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Working Group 1:

Water and Security - Can local planning and action further contribute?

Background Paper

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watersum

Sustainable Use of Transboundary Water Resources and Water Security Management Project

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1. Defining water security: what should be achieved?

As defined in GWP declaration, water security, at any level from the household to the global, means that **every person has access to enough safe water at affordable cost to lead a clean, healthy, and productive life, while ensuring that the natural environment is protected and enhanced**[1]. The Ministerial Declaration of the World Water Forum II (WWF2), entitled 'Water Security in the 21st Century', listed seven 'main challenges' to achieving water security:

1) meeting basic needs;
2) securing food supply;
3) protecting ecosystems;
4) sharing water resources;
5) managing risks;
6) valuing water; and
7) governing water wisely.

Water security arises at two interconnected levels: local/national and regional/international. At the local/national level, the **security of access to the resource is the crucial problem**. Consequently, good water governance appears to be pivotal to achieve water security.

This paper assesses local water security for improved water management in selected countries in the MENA region. The countries relevant for this assessment are **Morocco, Algeria, Tunisia, Libya** and **Egypt** in North Africa; and **Lebanon, Jordan** and **Syria** in the Middle East.

2. Why MENA countries are vulnerable to water unsecurity?

The **Middle East and North Africa (MENA)** covers an extensive region, extending from Morocco to Iran, including the majority of both the Middle Eastern and Maghreb countries[2]. The

[1] Definitions of water security emerged: Grey and Sadoff (2007) defines water security as the availability of acceptable quality and quantity of water for health, livelihoods, ecosystems, and production, coupled with acceptable level of water-related risk to people, environments and economies. UN Water defines water security as the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human wellbeing, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability (UN Water, 2013).

[2] MENA has no standardized definition; different organizations define the region as consisting of different territories. World Bank considers the following countries as countries from MENA region: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, West Bank and Gaza, Yemen. Sometimes also included in broader definitions are Armenia, Azerbaijan, Cyprus, Mauritania, Somalia, Sudan, Turkey and Western Sahara.

population of the region is large and continues to experience significant growth. Currently, MENA region is home to about 386 million people, with an average annual population growth rate of 1.7%.

MENA is the driest and most water-scarce region in the world, and this is increasingly affecting the economic and social development of most countries of the region. Population of 6.3 percent of the world's total currently used only 0.7 percent of the world's available freshwater resources. In addition, MENA region faces other major development challenges. These include a rapidly growing young population, high unemployment rates, and vulnerability to price shocks and climate change. The region also faces some political and security challenges, including extremism.

Why water security is particularly important for MENA region? Firstly, the region as a whole and most of countries are severely exposed to above mentioned threats:

- Water is already scarce in the MENA region, and that will be further discussed in following chapters. The region is exposed on both physical water scarcity (limited access to water, caused by water shortage or unsustainable management - over abstraction) and socio-economic scarcity (society's economic inability to develop additional water resources or social inability to adapt to the conditions imposed by physical scarcity). This scarcity will only grow over time due to increasing population, expected economic growth, and the likely impacts of climate change on water availability and demand;

- Low institutional capacity to manage water resources and water supply services, particularly at the local and community level, namely water governance deficiencies in MENA countries include failure to provide sufficient water for poor and marginalized areas, lack of attention to water legislation and infrastructure, and inability to balance competing demands between socio-economic needs and the environment. This will also be discussed in following chapters;

- Poverty trap, widely present in the Middle East and North Africa, further make more complex the issue of water security. The need for water security is particularly acute in rural and poor communities. Water is critical for economic growth and social wellbeing, so improved water governance requires understanding the social, economic and institutional links between reducing poverty and ensuring access to safe water;

Secondly, the Fourth Assessment Report of the International Panel on Climate Change projects dramatic changes in climate across the MENA region during this century. Under average climate change scenario, MENA's water shortage will increase fivefold by 2050—from today's 42 km^3 to approximately 200 km^3 (World Bank, 2012). Drinking water services will become more erratic than they already are. Cities will come to rely more and more on expensive desalination and on emergency supplies brought by tanker or barge. Service outages stress expensive water network and distribution infrastructure. In irrigated agriculture, unreliable water services will depress farmers' incomes and lower productivity. The economic and physical dislocations associated with the depletion of aquifers

or unreliability of supplies will increase. All of these developments will have short- and long-term effects on economic growth and poverty and will increasingly pressure public budgets (World Bank, 2012).

3. Major issues

In spring 2015 project team of the Project "Sustainable Use of Transboundary Water Resources and Water Security Management", Component 2, "Water and Security" (WaSe), performed the assessment of local water security for improved water management in selected countries in the MENA region, in order to plan the project's implementation phase. Assessed countries were **Morocco, Algeria, Tunisia, Libya** and **Egypt** in North Africa; and **Lebanon, Jordan** and **Syria** in the Middle East. Assessment results point out on some important issues of water security in MENA region, as presented in the following chapters.

3.1. Political and economic context

The total MENA surface area (21 countries) comprises of 11.1 million km^3, accommodating population of 381 million. Main climatic and environmental features include arid conditions in the region (about 85 per cent of the area is desert) and scarcity of water resources. MENA region is richest in oil and gas reserves and one of the poorest in renewable water resources.

Currently MENA countries face major development challenges, from rapidly growing young population, high unemployment rates, vulnerability to price shocks and climate change to some political and security challenges, including extremism and, most recently, violent conflicts in Libya and Syria. After the deep social and political changes in 2011 the region is still fragile and suffers from (mainly youth) unemployment, poverty and regional disparities. The recent events in the Arab world, have added new challenges to the fragile peace and security situation in the region.

MENA region also faces growing challenges from environmental stresses, resulting from population pressures, urban growth, water scarcity and pollution, desertification and climate change exacerbating water shortages.

Although the development planning framework differs significantly in the analysed countries, it can be concluded that there are significant improvements in this area.

Given the above mentioned, all analysed countries can be classified in three categories of suitability for Water SUM component 2 project intervention[3], according their current political and economic circumstances:

[3] The overall objective of the project "Sustainable Use of Transboundary Water Resources and Water Security Management - WaterSUM" is to promote and enhance sustainable water resources management and to promote a comprehensive and integrated approach to water security and ecosystem services for sustainable development in

- Countries in which it is not possible to implement the project activities due to war operations and serious security threats (Syria and Libya);

- Countries with fragile economic and, more important, political situation, exposed to certain security risks due to regional conflicts and internal tensions, in which it is possible to implement the project activities, but difficulties caused by internal political and structural constraints can be expected (Algeria, Egypt and Lebanon);

- Countries in which the implementation of project activities should not encounter major problems due to political and economic constraints (Morocco, Tunisia and Jordan).

3.2. Local responsibilities and power

Although an old commitment, decentralization in MENA countries still not been satisfactorily developed, even though in a number of countries—especially in North Africa—reforms have been initiated in order to decentralize their systems. Central governments retain substantial powers to intervene in local affairs, mainly through the position of officials who are appointed by central governments, and local elected authorities have in fact been kept under central government control. As a result, municipalities manage and implement central government programmes rather than their own, and are subject to the control of central government.

Municipal, provincial or regional level institutions are often hybrid structures, i.e. they are at the same time decentralised local authorities (with elected assemblies) and de-concentrated administrative units. There is often competition between the two kinds of local institutions, and as the jurisdictions are not clearly defined this often results in overlap, redundancy and conflict.

Decentralization in the region was mainly a top-down initiative, frequently initiated by international pressure, and by international aid agencies. Recently number of analysed countries accelerated decentralization processes (again as a top-down process), and have taken concrete steps towards a more decentralized system, mainly as a result of recent political changes in the region (notably Tunisia and Jordan). It seems that there is widespread recognition throughout the region that local governments need to become more transparent and accountable to local citizens. However, these reforms have been counterbalanced by measures that in fact increase the power of supervision by centrally appointed government representatives (notably Morocco and Algeria).

beneficiary countries in the MENA region in order to help halt the downward spiral of poverty, biodiversity loss and environmental degradation.
The project is divided into two components: Component 1, "Water Resources Management Good Practices and Knowledge Transfer" (Water POrT); and Component 2, "Water and Security" (WaSe). The goal of the WaSe component is to promote a comprehensive and integrated approach to water security and ecosystem services for sustainable development in 12 municipalities and their local communities in Morocco, Tunisia and Algeria as part of efforts to combat water scarcity, reduce the threat of conflicts and increase overall human wellbeing within the wider context of ensuring regional peace and stability.

Quality of municipal planning remains a key challenge for municipalities throughout MENA. Planning schemes are usually guided by the master planning approach (usually called 'General Plans' or 'Comprehensive Plans'), focusing almost exclusively on the spatial and physical planning of the city. There is a lack of consideration of stakeholder involvement by any means because there was limited mechanism for including them in the preparation or implementation of plans.

Local authorities have the lack of resources and financial power, and the low level of local resources. In many cases local administrations are overstaffed with little productivity, lacking technical expertise and transparency. Consequently, majority of responsibilities assigned to municipalities have remained fairly ineffective and their services are not sufficient. However, although numerous constraints hinder the decentralization process and local governments' functioning, and financial and political decisions still happen at the top, local authorities in most MENA countries gradually learn to exert some key local functions, even if they have seen a shift in terms of responsibilities without the related changes in power.

3.3. Water resources and water issues

Water resources are overexploited and the situation will probably worsen in the future. Most of the region is classified as arid or semi-arid and water is a scarce resource. Some 126.5 billion cubic metres of total renewable water can be mobilized annually in the eight analysed countries, which mean that currently total water demand exceeds naturally available water supplies by almost 20 per cent. Moreover, the quantity of water available varies considerably among MENA countries (from 113 m^3/inhabitant/year in Libya and 129 m^3/inhabitant/year in Jordan to 933 m^3/inhabitant/year in Lebanon), but still below the 1,000 m^3/inhabitant/year threshold in all analysed countries. Average water availability per capita has dramatically shrink in the last few decades (from an average of 2,925 cubic metres a year in 1962 to 1,179.6 in 1992 and to an alarming 743.5 in 2011) as a result of high population pressure, lower rainfall and higher evaporation due to climate change, overexploitation, poor water management and other issues. Current overall annual water demand in analysed countries is 102 billion m^3, and it is projected to reach 160 billion m^3 until 2050 (under average climate scenario). Consequently, the unmet demand (currently 6.6 billion m^3) will increase more than tenfold, to 65.5 billion m^3, endangering Egypt, Morocco and Syria the most. So, the threat of an imbalance between water demand and supply in MENA region is real, but significant progress has been made through government efforts and the financial backing of international organizations.

Indicator	Algeria	Egypt	Jordan	Lebanon	Libya	Morocco	Syria	Tunisia
Basic Human Needs Water and Sanitation	76.25	96.39	92.46	98.82	N/A	54.56	N/A	82.67
Total renewable water resources *per capita*	297.6	710.5	128.8	933.8	112.9	878.6	767.2	419.7
Water Stress Index (WSI)	19	11	31	5	22	9	3	23
Water Resources Vulnerability Index (Crit. Ratio)	49.04	117.15	100.41	29.09	618.00	43.48	99.76	61.75
Water Criticality Index	3	4	4	2	4	3	4	4
Water Scarcity Index (WScI)	0.790	0.977	0.973	0.830	0.988	0.844	0.999	0.907
Water Exploitation Index (WEI)	60	74	53	26	N/A	46	35	55
Social Water Stress Index	26	17	43	13.2	N/A	16	4	31
Water Poverty Index (RWPI)	79.37	74.94	81.09	86.91	78.89	70.5	81.20	81.55
Baseline Water Stress (BWS)	3.44	1.33	4.59	4.54	4.84	4.24	3.85	3.44
Water Dependency Ratio	3.6	96.86	27.21	0.79	0	0	72.36	8.71
Water footprint *per capita*	1,216.30	1,096.64	1,302.69	1,498.60	2,055.92	1,531.46	N/A	1,597.06

Figure 1. Water scarcity related indicators' matrix for eight countries covered by the study

To meet escalating demand, MENA countries rely on both conventional water resources (surface water and groundwater) and nonconventional (desalinated water, treated wastewater, irrigation drainage water, water harvesting and cloud seeding). From analysed, Jordan, Morocco and Syria depend more heavily on groundwater. Today's unmet demands are met primarily through unsustainably mining fossil groundwater reserves and partially by increasing water supplies through desalination. As a result, the water table is decreasing strongly in recent years, with salinization of some (mainly coastal) groundwater, particularly in North African countries.

Main weaknesses of water systems in analysed countries include:

- The general state of the network of water pipes is outdated and undersized and in serious need of rehabilitation, reinforcement, repair and maintenance. **Enormous amount of water produced is non-revenue water**, lost through network breakdowns, leakages and through illegal consumption. Rates of systemic water loss from the municipal sector are excessive (estimates in Jordan, for example, of up to 70 per cent; 51 per cent in Algiers, compared with 7 to 20 per cent in Europe), due to high leakages in the water supply network);

- Similarly, **wastewater infrastructure is outdated and in chronic need for maintenance**. Although wastewater treatment and reuse has been promulgated as high priority policy, especially in most water scarce countries, additional efforts are needed to establish efficient reuse systems (water pricing reforms, infrastructure upgrading, awareness rising, etc);

- Use of water per sectors is inefficient, with **high water allocations to agriculture** (84 per cent of overall withdrawal on average in analysed countries; more than 80 per cent in Egypt, Libya, Morocco, Tunisia and Syria), municipal purpose (10 per cent on average), and industry (six per cent on average). Algeria, Jordan and Lebanon have more balanced water usage, with nearly one third of overall water used as municipal. As a result, prices for municipal use are high, subsidizing agriculture water use (as it is the case in Jordan);

- **Pricing of water is non-efficient**, followed by mismatch between water intensity rates with production and value rankings. Coverage and monitoring of water meters is in many cases inadequate;

- **Adequate water conservation programs and government subsidies to encourage conservation are limited or lacking**;

- **Product structure in agriculture is inappropriate** throughout the region, including the growth of water intensive crops for exports, such as citrus fruit;

- **Political instability in the region** has also acerbated the water scarcity issues, raising new alarms over water scarcity.

Another important issue is the deterioration of water quality, which is closely linked to water scarcity. Water quality is often at the lower limit of the standards and degradation of water resources in the region is now reaching its limits. The high demand for the limited water supply often leads to decreasing water quality, both for domestic use, through an intermittent water supply provided to elevated tanks; and for agriculture, because of increasing water salinity caused by groundwater overexploitation. Moreover, the rapid growth of the industrial sector often results in discharge of untreated water in natural water bodies. Today the cost of environmental degradation of water forms a significant part of GDP: almost 1.2 per cent in Jordan and Morocco; one per cent in Egypt and Lebanon.

The recognition of the political importance of water seems to be improving in the region, and water is more and more seen as a priority area among the governments. This has been the result of the increase in the education and awareness levels of the population, which keep improving together with the progress of their socio-economic conditions, and the strengthening of the civil society. However, it has also been the result of the scarcity of the resource, the threat of climate change, the growing competition for water among various users, and the increasing investments for water infrastructure.

There has been a notable progress at the level of institutions and governance approaches in the region. Reform of water policies, national water plans, and financial approaches are the major factors in this regard. All of the analysed countries, except Egypt, are ruled by a single water acts. Strategic framework is also comprehensive: except Algeria (water strategy is still under preparation), all of the analysed countries have developed either long term national water strategy or national water master plan, including some countries that issued the both documents. Majority of analysed countries developed water sector strategic and action documents by using IRWM approach, and with well-designed horizontal and vertical coordination. Being developed in close cooperation with international aid agencies, those documents form a stable ground for national initiatives and projects in water sector.

Water sector institutional setting in analysed countries is largely centralised and managed mostly at the national level with little local stakeholder or civil society participation, resulting in ineffective, fragmented structures**, with the ministry in charge on the top of the decision making pyramid and clear hierarchy in the water sector**. The ministry assume ultimate responsibility for the country's water sector. Even in countries where responsibilities are largely decentralized, true devolution of powers has not been achieved. Responsibilities are decentralized, but matching powers or resources are not transferred. The local representative of the State (governor, wali, prefect, etc.) always has more power than municipal leaders. Moreover, the governor who represents central authorities but is more aware of local realities must often follow the instructions of central ministerial services. This is clearly the situation in Algeria, Morocco, Jordan and Tunisia and to a lesser extent in Egypt where some governors concentrate large powers.

However, the process of decentralization seems to be progressing, with river basin organizations, water boards, and regional water entities (river basin agencies in Algeria and Morocco; regional water establishments in Lebanon; CRDAs in Tunisia), being either established or improved. Egypt, Jordan, Lebanon, and Morocco seem to be more advanced than other countries, reflecting modern water principles in national legislation. However, the coordination between different water related institutions is a major water governance issue. Rivalries between water institutions are common, and the responsibilities of each body are not always clearly established. Efforts have been targeted to improve the accountability of the water sector operators and institutions, and the spread of the use of economic instruments has taken place throughout the region. The same applies to the progress in water demand management and water conservation practices.

Implementation of water policies showed modest levels of cross-sectoral coordination with ineffective permanent structures or institutions. The reasons are manifold and includes, among other, overlap of responsibilities among sectors, uncoordinated plans of action, lack of incentives for coordination, power politics, lack of transparency and fear of exposure, and lack of synchronization. Various levels of institutional fragmentation and overlap of responsibilities do exist, often inhibiting an effective IWRM. Planning and management is separate from budgeting processes. **The enforcement of laws, the implementation of water pricing reforms and water governance-related issues, are still challenging**. Most efforts have failed due to inadequate compliance or poor enforcement.

When comparing analysed countries towards the overall water government capacity, it can be noted that some countries are more advanced. **Jordan and Morocco both have high capacity for organization in the water sector**, demonstrated through both high policy and legal improvements, as well as the inclusion of all relevant government organizations, encompassing not only those in the water sector, but also those in the closely related sectors of agriculture and the environment. Division of power allows the Jordan Valley, Jordan's primary and productive agricultural region, to develop and use water differently than the cities and surrounding desert areas. A major concern is still the shortage of trained and competent personnel to serve as local water

authorities. High capacity is also evident for infrastructure development, operation and maintenance in both countries.

Despite the recognition of several positive trends and tendencies within the analysed countries, many challenges remain. **Water sector's financing gap represents one of the main shortcomings in implementing water plans/strategies**. The water sector, predominantly publicly owned with little private sector involvement, has funding shortages. Significant portion of financial support from donors through loans and grants is still covering the largest part of infrastructure investments. Cost recovery is generally low and impacts water services' financial sustainability.

Population growth will exacerbate the already existing water crisis. The population of MENA countries, estimated at 309 million in 2000, is expected to reach about 651 million by 2030, putting greater pressure on water infrastructure. Rising living standards and a sizeable young population pressing for enhanced economic growth, will further boost water demand. The expected increase in population growth related water stress will affect most countries in the MENA region, but groundwater-based countries (Algeria, Tunisia, Libya, Jordan), which already suffer from water stress, will be most severely affected.

Climate change risks may worsening this situation to the point where social conflicts arise as water resources become scarcer and access to water more difficult. The overall trend in reduced precipitation, coupled with higher temperatures and rates of evaporation, will reduce agricultural and pastoral productivity. A rise in sea levels is also predicted to impact large areas in MENA region. With growing demand for water, especially in cities, as well as growing shortages due to prolonged droughts, water will increasingly be allocated away from agricultural areas, causing rural hardship and accelerating migration to cities and abroad. Projected changes in climate will further exacerbate existing challenges of providing adequate infrastructure, housing, employment and social services, heightening the potential for social, political and economic conflicts. More or less, all analysed countries are exposed to similar weaknesses that can worsen their vulnerability to climate change. They are over-dependent on water sensitive economic sectors, such as agriculture, grazing, eco-tourism, aquaculture, etc. Ecological base is already harmed, particularly in water pollution, land degradation, desertification and the loss of biodiversity. Moreover, technological skills, financial and human resource are relatively limited to improve water sector's resilience towards climate changes.

Recognizing these future challenges, most MENA countries have identified a number of potential actions that could take to reduce its vulnerability, particularly with respect to its water and agricultural resources. However, when it comes to the progress made on the water-related adaptation policy framework, various assessments show that **progress has tended to be limited to moderate** in MENA countries.

The participation of NGOs and Water User Associations (WUAs) in water planning and implementation is increasing all over MENA region, particularly in local water management consultations. Moreover,

water user associations demonstrate the importance of joining local knowledge with modern information tools. Local community stakeholders and WUAs have been established throughout the region, aimed to foster farmer's participation in the irrigation sector with roles and responsibilities between the government and the farmers evolving over time. However, **stakeholder participation in water issues in analysed countries is modest in water planning and inadequate in implementation of the plans**. Although the participatory approach is relatively recognised through the implementation of WUAs, the effective participation in water management and decision making remains weak and in some countries without the supporting legislations. Main constraint to WUAs' sustainable function in the region is only nominal support to decentralization. This includes the lack of necessary incentives (policy and technical guidance, mechanisms and regulations), but also low (local) capacities and limited or non-existent accessibility of local communities to decision making.

4. Instead conclusion: does mena region need a gradual shift towards local water planning?

Improved local water governance, which we understand to include all aspects of management, decision making and participatory planning around sustainable water resources management, water demand management, and water and sanitation service delivery, is crucial to achieve equitable development and management in countries with scarce water resources. As discussed in previous chapters, many different actors, from national governments to local end-users, have an important role in creating the necessary enabling environment (policy, legislation, accountability, funding, capacity development). The starting point as well as goal is therefore, the realization that integrated water resources management can only be effective and sustainable if responsibilities of relevant government agencies are shared with communities and other local stakeholders who directly use, draw benefits from, but are also largely dependent upon such resources.

As discussed in previous chapters water sector institutional setting in analysed countries is largely centralised and managed mostly at the national level with little local stakeholder or civil society participation, resulting in ineffective, fragmented structures. As water shortages intensify, the many competing interests that exist in the use and allocation of water have to be respected and taken into account through a process of dialogue and concerted action. Consequently, local level ownership and accountability needs to be strengthened. Accountability for management measures – a requirement to improved access to and use of water resources - needs to be strengthened at both the level of end-users, communities, and local government agencies. This shift from highly centralised to decentralised planning and implementing structures should be based on the following principles in MENA countries (as suggested in Amman Seven Principles for Improved Local Water Governance) (EMPOWERS Partnership, 2007):

- Local water governance should be based upon the integrated participation of all stakeholders and end-users at all levels;

- Especial efforts are required to include the marginalized groups in decision making;
- The efforts of all actors (government, donors, civil society) should be harmonized and should contribute to achieving agreed and locally owned visions and strategies;
- Capacity building and organizational change is required, particularly in decentralized levels of government;
- Water information should be considered a public good; and access to information should be enabled for all citizens.

5. References

EMPOWERS Partnership (2007). Principles and Policy Recommendations for Improved Local Water Governance

Grey, D. and C.W. Sadoff. (2007). 'Sink or Swim? Water security for growth and development.' *Water Policy*. Vol.9, No. 6. 545-571.

Milutinovic, S. (2015). 'Local Water Security Assessment for Improved Water Management in Selected Countries of the Middle East and North Africa (MENA) Region'. *Report submitted for the Water SUM Project*. Budapest: REC.

UN-Water (2013). *Analytical Brief on Water Security and the Global Agenda*. http://i.unu.edu/media/unu.edu/publication/34287/UNWater_watersecurity_analyticalbrief.pdf. Assessed April 24th, 2015.

World Bank (2012). *Renewable Energy Desalination: An Emerging Solution to Close the Water Gap in the Middle East and North Africa.* Washington, DC: World Bank.