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**ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA (ESCWA)**

**WORKING PAPER**

**THE JOINT MANAGEMENT OF SHARED WATER RESOURCES WITHIN  
AN INTEGRATED WATER RESOURCES MANAGEMENT CONTEXT:  
FOSTERING A LEGAL FRAMEWORK FOR THE ARAB REGION**

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## Preface

Management of shared water resources emerges as an important concern in the context of the Arab region, where water scarcity is becoming an overwhelming reality, and in turn affects economic productivity and sustainable development. In this respect, water should be used as a catalyst and incentive for cooperation among riparian countries. It is also important to develop modes of cooperation among sharing states on the basis of the characteristics of the water resource and the regional socioeconomic and political context.

In this respect, the League of Arab States established in 2008 the Arab Ministerial Water Council. In its meetings the Council identified shared water resources as a regional priority and emphasized the importance of using all available international water-related legal instruments to secure and protect Arab water rights. The Council during its second session in July 2010 passed a resolution requesting ESCWA and the Center for Water Studies and Arab Water Security and other partner organizations to prepare a draft legal framework on shared waters within the Arab Region. This action is a major step towards improved legal arrangements between the member countries of the League of Arab States and potentially with their non Arab neighboring countries. The initiative provides an opportunity to clarify principles related to the management of shared water resources at the intra-regional level (between countries of the region) with prospects to also have an influence at the inter-regional level (between the region and the bordering non-Arab countries).

Towards this end, the ESCWA-BGR regional cooperation project, funded by the Federal Republic of Germany and implemented jointly by ESCWA and the Institute for Geosciences and Natural Resources (BGR), supported the preparation of an analytical review of the direction and rational behind the existing guiding principles of international water law as they relate to the Arab region. This review served as the basis for discussion during the Roundtable Meeting on the Guiding Principles of the Regional Framework on Shared Water in the Arab Region which was organized by the ESCWA-BGR Project at the UN House in Beirut from 13 to 14 December 2010 and attended by representatives of partner organizations named in the ministerial resolution, as well as additional international and regional water law experts.

On the basis of the ministerial resolution and the outcome of the roundtable meeting, Mr. Mohamed Al-Hamdi, First Economic Affairs Officer in the Water Resources Section at ESCWA, prepared this working paper that seeks to highlight the relevancy of international and regional legal instruments for the management, cooperation, allocation, and protection of shared water resources. It tries to map the regional specificities and justifications for a regional legal framework for the Arab region, and attempts to clarify the scope of application and the subject matter of such a legal framework. Based on the identified regional specificities and current international developments in the area of shared water resources, the working paper then examines the directions that would identify appropriate guiding principles for a legal framework in the Arab region. The paper finally looks into the different possible formats that a regional legal instrument for the Arab region might adopt.

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## I. INTRODUCTION

The link between sustainable development, in general, and water availability and the way it is managed is marked. Water development, management and use have been the focus of socio-economic and technical scientific research for the past two decades leading to concepts that support sustainable development like Integrated Water Resources Management (IWRM) and water governance. Adoption of these concepts in the form of policies and strategies and their translation into management plans has proven their viability in many countries. The concepts of IWRM and water governance deal with the diverse water issues ranging from water scarcity to quality deterioration and pollution control and service delivery. Integration of water as an input to the overall development process, as well as an output in the form of water supply services for the agriculture, industry and domestic sectors, serves indirectly also to advance the sustainable development agenda in the other social service sectors like health and education. In water scarce regions, like the Arab region, integrated management of water resources gains prime importance especially given the increasing water demand that results from the rapidly growing population of the region<sup>12</sup>. Limited resources coupled with growing demand and the prospects for interruption of the water cycle in the region by the expected impacts of climate change<sup>3</sup> would probably exacerbate the water scarcity situation in the region.

Although Arab countries can be viewed as a homogeneous social and cultural region and are perceived to be one of the water poorest regions of the world, the region can still be categorized by the level of economic development as well as by the severity of water scarcity. Member countries of the Gulf Cooperation Council (GCC), although are the water poorest countries of the region, have an economic capacity that allows them to overcome water scarcity through desalination<sup>45</sup>; needless to say that the per capita domestic water use in some of these countries is amongst the highest in the world<sup>6</sup>. Along the same lines, the Arab region also comprise six least developed countries<sup>7</sup> that, with the exception of Yemen and Djibouti, have an annual per capita water share that exceeds the water poverty level of 1000 m<sup>3</sup>.<sup>89</sup> With the exception of Iraq and Lebanon, the rest of the region's countries have an annual per capita share of renewable water resources that falls below the water poverty level of 1000 m<sup>3</sup>.<sup>10</sup>

Generally, the region is perceived to rely mostly on surface water that originates outside its borders<sup>11</sup>, comprising some 50-60% of all renewable water resources in the region. Although a distinctive feature of the region, sharing of international rivers does not cover all countries of the region. Only nine of the twenty two member countries of the League of Arab States rely on water

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<sup>1</sup> The Arab region constitutes 5% of the world population with only 1% of the global water resources.

<sup>2</sup> Declaration and resolutions of the first Arab Economic Summit. Available at <http://www.arabeconomicsummit.org>

<sup>3</sup> Climate change impact on water resources could be in the form of less rainfall, more rainfall and more frequent extreme weather conditions that lead to extended drought periods and flooding.

<sup>4</sup> It is estimated that the desalination capacity of the GCC countries amounts to half the total global desalination capacity.

<sup>5</sup> <http://www.Desaldata.com>.

<sup>6</sup> ESCWA. 2007. *Water Development Report 2: State of Water Resources in the ESCWA Region* (E/ESCWA/SDPD/2007/6).

<sup>7</sup> According to the UN, the least developed countries of the Arab region are Comoros, Djibouti, Mauritania, Somalia, Sudan and Yemen.

<sup>8</sup> <http://esa.un.org/unpp/index.asp>.

<sup>9</sup> <http://www.fao.org/nr/water/aquastat/data/query/index.html>.

<sup>10</sup> Ibid.

<sup>11</sup> The major rivers that originate outside the borders of the Arab region are: The Nile, Euphrates, Tigris, Senegal, Jordan, Jubba, and Shabelle.

from rivers that originate outside the political borders of the region<sup>12</sup>. Despite the fact that much attention is focused on these rivers, the region also shares groundwater that lies in, or flows through, cross-boundary aquifers<sup>13,14</sup>. Although many of these aquifers are directly connected to surface water hydrological systems, and as such would need to be treated and managed as combined hydrological units “basins”, some aquifers contain fossil groundwater that is considered non-renewable. In recent years, many countries of the region have, directly or indirectly, promoted groundwater development for irrigation, which have led to alarming declining trend of fossil groundwater reserves. In Yemen, for example, the policy of promoting irrigated agriculture as a means for economic growth as well as an element of the wider food security strategy during the 1980s has led to a depleting trend of most of the highland non-renewable aquifers<sup>15</sup>. Similarly, during the last three decades of the twentieth century, Saudi Arabia pursued a food security policy that offered major financial incentives for internal wheat production, which in turn led to declining groundwater storage.

Besides the major rivers and aquifers that cross the boundaries into the Arab region, there are many surface and ground water resources that cross the national boundaries of the different countries of the region<sup>16</sup>. These intra regional shared water resources, particularly the shared aquifers, have not been examined in a structured manner that would reveal their characteristics and contribution to the water budgets of the riparian countries. Although these rivers and aquifers are perceived not to contribute much to the overall water budgets of the different countries, in many cases they constitute the only water supply to border areas, which are mostly rural and rely on -water demanding- agricultural activities.

The Arab region has always put a great political emphasis on the issue of shared water resources, evident from the high solidarity level shown at the League of Arab State that aims to support the rights of Arab countries to just, fair and equitable shares in international water courses and transboundary aquifers. Within the Arab context, the issue of shared water resources has been overshadowed mainly by three cases; namely, the allocation of, the Jordan River, the Euphrates and the Tigris rivers, and the Nile river. Meanwhile, less attention is given to the other international rivers, or to the “intra-regional” shared water resources, which, have not been subject to major political tensions in the past.

It can thus be concluded that the Arab views towards international watercourses and transboundary aquifers have been politically driven and aim to (1) regain water rights of the Palestinian people to shared as well as national water resources and develop practical mechanisms to access them, (2) maintain the historical and existing water rights of Egypt and Sudan to the Nile, and (3) define an equitable and just share of the Euphrates and Tigris to Syria and Iraq. The League of Arab States show solidarity, in the form of political declarations, but leaves the actual negotiations to the concerned countries. This political supportive role<sup>17</sup>, although helpful, lacks a

<sup>12</sup> These countries are: Egypt, Sudan, Syria, Iraq, Mauretania, Lebanon, Jordan, Palestine, and Somalia.

<sup>13</sup> Some of these aquifers are: Upper Jezira, Bai Hassan, Lower-Upper Fars, Nubian Sandstone, Taoudeni, Mourzouk.

<sup>14</sup> BGR Hanover/UNESCO Paris. 2006. *Groundwater resources of the world*, 2006.

<sup>15</sup> Al-Hamdi. 2010. *اليمن 2020: سيناريوهات المستقبل*. Friedrich Ebert Stiftung-Yemen, “الأمن المائي: محاولة لتحليل واقع ومستقبل المياه في اليمن”

<sup>16</sup> Some of the shared rivers between countries of the Arab region include Nahr el Kabir el Janoubi as well as many seasonal rivers in many wadi systems that cross the national boundaries such as Wadi Sarhan between Saudi Arabia and Jordan. Many of the wadi systems between the Arab countries have not been studied since they discharge into uninhibited desert areas. Shared aquifers between the Arab countries are also many, with Al Wajeed, Saq-Ram (Disi), Umm er Radhuma-Dammam, Northwest Sahara, and Errachidia as examples of some of the larger transboundary aquifers.

<sup>17</sup> This role is selective in the sense that it reacts to the different issues on a case by case basis and while supporting a position in one case might find itself supporting an opposite position in another case.

unified position and vision to the many complex aspects connected to the management of shared water resources, evident from the lack of unified clear legal and institutional basis needed to structure that vision. The approach followed by the League might be viewed as one that provides the Arab countries with a maximum level of freedom to negotiate without being obligated to any stipulated position of the League.

Being part of the international community, member countries of the Arab League are subject to international law, and as such, within the broader sense, any regional unified legal position on international water resources cannot completely depart from the globally accepted general principles that dictate the management, cooperation and allocation of shared water resources. Given the sensitivity and complexity attached to the allocation of shared water resources, at present, there are no internationally binding rules that define the allocation process. Despite being the subject of discussion for many decades, the existing legal basis on the subject are in the form of nonbinding soft legal instruments, among which the Helsinki Rules (1966) are considered the most comprehensive. On the basis of the Helsinki Rules, and after 23 years of deliberations in the United Nations, the General Assembly in May 1997 adopted the Convention on the Law of the Non-navigational uses of International Watercourses, which after thirteen years of the adoption resolution has not entered into force<sup>18</sup>. As groundwater was not fully incorporated in the convention<sup>19</sup>, the General Assembly requested the International Law Commission (ILC) to prepare a legal instrument that covers the cooperation, management, allocation and protection of all types of transboundary groundwater resources. Subsequently, the general assembly adopted a resolution in December 2008 on the law of transboundary aquifers. The draft articles of the law are not binding and will be re-discussed by the General Assembly during its sixty-six session (2011) in order to examine the question of the legal form that might be given to the draft articles.

In the absence of internationally binding legal instruments, the focus turns to the international customary law<sup>2021</sup>, which contains a number of widely accepted rules and principles related to the management, cooperation, and allocation of shared water resources. Although the international customary water law is not an explicit set of written rules and principles, as it references widely accepted states' practices, it is considered as one of the primary legal sources used by the International Court of Justice (ICJ). Additionally, the customary principles related to international water resources are also used as basis for negotiating bilateral and multilateral operational agreements on shared water resources. It should be noted that although the UN watercourse convention is not in force yet, some of its principles, such as the obligation to cooperate, and the equitable and reasonable utilization, have been referenced by the International Court of Justice, thus elevating them to a status of customary law principles<sup>22</sup>.

Many riparian countries of international watercourses have entered in formal or informal bilateral agreements to clarify rights and duties as well as cooperation arrangements to manage

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<sup>18</sup> The convention need to be ratified, accepted, approved, or accessioned by at least 35 countries before it enters into force. At present, only 21 countries have ratified, accepted, approved, or accessioned the convention, of which 7 are Arab countries as follow; Iraq, Jordan, Lebanon, Libya, Qatar, Syria, and Tunis.

<sup>19</sup> The 97 convention covers only groundwater resources that are directly connected to surface watercourses. Fossil or non renewable aquifers are thus not included within the provisions of the convention.

<sup>20</sup> International customary law consists of rules of law derived from the consistent conduct of states acting out of the belief that the law required them to act that way. A marker of customary international law is consensus among states exhibited both by widespread conduct and a discernible sense of obligation.

<sup>21</sup> Dellapenna. 2001, *The customary international law of transboundary freshwaters*. Int. J. Global Environmental Issues, Vol. 1, Nos. ¾.

<sup>22</sup> GabCikovo-Nagymaros Project (Hungary/Slovakia), Judgment, 1. C. J. Reports 1997, p. 7.

these shared water resources, which have lead many to consider water as an element of cooperation rather than a cause for conflict<sup>2324</sup>. Although many of these agreements focus on specific issues, like allocation, quality protection, etc, they cannot be considered comprehensive in that they do not serve as a base for integrated management of these river basins. The current theoretical trend, backed by the principles of IWRM, is towards more comprehensive integrated agreements that involve all riparian countries with a focus on cooperation as the overriding direction featuring the “community of interests” as the main principle. Despite the absence of a binding international legal instrument for the uses of international water resources, global treaties and conventions cannot equally tackle all the various regional detailed concerns and specificities. Global legal instruments thus mostly provide the general directions and highlight guiding principles that can be considered during the negotiation process of bilateral or basin level operational agreements. Regional legal instruments on shared water, on the other hand, can actually fill the gaps of international instruments in that they are able to tackle more effectively the different regional specificities. A clear example of a regional legal framework is the United Nations Economic Commission for Europe (UN-ECE) Convention on the Protection and Use of Transboundary Watercourses and International Lakes<sup>25</sup>. Although the convention addresses many aspects of water management, it puts greater emphasis on water quality, pollution control and environmental protection, which broadly reflects the region’s concerns and priorities. It, on the other hand, does not detail many of the aspects related to water allocation, as water availability within the European context is not a pressing issue and thus is not among the region’s top priorities. By comparison, one may conclude that a similar regional legal framework for the Arab region would focus more on water allocation and maybe less on issues related to environmental protection in order to reflect the pressing water scarcity as a priority in the region.

This paper intends to highlight the relevancy of regional legal instruments for the management, cooperation, allocation, and protection of shared water resources. It tries to map the regional specificities and justifications for a regional legal vision for the Arab region, and an attempt to clarify define the scope of application and the subject matter of such a vision. On the basis of identified regional specificities, and current international developments in the area of shared water resources, the paper then examines the directions that would dictate the identification of appropriate guiding principles for a legal framework in the Arab region. The paper finally looks into the different options of format that a regional legal instrument for the Arab region can adopt.

## II. REGIONAL SPECIFICITIES

This section focuses on a few elements that are considered to uniquely shape the region with respect to the management of water resources. These elements include, water scarcity, agricultural productivity and employment, level of economic capacity in relation to water trade policies (virtual water), geopolitical aspects of water, and institutional capacity.

### A. WATER SCARCITY

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<sup>23</sup> Wolf. 2008. *Healing the enlightenment rift: Rationality, spirituality and shared water*. Journal of International Affairs, Spring/Summer 2008, vol. 61, no. 2.

<sup>24</sup> Wolf et al. 2006. *Navigating peace*. Woodrow Wilson International Center for Scholars.

<sup>25</sup> Available at: <http://www.unece.org/env/water/text/text.htm>

Covering an area of nearly 14 million km<sup>2</sup>, the Arab region is characterized as a dry region covered mostly by deserts. Despite the low population density, the region comprise almost 5% of the world's population, while at the same time receives only about 1% of the global renewable water resources<sup>26</sup>. The region is experiencing elevated rates of population growth that mostly exceed the world average<sup>27,28</sup>. Assuming a long term constant level of renewable water resources<sup>29</sup>, increasing water demand resulting from population growth has lead to the decline of the per capita share of renewable water resources within the Arab region from an annual average of 1,640 m<sup>3</sup> to around 880 m<sup>3</sup> between 1982 and 2008<sup>30</sup>, thus crossing the water poverty/scarcity level of 1000 m<sup>3</sup>. Table 1 shows some elements of the prevailing water scarcity levels in the Arab countries, where nearly 250 million people in 15 countries, or 75% of the population of the region, have a per capita share of renewable water that falls below the poverty threshold of 1000 m<sup>3</sup> and 120 million people, representing 35% of the region's population in 12 countries, with a per capita share that even falls below the acute water scarcity level of 500 m<sup>3</sup>. The table also shows that external water resources represent around 55% of the total renewable water resources in the entire Arab region, and comprise as much as 65% of the total renewable water resources in the ESCWA region<sup>31</sup>. Although, on average only 85% of the total regional renewable water resources is abstracted, disparity among countries of the region show a wide range, with 10 countries abstracting more than the total national available renewable water resources. This additional water is supplied from non-renewable groundwater storage and/or from non-conventional water sources in the form of desalinated water or treated wastewater.

In order to underscore the impacts of water scarcity, it has been estimated that, by using an average per capita domestic water consumption of 125 m<sup>3</sup>/yr, the total domestic water demand within the Jordan river basin would reach 2,800 million m<sup>3</sup> by 2025, thus requiring the transfer of all agricultural water for domestic use, which will have a profound effects on the agricultural sector and implying the need for major restructuring of the basin's agricultural and food security policies<sup>32</sup>.

TABLE 1 ELEMENTS OF WATER AVAILABILITY/SCARCITY IN THE ARAB COUNTRIES.

Country	Per capita share of internal renewable water resources (m <sup>3</sup> /yr)	Per capita share of external renewable water resource (m <sup>3</sup> /yr)	Per capita share of total renewable water resource (m <sup>3</sup> /yr)	Dependency ratio (% of external to total renewable resources)	Percentage abstraction of total renewable water resources
Algeria	327.3	12.2	339.5	4	52
Bahrain	5.2	144.4	149.5	97	220
Comoros	1412	0	1412	0	1
Djibouti	353.4	0	353.4	0	6
Egypt	22.1	680.7	702.8	97	119
Iraq	1170	1342	2512	53	87

<sup>26</sup> Ibid

<sup>27</sup> During 2000-2005, only Lebanon, Morocco, Oman and Tunisia, of the 22 member countries of the Arab League reported an average annual growth rates below the world's average of 1.24%, with 11 countries exceeding 2.5%.

<sup>28</sup> United Nations. 2007. *The population prospects; the 2006 revision*. (ESA/PWP.202)

<sup>29</sup> This assumption is not totally correct since substantial decline in the flow of the international rivers crossing into the Arab region has been experienced during the past thirty years.

<sup>30</sup> Data compiled from FAO's AQUASTAT database; available at <http://www.fao.org/nr/water/aquastat/main/index.stm>

<sup>31</sup> ESCWA member countries are: Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syrian Arab republic, United Arab Emirates, and Yemen.

<sup>32</sup> Gleick. 1996. *Basic Water Requirements for Human Activities: Meeting Basic Needs*. Water International, 21 pp. 83-92.



Jordan	111.1	41.6	152.7	27	99
Kuwait	0	6.9	6.9	100	2465
Lebanon	1144	-70	1074	-7	28
Libyan Arab Jamahiriya	95.3	0	95.3	0	718
Mauritania	124.4	3421.6	3546	96	15
Morocco	917.5	0	917.5	0	43
Oman	502.7	0	502.7	0	87
Palestine	195.8	6	201.8	3	50
Qatar	43.7	1.6	45.3	3	455
Saudi Arabia	95.2	0	95.2	0	943
Somalia	672.2	974.8	1647	59	22
Sudan	725.5	834.5	1560	53	58
Syrian Arab Republic	336	455.4	791.4	58	99
Tunisia	412.5	39.4	451.9	9	62
United Arab Emirates	33.4	0	33.4	0	2032
Yemen	91.6	0	91.6	0	161
<b>All Arab countries</b>	<b>406</b>	<b>471</b>	<b>877</b>	<b>54</b>	<b>84.4</b>

*Source: data compiled from the FAO-AQUASTAT data base.*

It is clear that the current growth in water demand, at a time when available water resources are under threat of decline and disruption by the potential impacts of climate change<sup>33,34</sup>, will only lead to higher levels of water scarcity and consequently to direct impacts on the social and economic development of the region. Making better use of the available water through the adoption and implementation of the principles of integrated management of water resources is a necessity and no longer an option. Realizing that external renewable water resources constitute more than half of the renewable water in the region, securing the rights to those resources becomes an element of national and regional security. A common vision and a unified understanding of the legal basis to manage shared water resources, whether internally within the region, or externally with neighboring upstream non-Arab countries can be considered as a major step towards achieving water security in the region.

## B. AGRICULTURAL PRODUCTIVITY AND EMPLOYMENT

The larger, more populous countries of the Arab region like, Egypt, Sudan, Iraq, Syria, Morocco, and Yemen have always be characterized as agricultural based countries. Reliable water sources, in the form of perennial rivers and consistent rains allowed agriculture to flourish in these countries for centuries. With recent changing patterns of rainfall and the introduction of drilling and

<sup>33</sup> As reported in the 2007 Hadley centre report that “Across the whole Gulf region, decadal average precipitation is generally projected to decrease throughout the 21st century. Increases in precipitation of up to (30%) by 2020s and (35%) by 2040s are projected for the Ethiopian highlands and south-west coastal fringe of the Arabian peninsula, while decreases of up to (20%) by 2020s to (30%) by 2040s are shown across Turkey, Lebanon, northern Syria, the Zagros mountain region of western Iran, the Hindu Kush region of Afghanistan, as well as other areas within central Iran and Afghanistan. By 2040s, precipitation decreases of between 10 and 20 % are widespread across the northern half of the Gulf region. This is of particular importance to fresh water supplies in the region because it includes a large portion of the catchment areas of the Tigris and Euphrates rivers.”

<sup>34</sup> Hemming et al. 2007. *Environmental stresses from detailed climate model simulations for the Middle East and Gulf region*. Hadley Centre for Climate Prediction and Research.

pumping technologies, many countries started to promote horizontal expansion of irrigated agriculture with groundwater as a more reliable water source.

Agricultural expansion has also been the result of food security policies calling for higher agricultural production, where the notion of “self sufficiency” had been a strong element of the food security policies in many countries of the region. In this section, the discussion will focus on two aspects related to agriculture in the Arab region; first, the degree of food security -in terms of agricultural production- which the region has been able to achieve<sup>35</sup>, and second, the economic output of the agricultural sector in relation to its employment capacity.

Since food security has been mainly oriented towards higher food production through the promotion of horizontal agricultural expansion, many countries of the region invested in major infrastructure projects in the form of dams, boreholes, channels, etc.<sup>36</sup> Other financial and economic incentive structures were also set up to benefit farmers and were mostly in the form of grants, subsidies, and credits for irrigation equipments, fertilizers, pesticides, fuels, etc. After around forty years of adopting such a policy, it has not succeeded in achieving the desired objectives. Except for Syria, all countries of the region supplement its wheat production from imports, with the region importing 61% of its wheat needs in 2008 costing around 12.3 billion US dollars. Wheat yield in the region is considered low by international standards, with only Egypt and Saudi Arabia exceeding the world average of 3.07 ton per hectare and as many as eleven countries falling below a yield level of 2.0 ton per hectare<sup>373839</sup>. One possible explanation for the low cereal yield could be the result of irrigation water stress, especially in rain-fed cultivated areas. Irrigation efficiency in the region is also reported at low levels that does not exceed 40%, which is an indication of large losses (wastage) of irrigation water<sup>40</sup>. Given that irrigation is by far the largest water using sector, improvements in irrigation water management could release large quantities of water for other uses in the domestic and industrial sectors. Although expansion of agriculture in the region has not contributed to achieving food security, many countries have recently been readjusting their agricultural policies, where although achieving food security is still a valid goal, approaches to realize this objective have been broadened to include economic development and trade instruments. This new policy direction is also driven by the declining contribution of agriculture to the national economies as well as the growing water scarcity facing many countries of the region.

TABLE 2 AGRICULTURAL EMPLOYMENT AND THE CONTRIBUTION OF AGRICULTURE TO GDP IN THE ARAB REGION.

Country	Total labor force (% of population)	Labor force in agriculture (% of total labor force)	Contribution of agriculture to GDP (%)
Algeria	42	22	9
Bahrain	48	1	1

<sup>35</sup> Since the objective of this paper is not to comprehensively review the agricultural sector, analysis will be limited to the production of cereals in general and wheat in particular.

<sup>36</sup> Examples of these projects are: Tushka project and Al-Salam irrigation canal in Egypt, 48 large dams in Morocco with a capacity of 14 billion m3, Lake Assad in Syria with a capacity of 14 billion m3, 5 large dams in Iraq with a capacity of nearly 30 Billion m3, Huge investment in Center Pivot Irrigated Schemes in Saudi Arabia that increased irrigated area by more than 9 folds (from 150,000 ha to 1.36 mil. ha) between 1975 and 1991, and the Merowe High Dam in Sudan with a capacity of 12.5 billion m<sup>3</sup>.

<sup>37</sup> Wheat yield data for Bahrain, Comoros and Djibouti are not available.

<sup>38</sup> Similarly, all countries of the region supplement its total cereal production from imports, with the region importing 58% (with a range of 22%-100%) of its total cereal needs in 2008 costing around 24.4 billion US dollars.

<sup>39</sup> Data on yield, production and trade of cereals and wheat are compiled from the FAO-ProdSTAT data base, available at <http://faostat.fao.org/site/339/default.aspx>

<sup>40</sup> League of Arab States, Arab Ministerial Water Council. 2010. *Draft of the Arab Water Security strategy in the Arab Region*.

Comoros	43	70	46
Djibouti	43	75	4
Egypt	32	26	14
Iraq	25	6	9
Jordan	29	7	4
Kuwait	51	1	0
Lebanon	36	2	5
Libyan Arab Jamahiriya	37	3	5
Mauritania	42	51	13
Morocco	37	27	16
Oman	38	30	2
Palestine	34	9	--
Qatar	65	1	0
Saudi Arabia	36	6	2
Somalia	40	67	65
Sudan	31	53	26
Syrian Arab Republic	32	21	20
Tunisia	37	21	10
United Arab Emirates	62	3	2
Yemen	24	41	14
All Arab countries	34	26	--

*Source: data compiled from the FAO-AQUASTAT data base.*

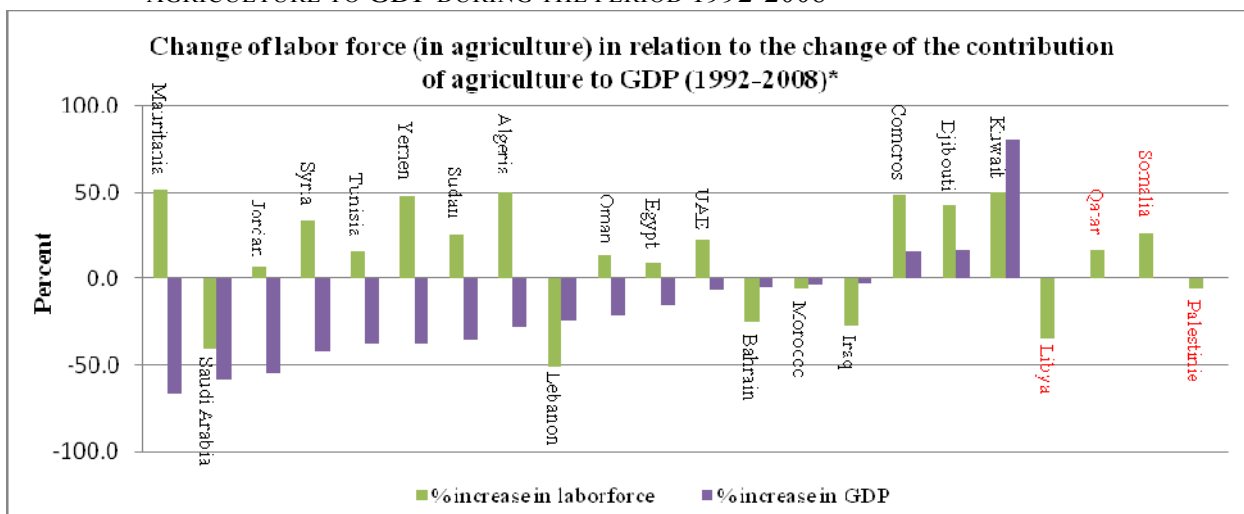
Despite the restructuring of the agriculture sector in many countries of the region, it remains to be an important and sensitive economic sector due to its large capacity to absorb formal and informal employment. Table 2 explicitly show that the agriculture sector employs around 26% of the total labor force in the Arab region, with higher values in the least developed countries (Djibouti, Comoros, Somalia, Sudan, Mauritania, and Yemen) and lower values in the “more economically developed or oil based” countries (GCC countries, Lebanon, Jordan, and Libya). Figures of the remaining countries fall in the middle with values close to the regional average. Contribution of agriculture to the Gross Domestic Product (GDP) is modest, ranging from as low as zero to more than 60%. It can also be observed that little correlation exist between agricultural employment and the contribution of the agriculture sector to (GDP). It can thus be concluded that despite the low contribution of agriculture to economic output of the individual countries and consequently of the entire region, agriculture serves to contain and maintain unemployment rate at current levels<sup>41</sup>.

As highlighted in figure 1, a review of the historical records of agricultural employment in relation to the contribution of the agriculture sector to GDP reveals that ten out of eighteen countries of the region experienced growth in agricultural employment while a reduction in the contribution of agriculture to GDP during the period between 1992 and 2008<sup>42</sup>. The relatively large employment within the low productive agricultural sector (in terms of contribution to GDP) in many countries of the region is an indication of high poverty levels within that sector. The trend of increasing labor force in agriculture with shrinking contribution to the GDP is another indicator of increasing poverty levels of those living out of agriculture.

<sup>41</sup> According to the UN Statistical Division (available at <http://unstats.un.org/unsd/demographic/products/socind/default.htm>), unemployment rates vary with low (below 6% for the GCC countries), medium (6%-10% for Egypt, Lebanon and Morocco), high (10%-20% for Algeria, Comoros, Iraq, Jordan, Syria, Tunis and Yemen), and very high (above 20% for Djibouti, Mauretania, and Palestine).

<sup>42</sup> Among which are some of the larger more populous countries of the region like Egypt, Sudan, Syria, and Yemen.

FIGURE 1 TREND OF AGRICULTURAL EMPLOYMENT IN RELATION TO THE CONTRIBUTION OF AGRICULTURE TO GDP DURING THE PERIOD 1992-2008



\*GDP figures: for Bahrain (1992-1995), Iraq and Lebanon (1997-2003/8), Djibouti and Mauritania (1992-2007), Kuwait and Yemen (1992-2003), Oman and UAE (1992-2004/6),  
Data on the contribution of agriculture to GDP during (1992 – 2008) for Libya, Qatar, Somalia, and Palestine is not available.  
Source: data compiled from the FAO-AQUASTAT data base.

### C. ECONOMIC CAPACITY IN RELATION TO TRADE POLICIES

Virtual water, defined as “the volume of freshwater used to produce the product, measured at the place where the product was actually produced”<sup>43</sup>, was introduced during the 1990s by Prof. Allan of King’s College London<sup>44</sup>. The work on virtual water has led to the development of the concept of water footprints for all productive sectors including all agricultural and industrial products in the different regions and countries of the world. The development of these concepts can ideally lead to enhance the water use efficiency at the global, regional and national levels. By importing products from regions where water is more readily available, e.g. from direct rainfall (green water<sup>45</sup>)<sup>46</sup>, domestic scarce water resources can be reallocated to higher value uses. It was estimated that a global annual agricultural water savings of 352 billion m<sup>3</sup> could be realized if agricultural products are traded strictly in accordance to the assumptions and values of the concepts of virtual water and water footprints of the different countries<sup>47</sup>.

Since water in most of the Arab countries is rather scarce, applying the principles of virtual water would lead to the need for reallocation of most, if not all, water resources in the region to higher value economic uses like those in industry and manufacturing, while importing “cheaper”-less valuable- rainwater, in the form of agricultural products. Although ideally this can be considered an efficient solution to water scarcity, it faces some limitations in its practical application. First, many of the Arab countries are already at a stage of mining nonrenewable groundwater reserves, and as such would need to abort all economic activities connected to the use of nonrenewable water resources and reallocate all renewable water for the more productive domestic and industrial sectors. While the economies of some countries of the region like the GCC countries can afford to import all of their water needs in the form of products produced abroad, many countries of the region have weak economies that would make it more difficult to adopt such a policy, particularly with unstable global food prices<sup>48</sup><sup>49</sup>. Second, even for countries that are still not characterized to be under water scarcity (those with a per capita share of renewable water exceeding the annual poverty level of 1000 m<sup>3</sup>), the relative value of the available water in these countries, mostly river “blue” water, is higher than the available green water or more abundant-lower value- blue water, in other regions of the world. Thus, according to the principles of virtual water, import of most agricultural and industrial commodities is justified. Similar to the other countries of the region, these countries do not have advanced industrial and manufacturing sectors that can absorb all the water that can be released or reallocated from agriculture. Third, given the high employment in the already low economically-contributing agricultural sector, a shift of agricultural policy towards more import and less internal production, would lead to increased unemployment and greater poverty levels. Despite these shortfalls, the concept of virtual water can

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<sup>43</sup> Hoekstra and Chapagain. 2007. *Water footprints of nations: water use by people as a function of their consumption pattern*. Water Resources Management 21 (1): 35–48.

<sup>44</sup> Prof. Allan was awarded the 2008 Stockholm Water Prize for his work on virtual water.

<sup>45</sup> According to Falkenmark, green water is defined as the fraction of rainwater that infiltrates into the root zone and is used for biomass production; equating with evapo-transpiration, while blue water comprise runoff, groundwater, and stream base flow.

<sup>46</sup> Falkenmark. 1995. *Land-water linkages - A synopsis in Land and Water integration and river basin management*. FAO Land and Water Bulletin 15-16.

<sup>47</sup> Chapagain et al. 2006. *Water saving through international trade of agricultural products*. Hydrology and Earth System Sciences 10, 455–468

<sup>48</sup> Except for the major oil exporting countries (Algeria, Libya and the GCC countries), all Arab countries have a net negative trade balance that amount to 134.6 Billion USD. On average, 8 Arab countries (with a population of nearly 100 million, representing a third of the region’s population) have per capita GDP of less than 1700 USD, and 3 countries (with a combined population of about 130 million, representing another 40% of the region’s population) with a per capita GDP of less than 3000 USD.

<sup>49</sup> Data compiled from the UN statistical Division, available at: <http://unstats.un.org/>

still add value and benefits if viewed from the perspective of regional integration. National trade policies would therefore need to be reviewed and modified in light of the assumptions and factors of virtual water and water footprints of the different countries of the region.

#### D. GEO-POLITICS OF WATER IN THE ARAB REGION

Located downstream of the major international rivers, some Arab countries are largely reliant on the flow of these rivers for much of their water needs. Egypt, Sudan, Syria, Iraq, Mauretania, and Somalia, are all located downstream to non Arab countries like Ethiopia, Turkey, Senegal, Iran to name a few. This puts these Arab countries in a vulnerable position and at risk of lower water availability from these international rivers, especially given the exponentially growth of water demand in the upstream countries. In the absence of comprehensive water allocation treaties and agreements between riparian countries of these international rivers, coupled with the rising claims of upstream countries for higher shares, the downstream Arab countries are facing the risk of lower supplies from these rivers or maintaining the status quo at best. Some of the upstream countries have adopted national policies that stress on their sovereign right to make use of water from “transboundary” rivers within their territories. They also try to reflect the concept of economic optimization of the use of these resources, and as such puts some of the region’s downstream countries at a disadvantage due to the higher productivity of water use in the upper catchment areas of these river basins, which are mostly located within the boundaries of upstream riparian countries<sup>50</sup>.

Besides policies that reflect sovereignty and optimum use of international water resources, the perception by upstream countries that they have greater power of control over international water resources, although not noted as official policies, seems to be embedded within their negotiation strategies<sup>51</sup>. On the bases of such convictions, upstream countries have either proceeded with large investment in water intensive activities or demanding higher shares of water for expansion in agriculture. The imbalance of power among the riparian countries usually dictates their behavior towards the use of the resource itself and/or towards the other riparian countries. This is evident from the distinctions that can be made between the various river basins, where Egypt for example, although a downstream country, have been able to resist any reductions in its share to the Nile, and even demanding the application of the widely accepted integrated management approach of the entire Nile basin, which could lead to an increase in its water share from the Nile. On the other hand, Syria and Iraq, also downstream countries, have experienced declining river flows during the past thirty years as a result of major water diversions in Turkey, the largest of the three riparian countries.

Another case that demonstrates the impacts of water hegemony is the occupation of land by military force and diversion of water resources from within the occupied territories to other areas, while at the same time depriving those under occupation from access to their water resources. The Palestinian Water Authority (PWA) is prevented, by the occupying Israeli forces, from accessing both transboundary as well as internal aquifers<sup>52,53</sup>.

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<sup>50</sup> The official Turkish policy on “transboundary” water resources is (1) “each riparian state of a transboundary river has a sovereign right to make use of the water in its territory”, and (2) “transboundary waters should be used in an equitable, reasonable and optimum manner.” Available at: [http://www.mfa.gov.tr/turkey\\_s-policy-on-water-issues.en.mfa](http://www.mfa.gov.tr/turkey_s-policy-on-water-issues.en.mfa).

<sup>51</sup> Suleyman Demirel, prime Minister of Turkey in 1992 was quoted: “Neither Syria nor Iraq can lay claim to Turkey’s rivers anymore than Ankara could claim their oil. This is a matter of sovereignty. We have a right to do anything we like.”

<sup>52</sup> “The Palestinian Water Authority (PWA) is unable to conduct integrated management of the resource in the West Bank within the current governance framework. The governance system established by article 40 requires the approval by Israeli authorities of any

## E. INSTITUTIONAL CAPACITY

Many Arab countries have adopted policies and strategies that generally follow the principles of integrated water resources management, with most countries even translating these policies into management plans<sup>54</sup>. Despite these positive developments, many countries face the challenge of adequate implementation and enforcement of these policies and plans. One of the major challenges that have been identified as an obstacle to adequate implementation of IWRM policies and plans is the low institutional capacity within the countries of the region<sup>55</sup>. Institutional capacity, in this context, reflects all of the factors connected to the enabling environment, including human, financial, administrative, organizational, legal, and political capacities to effectively enforce the existing water related legislation and implement associated water management plans. The strong link of the water issues to the national socio-economic development helps elevate the water agenda, as a cross cutting issue, to a level that requires its incorporation in the planning process of the various sectors. Examples of such links and impacts are those of water on the social service sectors of health and education, as well as on other economic sectors like agriculture, tourism, trade, manufacturing, etc. Additional to the common perception that the water sector is mainly dominated by its technical aspects and thus can be enhanced through stronger technical capacity, the complex nature of integrating water into the overall national planning and development processes, adds other levels of needed capacity enhancements.

A common feature of almost all IWRM plans of the Arab countries is the need for capacity building and enhancement in many related aspects of water management, be it in direct service delivery or in resources management. This leads to the conclusion that, to varying degrees, countries of the region lack the adequate capacity to provide water services and manage water resources in a manner that maximize its contribution to the welfare of the population. With inadequate capacity to manage internal water resources, management of shared water resources introduces additional capacity requirements related to international law, international relations, as well as technical aspects connected to data collection, monitoring and management. A strong political will is also considered to be a vital factor in the development of a clear vision for managing both internal as well as shared water resources. Additionally, special organizational arrangements between riparian countries would need to be developed in order to facilitate communication and coordination between riparian countries with the aim to reach a stage of integrated policy development and joint operational planning at the “shared” basin level.

In summary, it is argued that the special characteristics, or specificities, of the Arab region have a determinant role to play in how water resources, both internal, shared with non Arab countries, or shared among countries of the region, are allocated, managed, and used. Some of these specificities include the growing water scarcity (compounded by the potential adverse impact of climate change), large variations in the economic strength of the different countries, a tradition of agricultural-based economies and employment, unclear national and regional food security policies,

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proposed PA management measure or infrastructure project within the West Bank. This arrangement, together with the way it has been implemented, gives Israeli authorities control over the allocation and management of West Bank water resources.” (World Bank, 2009)

<sup>53</sup> World Bank. 2009. *Assessment of restrictions on Palestinian water sector development*.

<sup>54</sup> ESCWA. 2007. *Guidelines with regard to developing legislative and institutional frameworks needed to implement IWRM at the national level in the ESCWA region*. (E/ESCWA/SDPD/2007/1).

<sup>55</sup> ESCWA. 2005. *Development of frameworks for the application national strategies on IWRM in the ESCWA region*. (E/ESCWA/SDPD/2005/10).

low institutional capacity to effectively manage internal as well as shared water resources, insecurity of water rights to international water resources and a sense of vulnerability from being the downstream riparian countries, political tensions and instability in some countries of the region, and a power imbalance and water hegemony that favours non-Arab upstream countries and occupying forces. These issues and others determine the way in which countries of the Arab region view and manage both internal and shared water resources.

### **III. JUSTIFICATION FOR A LEGAL FRAMEWORK FOR SHARED WATER IN THE ARAB REGION**

Based on some of the specificities of the Arab region that have been analyzed in the previous section, it is logical that some countries, especially those under threat of lower access and share to the major international rivers, would opt for the development of a binding legal instrument that sets their rights of prescribed shares to shared water resources<sup>56</sup>. Ideally, a regional binding legal instrument that sets the guiding principles and allocation rules of shared water resources for the entire region, including the upstream non Arab countries would be favored by most of the Arab countries. Realizing the major obstacles that would face the development of such a legal instrument, a second best alternative would be the application of the provisions of a widely accepted legal instrument to the entire region. The only legal instrument that is of direct relevance is the United Nations 97 watercourse convention. Again the diverging views between the different countries, particularly Arab downstream countries and non-Arab upstream countries makes this proposal render idle. A third alternative is the development of a regional legal instrument under the umbrella of the League of Arab States<sup>57</sup>, which on one hand could establish a clear unified vision on the cooperation and management of the shared water resources and thus facilitate the joint management of shared water resources among the Arab countries, on the other hand can be viewed as a handicapped instrument since it would not tackle the issue of international rivers and transboundary aquifers with non Arab countries.

This section aims to discuss relevant issues that clarify the added value expected from a regional legal instrument on cooperation and management of shared water resources between the Arab countries.

#### **A. CONJUNCTIVE MANAGEMENT OF SURFACE AND GROUND WATER RESOURCES**

Although in practice, it tends to be more convenient to manage surface water separately from groundwater, due mainly to the prevailing nature of their uses where surface water users are mostly situated along the watercourse or as part of surface water diverging projects, theoretically, management of water resources should incorporate both surface and groundwater resources according to a basin level integrated management plan. The physical linkages between surface water and groundwater are in many cases difficult to determine and need detailed hydro-geo-logical examinations and field investigations. Due to the unseen nature of groundwater, it is often more difficult to monitor, regulate and enforce related policies and plans than surface water. With surface water resources reaching near to their full potential use, many countries of the region are turning to groundwater to satisfy the growing demand. The increasing reliance on groundwater has resulted in declining water reserves of most renewable and non-renewable aquifers in many countries of the region. Available records show that at least ten of the Arab countries withdraw groundwater in

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<sup>56</sup> A clear example of such a position is that of Iraq, repeatedly requesting the Arab countries to ratify the United Nations 97 watercourses convention.

<sup>57</sup> To include only the member countries of the Arab League



access of the annual renewable recharge, leading to declining groundwater levels<sup>58</sup>. Most of these countries are tapping non renewable groundwater reserves to satisfy the growing agricultural water demand as is the case in Saudi Arabia, Libya and Yemen. Unlike surface water, regulation of groundwater use has proven to be more difficult and requires extensive and costly monitoring systems. Many countries are suffering from illegal drillings despite adopting licensing arrangements, and where drilling is regulated, monitoring of abstraction rates is very weak or nonexistent. It may be concluded that although groundwater, both renewable and nonrenewable, is gaining significance in satisfying the growing water demand in the Arab region, it is not conjunctively managed with surface water within integrated water resources management plans.

Realizing that many of the shared water resources between the Arab countries are local as well as extensive, mostly, non renewable aquifers that extend across the political borders of various countries, it is evident that any legal instrument needs to incorporate groundwater resources together with surface water in one inclusive instrument. It should be noted that almost all existing legal instruments mark a distinctive separation between surface water and groundwater resources. Even in the UN 97 watercourse convention, groundwater is only incorporated to the degree it connects to surface waters<sup>59</sup>, and as such non renewable aquifers are thus not included within the provisions of the convention. In order to overcome this deficiency, the United Nations has initiated the work towards the codification of a legal instrument that incorporates all types of aquifers<sup>60</sup>. Although the draft articles of the law of transboundary aquifers incorporate both renewable and non renewable aquifers, it fails to include surface water within its provisions. The absence of a single legal instrument that addresses all types of shared water resources, although a deficiency on the global level, marks an opportunity for the Arab region to incorporate all types of shared water resources into a single comprehensive legal instrument. It is evident that, given the growing importance of non renewable aquifers and the need to manage them in an efficient manner, any regional legal framework for the Arab region would need to take their distinctive characteristics into considerations within its provisions.

#### B. DIVERGENT POSITIONS OF ARAB COUNTRIES ON THE INTERNATIONAL LEGAL INSTRUMENTS

Given that most of the Arab countries sharing international watercourses are considered downstream countries, it is expected that they would have similar positions on the rights of downstream countries to a fair share of these shared water resources. Although they probably agree on the principle of the right to a fair share, the local circumstances and conditions in the different part of the region have resulted in three distinctive positions. The first position is that of the countries that have ratified the UN 97 watercourse convention, which although they would probably have liked to see a heavier weight to the principle of no significant harm, they seemingly agree to the supremacy of the principle of equitable and reasonable utilization in an effort to minimize their losses and establish, as much as possible, a quantitative share to international rivers. The second position is that of countries that would like to maintain the status quo by holding on to the existing historical allocation agreements and believe that any shift of that position could lead to a reduction of their shares at a time of internal growth in water demand. This position have lead them oppose the approval of the UN 97 watercourse convention thinking that the convention would be used as a

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<sup>58</sup> According to the FAO-Aquastat data base, these countries are: Kuwait, Qatar, Bahrain, Libya, Saudi Arabia, Jordan, United Arab Emirates, Yemen, Tunisia and Djibouti.

<sup>59</sup> The convention defines a water course as “a system of surface waters and groundwater constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus.”

<sup>60</sup> General Assembly resolution number (A/63/439) annexed the law of transboundary aquifers.

legal entry point by the upstream riparian countries to modify the historical agreements. The third position is of those countries that do not share international rivers and as such think that the issue of shared water resources is not of a direct concern to them. As such their position is probably influenced by political drivers and solidarity sentiment<sup>61</sup> with either of the two positions.

Despite the diverging positions of the Arab countries on the UN 97 watercourse convention, developing a unified vision on the regulation, management and allocation of shared water resources is still a possibility. The diverging positions of the Arab countries on the convention can be attributed to the lengthy deliberations among many member countries of the United Nations leading to the introduction of elements of varying significance to countries of the Arab region. Nevertheless, many of the differing viewpoints of the Arab countries can be streamlined within a separate legal instrument. Two examples of streamlining positions are; the emphasis of the legality of historical agreements and the identification of the drainage basin, instead of the watercourse, as the main hydrological management unit, within the provisions of a regional unified legal framework. Reaching a common regional position on the issues that govern cooperation, management and allocation of shared water resources and the reflection of that common position into a legal instrument can strengthen the position of individual countries when negotiating agreements with upstream non-Arab countries through the unanimous legal backing of all Arab countries. Moreover, a regional legal framework would, from the legal sense, contribute to the international customary water law since states practices constitute an element of the development of international customs, thus indirectly stressing the needs and concerns of downstream countries.

### C. PROMOTION OF ARAB INTEGRATION

The Arab League was established over sixty five years ago with the aim to strengthen the links between member countries and coordinate their political plans in order to achieve higher levels of cooperation and maintain their independence and sovereignty<sup>62</sup>. Since its establishment, the League has developed and concluded many mutual treaties, conventions and agreements in an effort to achieve the desired level of integration<sup>63</sup>. Institutionally, besides the main Ministerial Council of Foreign Affairs, the League has over the years established various Ministerial Councils<sup>64</sup>. Recognizing the pivotal role of water in sustainable development and the compounded impacts of water scarcity at the local, national and regional levels, the League of Arab States established the Arab Ministerial Water Council (AMWC) in 2009. Although the decision to establish the Council has come relatively late in comparison with other ministerial councils of the League, it nevertheless reflects a regional political will to elevate water issues from the traditional technical level to the more influential political level. Establishment of the Council also reflects the interest of the member countries to deal with water issues of the regional nature, including those connected to the management of shared water resources.

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<sup>61</sup> Some countries that do not share international watercourses but have ratified the UN 97 watercourse convention, which may be considered as supportive to the position of the first group, are Libya, Qatar and Tunisia.

<sup>62</sup> According to the Charter, areas of cooperation between member countries include economic and financial affairs, trade and customs, transport and communications, culture, Immigration and security, social, and health. The charter of the League is available at [http://www.arableagueonline.org/las/arabic/categoryList.jsp?level\\_id=108](http://www.arableagueonline.org/las/arabic/categoryList.jsp?level_id=108)

<sup>63</sup> Examples of these treaties and conventions are: Treaty of mutual defense and economic cooperation between the countries of the Arab League, Convention of Arab free trade zone, Arab agreement on judicial cooperation, and Convention of the Organization of Arab Women.

<sup>64</sup> The League has ministerial councils for media, interior, justice, housing, environment, telecommunications, electricity, tourism, social affairs, youth, health, and water.

Among the various resolutions of the council on shared water resources, two have focused on trying to establish a unified position on the international legal instruments governing the cooperation, management and allocation of shared water resources<sup>65</sup>. These resolutions have resulted in activities where experts and representatives of Arab countries have met to consolidate joint comments on the draft articles of the Law of transboundary Aquifers and, on a separate meeting, attempted to converge the views of the different Arab countries on the UN 97 watercourse convention. Another initiative that aims at higher integration of water related policies at the regional level is the resolution of the first Arab Economic and Social Development Summit (Kuwait, 19-20 January 2009) to mandate the AMWC to prepare a regional strategy for Arab water security. Despite its title, the draft strategy includes a wide range of water-related issues covering most of the components and principles of integrated water resources management. On shared water, the draft strategy highlights the potential political tensions that could result from the absence of clear treaties and agreements to regulate their allocation, and stress that unless this is achieved, tensions will continue to threaten stability in the region. Moreover, the draft strategy underscores the situation in the occupied Arab territories,<sup>66</sup> where water resources are being unlawfully utilized by Israel, while Arab residents are deprived of the rights to access their own water resources. The strategy also acknowledges the need for a sound legal foundation for the management of water resources which are shared between the Arab countries and emphasizes the need for clear tools to facilitate bilateral and basin level agreements on the basis of fair allocation mechanisms, so as to ensure an equitable and reasonable share of shared water resources for all riparian countries.

In view of the efforts pursued by the AMWC to advance the issue of cooperation over shared water resources between Arab countries and in order to establish a sound legal basis to regulate intra regional shared water resources, the Council, at its second session, passed the following resolution:

*“[To] invite the Center of Water Studies and Arab Water Security and the United Nations Economic and Social Commission for Western Asia (ESCWA), in coordination with the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD) and the Stockholm International Water Institute (SIWI) to prepare a draft legal framework on shared waters within the Arab Region for its discussion during the next meeting of the Technical Scientific Advisory Committee of the Ministerial Council in January 2011.”*<sup>67</sup>

This action by the Council may be viewed as a major step towards integrated water policies and improved legal arrangements between the Arab countries. By submitting to a set of clearly defined guiding principles, the region would have the chance to position itself with regard to the management of shared water resources, not only within the wider regional context (between the region and its bordering non-Arab countries), but also between the countries of the region. It is understood that the ultimate aim of the proposed legal framework is to serve as a guide that sets out the main principles upon which the cooperation, management and allocation of shared water resources between riparian countries and aquifer states are to be based, recognizing that shared water resources should include all, surface and groundwater (both renewable and non-renewable) resources, that exist or flow across or along common national borders of two or more countries.

<sup>65</sup> League of Arab States. 2009. *Report and Resolutions of the Arab Ministerial Water Council First Session (Algiers, 27-28 June 2009)* (available in Arabic). and League of Arab States. 2010. *Report and Resolutions of the Arab Ministerial Water Council Second Session (League of Arab States, 1-2 July 2010)*. (available in Arabic).

<sup>66</sup> According to the strategy the Arab occupied territories include the Palestinian occupied territories, the Syrian Golan, and certain areas in southern Lebanon.

<sup>67</sup> League of Arab States. 2010. op. cit.

#### D. CONFLICT PREVENTION AND RESOLUTION

The aim of any legal instrument that involves more than one country is to clarify the rules and procedures on an issue and is mostly the result of bilateral or multilateral negotiation process. Negotiating agreements on shared water resources are lengthy, difficult to reach, and usually involve other, related or unrelated, political considerations, and as such, agreements on shared water are not always bound to only technical matters. This is certainly true in water scarce areas, where water is viewed as a source of political power especially by the upstream countries. Agreements on shared water resources, either binding on the operational level, or unbinding on the more general level, contribute to the prevention of dispute and assist in their resolution once they occur.

The charter of the Arab League states that member countries should not resort to force as a mean to resolve conflicts and indicates that once the parties seek mediation of the League, then its resolutions are binding to all parties of the conflict. Although reliance on mediation and collective solidarity among the member states of the Arab League can be viewed as an effective method for conflicts resolution, the institutional setup of the League does not incorporate a tribunal that looks into the conflicts between its members similar to that of the South African Development Community (SADC) region<sup>68</sup>. In the absence of regional tribunal, regional treaties and agreements can be viewed as effective conflict prevention mechanisms. This is certainly true for issues connected to national security, of which shared water resources qualifies as an issue that involves many of the ingredients for conflicts.

Although an armed conflict on water has not taken place between the Arab countries, the growing demand on water and the need of the different countries to secure rights to shared water resources could trigger the long prediction of a water war in the region. The only major incident over shared water took place during the mid seventies when Iraq and Syria came to the brink of war. In 1974 Iraq accused Syria on holding back water and asked the Arab League to intervene, which responded by forming a mediation committee. Syria withdrew from the committee and by May 1975 the incident escalated and threatened to turn violent with both countries building up troops at both sides of the border. Eventually with mediation from Saudi Arabia, an agreement was reached by which Syria agreed to use only 40 % of the water from the Euphrates River and let 60% of the flow into Iraq<sup>69</sup>. This incident shows the high level of vulnerability of the countries of the region towards the use and allocation of shared water resources. Without an adequate mechanism to reduce the risks for conflicts over water, the region is a candidate for violent incidents, not only between riparian countries of international watercourses, but also between riparian countries of smaller shared surface water and transboundary aquifers. It can thus be concluded that a legal instrument that clarifies the rules and principles on cooperation, management and allocation of shared water resources can be an effective tool not only for resolution of conflicts, but also for their prevention in the first place.

#### IV. SCOPE, SUBJECT MATTER, AND DEFINITION OF TERMS

A legal instrument that aims to regulate shared water resources would need to clearly define those resources in terms of their physical properties as well as the concept used in their

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<sup>68</sup> Article (20) of the League's charter sets the possibility to establish an Arab Court of Justice, but requiring the consent of two thirds of the member countries.

<sup>69</sup> Biswas. 1994. *International Waters of the Middle East: From Euphrates-Tigris to Nile*. New York: Oxford University Press, 53.

management. Therefore, a legal framework must begin by defining the subject matter that is regulated. The UN 97 watercourse convention, for example adopts a scope that includes the use<sup>70</sup>, protection, preservation and management of international watercourses and defines a watercourse as “a system of surface waters and groundwater constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus;” and defines an “international watercourse” to be “a watercourse, parts of which are situated in different States”<sup>71</sup>. The Draft articles of the law of transboundary aquifers also identifies its main scope to include the “utilization<sup>72</sup>, protection, preservation and management of transboundary aquifers or aquifer systems” and defines an aquifer as “a permeable water bearing geological formation underlain by a less permeable layer and the water contained in the saturated zone of the formation” with transboundary to mean “an aquifer or aquifer system, parts of which are situated in different states”<sup>73</sup>. This section will review the scope, subject matter, and definition of terms used in some legal instruments with an aim to identify an appropriate structure for a legal instrument on shared water in the Arab region.

#### A. SCOPE

The aforementioned two legal instrument examples include a wide scope that incorporates many aspects of water use in terms of type, quantity<sup>74</sup>, and quality. It is observed that the level of the legal instrument dictates, in many cases, its scope, with operational bilateral agreements focusing on more specific issues of concern such as water quality protection or allocation rules while broader international and regional legal instruments tend to be more general and cover a wider range of issues including type of use, water quality, and allocation rules. An illustration example of a bilateral operational agreement is the agreement between Syria and Lebanon on the allocation of the Orontes River, where from the outset of the agreement it details the rules of water allocations to the two countries. Surprisingly, the agreement does not cite water quality or the need to protect the river from contamination even once throughout the agreement<sup>75</sup>. In other water rich regions, bilateral water agreements tend to detail the procedures that ensure the protection of water resources and the environment and would probably not reflect water allocation rules in great details. An example of such an agreement is the Great Lakes Water Quality Agreement (GLWQA) between Canada and the USA<sup>76</sup>.

A regional legal instrument on shared water for the Arab region would need to take the specificities of the region, particularly water scarcity into considerations when identifying its scope. Despite the common regional perception that allocation rules should override any legal instrument on shared water resources, it should be realized that water quality needs to be equally integrated within the provisions of the legal instrument since polluted water, in many cases, could be more harmful than no water. A balance between allocation provisions and quality protection of shared water resources is the current global mainstream and would need to be incorporated in any regional legal instrument for it to be considered acceptable. A proposed scope of application of the legal instrument would need to be drafted along the following lines:

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<sup>70</sup> Uses of water for purposes other than navigation.

<sup>71</sup> Available at [http://untreaty.un.org/ilc/texts/8\\_3.htm](http://untreaty.un.org/ilc/texts/8_3.htm)

<sup>72</sup> Utilization is defined as “includes extraction of water, heat and minerals, and storage and disposal of any substance”

<sup>73</sup> Available at [http://untreaty.un.org/ilc/texts/8\\_5.htm](http://untreaty.un.org/ilc/texts/8_5.htm)

<sup>74</sup> Detailed clarifications on the factors that determine water allocations are included in other sections of the above two legal instruments.

<sup>75</sup> Lebanese official gazette no. 69, 19 December 2002.

<sup>76</sup> Available at <http://www.ijc.org/en/activities/consultations/glwqa/agreement.php>

- *The present legal instrument applies to; the use of waters of a shared drainage basin or a shared aquifer in the Arab Region, other activities that may have an impact upon those water resources, and measures of cooperation, protection and management related to those water resources.*

## B. SUBJECT MATTER AND DEFINITION OF TERMS

While the UN 97 convention focuses on surface water and only includes groundwater to the extent that it connects to surface water, the draft articles of the law of transboundary aquifers focuses only on groundwater without any distinctions found between renewable or nonrenewable aquifers. The draft articles of the law of transboundary aquifers, being the latter, seems to complement the UN 97 convention by incorporating nonrenewable groundwater, but at the same time neglect to clearly connect renewable groundwater to surface water and as such appears to overlap with the provisions of the watercourse convention. This overlap could lead to confusion of the rules that govern renewable groundwater resources. Given that both legal instruments were developed by the International Legal Commission of the United Nations, it could have been more beneficial for the law of transboundary aquifers to only concentrate on nonrenewable groundwater while leaving renewable groundwater to be regulated through the UN 97 watercourse convention or introduce the draft articles as a protocol to the convention.

Many agreements, both at the bilateral and multilateral levels, seem to focus on one type of water resources, either surface water or groundwater, depending on the prevailing climate, geology and hydrogeology of the region. It is therefore understandable for the Nile basin riparian countries to seek an agreement that addresses mainly the use of surface water, and for the Northwestern Sahara aquifer riparian countries to work towards an agreement on the use of groundwater. Given the large diversity of the Arab region, in that it includes a number of the major international rivers and some extensive and local transboundary aquifers shared between the Arab countries, as well as the heavy reliance on both types of resources in different parts of the region, it is only appropriate that a regional legal instrument includes both types of shared water resources; namely surface as well as renewable and nonrenewable groundwater resources. Proposed definitions of the subject matter of the legal framework are as follows:

- *“Shared drainage basin” means a geographical area extending between two or more Arab states determined by the watershed limits of the system of waters, including surface and underground waters.*
- *“Shared aquifer” means permeable water bearing geological formation extending between two or more Arab states and underlain by a less permeable layer.*
- *“Shared water resources” means fresh water resources, whether surface water or groundwater that are shared by two or more Arab States.*
- *“Surface water” means water on the earth’s surface, whether contained in a defined course or wadi, or falling on the earth’s surface as precipitation before infiltrating into the ground.*
- *“Groundwater” means water contained in an aquifer, whether or not the aquifer receives significant contemporary water recharge.*
- *“Pollution” means any detrimental alteration in the composition or quality of the water in the shared water resource which result directly or indirectly from human conduct.*

## C. MANAGEMENT CONCEPT – DRAINAGE BASIN VS. WATERCOURSE

Although global and regional legal instruments do not directly dictate the management details of shared water resources, they usually have an indirect influence through the definition of the geographical limitations and boundaries of the resources that they employ. The distinction between a drainage basin and a watercourse has a profound impact on the way the resource is managed, especially with the global trend towards the basin level management approach. While the Helsinki Rules<sup>77</sup> identify the drainage basin to be the main management hydrological unit, the UN 97 convention reduces the scope to the watercourse only. The reason for the shift from the wider geographical coverage of a drainage basin to the watercourse is embedded within the views of countries on sovereignty and its reference to land. Limited sovereignty on shared water resources is nowadays widely accepted and in order to curb the concept of limited sovereignty and restrict it only to water and not land, a shift in the scope from a drainage basin to a watercourse was adopted. In fact the UN 97 watercourse convention, in article 8, refers to the concept of sovereignty within the context of cooperation between sharing states in order to attain optimal utilization and adequate protection of the resource. Although the discussion over the issue of sovereignty is more of a political nature, it has direct implications on the management of shared water resources, where retraction from the concept of a drainage basin to the narrower watercourse has practically meant that the water subject for sharing is limited to the blue water segment of all available water within the drainage basin. This issue is one of the main reasons for Egypt's reservations to ratify the UN 97 watercourse convention. The adoption of integrated management of water resources at the basin level would account for all types of available water resources, including green water, which could enlarge the available water resources and justify the current or even an increased share to the dryer downstream countries.

Given the common historical socio cultural background of the Arab countries and the apparent intentions for socio economic integration under the political umbrella of the League of Arab States, the region can serve as model shifting the paradigm of water being a source for conflict to water as a driver for cooperation. This is partially reflected in the draft Arab water strategy, where shared water resources between the region and the neighbouring non Arab countries or among the Arab countries themselves, are considered an important element of the Arab water security. As such, the concept of individual national sovereignty can encompass and endure joint management of shared water resources, which indirectly mean that the drainage basin or the catchment area becomes the more appropriate hydrological management unit. Along these lines and inspired by the Helsinki rules on the use of waters of international rivers, the drainage basin within the regional legal instrument may be defined as:

- *A geographical area extending over parts of two or more countries determined by the watershed limits of the system of waters, including surface and underground waters.*

Although aquifers, with adequate technical and financial resources, can be delineated quite accurately to determine their physical properties, some aquifers are very extensive and cover wide areas in riparian countries. In such cases, the adoption of the concept of drainage basin reflects the need to consider the entire aquifer area which could extend for hundreds or even thousands of kilometres in both or either side. Due to the normally slow flow of groundwater, impacts of activities at one end of the aquifer on the other far end could either take an extended time period or in some cases might not show an impact at all. In these cases, sharing parties are encouraged to conduct joint investigations and modelling activities in order to delineate the aquifer area across the borders of riparian countries in order to identify and delineate appropriate resource management areas. Water quantity and quality considerations like over abstraction and waste disposal will need

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<sup>77</sup> Available at [http://www.internationalwaterlaw.org/documents/intldocs/helsinki\\_rules.html](http://www.internationalwaterlaw.org/documents/intldocs/helsinki_rules.html)

to be incorporated within the criteria used in the modelling and field investigations. An example of an arrangement that defines a management unit within a much larger aquifer is the mutual memorandum of understanding between Saudi Arabia and Jordan on the utilization of the Disi aquifer, where 10 km on each side of the borders have been identified as a protection zone, and may thus represent the core of a groundwater management area.

Unlike the draft articles of the law of transboundary aquifers, more emphasis should be given to the groundwater that exist in or flow through the geological formation rather than on the formation itself. Although riparian countries share the geological formation, it is the water that exists or flows through that formation that produces the benefits to be shared by the riparian countries.

## **V. GENERAL GUIDING PRINCIPLES OF THE REGIONAL LEGAL FRAMEWORK**

Within the content of the various legal instruments on shared water resources, the section on the guiding principles constitutes the heart of these documents. It is these principles that usually set the direction and dictates the modality of cooperation between riparian countries. This section reviews the guiding principles of the various global legal instruments on shared water, and, on the basis of the specificities of the Arab region, aim to highlight the most appropriate principles to be included within a legal instrument for the Arab region.

Of the various soft legal instruments, the 1966 Helsinki Rules on the uses of the waters of international rivers is probably the most extensive and has formed the basis for the subsequent United Nations 1978 watercourse convention. Generally, the guiding principles included in the international legal instruments can be summarized as follows:<sup>78,79</sup>

- *The general obligation to cooperate;*
- *Exchange of data and information;*
- *Notification of planned measures;*
- *Dispute settlement;*
- *Environmental protection;*
- *Sovereignty over shared resources;*
- *Equitable and reasonable utilization;*
- *The obligation not to cause significant harm.*

Of these general principles, it appears that the general obligation to cooperate is the least controversial and is widely accepted by most countries. It should be noted however that while certain countries agree to the notion of cooperation in general, they are more conservative on the degree of procedural details to be introduced in a legal instrument at the international or regional level. The next four principles can be viewed as subsidiary or direct application of the first principle

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<sup>78</sup> Salman, S., 2007, "The United Nations Watercourse Convention Ten Years Later: Why has its Entry Into Force Proven Difficult?", *Water International*, 32 (1): 1-15.

<sup>79</sup> Seligman, D. et al., 2008, *World's Major Rivers: An Introduction to International Water Law with Case Studies*, (Las Vegas, Nevada: Colorado River Commission of Nevada).



of cooperation, where they reflect the willingness of riparian countries to cooperate in good faith and neighbourliness. Like the first principle, generally, these principles are accepted by many countries unless found to be sensitive to national security. The last three general principles in particular have been a source of disagreement, leading in some part to the current status of the UN 97 watercourses convention, where, 13 years after the resolution was adopted by the General Assembly, has only been ratified by 23 countries. Ratification by at least 35 Member states of the United Nations is required for the convention to enter into force.

#### A. COOPERATION

Cooperation lies at the basis of all other principles governing shared water resources and is considered a necessary predicate to the effective implementation of the proposed basic principles that follow. Theoretically cooperation in general and particularly on shared water resources falls within a spectrum that has dispute and integration at each of its ends<sup>80</sup>. In an ascending order, cooperation starts with communication followed by coordination, collaboration, and finally reach the level of full integration in the form of joint actions. Examples of each of the stages along the cooperation spectrum are notification, information sharing, and regional assessments for communication and coordination, implementing suites of national investments that capture incremental cooperative gains and adapting national plans to mitigate regional costs and to capture regional gains for collaboration, and joint project assessment and design, joint ownership of infrastructure, joint institutions, and joint investment for full integration. A critical element in reaching full integration is a supportive political environment that includes besides a clear vision, conviction of the national long term benefits as well as perseverance to overcome any obstacles along the way. Moreover, reaching high levels of cooperation is a lengthy process that requires trust building initiatives from both sides. It is envisaged that the proposed regional legal framework in the Arab region aims to establish a platform for communication and coordination with the hope that it develops further into an instrument that facilitates greater collaboration and ultimately full integration among riparian Arab countries in the management of their shared water resources. A proposed draft article for the cooperation principle is as follows:

- *Arab States agree to cooperate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain the maximum possible sustainable utilization, adequate protection and effective management of their shared water resources.*

#### B. REGULAR EXCHANGE OF DATA

Data and information of a hydrological, meteorological, hydrogeological and ecological nature, as well as related forecasts, are necessary for states sharing water resources to implement the principle of equitable and reasonable utilization and to effectively manage shared water resources. Wherever possible, such data and information should be provided in a form that is readily usable by the state to which it is communicated. It becomes important that countries make the necessary institutional arrangements to facilitate the exchange of data and information both at the local, national, or regional levels. Strengthening institutional communication and coordination mechanisms at the technical level between the Arab countries can be viewed as a trust building measure as well as a step towards an integrated institutional set up at the basin level. A proposed draft article for the principle on the need for regular exchange of data and information is as follows:

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<sup>80</sup> Grey and Sadoff. 2003. *Beyond the river: the benefits of cooperation on international rivers*. Water Science & Technology, Vol 47 No 6 pp 91–96.

- *Pursuant to the principle of cooperation on shared water resources, Arab States sharing a water resource shall, on a regular basis, exchange readily available data, information, and forecasts on the condition of the resource, in particular that of a hydrological, meteorological, hydrogeological, and ecological nature, as well as those related to water quality.*

### C. NOTIFICATION OF PLANED MEASURES

Prior notification of planned measures that may lead to significant adverse effects on other states sharing freshwater resources is one of the most basic principles of international water law. Procedures of prior notification might involve exchange of information and data and could even include joint field investigations and as such can be viewed as an effective mechanism for dispute prevention. Furthermore, notification measures could lead to other dispute resolution mechanisms like mediation and arbitration. Nevertheless, notification of a planned measure cannot be considered as a request for consent of the notified state. It can thus be concluded that the vulnerability of the notification process, or its negligence turning into a conflict, depends to a large extent on the strength and robustness of the existing joint, or regional institutional arrangements, which are directly related to the willingness of the riparian countries to cooperate. Unlike the UN 97 watercourse convention, where prior notification procedures are detailed within the provisions of the convention itself, it is proposed that prior notification in the proposed regional legal instrument be formulated in general terms rather than a detailed rule of conduct. It is envisaged that bilateral and basin level operational agreements between Arab countries sharing water resources would detail the notification procedures of planned measures. Another, more favourable alternative is the possibility to prepare a set of detailed notification procedures that can be incorporated into the proposed regional legal instrument, after its ratification, as a separate protocol or annex. A proposed draft article for the principle on notification of planed measures is as follows:

- *Pursuant to the principle of cooperation on shared water resources, Arab States sharing a water resource shall exchange information and consult each other and, if necessary, negotiate on the possible effects of planned measures on the condition of the shared water resource.*

### D. DISPUTE SETTLEMENT

It can be argued that the existence of a legal instrument on shared water is in itself an effective mean for conflict prevention. As has been highlighted in previous sections, the Arab region is facing a major challenge to overcome the growing water scarcity, which given the magnitude and importance of shared water resources, if not positioned within a cooperative framework, might lead to disputes that have the potential to escalate into armed conflicts. Given the importance of the subject, international legal instruments tends to detail settlement arrangements and procedures, which usually involve a mix of technical, institutional and legal engagements. Chapter 6 of the Helsinki Rules, which includes 12 articles, is entirely devoted to the dispute prevention and resolution, whereas the UN 97 watercourse convention includes a detailed article that contains 10 item points on dispute settlement and an attached annex of 12 articles on details for arbitration. The important question then becomes, on how far is a detailed set of dispute settlement procedures adds value to the proposed regional legal instrument while at the same time does not hinder its approval and ratification. There is no doubt that detailed procedures on dispute settlement adds great value to the proposed legal instrument, but could at the same time distract the deliberations of the Arab countries into disagreements on the details thus posing the risk to impede

the endorsement for the legal instrument altogether. Given these valid risks, it might be better to follow a step wise approach, by which the framework, in its general format is deliberated and endorsed first, followed by a second step to prepare and adopt details for dispute settlement as an attached protocol or annex to the legal instrument. Nevertheless, the legal instrument would need to include an article on the general approach towards dispute settlement as one of the articles that reflect the notion and essence of cooperation. A proposed draft article on the principle of dispute settlement is as follows:

- *In the event of a dispute between two or more Arab states concerning the interpretation or application of this framework agreement, or other issues of relevance to the utilization, protection or management of shared water resources, the parties shall seek the settlement of the dispute by peaceful means and in accordance with the relevant provision of the charter of the League of Arab States.*
- *If the parties concerned cannot reach agreement by negotiations, they may jointly seek mediation or conciliation by the Arab Ministerial Water Council, or agree to submit the dispute to arbitration or to the International Court of Justice.*

#### E. SOVEREIGNTY VERSUS TERRITORIAL INTEGRITY

In general, the position of riparian countries on the different principles is primarily determined by their geographical location. Upstream countries tend to opt for the inclusion of the sovereignty principle, which gives them greater control over shared resources.<sup>81</sup> Although the sovereignty principle is aligned with the Charter of the United Nations, unlike land and fixed borders, water resources are of a mobile nature, distributing benefits across borders, and as such, sovereignty over them is more likely to be limited. Following this argument, downstream countries, on the other hand, are against the inclusion of the sovereignty principle in legal instruments,<sup>82</sup> putting greater emphasis on absolute territorial integrity<sup>83</sup> as the overriding principle determining water allocation between riparian countries. Both of the principles of absolute territorial sovereignty and absolute territorial integrity have received little support amongst the international legal community and in states' practices. They are regarded as inequitable in their allocation of water resources, as well as in their biased preference for upstream and downstream states respectively. A more acceptable principle from both ends is the principle of reasonable and equitable utilization, which combines elements of both principles in that it recognizes and evaluates the shared and competing interests of all states sharing the water resource<sup>84</sup>.

#### F. PRINCIPLES OF EQUITABLE UTILIZATION AND NO SIGNIFICANT HARM

From a general reading of country positions on the principle of equitable and reasonable utilization, it appears that all countries are in agreement on its notions of equity and fairness, but differ significantly on the weighting of the various factors that determine an equitable and reasonable utilization of a shared water resource. The extent of these differences is magnified by the

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<sup>81</sup> Ibid. p. 18.

<sup>82</sup> McCaffrey, S. 2009. *Current Developments: The International Law Commission Adopts Draft Articles on Transboundary Aquifers*. The American Journal of International Law, 103 (2): 272.

<sup>83</sup> Absolute territorial integrity provides lower riparian states the right to the continuous or natural flow of a river flowing from upper riparian states and permits upper riparians to exploit the waters of a river so long as such utilization does not affect the interests of lower riparians. In effect, lower riparian states receive a veto power or a monopoly over the water rights of upper riparian states.

<sup>84</sup> Eckstein. 1995. *Application of International water law to transboundary groundwater resources and the Slovak-Hungarian dispute over Gabčíkovo-Nagymaros*. Suffolk Transnational Law Review, 19, p. 67.

fact that existing legal instruments<sup>85</sup> specify a wide range of various factors to be considered in defining and identifying an equitable and reasonable use of shared water resources. The extended list of allocation factors seems to have been developed as a result of the consensus building process, which led to the need to take account of all concerns. It is believed that once the allocation factors are consolidated in a simplified format that allows for quantifying the share of each riparian country, the current debate on the supremacy of the two main principles – equitable and reasonable utilization and no significant harm – on each other will become irrelevant. Under the equitable and reasonable utilization principle, each riparian state is entitled to a reasonable and equitable share in the beneficial uses of a shared water resource. It is perhaps the fundamental principle governing such resources and is widely accepted as a general rule of customary international law.

The principle of no significant harm receives wide recognition today as a general principle of international law and is applied in numerous international treaties, declarations, and other international legal instruments<sup>86</sup>. Customary international law obliges states not to use, or allow the use of, their territory for acts contrary to the rights of other states. When considering whether one state's action causes, or will cause, harm to the territory of another, it has been suggested that the harm must be "appreciable", "substantial" or "significant" before international water law may be explored. For an action to rise to the level of "appreciable" or "substantial" harm, the action must have significant and consequential effects upon public health, economic productivity, or the environment of another state. Although harm within the context of water management might instinctively be linked to water quality, over-exploitation of a shared water resource or the diversion of a shared river could detrimentally affect another state's territory in violation of the essence of this principle and international law.

Despite concerns over the complex relationship between the principles of equitable and reasonable utilization, and the no significant harm, and the opinion that "harm" is best ascertained in the context of specific agreements concluded by two or more states concerning particular shared water resources, the inclusion of the no significant harm as a separate principle within the provisions of a legal instrument for the Arab region seems to be in line with the region's specificity of being mostly downstream countries. Once a legal instrument incorporates the no significant harm as a guiding principle, it becomes necessary to adopt an approach that incorporates mitigation and possibly compensation. A proposal draft article for the principle of equitable and reasonable utilization is as follows:

- *In fulfilment of their agreement to cooperate in the use, protection and management of shared water resources, Arab States agree to take all appropriate measures to ensure that those water resources are utilized in an equitable and reasonable manner in relation to all sharing States.*
- *Utilization of a shared water resource in an equitable and reasonable manner should take into account relevant factors and circumstances including, but not limited to, the natural and physical characteristics of the resource, past, current and potential future social and economic water needs, and the availability and use of alternative water resources. Depending on the local circumstances, these factors could, in full or in part, be considered to guide the evaluation of uses and accordingly facilitate the allocation process of shared water resources among riparian states on an individual case basis.*

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<sup>85</sup> The Helsinki rules, the 1997 UN watercourse convention, and the draft articles on the law of transboundary aquifers.

<sup>86</sup> Ibid p. 20.

- *In the absence of agreement or custom to the contrary, within a shared water resource, drinking needs have priority over all other uses, followed by household, livestock, industry and irrigation needs respectively.*

Moreover, a proposal draft article for the principle of the no significant harm is as follows:

- *Arab states shall, in utilizing a shared water resource in their territories, take all necessary measures to prevent the causing of significant harm to all sharing states. Where significant harm is caused to another state, the state whose use causes such harm shall, take all appropriate measures to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation.*
- *Harm is considered significant when the action of one state leads, directly or indirectly, to consequential negative effects on public health, economic productivity, or the environment of another state.*

#### G. FACTORS OF EQUITABLE AND REASONABLE UTILIZATION

There are two important elements that need to be clarified within a regional legal instrument that employs the equitable and reasonable utilization principle, the first is the evaluation of needs vs. rights, and the second is the definition of fairness in respect to equity.

A closer look into the three main legal instruments, namely the Helsinki rules, the UN 97 watercourse convention, and the draft articles of the law of transboundary aquifers, reveals that all three identify a wide range of factors that aim to allocate water shares among the riparian countries. Almost all three sets of factors can be grouped into three categories, namely the natural and physical properties of the resource, the various needs of water and resources availability, and the management and protection measures of the resource. Within the context of equitable and reasonable utilization, the factors imply that an equitable utilization does not mean equal shares and that all factors will need to be weighed and evaluated together as a whole and on a case by case basis. The emphasis on water needs and the availability of alternative water sources among the factors seem to lead to a discussion on the fundamental question of whether riparian countries are entitled to a share in the shared water resource on the basis of their needs, or on the basis of their rights irrespective of their needs. In other words, does a water rich country have the right to access a shared water resource regardless of its reliance on that resource to substantially satisfy its water needs? In principle, every riparian country should have the right to access and benefit from an equitable share of the resource and use that share in a beneficial manner that it sees fit, without reference to any restrictions on the type of use or the return benefits of that use as long as it does not result in “significant” harm to the other riparian countries. If this is the case, then the concept of needs is put into an appropriate perspective, where it does not eliminate or replace rights. The concept of secured and clear property rights of the different riparian countries to specified shares helps also, directly and indirectly, to increase the social and economic value of shared water resources.

Having established the right of each riparian country to a water share to be utilized in any reasonable way it sees fit, the more difficult question refers to the distribution of the shares among the riparian countries. It is suggested that the aforementioned set of factors of the different legal instruments is inclusive<sup>87</sup>, and as such may constitute a basis for the allocation of water shares among riparian countries. An observation of the three categories of the factors reveals that while the

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<sup>87</sup> The factors do not take political disparities into consideration, which in many cases influence the negotiation process.

natural factors can be assumed to be of a fixed nature<sup>88</sup>, the demand factors are time dependant and cannot be easily predicted due to the large number of variables that dictate the socio economic and political development of a country. The element of time dependency introduces an additional level of difficulty in the allocation process since what appears reasonable and equitable today might in a few years appear less reasonable or equitable given the socio economic changes of one or all riparian countries. Such changes would, in practical terms, raise the need for continuous review of the allocation process, which might not be a politically feasible approach.

Although the notion of fairness appears to be embedded within the meaning of equitable and reasonable, it is rather useful to define fairness and identify its elements as to facilitate the weighing of the different factors and lead to an acceptable allocation process. In connection to property rights of shared water resources, with all of its privileges and duties, should fairness be interpreted as a reward to those countries using water more efficiently and as a penalty to other countries making less efficient use of available water, or to countries with financial capacities to develop other alternative water sources such as desalination? It is believed that a differentiation should be made between a right to a share and the decision on how to make use of that share, which mostly becomes an issue of internal national affairs, irrespective of the capacity to develop other internal water resources. Nevertheless, fairness also dictates that a country that has developed shared water resources to the extent that its population have become heavily reliant upon them not be deprived of an adequate share of those resources – taking into account possibilities for conservation and greater efficiency of use. But at the same time, other sharing states that have been slower to develop these shared water resources should not be foreclosed from reasonably increasing their use of these resources, provided such increase is efficient and necessary for the improvement of living conditions, or economic development. Although clear answers on the issue of fairness cannot be reached within the scope of this paper, these questions would need to be raised during the bilateral or multilateral negotiations between riparian countries on the allocation process of shared water resources.

Based on the above discussion, it is advisable not to incorporate a preset of factors that direct the allocation process into the regional legal instrument, but leave it to the directly involved parties to negotiate the allocation process in accordance to the elements of fairness and specificities of the situation on a case by case basis.

## H. ENVIRONMENT PROTECTION

The inclusion of a separate principle that highlights the need to protect the environment within the provisions of a regional legal instrument on shared water is partly an indirect endorsement of the other two principles of the obligation not to cause significant harm and the obligation to cooperate. Generally, this principle puts greater obligations on the upstream watercourse or aquifer sharing states. The main aim of an environmental protection provision within a regional legal instrument on shared water is to prevent, control and reduce water pollution from point and non-point sources that causes or is likely to cause transboundary impact and to ensure that shared waters are managed using ecologically sound and rational water management approaches. In order to prevent, control and reduce transboundary impacts, countries need to take relevant legal, administrative, economic, financial and technical protective measures at the national level. Furthermore, countries need also to, ensure the control of pollution at source, apply appropriate and effective technologies, institutionalize the application of environmental impact assessments, and the

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<sup>88</sup> Factors related to hydrology and hydrogeology are influenced by climate change.

promotion of other issues of direct relevance like monitoring, research and development, stakeholder consultation and participation, and the exchange and protection and public disclosure of data and information. Like the other principles on notification and dispute settlement, the regional legal instrument can highlight, in general terms, the need for environmental protection, while leave detailed measures to be developed in due time and be incorporated through an annex. A proposed draft article for the principle of environmental protection is as follows:

- *Arab States shall, individually and where appropriate jointly, prevent, reduce and control the pollution of a shared water resource that may cause significant harm to other sharing states or their environment, including harm, to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the shared water resource. Arab states shall take steps to harmonize their policies in this connection.*

## I. COMMUNITY OF INTERESTS AND OPTIMAL UTILIZATION

The community of interest principle proposes to utilize the waters of a river basin as a single unit in an integrated and optimal manner. The maximized benefits that result from its use are then shared between the riparian countries. By seeking the optimal benefits from the use of shared water resources, it goes a step beyond the principle of reasonable and equitable utilization. This theory promotes the highest economic efficiency and the greatest beneficial use possible, though sometimes at the cost of equitable distribution of benefits among the states sharing the resource. Moreover, being based on economic efficiency, this theory ignores all national boundaries and considers the entire water system as a single economic and geographic unit. Though ideally the theory of community of interest can be regarded as the most efficient theory for the management of shared water resources, in practice it faces many obstacles related to, the criteria to be used for the distribution of benefits, sovereignty, national security, etc. that make it impractical. It is therefore proposed not to include a separate principle on community of interests in the regional legal instrument, but strive to achieve full integrated management of shared water resources indirectly through the draft text of the other principles.

## VI. FORMAT OF THE REGIONAL LEGAL FRAMEWORK ON SHARED WATER RESOURCES

Although the resolution of the Arab Ministerial Water Council calls for the preparation of a legal framework, such a framework would need to take a specified legal format that reflects its purpose and function. In principle, the regional legal framework can either be of a binding or a non binding format. A non binding format like a statement, guidelines, or a declaration might be favoured from a political standpoint and will probably be more easily adopted and approved within the Arab Ministerial Water Council. Such a format, on the other hand, is usually of an advisory nature and lacks mechanisms for implementing its provisions and as such is mostly ineffective and does not lead to solid results on the ground. Unlike the Universal Declaration of Human Rights, it is doubtful that a regional declaration on the cooperation and management of shared water resources in the Arab region would in time develop into a binding legal instrument.

The other format that the regional legal framework can adopt is any binding form like an agreement, a treaty, a charter, or a convention. Regardless of the name and despite the expected more difficult political negotiation process for its approval, such a format would facilitate a practical approach towards cooperation on and management of shared water resources. In order to facilitate support for the approval process of a binding legal instrument, it is advisable that the legal instrument sets the direction and identifies the general principles that would guide the development

of bilateral and basin level operational agreements and at the same time should avoid setting detailed procedural arrangements. When such detailed procedures are necessary, they can be drafted, negotiated and attached to the legal instrument as protocols or annexes at a later stage. Examples of such issues that could be detailed at a later stage are the dispute settlement arrangements, notification procedures, and environmental protection measures. It is also important that a binding legal instrument identifies appropriate institutional arrangements that are mandated to follow up its implementation. In this case, it is important to build upon the existing institutional structures of the Arab Ministerial Water Council and its technical secretariat. In this regard, it might be necessary to establish a special technical committee of high level official representatives of member countries to assist the Ministerial council in carrying out its relevant duties connected to the proposed regional legal instrument.

## **VII. CONCLUSIONS**

Given the increasing water demand that results from rapid population growth, integrated management of water resources in the water scarce Arab region gains prime importance. Limited resources coupled with growing demand and the prospects for interruption of the water cycle by the expected impacts of climate change would probably further exacerbate the water scarcity situation in the region.

Generally, the region is perceived to rely mostly on surface water that originates outside its borders, comprising some 50-60% of all renewable water resources in the region. Despite the attention given to the major international rivers (Nile, Euphrates, Tigris, and Senegal), countries of the region also share many smaller perennial and seasonal surface waters as well as groundwater that lie in or flow through cross-boundary aquifers.

Despite the absence of a binding international legal instrument on the utilization of international water resources, global treaties and conventions cannot equally tackle all the various regional detailed concerns and specificities. Regional legal instruments on shared water, on the other hand, can partially fill the gaps of international instruments in that they are able to tackle more effectively the different regional specificities. Realizing that external renewable water resources constitute more than half of the renewable water in the region, securing the rights to those resources becomes an element of national and regional security. A common vision and a unified understanding of the legal basis to manage shared water resources, whether internally between countries of the region, or externally with neighboring upstream non-Arab countries can constitute a major step towards achieving water security in the region.

Specificities of the Arab region have a determinant role to play in how water resources, both internal, shared with non Arab countries, or shared among countries of the region, are allocated, managed, and used. Some of these specificities include the growing water scarcity (compounded by the potential adverse impact of climate change), large variations in the economic strength of the different countries, a tradition of agricultural-based economies and employment, unclear national and regional food security policies, low institutional capacity to effectively manage internal as well as shared water resources, insecurity of water rights to international water resources and a sense of vulnerability from being the downstream riparian countries, political tensions and instability in some countries of the region, and the power imbalance and water hegemony that favours non-Arab upstream countries and occupying forces. These issues and others influence the way in which countries of the Arab region view and manage both internal and shared water resources.



Based on some of the aforementioned specificities of the Arab region, it is logical that some countries, especially those under threat of lower access to shared water resources, would opt for the development of a binding legal instrument that sets their rights of prescribed shares to shared water resources. Some of the relevant issues that clarify the added value expected from a regional legal instrument on cooperation and management of shared water resources between the Arab countries include, the opportunity to addresses all types of shared water resources, namely surface, renewable and nonrenewable groundwater resources in a single legal instrument; converging the views of the various Arab countries into a common position; and an imperative step towards conflict prevention and Arab integration.

It is observed that the level of the legal instrument dictates, in many cases, its scope, with operational bilateral agreements focusing on specific issues of concern such as water quality protection or allocation rules while broader international and regional legal instruments tend to be more general and cover a wider range of issues. Despite the common perception that allocation rules should override any legal instrument on shared water in the Arab region, it should be realized that water quality needs to be equally included within the provisions of the legal instrument. A balance between management and allocation provisions and quality protection measures of shared water resources is the current global mainstream and would need to be incorporated in any regional legal instrument for it to be considered acceptable. Of all guiding principles, cooperation should form the backbone of the regional legal instrument and should be viewed as a necessary predicate to the effective implementation of the other proposed basic principles that follow. Other principles to be incorporated in the provisions of the regional legal instrument include, the regular exchange of data and information, timely notification of planed measures, dispute settlement, the obligation not to cause significant harm, reasonable and equitable utilization, and environmental protection.

Although the existing international legal instruments identify a long list of factors to define and indentify equitable and reasonable uses and thus indirectly contribute to the allocation of shared water resources, it is recommended not to incorporate a preset of factors that dictate the allocation process into the provisions of the regional legal instrument. It is proposed that the legal instrument is drafted as to encourage the involved parties to negotiate the allocation process in accordance to the elements of fairness and specificities of the situation on a case by case basis. Although the resolution of the Arab Ministerial Water Council calls for the preparation of a legal framework, such a framework needs to take a specified legal format that reflects its purpose and function. Although in principle, the regional legal framework can adopt either a binding or a non binding format, given the regional specificities and the relevant factors that justifies its preparation, a legal instrument in the form of a binding “framework agreement” is recommended.