** The tourism comfort will decline. Bleaching of coral reefs will affect tourism in countries in the Red Sea basins, mainly Egypt and Jordan. Beach erosion and sea level rise will affect coastal tourist destinations (Egypt, Tunisia, Morocco, Syria, Jordan, and Lebanon), which will affect national incomes.
- **Biodiversity** is already deteriorating. A 2°C rise in temperature, combined with a decrease in water availability could make extinct up to 40% of all the species.
- **Education:** Some schools in the region do not receive water every day, which affects school attendance – especially for girls. Education and training will be key parts in making the transition to a more diversified economy successful.
- **Conflict:** There is increasing evidence that unless countries apply economic policies that shift away from increased water use and establish strong resource management institutions; water will continue to act as an irritant and fuel political tensions between and within countries.
- **Disaster Risk Reduction:** The region's characteristic arid soil, erosion, and excessive runoff are conducive to natural disasters related to flooding and extreme precipitation; this has important implications for disaster risk management.
- **Gender:** Environmental degradation, water scarcity, climate change and disaster risks have important gender implications. Gender disparities influence both needs and possibilities to participate in development processes. Vulnerability and poverty are strictly connected to gender inequality. Women's responsibilities for family health, nutrition and sanitation, result in less time to participate in community affairs and decisions, and less time for recreation. Women have less means to cope, and are therefore more vulnerable to environmental shocks, such as droughts. And in general, for all these reasons the effects of disasters, climate change and other environmental changes are often different for women than men. Women are also disproportionately vulnerable to sexual exploitation, abuse, and other forms of violence, and these risks increase in times of disaster and conflict.

Box 1. Examples of impacts related to water scarcity and climate change. Sources: Tropp et al. (2006), Kjellen (2007), SIWI (2008a), AFED (2008), AFED (2009) and Klawitter et al (2007).

4. What are key actors doing to manage the problems?

4.1 International legal framework

The UN Convention on the Law of the Non-navigational Uses of International Watercourses (1997) is yet to be ratified but is recognized as the authoritative instrument of customary *international law governing transboundary watercourses* (surface water). Debates around this convention have mainly been focusing on the rule of *equitable and reasonable utilisation* and, specifically, the obligation *not to cause significant harm*. The convention can ultimately be

considered a rule that restricts the sovereignty of riparian countries for the mutual benefit of all riparian countries. Appendix 2 presents a list of countries that have ratified the convention. (Israel refrained from voting; Turkey is one of two countries that voted no.)

Related to climate change, the Kyoto Protocol continues to be the sole legally binding international agreement on reduction of greenhouse gases. The Copenhagen Accord is a political declaration that is not supported by all countries. In the MENA-region, only Tunisia, Morocco, Israel and Jordan have associated themselves with the Copenhagen Accord. There has been talk that only those countries associated with the Accord would be eligible for funding through the 'Copenhagen Green Fund' and the additional funding set out in the Accord for adaptation (\$30bn 2010-2012 and \$100bn/year by 2020). As it becomes clearer what the mechanisms will be for accessing this funding *Sida could explore whether MENA countries can access this money to use for adaptation in the water sector.*

4.2 Regional bodies and priorities

There are some 20 organisations working on regional water issues in MENA, from political to community level, including intergovernmental, international and non-governmental organisations. Many of the regional, predominantly sectoral, water institutions are described by SIWI (2009a) and others, and will not be repeated here. The only addition that will be made is the Arab Ministerial Water Council (originating in the League of Arab States), which was established in 2009. It provides a mechanism for Arab-wide political cooperation on water. They have biannual meetings and are advised by an executive bureau/consultative committee (where e.g. WB, AfDB, and other IFIs are standing members). As the Ministerial Water Council is so new, results remain to be seen.²⁸ It is worth noting that many regional Arab bodies related to water governance and management have been established recently, as *water increasingly is seen as a limiting factor for development.*

The MENA/Arab countries stated their priorities related to water resource management at the 5th World Water Forum (Istanbul, 2009). It is interesting to note that among the priorities are: *understanding the impacts of climate change*, vulnerability assessment and adaptation measures for water resources; and promoting *Integrated Water Resources Management (IWRM) and transboundary cooperation*. Other priorities are disaster risk reduction; ensuring water and sanitation for all and water for food; and improved water governance and management.

4.3 Transboundary institutions

There are a number of water-related agreements in the MENA-region, but these are often bilateral or tri-lateral agreements rather than an agreement between all riparian states. There are also a number of technical water committees, but they appear to be ad-hoc and exclusive (a few riparian states) rather than strategic and inclusive (all riparian states). The lack of strong institutions is a sign of how politicised regional waters are in the region, the low level of political will, trust and cooperation. As mentioned above, strong institutions are an important feature of basin resilience, and the lack thereof may increase the basin vulnerability.

4.4 National governments

Historic coping strategies for water scarcity in the MENA region have been to extract groundwater (with long-term consequences), increasing the use of treated wastewater, and

²⁸ Contact has been made with Ms Chahra Ksia, Director, at the Center of Water Studies and Arab water security in the Arab League. Awaiting reply.

desalination - the primary response in the more affluent countries. In Jordan, when demand exceeds supply, they exploit non-renewable fossil water. Recently, the richer countries in the region have even opted to lease land in other countries to produce the foodstuff they need. The poorer countries are facing a larger challenge to address the growing water scarcity.

Hence, until recently, the MENA-countries have adopted a supply-oriented approach to managing their water resources. However, managing the supply of water cannot in itself ensure that the needs of a country can be met in a sustainable way. Also demand-side activities need to be addressed. If water would be managed well, 200 million m³ of water could be saved in Jordan annually, and 500 million m³ could be saved in Israel; water that is much needed for both environmental needs and for domestic use²⁹.

It will, however, *not be sufficient to improve water management or increase water use efficiency; a dramatic change of water allocations is required* and seeking new ways of *improving rainfed agriculture* (e.g. through utilising green water).

Improving both national and regional water governance is much needed. This is difficult where there is a lack of trust or even hostilities between the countries, and where water is so politicised as in the MENA region (especially the Middle East).

4.5 Donors

There are many bilateral and multilateral donors, International Financing Institutions (IFIs) and organisations supporting regional water management in MENA, some of which are briefly described in this section. The general feeling amongst the interviewees is that transboundary water resource management is challenging but very much needed, and that donor coordination at the regional level in MENA is not very developed. Basically, a regional organisation, for instance in the Arab League-system, should be coordinating the support but donors need to cooperate and coordinate more to improve effectiveness and reduce overlaps.

The *UN-system*³⁰ (UNDP, ESCWA, UNEP, UNESCO) cooperates with the Arab League-system on water and climate change. ESCWA coordinates issues around climate change and water resources, and climate change and land resources. UNEP is hosting the Climate Change Centre, and UNDP is implementing the Water Governance Programme. UNEP and ESCWA are financing studies, for instance on *Climate change and shared waters* (UNEP); *Inventory of shared waters in Arab countries* (surface and groundwater) (ESCWA); *Pilot on water monitoring in small watersheds* (ESCWA); and *Impacts of climate change on water* (ESCWA). ESCWA is preparing support to *regional climate change modelling and downscaling*.

UNDP Regional Water Governance Program (RWGP) attempts to support both the political level, using a cross-sectoral approach integrating different socio-economic aspects of water governance, and the grass-root level through a rights-based approach, including a public awareness program around human rights to water, justice, etc (co-financed by Sida). *Challenges and opportunities for good water governance* will be identified. Furthermore, UNDP is arranging a meeting in March 2010 to initiate a *cross-sectoral dialogue on water*.

²⁹ Personal communication with Gidon Bromberg, 31 January, 2010.

³⁰ Personal communication with Carol Chouchani Cherfane, 1 February 2010; Dr. Hosny Khordagui, 1 February, 2010; and Léna Salamé, 29 January 2010.

Representatives from 4 different sector ministries (water, environment, economic, and social) are invited from the countries that have endorsed the RWGP.

In the MENA-region UNESCO works with conflicts and transboundary issues mainly through the Potential Conflict to Cooperation Potential (PCCP) programme. The PCCP is supporting process-oriented case studies focusing on river basin research and development, where dialogue is a positive side effect (e.g. one ongoing in the Jordan river basin, and one planned for Euphrates-Tigris basin); training in conflict management; and research. The PCCP has access to an international network of water experts, with national committees and national focal points. Besides Jordan and the Euphrates-Tigris basins, UNESCO tries to focus on overlooked basins.

EU and the Union for the Mediterranean (UfM)³¹: In EU-context, the Mediterranean is in focus, excluding the Arabic peninsula, Iran and Iraq. This is important as decisions and priorities might be very different depending on if it is the MENA or the Mediterranean countries that meet. *In the Mediterranean, EU is a strong actor*, and focuses on the Water Framework Directive and river basin management.

Turkey is not a part of the MENA-region, but an important political player in the Middle East and a powerful riparian country to some of the river basins, including the Euphrates-Tigris and the Orontes. Turkey voted no to the 1997 UN Convention (see section 4.1), and does not apply to internationally accepted principles on transboundary waters, including “equitable sharing”. There are hopes that the EU approximation could give leverage to Turkey’s cooperation over shared resources. The EU Water Framework Directive calls on EU-member countries to cooperate around shared waters. If the water resource is shared with a non-EU country, the EU-member state should “endeavour to produce a single unit of the basin”. This means that there must be *genuine efforts made by the EU-member*, and that failure to cooperate over shared water resources should not be the fault of the EU-member state. Although it is unclear if the EU will be able to enforce this type of cooperation, there are signs of improved relations between Turkey and its neighbours; Turkey has adopted a “zero problems” foreign policy, which means that all international problems should be solved. An important sign is that Turkey and Syria have entered into a number of agreements during 2009.³²

The up-coming long-term Mediterranean Water Strategy (MWS) will be the main guiding document for EU and UfM. The MWS will include 4 chapters: (i) Water governance including transboundary issues; (ii) Water and climate change adaptation; (iii) Water financing; and (iv) Water efficiency and WDM. The strategy will be presented and possibly approved at a Ministerial meeting in April 2010. Thereafter an Action Plan will be formulated. *The Action Plan is foreseen to be more difficult* and the views at the Jordan-meeting were much diverted (especially Turkey had doubts). One goal of the UfM worth noting is that River Basin Management Plans should have been adopted by 2009.

The Mediterranean EU-Water Initiative (MED EUWI) is a political initiative supported by the Forum of the Water Directors of the UfM. One of the objectives of MED EUWI (OBJ-2) is to assist meeting targets related national and transboundary IWRM plans. However, it seems that currently only national processes (Lebanon, Egypt) receive support. Other MED EUWI

³¹ Personal communication with Vangelis Constantianos, 21 January, and Danuta el Ghuff, 28 January 2010.

³² Personal communication with Annika Nilsson, 10 February, and Peder Spångberg, 3 February.

support includes thematic papers, a regional assessment on water supply, sanitation and health (prepared by WHO), and a number of workshops and meeting platforms. Lessons from the MED EUWI include: *Anchoring activities at high political level is crucial and an absolute asset; policy dialogue is time consuming; stakeholder participation is critical to set the agenda - activities must respond to a demand; capacity building of partners is crucial; and expectations must be realistic.*³³

Furthermore, the EC is funding the CIRCE project aiming at predicting and quantifying the physical *impacts of climate change in the Mediterranean*, and to assess the most influential consequences for the population of the region. CIRCE develops regional case-studies and develops specific modelling scenarios for the Mediterranean region.

Besides the above, the EC is supporting water in the region in other ways, for example through de-pollution investments (e.g. HORIZON 2020) and regional cooperation in the areas of energy, transportation, and water. Transboundary water cooperation is very challenging compared to energy and transportation, as water is more politically sensitive.

Switzerland/SDC³⁴: SDC is supporting regional water resource management in the MENA region. For instance they are collaborating with Global Water Partnership Mediterranean (GWP-Med) around the Orontes River. SDC is furthermore trying to investigate a possible emerging entry point to support regional water issues in the Mid-East, through the Strategic Foresight Group (SFG). The SFG-publication “The cost of conflicts in the Middle East”, was very well received by the governments in the region, who invited SFG arrange a high-level seminar on water and security during February 2010. The seminar was very well attended and is seen as a first step in a process followed by more consultations and encounters to find collaborative solutions to the water problems of the region. *This process may be a good entry point for future regional cooperation and should be followed.* There might be an opportunity for Sida to cooperate with SDC and SFG on the economics of water.

Other bilateral donors on the regional level include the US, for instance through co-funding the EXACT Executive Action programme, which is a water database project for the Mid-East. There have been two meetings per year, even in times of high political conflict, *i.a.* due to US persistence. There is a growing consent among Palestinian civil society and officials, which view EXACT as promoting Israeli and US interests.³⁵

4.6 Gaps and overlaps

Interviews with stakeholders and the literature review reveals some areas that are crowded, and areas where there are gaps or need for reinforced support. Some gaps and overlaps are listed below.

General issues

The non-governmental organisation AFED highlights an alarming deficiency in scientific and technological capabilities in the MENA-region. The rate of expenditure on scientific research is around 0.2% of GDP in the Arab region, very low compared to the world average of 1.4%.

³³ MED EUWI, 2008

³⁴ Personal communication with Thomas Walder, 4 February 2010.

³⁵ Jägerskog, 2007.

There is also a general lack of priority given to environmental management; in average less than 1% of the national budgets are allocated to environmental purposes.³⁶

There is a lack of primary data on watershed monitoring. There is also a knowledge gap on how to measure, manage, and collect information (knowledge management). Although groundwater is important to the MENA-region, groundwater does not receive a lot of attention. For instance, it is not known how groundwater resources will be affected by climate change. Furthermore, many donors seem to focus on a few large river basins, such as the Jordan River and the Red-Dead canal. Smaller river basins, such as the Orontes or Al Kabir, are more overlooked.

Policies that deal with agriculture, trade, energy, real estate, finance, and social protection, and that affect overall economic diversification may have more impact on water management than many policies championed and implemented by water-related ministries. Water is a cross-cutting issue and must be dealt with as such, in an integrated way and through integrated dialogue. This is currently a gap, as water is mostly treated in a sectoral way. The integrated, cross sectoral communication is crucial when it comes to water issues, but is currently weak.

There is a need to improve integration of socio-economic aspects of water use and water efficiency, and include all different water using sectors. There are currently no regional programmes that focus primarily on the water economy, with trust- and peace building being a secondary or long-term goal. However, there are some work done related to the socio-economic aspects of water and water accounting, e.g. by the Friends of the Earth Middle East and The Center for Environment and Development for the Arab Region and Europe (CEDARE).

Water governance is currently weak in most countries, although they are progressing at different speed. There is currently no forum available for exchange of lessons learnt within (and outside?) the region, with study visits and discussions.

UN ESCWA states that there is a lot of support to transboundary water resource management and IWRM, and too much focus on workshops. Rather more attention should be put on implementation and technical cooperation. The issue of water quality is emerging but overlooked.

Political interest in climate change is emerging, but, according to AFED (2009) virtually no work has started to prepare the countries for climate change challenges. “Specifically, no concerted *data gathering* and *research* efforts could be traced regarding the *impacts* of climate change on health, infrastructure, biodiversity, tourism, water, and food production. The economic impact seems to be totally ignored.” Although the EU CIRCE project has several case studies for the region and is building up a body of evidence, the general point remains valid. There need to be much more focus on *monitoring* of the water resources (surface and groundwater), supporting the efforts of regional climate change modelling and downscaling, and *capacity to interpret and understand the results of the downscaling*, on vulnerability assessments and adaptation measures.³⁷ Kjellen (2007) furthermore recommends support to i.a. increase *public awareness* on increasing climate variability, implementing

³⁶ This can be compared to a World Bank “rule of thumb” of 1.4-2.5% of the budgets in developing countries that ought to be allocated towards the environmental sector.

³⁷ Personal communication with Bo Holst, 4 February, 2010.

adaptation *demonstration projects*, promoting *IWRM*, networking and experience-sharing, development of some sort of *regional integrated assessment framework for climate adaptation strategies*, for instance in urban areas, to identify projects that have large marginal benefits, and an assessment of the current development *loan portfolio* in the region to understand the degree to which climate change risks are or are not integrated into current loan projects.

Transboundary water resource management

Establishment of River Basin Organisations (RBO) is under consideration.³⁸ However, the enabling environment for transboundary cooperation around shared watercourses is currently not there. Establishing a legal and institutional framework for joint management of water resources is crucial.

Although there is a heavy reliance on groundwater resources in the region, most attention is focused on shared surface water. Tropp et al. (2006) mentions the North Western Sahara Aquifer System (Tunisia, Algeria, Libya) as an interesting case of cooperation around shared groundwater resources.

4.7 Sweden in the MENA-region

Some voices about Sweden's comparative advantages in the region:³⁹ Sweden and Sida is considered to be *neutral, have important financial and human resources, a long-term commitment and a willingness/ability to follow through*. Sida is furthermore seen as a serious donor that is working with *issues of prime importance* (human rights, gender, water, etc.). These aspects have resulted in a reputation of a strong and robust partner.

Many cooperating partners have troops in the region, or are in other ways perceived as biased or driving their own agenda. In this sense, Sweden (and Switzerland) is in a quite unique position in the MENA-region, which perhaps is especially important in the Euphrates-Tigris Basin. Sweden has been able to initiate cooperation with countries otherwise resisting third-party involvement or hesitating regional cooperation. A prime example is the International Training Programme (ITP) for the Euphrates-Tigris basin, where all countries were represented and attendance was endorsed by the respective governments. Also the other ITPs in the MENA region such as Transboundary Water Management and Climate Change have broad attendance.

In general terms, Sweden has a quite large experience from supporting IWRM and transboundary water resource management. The Swedish resource base include (but is not limited to) experience in demand-side management and water saving technologies; changing from political boundaries to an ecosystem approach for water management; training, research and education; collecting, interpreting and communicating climate change information; assessing policy instruments, etc.

5. Lessons learnt from other regions

This section will summarise some general lessons learnt from Sida's support to transboundary water resource management in different regions relevant to the MENA-region. More detailed information and lessons from other basins are presented in Appendix 3.

³⁸ MENA/Arab (2009); and personal communication with Carol Chouchani Cherfane, 1 February 2010;

³⁹ Personal communication with: Léna Salamé (28 Jan 2010); Hosny Khordagui (1 Feb 2010); Klas Sandström (8 Feb 2010);

5.1 General lessons learnt⁴⁰

In general, there are *three broad lessons* from setting up the regulations and management structure for river basins:

- The legitimacy of bringing a treaty into force is critically important;
- The institutional arrangement and responsibilities for the treaty implementation are fundamental to its ongoing effectiveness and adaptability;
- Mechanisms for monitoring and even enforcement need to be in place to facilitate the dialogue around compliance.

Other important lessons include:

- Regional basin cooperation requires support in setting up an enabling environment.
- The result of the work is heavily dependent on the national capacity in the riparian countries. Local institutions must understand their role in a transboundary context.
- One important aspect of transboundary water cooperation is to understand the power structures in the region. It may be fruitful to “level the playing field” by targeting support to the relatively weaker part.
- Monitoring of transboundary water management (TWM) interventions is not well developed but is receiving more attention.
- TWM interventions require a long-term perspective and take time to show results (10-20 years). Jägerskog (2007) states that support to TWM in a politicised area are seldom rewarding immediately and involves *high-risk*. If cooperation is achieved, however, the *support is highly rewarding*.
- Short- or medium-term results that can be expected include: increased networking, establishment of institutions, and capacity development.
- Process financing is key.⁴¹

5.2 Lessons from Southern Africa, Mekong, and the Baltic Sea⁴²

Southern Africa

The *Swedish Initiative for Regional Water Resource Management in Southern Africa* has, since its inception in 1996, developed a strategy that guides the program. Focus is given to three river basins, as well as to thematic areas of strategic concern related to IWRM. All projects financed by the Regional Water Initiative is promoting the same goal, which gives a comprehensive approach, where each intervention is complementary and reinforcing the other. Support is given both to political levels, through River Basin Organisations (RBOs), as well as to local levels, through support to communities to participate in decisions concerning their natural environment.

The partner countries in the Southern African region perceive Sida as a trustworthy and reliable partner, that: (i) *does not have an own agenda*; (ii) *respects national sovereignty*; (iii) *supports processes of creating ownership*; (iv) *respects that TWM takes time*; and (v) *is flexible*.

Key success factors to Sida’s support to TWM in SADC appear to be:

- The long-term commitment

⁴⁰ If nothing else is stated, all information related to Southern Africa and Mekong is taken from Ramböll, 2009. Information related to the Baltic states is based on personal communication with Lars Eklund, Sida, and the Helcom website.

⁴¹ Jägerskog, 2007.

⁴² If nothing else is stated, all information concerning Southern Africa and Mekong is taken from Ramböll, 2009.

- Visible presence (Sida has been present in the field since 1996). The unbroken presence of a Sida officer in the region has led to close cooperation and mutual understanding of needs and demands, which has been appreciated.
- Support is based on needs identified in/by the region
- Open and flexible support, can adapt to changes during the process
- Coordination with other donors gives less vulnerability for individual projects
- Committed local project implementers (“finding the right partner”)

Mekong

Sida has been supporting the Mekong river since the 1980s. An agreement on cooperation around the lower Mekong was entered into 1995. The -95 agreement emphasise sovereignty and territorial integrity and denies the Mekong River Commission (MRC) enforcement power, and the rules for water allocation are highly specified.

The MRC has been successful in building up technical expertise and providing a dialogue platform in a politically very sensitive environment. However, as the -95 agreement is more limiting than empowering the mandate of the MRC, it remains quite weak when it comes to implementation. The MRC seems to focus mostly on technical issues and has a functional approach that environmental/water cooperation will have spill-over effects on conflict management. *It does not receive enough high-level political attention and issues of sovereignty are more important than the betterment of the whole basin.* However, it can also be concluded that, in an environment as sensitive as the Mekong, transboundary water management will take time. And technical cooperation is probably better than no cooperation at all.

Baltic Sea⁴³

Important lessons from the Baltic Sea cooperation include the importance of *high-level political attention* from all riparian states, working towards a *common, clearly defined goal*, having a *strong institution* overseeing the implementation, and funding provided by *complementary and well-coordinated donors and IFIs*.

6. Implications for Sida

6.1 Conclusions

Based on this brief desk study the following can be concluded:

1. Water scarcity is a key environmental issue and a major constraint to economic and human development in the MENA region.
 - o Climate change is expected to further reduce water availability. Water quality is a growing concern.
 - o Water supply strategies must be complemented by demand-side and water efficiency activities. It will, however, not be sufficient to improve water management or increase water use efficiency; a dramatic change of water allocations is required.
 - o Water is a transboundary resource and the water dependence in the region is high. This interdependence requires – and may constitute a basis for - regional cooperation.

⁴³ Personal communication with Lars Eklund, 25 February, 2010.

2. Water in the MENA region, especially in the Middle East, is a highly political issue, which complicates transboundary water cooperation. However, cooperation around technical issues, development and research activities are less sensitive.
3. The presence of strong institutions, international agreements and trust, combined with clearly stated goals and political buy-in, are important features of a successful regional cooperation and to promote basin resilience.
4. Support to TWM is a long-term process and high risk endeavour, albeit potentially very rewarding.
5. Support should be based on needs identified in/by the region and respond to a demand. Community participation is critical to set the agenda. Inter-state activities should be anchored at high political levels.
6. The result of TWM is dependent on national capacity. It might be fruitful to support the relatively weaker riparian to “level the playing field”.
7. There is a general lack of capacity related to scientific research, water economy, monitoring of surface and groundwater, collecting and interpreting climate change information, knowledge management, adopting and implementing an integrated approach to water resource management, and understanding effects and sharing experiences of governance reforms and policy instruments.
8. Sweden has a unique position in the MENA region of being a flexible, neutral, and robust partner, able and willing to cooperate with all countries in the region.
9. Teaming up with like-minded donors will spread the risk and may increase the leverage.
10. The ITPs should not only be seen as capacity development support, but constitute important entry points to deepened cooperation.

6.2 Issues for Sida to consider

Sida should consider developing a strategy for the Swedish regional water programme in MENA. The strategy could include a geographic (one or a few river basins or transboundary aquifers) and thematic focus considering Sweden’s comparative advantages. The strategy would then guide all interventions to become mutually reinforcing and complementary.

TWM has been identified as a priority by the MENA/Arab countries, although the interest varies for different countries. TWM would be facilitated by a legal framework and an enabling environment. Sida may want to investigate if support could be given through existing regional organisations, e.g. within the Arab League system, to establish structures and support systems that will enable formation of RBOs.

Sida should consider what criteria to use when choosing the geographic area to support. Perhaps if there is a history of support and a network established, or if there are any entry points elsewhere. Sida’s human and financial resources will be one important criterion. Examples could be supporting the *Euphrates-Tigris*, considering the unique position of Sweden (and Switzerland) and utilising the ITP as an entry point. Another example is to

cooperate on the already initiated support to *Orontes* together with SDC and GWP Med. The Orontes is a small basin, but one entry point might be the fact that Turkey is downstream. One complicating factor is that Syria has wanted to include the Euphrates-Tigris in the discussions over Orontes; perhaps the basins should be dealt with separately to start up with. If the Orontes is chosen, Sida could consider giving bilateral support to Syria to level the playing field, e.g. through support to national IWRM plan, to develop policy instruments to improve water allocation, etc. A third idea would be to support groundwater management, for instance the *North Western Sahara Aquifer System*. This seems to be an overlooked area, both geographically and thematic.

In the targeted basins, Sida could, carefully, step by step, and with a humble approach, support different steps towards the formation of a RBO. The *expectations must be realistic*; although the long-term objective could be ‘a sustainable, equitable and efficient use of the shared waters’, and the medium- to long-term outcome could be the ‘formation of an efficient and capable RBO’ or ‘signing of an agreement’; immediate outputs should be more limited. Immediate outputs could include supporting joint research, studies, or development activities with poverty alleviation and trust building benefits where a need have been identified, for instance related to water quality, water economy, monitoring, experience sharing, etc. It is important to also *use process indicators* when monitoring result. The activities should consider the importance of *trust-building* at all levels, and support could be targeted to both political dialogue opportunities in a ‘safe’ environment, to technical cooperation and project implementation, and to community development support. Sida could also consider giving specific support to the relatively weaker country if that is deemed fruitful. Sida could consider teaming up with other donors, to improve the muscles and spread the risk. The cooperating partner will depend on the basin. For instance, in very sensitive basins such as the Euphrates-Tigris, perhaps Switzerland is the only possible partner.

In order to fuel a political demand and enhance regional ownership, support to thematic areas of strategic concern should be considered. Sida could consider supporting ongoing activities, for instance relating to *water economy*, *water demand management*, or to *climate change* modelling and downscaling. The results should be *communicated* and widely disseminated.

Another strategically important area is *capacity development*. Sida may want to investigate the possibilities to support regional research institutes, or teaming up the ITP participants with Swedish research institutes in relevant areas, to perform joint research that are needed and develop research capacity in the region.

Lastly, it is not likely that transboundary water cooperation alone will create peace and stability in the region, especially in such a torn region as the Middle East. However, access to clean and sufficient water and sustainable and equitable management of the shared resources will reduce tensions, water would be less of an irritant and the basin vulnerability would be reduced, which would be beneficial for peaceful development of the region.

List of references

- AFED, 2009. *Arab Environment: Climate Change – Impact of Climate Change on Arab Countries*. Mostafa K. Tolba and Najib W. Saab (Eds.). Report of the Arab Forum for Environment and Development, 2009.
- AFED, 2008. *Arab Environment: Future Challenges*. Mostafa K. Tolba and Najib W. Saab (Eds.). Report of the Arab Forum for Environment and Development, 2008.
- Arab Countries, 2009. 5th World Water Forum – Key messages of the Arab Countries Regional Process.
- EU Water Initiative (EUWI), 2009 *Annual Report Summary*.
- EU Water Initiative Mediterranean (MED-EUWI). *Brief Report on Activities 2008*.
- IPCC, 2007.
- Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, 2007: Africa. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK, 433-467.
 - Cruz, R.V., H. Harasawa, M. Lal, S. Wu, Y. Anokhin, B. Punsalmaa, Y. Honda, M. Jafari, C. Li and N. Huu Ninh, 2007: Asia. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 469-506.
- Jägerskog, Anders, 2009. *Issue paper on Development Assistance and its underlying assumptions – what can functionalism and realism tell us?* Sida, Regional Team for Environmental and Economic Development (REED), Draft, December 2009.
- Jägerskog, Anders, 2007a. *MENA Water Overview: Transboundary Cooperation, IWRM and Opportunities for Swedish Engagement*. SIWI Paper 12, Stockholm, June 2007.
- Jägerskog, Anders 2005. “Functional water co-operation in the Jordan River Basin: Spillover or spillback for political security?” In Brauch, H. G., J. Grin, C. Mesjasz, N. Chadha Behera, B. Chourou, U.O. Spring, P.H. Liotta and P. Kameri-Mbote (Eds.). *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts* Berlin: Springer Verlag.
- Kjellen Bo, et al., 2007. *Issues Paper: climate change in the Middle East and North Africa: Impacts and Adaptation Options*. SEI, December 2007.
- Klawitter, Simone and Quazzaz, Hadeel, 2007. “Water as a human right: the understanding of water in the Arab Countries of the Middle East” in *Water Resources in the Middle East*. Springer Berlin Heidelberg.
- Phillips David J.H., Anthony Allan, Marius Claassen, Jakob Granit, Anders Jägerskog, Elizabeth Kistin, Marian Patrich and Anthony Turton, 2008. *The TWO Analysis - Introducing a Methodology for the Transboundary Waters Opportunities Analysis*. SIWI Report 23, 2008.

- Phillips David J.H., Marwa Daoudy, Stephen McCaffrey, Joakim Öjendal and Anthony Turton, 2006. *Trans-boundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing*. Ministry for Foreign Affairs, Sweden.
- Ramboll, 2009. *Learning Review of Transboundary Water Management Interventions – Preliminary Report*. Ramboll Natura, December 2009.
- SIWI, 2009a. Regional Water Intelligence Report. *Regional Institutions of the MENA Region*. Ancillary Regional Water Intelligence Report, January 2009.
- SIWI, 2009b. Water and Energy Linkages in the Middle East. Middle East Seminar Report, World Water Week 2009. Jakob Granit, and Rebecca Löfgren (Eds.).
- SIWI, 2008a. Regional Water Intelligence Report, Middle East. Report to Sida, Stockholm, July 2008.
- SIWI, 2008b. Regional Water Intelligence Report, Middle East. Update Report July to December 2008. Drought and Financial Crisis. Report to Sida, Stockholm, December 2008.
- Tortajada Cecilia, 2007. Water governance in the MENA region: Critical Issues and the Way Forward – The Case of Stakeholder Participation and Public Awareness, Third World Centre for Water Management.
- Tropp Håkan and Anders Jägerskog, 2006. Thematic paper: “Water Scarcity Challenges in the Middle East and North Africa”. *Human Development Report 2006 – Water for Human Development*. Stockholm International Water Institute, Final Draft 23 February, 2006.
- UNDP, 2009. *Arab Human Development Report 2009. Challenges to Human Security in the Arab Countries*.
- UNEP, 2009. *Hydropolitical Vulnerability and Resilience along International Waters ASIA*.
- UN Economic and Social Commission for Western Asia (ESCWA), 2009a. *Knowledge mapping and analysis of ESCWA Member States’ Capacities in Managing Shared Water Resources*. United Nations, New York, 2009.
- UN ESCWA, 2009b. ESCWA water development report 3. Role of desalination in addressing water scarcity. United Nations, New York, 2009.
- UN ESCWA, 2006. Regional Cooperation between countries in the management of shared water resources: case studies of some countries in the ESCWA region. United Nations, New York, 2006.
- Union for the Mediterranean (UfM), 2008. Barcelona Process: *Declaration of the Euro-Mediterranean Ministerial Conference on Water*. Adopted at the Euro-Mediterranean Conference on Water held in Jordan on 22 December 2008.
- Wilk, J. and Wittgren, H.B. (eds), 2009. Adapting Water Management to Climate Change. Swedish Water House Policy Brief Nr. 7, SIWI, 2009.
- World Bank, 2007. *Making the Most of Scarcity - Accountability for Better Water Management Results in the Middle East and North Africa*.

Internet sources (accessed January-February, 2010)

Arab Centre for the Studies of Arid Zones and Dry Lands (ACSAD):

<http://www.acsad.org/aboutACSAD.htm>

Arab Forum for Environment and Development (AFED). <http://www.afedonline.org/en/>
AFED, 2009; Tobla Mostafa K. and Najib W. Saab (eds.). *Arab Environment Climate Change. Impact of climate change on Arab countries.*

<http://www.afedonline.org/afedreport09/Full%20English%20Report.pdf>

AFED, 2008. *Arab Environment: Future Challenges.* <http://www.afedonline.org>

Centre for Environment and Development for the Arab region and Europe (CEDARE):

<http://www.cedare.int/cedare.int/Main.aspx>

CIA The World Factbook. <https://www.cia.gov/library/publications/the-world-factbook/index.html>

CIRCE – Climate Change and Impact Research: The Mediterranean Environment:

http://www.circeproject.eu/index.php?option=com_frontpage&Itemid=1

COP15 Copenhagen 2009:

<http://www.denmark.dk/en/menu/Climate-Energy/COP15-Copenhagen-2009/cop15.htm>

EU Water Initiative: <http://www.euwi.net/>

Helsinki Commission, HELCOM: <http://www.helcom.fi/>

Human Development Report 2009, HDI ranking. <http://hdr.undp.org/en/statistics/>

Israel/Palestine Center for Research and Information. <http://www.ipcri.org>

Brooks David B., *Water Demand Management as governance: Lessons from the Middle East and South Africa.* <http://www.ipcri.org/watconf/papers/david.pdf>

Klawitter Simone, and Hadeel Quazzaz. *Water as a human right: The understanding of water in the Arab countries of the Middle East.* Heinrich Boell Foundation, Arab Middle East Office. <http://www.ipcri.org/watconf/papers/simone.pdf>

Strategic Foresight Group. The cost of conflict in the Middle East – Excerpts from the report.

<http://www.strategicforesight.com/Cost%20of%20Conflict%20-%206%20pager.pdf>

Syria Today. <http://www.syria-today.com/>

-Syria-Turkish Hydrodiplomacy, by Marwa Daoudy, January 2010. <http://www.syria-today.com/index.php/focus/5260-syrian-turkish-hydrodiplomacy>

-Parting the waters, by John Dagge, January 2010. <http://www.syria-today.com/index.php/focus/5259-parting-the-waters>

UNEP GRID-Arendal, UNEP GRID-Arendal, Water scarcity index.

<http://www.grida.no/publications/vg/water2/page/3240.aspx>

Union for the Mediterranean: www.ufm-water.net

- Water Expert Group, Conclusions from first meeting 7-8 September 2009

UN Water for life decade, 2005-2015. <http://www.un.org/waterforlifedecade/scarcity.html>

World Water Week (WWW), Report 2009: <http://www.siwi.org/>

Syria Today, January 2010 Issue No. 57. <http://www.syria-today.com/>

- Dagge John: *Parting the Waters*
- Daoudy Marwa: *Syrian-Turkish Hydrodiplomacy*

Personal contacts

Akkadia, *Klas Sandström*. Telephone conversation, 8th of January 2010.

EU Water Initiative: *Maria Vink*, European Commission. Telephone conversation, 20th of January 2010.

European Delegation, Amman: *Danuta el Ghuff*. Telephone conversation, 28th of January, 2010.

Friends of the Earth Middle East, Good Water Neighbours.

Gidon Bromberg, Co-director Israel, Telephone conversation 31st of January, 2010

Nader Al-Khateeb, Co-director, Palestine, Telephone conversation 31st of January, 2010

Global Water Partnership Mediterranean (GWP-Med): *Vangelis Constantianos*, Executive Secretary. Telephone conversation, 21st of January, 2010.

Ministry of the Environment, *Annika Nilsson*, Division of Natural Resources. Telephone conversation 10th of February, 2010.

Ministry of Foreign Affairs, *Peder Spångberg*, Country Officer Turkey. Telephone conversation 3rd of February, 2010.

Sida – Consulate General of Sweden in Jerusalem: *Magdalena Svensson*. Consul, Development Cooperation (Infrastructure and Economic Development). Telephone conversation, 29th of January, 2010.

Sida – Embassy of Sweden in Nairobi: *Anders Jägerskog* Senior Programme Manager Water Resources, Regional Team for Economic and Environmental Development (REED). Telephone conversation 3rd of February, 2010.

Sida, *Lars Eklund*, Team Ukraine and Team Belarus. E-mail correspondence 25th February, 2010.

SMHI, *Bo Holst*. Telephone conversation, 4th of February, 2010.

Stockholm International Water Institute (SIWI): *Jakob Granit*, Project Director. Telephone conversation, 2nd of February, 2010.

Swiss Development Cooperation (SDC): *Thomas Walder*. Telephone conversation, 4th of February, 2010.

UNDP Regional Office Cairo: *Hosny Khordagui*, Programme Director, Regional water governance programme. Telephone conversation 1st of February, 2010.

UNESCO, *Léna Salamé*, Programme Specialist, Division of Water Sciences. Telephone conversation 29th of January, 2010.

UN ESCWA, *Carol Chouchani Churfane*, Chief, Water Resources Section, Beirut. Telephone conversation 1st of February, 2010.

Appendix 1: Table Water Availability in the MENA region

Ranking	Country	Total internal renewable water resources ³ (km ³ /year)	Groundwater: produced internally ³ (km ³ /year)	Surface water: produced internally ³ (km ³ /year)	Water resources: total renewable per capita ³ (m ³ /capita year)
108	Iraq	35.20	1.20	34.00	3 287
131	Iran	128.50	49.30	97.30	1 955
141	Syria	7.00	4.20	4.80	1 622
149	Lebanon	128.50	49.30	97.30	1 261
155	Morocco	29.00	10.00	22.00	971
156	Egypt	1.80	1.30	0.50	859
162	Tunisia	4.15	1.45	3.10	482
163	Algeria	13.90	1.70	13.20	478
164	Djibouti	0.30	0.02	0.30	475
165	Oman	0.99	0.96	0.93	388
167	Israel	0.75	0.50	0.25	276
168	Yemen	4.10	1.50	4.00	223
169	Bahrain	0.004	0.00	0.004	181
170	Jordan	0.68	0.50	0.40	179
172	Malta	0.05	0.05	0.00	129
173	Saudi Arabia	2.40	2.20	2.20	118
174	Libya	0.60	0.50	0.20	113
176	Qatar	0.05	0.05	0.001	94
178	United Arab Emirates	0.15	0.12	0.15	58
179	Palestine (Gaza)	0.05	0.05	0.00	52
180	Kuwait	0.00	0.00	0.00	10

Source: Tropp and Jägerskog, 2006. Thematic paper: “Water Scarcity Challenges in the Middle East and North Africa”. *Human Development Report 2006 – Water for Human Development*. Stockholm International Water Institute, Final Draft 23 February, 2006.

The country selection is based on the World Bank’s definition of the MENA region.

N.B. The water dependency ratio refers to *surface water*. Many of the countries that have zero water dependency ratio do in fact share transboundary groundwater aquifers with other countries.

Appendix 2: Parties to the UN Watercourses Convention

Currently 18 countries have ratified the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses. In order for the Convention to enter into force, 35 ratifications are required.

Parties to the UN Convention:

Spain: 24 Sep. 2009
Tunisia: 22 Apr. 2009
Uzbekistan: 4 Sep. 2007
Germany: 15 Jan. 2007
Libya: 14 June 2005
Portugal: 22 June 2005
Qatar: 28 Feb. 2002
Netherlands: 9 Jan. 2001
Iraq: 9 July 2001
Namibia: 29 Aug. 2001
Hungary: 26 Jan. 2000
Sweden: 15 June 2000
Lebanon: 25 May 1999
Jordan: 22 June 1999
Finland: 23 Jan. 1998
Syria: 2 Apr. 1998
Norway: 30 Sep. 1998
South Africa: 26 Oct. 1998

Source: WWF

http://www.panda.org/what_we_do/how_we_work/policy/conventions/water_conventions/

Appendix 3: Lessons from other regions

Lessons from Southern Africa⁴⁴

The Southern African development Community (SADC) region has in some ways similar water characteristics as the MENA region, for instance the fact that water is unevenly distributed, many of the countries has a semi-arid or arid climate, and water being a shared resource. The region has been torn by wars, is still deeply affected by poverty and low human development, and there has been varying degrees of distrust and (non-violent) conflicts over water.

The SADC-region has established a legal framework for transboundary water resource management through a SADC Protocol, which is based on the 1997 UN-convention. Through provisions in the Protocol, the SADC Secretariat is facilitating the establishment of River Basin Organisations (RBOs), a process that often is supported by donors.

The *Swedish Initiative for Regional Water Resource Management in Southern Africa* started in 1996, and has developed a strategy that guides the program. The support is aiming at supporting the Southern African region to utilise its water resources sustainably, equitably and efficiently. The focus is on three river basins (the Zambezi, the Okavango, and the Pungue), capacity development and awareness raising activities, through for instance higher education and research on IWRM. Also thematic regional support can be given to issues of strategic concern (such as monitoring, water demand management, and water quality).

The partner countries in the region perceive Sida as a trustworthy and reliable partner, that: (i) *does not have an own agenda*; (ii) *respects national sovereignty*; (iii) *supports processes of creating ownership*; (iv) *respects that TWM takes time*; and (v) *is flexible*.

Sweden has been giving support to *inter alia* the Okavango river basin, through different interventions (from the political to the grass root level), for many years. This support is a good example of a “broad, long lasting, complementary, coordinated” support based on articulated needs in the region (Ramböll, 2009). The approach to work both top-down and bottom-up has been successful and has created trust between the parties, and awareness of the issues. It is a good example of how to achieve mutual interaction between poverty related issues on the local level, and more policy related issues on the regional institutional set up.

Key success factors to Sida’s support to TWM in SADC appear to be:

- The long-term commitment
- Visible presence (Sida has been present in the field since 1996). The unbroken presence of a Sida officer in the region has led to close cooperation and mutual understanding of needs and demands, which has been appreciated.
- Support is based on needs identified in/by the region
- Open and flexible support, can adapt to changes during the process
- Coordination with other donors gives less vulnerability for individual projects
- Committed local project implementers (“finding the right partner”)

⁴⁴ Ramböll, 2009, is used as a reference for this section.

Lessons from the Mekong river basin⁴⁵

Although the Mekong Committee was established over 50 years ago, an agreement on cooperation in the lower Mekong was only signed in 1995, after the ending of the cold war. The members of the Mekong River Commission (MRC) have agreed to cooperate around issues concerning transboundary sustainable development, the uses, management and protection of water and other resources. The -95 agreement emphasise sovereignty and territorial integrity and denies the MRC enforcement power, and the rules for water allocation are highly specified. The MRC has no mandate to overrule the decisions taken by member states. Sida has been supporting the Mekong river since 1980s. Although Sida is emphasising the environmental aspects of the support, also issues of water governance should be further spelled out. The former head of SENSAs has stated that a “stronger commitment to regulation will be necessary” and that sooner or later the countries will have to “compromise their sovereignty for the betterment of the river basin as a whole”.⁴⁶

One of the most important results, albeit difficult to measure, of donors (including Sida) support to the basin is the establishment of a successful framework for dialogue in a region of much political sensitivity. One important achievement of the MRC is that the true size and economic value of the Mekong fisheries have been established, and from there, the importance of the fishery resources to the region and especially to the poor is understood. However, when it comes to the actual implementation of the agreement, results and impacts are less impressive. The resource data and technical information is impressive, but the state-of-the-art hydrological modelling is not used proactively for managing and regulating the Mekong. The MRC collaboration is still fragile; the linkages between MRC and national development planning processes is weak, and MRC receives limited attention from decision makers and civil society in the riparian countries. On the positive side, the attention given to MRC from the international community may have made the riparian countries more careful when planning development projects with transboundary impacts.

Key observations from Sida’s support to the MRC:

- Only little reference is given to MRC’s role within water governance in Sida’s documents. Sida’s focus has rather been on policies concerned with environmental protection and poverty reduction.
- Although Sida states a belief in that TWM is “a vehicle to promote peace, stability, and regional economic development”, the consultants argue that maybe the MRC is neither in a good position to contribute to poverty reduction, nor to be an instrument in conflict management.
- Sida has been supporting the MRC since 1996 with around 155 million SEK, and it would be difficult to conclude that the support has contributed to any substantial poverty reduction and environmental protection in the region – at this stage.

Thus, it can be concluded that the MRC has been successful in building up technical expertise and providing a dialogue platform in a politically very sensitive environment. However, as the -95 agreement is more limiting than empowering the mandate of the MRC, it remains quite weak when it comes to implementation. The MRC seems to focus mostly on technical issues and has a functional approach that environmental/water cooperation will have spill-over effects on conflict management. It does not receive enough high-level political attention and issues of sovereignty are more important than the betterment of the whole basin. However, it

⁴⁵ Ramböll, 2009, is used as a reference for this section.

⁴⁶ Christer Holtsberg, quoted in Ramböll (2009).

can also be concluded that, in an environment as sensitive as the Mekong, transboundary water management will take time. And technical cooperation is probably better than no cooperation at all.

Lessons from the Baltic Sea⁴⁷

The Baltic Sea is different from the MENA-region in that sense that it is not water scarce, the riparian countries are developed, and the level of education and human development is in general high. Furthermore, besides the cold war and frosty relations, there have not been any major violent conflicts in many years. However, there might still be some interesting lessons to learn from the cooperation around the Baltic Sea.

The Helsinki Commission (HELCOM) works to protect the marine environment of the Baltic Sea from all sources of pollution and is the governing body of the Helsinki Convention. HELCOM was established in 1974, but the “real” work with improving the Baltic Sea environment and implement the Baltic Sea Action plan was able to fully take off after the establishment of the Action Plan at the end of the cold war. The Action Plan was important in that it provided a clear goal that was easy to communicate, which is important to receive political support. Furthermore, the Action Plan gave guidance to donors and International Financing Institutions (IFI) on priorities. The highest polluters to the Baltic Sea were identified (the ‘hot spots’), and joint efforts of the riparian states were initiated to decrease the amount of pollution by channelling funds to where the impact would be the greatest; where we would get the most “bang for the buck”. Sweden through Sida has been providing grant-based funding for infrastructure investment around the Baltic Sea, mainly in the Baltic States, North-western Russia, Poland and Ukraine. Besides reducing pollution to the Baltic Sea, Sida’s goal was to support institutional reforms of the water sector in the countries.

Sida has teamed up with other Nordic donors and IFIs, such as the World Bank (WB) and the European Bank for Reconstruction and Development (EBRD). This approach has been successful and given synergetic effects:

- the partner countries have benefitted from grants to “soften” the credits from the IFIs;
- Sida has been able to provide funding for environmental improvements of great benefit to the marine environment, for instance to wastewater treatment plants;
- The combination of support to institutional reforms and investments has proven to be very effective.
- The supervision has been performed jointly between Nordic donors and IFIs and thus the administrative and human resources have been used efficiently;
- “Free” money for investment can be suboptimal because the money may not always go to the highest priorities. Attaching grant funding to loans render the investment a higher political interest and give leverage to institutional reforms.

Important lessons from the Baltic Sea cooperation are the importance of high-level political attention from all riparian states, working towards a common, clearly defined goal, having a strong institution overseeing the implementation, and funding provided by complementary and well-coordinated donors and IFIs.

⁴⁷ E-mail communication with Lars Eklund, 25 February 2010.