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Economic and Social Commission for Western Asia (ESCWA)

A Conceptual Framework for Understanding Water Security

in the Arab Region

Draft Working Paper for Discussion

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Introduction

In terms of water scarcity, the Arab States are among the most water scarce in the world with 18 out of 22 Arab States falling below the renewable water resources scarcity annual threshold of 1,000 m^3 per capita and 13 member countries falling below the absolute water scarcity threshold of 500 m^3 per capita per year.[1] The total renewable water resources available in the region for the year 2014 range from as low as 5.9 m^3/capita/year in Kuwait to 2,931 m^3/capita/year in Mauritania.[2] The freshwater scarcity situation in the Arab region is exacerbated by additional factors such as dependency on transboundary water resources, declining water quality, accessibility constraints due to occupation and conflict, climate change, non-revenue water losses, high unaccounted for water, accessibility and intermittency, inefficient use of water and high population growth rates. In 2015, there were over 51 million people in the Arab region that lack access to basic drinking water services, and over 74 million people without access to basic sanitation services.[3] Furthermore, while over 56 per cent of the Arab region's population now lives in cities,[4] water for agriculture remains a priority to ensure food security and maintain rural livelihoods in the region's middle and low income countries, which is significant as the agricultural sector continues to consume nearly 80 per cent of the region's freshwater resources. Energy expenditures needed for desalination and pumping water from distant sources and deep groundwater aquifers add to the financial burden to meet water demand.

Figure 1. Water Scarcity in the Arab Region.

Source: FAO AQUASTAT database – Food and Agriculture Organization of the United Nations (FAO). Available from http://www.fao.org/nr/water/aquastat/main/index.stm.

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[1] FAO, AQUASTAT database. Available from http://www.fao.org/nr/aquastat/. Accessed 30 March 2015.

[2] Ibid.

[3] WHO and UNICEF (2018). *Joint Monitoring Programme for Water Supply, Sanitation and Hygiene: A snapshot of Drinking Water, sanitation and Hygiene in the Arab Region*.

[4] United Nations Human Settlements Programme UN-Habitat (2012). The State of Arab Cities 2012/2013: Challenges of Urban Transition. Second Edition. Nairobi (December).

The water scarcity in the region has been perceived as tantamount to water insecurity for many Arab States. This is more so in countries sharing water resources with other countries, specifically downstream countries. In the Arab region there are 27 shared surface water basins with 14 countries out of the 22 Arab countries being involved as riparian States[5, 6]. The number of shared groundwater resources in the Arab region outnumbers that of shared surface water basins, with 40 shared aquifers present in 21 out of 22 Arab countries[7,8]. This concept of equating water quantity to water security was the prevalent concept up to the 1990s. Water security was largely used to express a condition of having sufficient water supply to satisfy the demands of a state's population. More recently there has been a gradual shift towards the individual's water security away from traditional notions of security and conflict.

Water Security

Water security is a popular concept with a range of proposed definitions but without consensus upon one. Although there is no linear development of the concept either, certain trends can nonetheless be observed. Up until the 1990s, the term "water security" was largely used to express a condition of having sufficient water supply to satisfy the demands of a state's population. This was most easily represented by the "Falkenmark indicator" which identified thresholds for "water stress" (1,700 m^3/capita/year), "water scarcity" (1,000 m^3/capita/year) and "absolute water stress" (500 m^3/capita/year).[9] Water scarcity, thus, was perceived as tantamount to water insecurity. This holds true in particular for the Arab region where a majority of countries fall below the threshold of 1,000 m^3 per capita per year. Nevertheless, the Falkenmark indicator is typically applied to countries as a whole, which can only indicate the average water security of a state but not of each of its inhabitants. Another dimension that has been proposed for defining water security is a dimension of national water independence as a criterion for water security, comparable to the concept of food sovereignty. This is potentially appealing in the case of the Arab region, where most of the available freshwater resources are transboundary in nature. The resultant "dependency" on external flows has thus been viewed as a key security issue. The driving force behind this dimension is the link between environmental stress and violent conflicts which had surfaced in the 1980-1990s[10] and were then also extended to the resource water.

Whereas most definitions mentioned so far are preoccupied with national water security, traditional notions of security have increasingly withered away as the level of attention is more and more shifting towards the individual's water security.

Following the end of the cold war, security studies were liberated from an almost exclusively state-centred focus, giving way to approaches that focused instead on the security of the individual human being or of ecological systems. This trend was propelled by the introduction of the concept of "Human Security". The argument was that while territorial security is still important it is insufficient because it does not necessarily

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[5] ESCWA and Federal Institute for Geosciences and Natural Resources (BGR) (2013). Inventory of Shared Water Resources in Western Asia (E/ESCWA/SDPD/2013/Inventory). Beirut.

[6] Food and Agriculture Organization (2006). WRI Major Watersheds of the World Delineation Database.

[7] ESCWA and Federal Institute for Geosciences and Natural Resources (BGR) (2013). Inventory of Shared Water Resources in Western Asia (E/ESCWA/SDPD/2013/Inventory). Beirut.

[8] International Groundwater Resources Assessment Centre (2015). Transboundary Aquifers of the World. Available from http://www.un-igrac.org/ggis/tba.

[9] Falkenmark, M., 1989. *The massive water scarcity now threatening Africa: why isn't it being addressed?*. Ambio, 112-118.

[10] Note particularly the publications by Thomas Homer-Dixon (1991; 1994; 2001; also with V. Percival (1996); and with J.Blitt (1998)); Kaplan (1994); Günther Bächler (Bächler et al., 1996; Bächler and Spillmann, 1996a,b); and Michael Klare (2001). Note as well that Homer-Dixon and Bächler did also mention the influence of other socio-economic factors, whereas Kaplan and Klare mainly attributed resource scarcity alone to the emergence of violence. Regardless of this surge in academic salience, many scholars have pointed out that it has already been long known that competition over resources constitutes a potential cause for warfare (Renner et al., 1991).

imply the security of all individuals or population groups of a country. Secondly, this new approach also broadened the security agenda to not only consider military threats to territorial integrity and national sovereignty, but rather a security from a broader range of threats. These were categorised into: economic security, food security, health security, environmental security, personal security, community security, and political security.[11] Water in fact relates to each of these categories and due to its centrality for Human Security, water has thus also come to be regarded a security issue.

In terms of "water security" definitions, the Human Security concept has become the predominant notion nowadays, having influenced most of the broader definitions of water security. On the other hand, many narrow and discipline-specific definitions coexist – its contents depending on the respective background. These do not necessarily follow the Human Security approach, but most do.

Several actors have attempted to conceive a comprehensive and integrative definition of water security by fitting in as many of the aspects usually discussed under its umbrella as possible into one single definition and addressing various scales of security from the regional to the nation to the interstate to the household. The probably most cited and representative are presented in Table 1.

Table 1. Most cited definitions of water security

Source	Water security Definition
Ministerial Declaration of The Hague on Water Security in the 21st Century (March 22, 2000)	*Ensuring that freshwater, coastal and related ecosystems are protected and improved; that sustainable development and political stability are promoted, that every person has access to enough safe water at an affordable cost to lead a healthy and productive life and that the vulnerable are protected from the risks of water-related hazards*
Global Water Partnership (2000)[12]	*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*
Grey and Sadoff (2007)[13]	*The availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems, and production, coupled with an acceptable level of water-related risks to people, environments, and economies*
UN Water (2013)[14]	*The capacity of a population to safeguard sustainable access to adequate quantities of and acceptable quality water for sustaining livelihoods, human well-being, 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*

[11] United Nations Development Program (UNDP), 1994. *Human Development Report 1994*. New York/Oxford: Oxford University Press.

[12] Global Water Partnership (GWP), 2000. *Towards Water Security: A Framework for Action*. Stockholm: GWP.

[13] Grey, D. and Sadoff, C., 2007. Sink or swim? Water security for growth and development. *Water Policy, 9*(6): 545–571.

[14] UN Water, 2013. *Water Security and the Global Water Agenda: A UN-Water Analytical Brief*. Hamilton: United Nations University, Institute for Water, Environment and Health.

These definitions are more concerned with individual security instead of states' security. Moreover, they also consider non-military threats and are concerned with more than just quantity and quality, but also with health, economy/industry, and ecosystems. Even more, interdisciplinary elements and multisectoral dependency of water security are increasingly evident in the language being used.

Almost no definition can be found referring to notions of national independence or self-sufficiency. This probably owes in large part to the definitions being concerned with individuals and not nations. This said, Human Security as a concept is not supposed to imply that national security is any less important, it only says that it is not sufficient on its own, as a country may be considered nationally secure but still host individuals who are insecure – and vice versa. Hence, given that national security still maters, a case could be made that such factors should indeed be included in a holistic definition of water security – or at least when referring to a national water security.

Water Security in an Arab Context

The Arab Ministerial Water Council (AMWC) in the League of Arab States adopted in 2011 the *Arab Strategy for Water Security in the Arab Region to Meet the Challenges and Future Needs for Sustainable Development 2010-2030*.[15] This strategy has the main goal of meeting the sustainable development challenges through a work plan that tackles several aspects of water resources management such as capacity building, research and development, provision for drinking and irrigation water services, unconventional water resources, and integrated water resources management. The strategy is meant to unify and guide the Arab efforts in managing their water resources, and has been operationalized in an action plan approved by the AMWC in May 2014.

The Arab strategy for water security identified several challenges, key pillars and expected outcomes that are summarized in the Table 2. However, he Arab Strategy did not provide a regional definition for water security but stressed water scarcity, shared water resources and climate change as the dominant challenges in the region. It can be further inferred from the title that the main objective of the strategy is to meet the challenges and future needs for sustainable development. This would naturally encompass the three pillars of development: social, economic and environmental and thus matching with more recent definitions of water security centering on the concept of Human security and sustainable development.

More recent is the Gulf Cooperation Council (GCC) Unified Water Sector strategy which has a vision by 2035 for the GCC countries to have established sustainable, efficient, equitable, and secure water resources management systems contributing to their sustainable socio-economic development.[16] It is very interesting for the vision statement to highlight sustainable and equitable water resources management systems again in harmony with modern concepts of water security with the exception being the concern with the protection against war and terrorist attacks or the contamination of drinking water, hence appealing to more traditional conceptions of security. In addition to some of the challenges highlighted in the Arab strategy for water security this strategy stresses the growing dependency on desalination and the over-exploitation and deterioration of groundwater both renewable and non-renewable.

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[15] League of Arab States, Arab Ministerial Water Council, *Arab Strategy for Water Security in the Arab Region to Meet the Challenges and Future Needs for Sustainable Development 2010-2030*, adopted by Arab Ministerial Water Council in May 2011. English translation by the GIZ/ACCWaM project approved by AMWC in June 2012.

[16] Al-Zubari Walled (2017). An overview of the GCC Unified Water Strategy, 2016-2035. Presented at the 12th Gulf Water Conference. Bahrain.

Table 2. Key challenges, pillars and expected outcomes of the Arab Strategy for Water Security in the Arab Region to Meet the Challenges and Future Needs for Sustainable Development 2010-2030.[17]

Challenges	Key Pillars	Expected Outcomes
• Inability to secure water needs • Exacerbation of social and political impacts of the food crisis and increased poverty • Low water usage efficiency • Shared water resources • Absence of a holistic approach to water sector management • Population growth and increased demand for water • Lack of individual and societal awareness of water issues • Impacts of climate change • Water in occupied Arab territories • Increasing role of water in economic development • Finance of water projects and private sector participation • Insufficient institutional and human capacity in the water sector • Inadequate role and contribution of scientific research and technology transfer in the water sector • Weak legal and legislative frameworks • Lack of service provision for clean drinking water and sanitation	• Follow-up of regional studies on the status of water resources in the Arab Region and establishment of an integrated Arab water information system • Scientific research and transfer and localisation of modern technology • Tackling climate change impacts on water resources in the Arab Region, and adopting adaptation measures • Implementing the principles of integrated water resources • Achieving the Millennium Development Goals • Availing necessary funding for water projects • Increasing the efficiency of water use • Protection of water rights for Arab States in terms of water shared with non-Arab states, water rights in the occupied Arab territories and water shared between Arab States • Build institutional and human capacity in the water sector • Raise awareness of water and environmental issues among all members of the community • Protection of the coastal aquatic environment • Expansion in the use of non-conventional water • Institutional development and water legislation and laws • Integration between the Arab Strategy for Water Security and relevant Arab strategies	• Provide information on all water resources in the Arab Region, including shared water. • Achieve sustainable development that is in line with available water resources and the effects of climate change. • Raise awareness of water and environmental security among all segments of society and civil society organisations in the field of integrated management of water resources. • Building human and institutional capacities in the Arab States in various fields of water management, particularly with regards to international law; manage negotiations on shared and other water in the occupied Arab territories; and enhance curricula and training to meet the requirements of national institutions working in the water sector. • Increase the amount of funding available for the water sector and build an Arab industrial and technological base in this field. • Provide mechanisms and frameworks for cooperation between Arab States and activate mutual agreements concerned with the management of shared water resources.

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[17] League of Arab States, Arab Ministerial Water Council, *Arab Strategy for Water Security in the Arab Region to Meet the Challenges and Future Needs for Sustainable Development 2010-2030*, adopted by Arab Ministerial Water Council in May 2011. English translation by the GIZ/ACCWaM project approved by AMWC in June 2012.

Conceptual Framework for Understanding Water Security in the Arab Region

There is a general agreement on the main regional challenges to water security in the Arab region and which can be grouped under three main headings that include water stress and scarcity, shared water resources and climate change. Other national challenges vary across the region but largely focus on water governance to achieve water security and the related means of implementation. Another agreement is the centrality of water to development in its three pillars social, economic and environmental, the intersectoral holistic requisite of water governance.

In terms of means of implementation for achieving water security in the region again the needs vary across the region, but these can be grouped under main regional headings that include enhancing water-related infrastructure and services, regional cooperation, coherence and coordination, research and development, technology transfer, financing and capacity building.

Any conceptual framework for understanding water security in the Arab Region must account for the regional specificities and must be framed within a human rights approach to development. This framework stands to benefit from the 2030 Agenda for Sustainable Development[18] and in its vision and water related Sustainable Development Goals (SDGs) which echo a large number of the elements set out in water security definitions. The 2030 Agenda vision clearly adopts a human rights based approach as explicitly reaffirmed "*commitments regarding the human right to safe drinking water and sanitation and where there is improved hygiene*." The holistic approach is also advanced in the Agenda where it is stated that *"interlinkages and integrated nature of the Sustainable Development Goals are of crucial importance in ensuring that the purpose of the new agenda is realized"* and that "*SDGs and targets are integrated and indivisible*." This agenda further pledged to leave no one behind on its path to achieving sustainable development and to achieve gender equality.

The dedicated SDG 6 for water in the 2030 Agenda aims to ensure availability and sustainable management of water and sanitation for all, and has six associated targets and two means of implementation. However, water security should not be constrained to SDG6 as SDGs and targets are integrated and indivisible and there are several water related targets. This can be demonstrated by taking some of the definitions of water security and matching them to some of the SDGs and targets as illustrated in Table 3.

The water security framework must also account for the various scales of analysis for water security ranging from the regional to the interstate to the national and ending with the household or individual level. Priorities, challenges and means of implementation may have different rankings as the scale of analysis vary. At the regional scale cooperation and climate change may be most highly rank whereas at the national scale water stresses and scarcity maybe more highly ranked whereas at the local scale financing for improving infrastructure and services maybe be the most highly ranked and finally at the household levels issues of accessibility, equity, intermittency and affordability may be of higher concern.

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[18] United Nations, General Assembly (2015). Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/701) (22 September). Available from http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

Table 3. Linkages between Common Definitions of Water Security and the Sustainable Development Goals.

Water Security Definition Component	Related SDGs and Targets
The Hague Ministerial Declaration (2000) • freshwater, coastal and related ecosystems are protected • sustainable development and political stability are promoted • every person has access to enough safe water at an affordable cost • to lead a healthy and productive life • the vulnerable are protected from the risks of water-related hazards	 • SDG 6.6, 14, 15 • All SDGs, SDG 6.5, 16, 17 • SDG 6.1, 6.2, 6.3, 6.4, 6.4.3, 7 • SDG 2, 3 • SDG 6.5, 13, 13.1, 16
Grey and Sadoff (2007) • acceptable quantity and quality of water • for health • livelihoods • ecosystems • production • acceptable level of water-related risks to people • environments • economies	 • SDG 6.1, 6.2, 6.3, 6.4, 6.4.3, 7 • SDG 2, 3 • SDG 1, 2, 11, 12, 15 • SDG 6.6, 14, 15 • SDG 9, 12 • SDG 6.5, 13, 13.1, 16 • SDG 11, 12, 14, 15 • SDG 8, 9
UN Water (2013) • sustainable access to adequate quantities of acceptable quality water • sustaining livelihoods • human well-being • socio-economic development • protection against water-borne pollution • water-related disasters • preserving ecosystems • climate of peace and political stability	 • SDG 6.1, 6.2, 6.3, 6.4, 6.4.3, 7 • SDG 1, 2, 11, 12, 15 • SDG 1, 2, 3 • SDG 1, 2, 3, 4, 5, 7, 8, 9, 10, 12 • SDG 3.3, 3.9, 6.1, 6.2, 6.3 • SDG 6.5, 13, 13.1 • SDG 6.6, 15 • SDG 6.5, 16, 17

A conceptual framework for understanding water security in the Arab Region that takes into account the regional systemic conditions into consideration as hinderers to achievement of water security and that is based on the pillars of sustainable development and human rights with an enabling environment based on as set of means of implementation is presented in Figure 2.
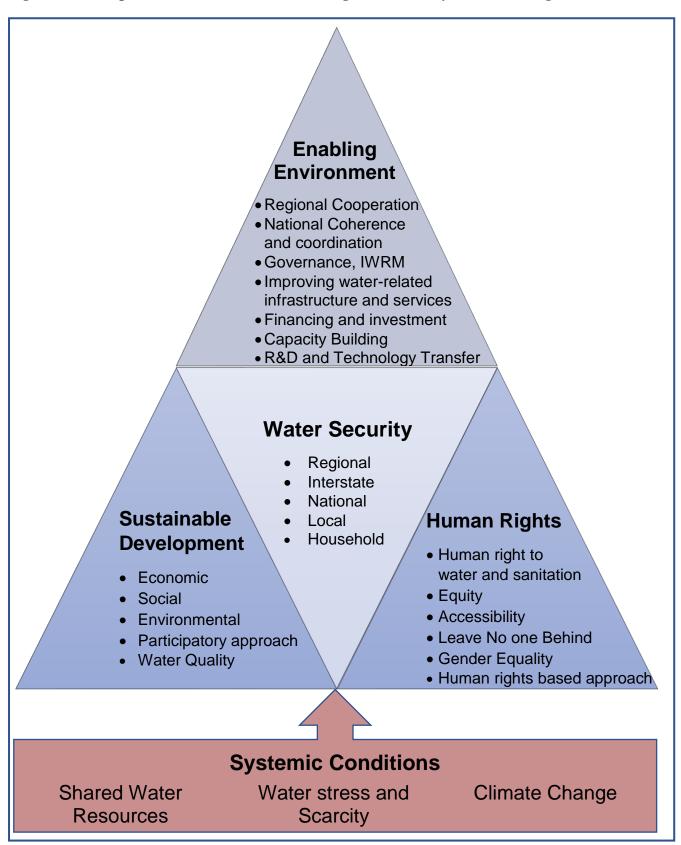
Figure 2.A Conceptual Framework for Understanding Water Security in the Arab Region.

Enabling Environment
- Regional Cooperation
- National Coherence and coordination
- Governance, IWRM
- Improving water-related infrastructure and services
- Financing and investment
- Capacity Building
- R&D and Technology Transfer

Water Security
- Regional
- Interstate
- National
- Local
- Household

Sustainable Development
- Economic
- Social
- Environmental
- Participatory approach
- Water Quality

Human Rights
- Human right to water and sanitation
- Equity
- Accessibility
- Leave No one Behind
- Gender Equality
- Human rights based approach

Systemic Conditions

Shared Water Resources   Water stress and Scarcity   Climate Change