

**WATER IN THE MIDDLE EAST**  
**THE SCARCE RESOURCE IN THE REGION**

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## ABSTRACT

Water in the Middle East is the most problematic issue due to the scarcity of water resources, and necessity to administer their uses to satisfy health, energy, science, industry and transportation interests. Current patterns of the consumptive uses of water, are likely to add further strains on security requirements.

The fact that the major water resources of the Middle East are jointly shared among different countries and as unused water resources became less and less has in recent years led to competition over these resources and in certain cases to conflicts and even to mobilization of armed forces.

This study includes five chapters. The historical and descriptive methods were used in the study. The material used in the study were primary written literature.

The first chapter is "About the Study". The subject and the purpose of, the hypothesis and the method of, and the layout of the study were explained in this chapter.

The law of the non-navigational uses of international watercourses was studied in the second chapter. The chapter includes two main parts. The first part deals with the general nature of this branch of law. The second part is about the major codification studies on the law of the non-navigational uses of international watercourses.

The third chapter is about the major international watercourses in the Middle East, including the Jordan, the Nile and the Orontes Basins. The hydrologic features of the these international watercourses was studied in this chapter. Also the major hydraulic works and management plans on the basins, and the positions of the riparian states regarding to these basins were analyzed in this chapter.

The fourth chapter examines the Euphrates-Tigris Basin, which is also a very important rivers of both Turkey and the Middle East. The sections of the third chapter are also included in this chapter, in addition to a general hydrological survey of Turkey and the arguments of the riparian states regarding to the basin.

The fifth chapter is the "Concluding Remarks". It consists of three sections. The first section lies the findings about the study laid down throughout the study. The second section is about the proposals, which are made in accordance with findings. The Conclusion is the last section of this chapter.

## ÖZ

Ortadoğu, ülkelerarası çatışmalar açısından dünyanın en sorunlu bölgelerinden biridir. Ülkeler arasında var olan ve tarihten gelen düşmanlık ve çatışmalar bölgeyi bir barut fıçısına çevirmiştir. Bu barut fıçısını ateşleme olasılığı olan birçok fitil vardır. Ortadoğu'daki uluslararası (sınıraşan) su kaynaklarının kullanımı sorunu da bu fitillerden birisidir.

Bu çalışmada, Ortadoğu'da Sınıraşan Sular Sorunu incelenmiştir. Çalışmada tarihsel ve betimsel yöntemler kullanılmış olup, kullanılan kaynaklar birinci dereceden yazılı kaynaklardır.

Çalışma beş ana bölümden oluşmaktadır. Birinci bölüm "Çalışma Hakkında" Bölümü olup, çalışmanın konusu ve amacı bu bölümde anlatılmıştır. Bu bölümde ayrıca çalışmanın denencesi ve yöntemi belirtilerek, çalışmanın sunuş sırası da aktarılmıştır.

İkinci Bölüm'de Uluslararası Su Hukuku'nun konumuzla ilgili yönleri incelenmeye çalışılmıştır. Bölüm iki ana kısımdan oluşmaktadır. Birinci kısımda Uluslararası Su Hukuku'nun genel niteliği incelenmiş, ikinci kısımda da bu konuda yapılan kodifikasyon çalışmalarından bahsedilmiştir.

Üçüncü Bölüm'de Ortadoğu'daki önemli sınıraşan nehirler olan Şeria, Nil ve Asi Havzaları kapsamlı bir şekilde incelenmiştir. Bu bölümde bahis konusu nehirlerin hidrolojik özellikleri ve bu havzalardaki havza yönetimi çalışmaları incelenerek, tarihsel bir sıra içerisinde gerekli bilgiler aktarılmaya çalışılmıştır.

Dördüncü Bölüm ise Türkiye'nin başlıca sınıraşan nehirleri olan Fırat ve Dicle Nehirleri incelenmiştir. Bölümün incelenmesinde izlenen yöntem Üçüncü Bölüm'deki gibidir.

Beşinci Bölüm "Sonuç" Bölümü'dür. Bölüm üç kısımdan oluşmaktadır. Birinci kısımda çalışmada elde edilen bulgular ortaya konmuştur. İkinci kısımda bu bulgular ışığında öneriler geliştirilmeye çalışılmıştır. Son kısım ise kısa bir değerlendirme niteliğini taşımaktadır.



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## LIST OF ACRONYMS

ATI .....	Absolute Territorial Integrity
ATS .....	Absolute Territorial Sovereignty
CCS .....	Community Co-Riparian States
DSÝ: .....	State Water Works
DSÝ .....	The General Directorate of State Hydraulic Works of Turkey
GAP.....	Southeastern Anatolia Project
GNP .....	Gross National Product
HEPP .....	Hydroelectric Power Plant
I.I.L. ....	Institute of International Law
ICJ.....	International Court of Justice
ILA.....	International Law Association
ILC.....	International Law Commission
JTC .....	Joint Technical Commission
LTS .....	Limited Territorial Sovereignty
OAU .....	Organization for African Unity
OECD ....	Organization of Economic Cooperation and Development
PCIJ.....	Permanent Court of International Justice
PKK .....	Kurdistan Worker's Party
SPLA .....	Sudnese People's Liberation Army
U.N.....	United Nations
UNDP ...	United Nations Development Programme
UNEP ....	United Nations Environment Programme
UNRWA..	UN Relief and Works Agency for Palestine Refugees

US.....United States

USA.....United States of America.

USAID: ...United States Agency of International Development

USSR.....United Soviet Socialist Republics.

WMO .....World Meteorological Organization



## **I. ABOUT THE STUDY**

This chapter consists of three sections. The first section (1.1) deals with the subject and the purpose of the study. The hypothesis and the method of the study was examined in the second section (1.2). In the last section (1.3), the layout of the study was presented.

### **1.1. The Subject and the Purpose of the Study**

Because it is essential to health, agriculture, energy, science, industry, transportation, and recreation -in short, to human existence- water is an incredibly complex matter, at once political, economic, legal, social and ecological in its nature, and no issue is so crosscutting as water.

It is important to review several facts which characterize the world's water supply. The total volume of the earth's water is about 1.4 billion mcm. Of this total volume, 97.3 per cent is salt water - only 2.7 per cent is fresh, and most of this, which is 77.2 per cent, is frozen into ice caps and glaciers. Of the remaining 22.8 per cent of fresh water, 22.4 per cent is to be found in underground aquifers. Only 0.36 per cent is readily available for human use in lakes and rivers: the rest is present in gaseous form in the earth's atmosphere. Thus types of water which make up the hydrological cycle are several: seawater, ice, atmospheric water, groundwater, and surface water.

In a world populated by some 5,500 million people, more than a third do not have safe drinking water and a quarter do not have sanitation. Some 50,000 deaths occur every day from waterborne diseases. To put this in perspective, this is a third of all deaths occurring in the world.<sup>1</sup>

As the earth moves into the 21<sup>st</sup> century, water is becoming one of the largest, and certainly most universal, problems facing mankind. Global water withdrawals are believed to have grown more than 35-fold during the past three centuries, and are projected to increase by 30-35 per cent by the year 2000. Current patterns of freshwater use cannot be

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<sup>1</sup> Leonard Bays, "Urbanisation and Birth-Rate Thwart Global Water Progress", *Water Technology International*, in Mary Monro (ed.), London: Century Press, 1991, p. 11.

sustained if human populations reach 10 billion by 2050, because of two important reasons.<sup>2</sup> First, the global population is increasing rapidly, and is likely to continue to do so till about the year 2050, or even beyond. This means more and more water would be required for domestic and industrial uses, agricultural production and hydropower generation for this expanding population. Second, as more and more people attain a higher standard of living, per capita water demand would continue to increase as well.

On the other hand, water resources, by their very nature, ignore the political boundaries which divide the globe into nation-states. Of 214 first-order river systems around the world, 155 are shared by two states and 59 by 3-12 states. Already these major rivers support 40 per cent of the world's population. For that reason, several of them have already caused international conflict, and as the world grows thirstier, these tensions will increase.

Four of these conflict-laden river systems are located in the Middle East. The Middle East is the region that is facing the most serious water problems in the world. There are several reasons for these problems: The very limited availability of water in the desert to semi-desert climate; the rapid population growth; the high cost of developing new sources of water; and the tensions among countries preventing cooperation in the water sector.

Water in the Middle East is also a conflict-laden determinant of both the domestic and external policies of the region's principal actors. As water shortages occur and full utilization is reached these policies tend to be framed more and more in zero-sum terms.<sup>3</sup>

According to Doğu Ergil, the expression *playing with fire* which denotes danger has been replaced by *playing with water* in the Middle East, and it is not inconceivable that a major future interstate conflict in the Middle East might arise not from the region's most plentiful resource, oil, but from its scarcest, water.<sup>4</sup>

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<sup>2</sup> United Nations Environment Programme, **Caring for the Earth: A Strategy for Sustainable Living**, Gland: UNEP, 1991, p. 137.

<sup>3</sup> Thomas Naff and Ruth C. Matson, **Water in the Middle East: Conflict or Cooperation?**. Boulder: Westview Press, 1984, p. 1.

<sup>4</sup> Doğu Ergil, "Ortadoğu'da Su Savaşları mı?", **S.B.F. Dergisi**, Vol. 45, Nos. 1-4, January-December 1990, pp. 74-75.

Although countries in the Middle East rich in oil and gas do not feel the water shortage and do not suffer from it because the richness on energy compensates for the lack of the naturally unavailable water by artificially producing it through desalinating sea water. The problems arising from the water shortage are under consideration in the poor Middle East countries.

The purpose of this study is to analyze the conflicting nature of the water in the Middle East. Beginning with a theoretical framework, that is the law on the non-navigational of the international watercourses, the four major river systems in the Middle East were analyzed from different perspectives in order to determine the place of the water in the political and economic life of the Middle East.

## **1.2. The Hypothesis and the Method of the Study**

The hypothesis of the study is as follows:

*The water in the Middle East is a conflict-laden determinant in the region. For that reason, the issue of the utilization of international water resources in the Middle East is one of the leading factors causing instability in the region.*

The descriptive and historical methods were used in this study. The descriptive method is to describe the problem and the current situation by way of establishing the facts. The historical method is to examine the past events, issues, persons and institutions by analyzing documents and evidences about them.

It is also of note that, besides of these methods, the academicians, bureaucrats and experts were interviewed to gain a true and detailed mode of vision about the subject of the study.

## **1.3. The Layout of the Study**

This study consists of five chapters. Apart from that, an implicit *Four Divisions Approach* was used in the study, although it was not explicitly stated. Before proceeding to

explain the contents of the chapters of the study, it is useful to give a general knowledge about the above-mentioned approach by showing it on the Table 1.1.

**Table 1.1**  
**Chapters and Divisions of the Study under Four Divisions Approach**

<b>Chapters</b>	<b>Divisions</b>
Chapter I	The First Division <i>The Division of Method</i>
Chapter II	The Second Division <i>The Division of the Theoretical Framework</i>
Chapters III and IV	The Third Division <i>The Main Subject of the Study</i>
Chapter V	The Fourth Division <i>The Division of Conclusion and Evaluation</i>

The layout of the study is as follows:

The first chapter is the introductory chapter of the study. The subject and the purpose of, the hypothesis and the method of, and the layout of the study were explained in this chapter.

The second chapter is about the theoretical framework of the study. The law of international watercourses was examined in two main parts. The first part is about the general nature of this branch of law. The major codification studies on the law of the non-navigational uses of international watercourses was studied in the second part.

The third chapter includes general review about the major international watercourses of the Middle East, which are the Jordan, the Nile and the Orontes Basins. The hydrological features of the basins, the major hydraulic works and management plans on the basins, and the positions of the riparian states regarding to these basins were analyzed in this chapter.

The fourth chapter examines the Euphrates-Tigris Basin, which is also a very important rivers of both Turkey and the Middle East. The sections of the third chapter are also included in this chapter, in addition to a general hydrological survey of Turkey and the arguments of the riparian states regarding to the basin.

The fifth chapter is the Concluding Remarks. It consists of three sections. The first section lies the findings about the study laid down throughout the study. The second section is about the proposals, which are made in accordance with findings. The Conclusion is the last section of this chapter.





## II. THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES

The law of the non-navigational uses of international watercourses is one of the most unsettled areas of international law and is still immature and at a relatively early stage of development. This immaturity finds expression on two levels: First, in the regulation of only a small portion of the earth's water resources, surface and ground; and second, in the lack of comprehensive and binding rules which have been formally codified. On the other hand, important progress has been made in the field in the second half of the twentieth century, clearly indicating the directions in which this branch of the positive law is evolving.<sup>5</sup>

However, it must be noted that the current legal principles on this branch of international law were established mainly by precedent and regulated by treaties binding only the signatory states, and remained at the customary level leading to very different interpretations.<sup>6</sup> There is an urgent need to establish a set of comprehensive rules for a better legal order on this branch.

In this chapter, the law of the non-navigational uses of international watercourses was studied. The chapter includes two main parts. The first part deals with the general nature of this branch of law. In this part, international law as a frame of reference to international watercourses (2.1.) was examined. Then, the major concepts applicable to international watercourses (2.2.), the legal doctrines of water utilization (2.3.) and the principles applicable to the law of the non-navigational uses of international watercourses (2.4.) were studied in general terms.

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<sup>5</sup> Deborah Housen-Couriel, **Some Examples of Cooperation in the Management and Use of International Water Resources**, Jerusalem: The Harry S. Truman Research Institute for the Advancement of Peace, 1994, p. 5.

<sup>6</sup> Gün Kut, "Ortadoğu'da Su Sorunu ve Türkiye" in **Ortadoğu Sorunları ve Türkiye**, (ed. Haluk Ülman), İstanbul: TÜSES Yayınları, 1991, p. 105.

The second part is about the major codification studies on the law of the non-navigational uses of international watercourses. In this part, the works of two important international organizations, namely the International Law Association and International Law Commission, (2.5.) are examined, and then bilateral treaties among riparian states sharing Euphrates-Tigris Basin, i.e. Turkey, Syria and Iraq, (2.6.) are studied.

However, before proceeding to examine the subject it must be noted that, there is a confusion about the concept of *international watercourse*. Turkey accepts the concept of *transboundary watercourse*, claiming that these two concepts are different in nature. Turkey's argument was examined in the Chapter IV. However, as Gün Kut pointed out also, the international trend is towards to using the concept of international watercourse.<sup>7</sup> Therefore, for the sake of unification and clarity, the concept of international watercourse will be used in the rest of the study.

## 2.1. International Law as a Frame of Reference

There are certain difficulties of international law in dealing with international watercourses. The primary difficulty arises on the physical nature of an international watercourse. Indeed, there is a conflict between a physical truth and an artificial case. Namely, a watercourse is a physical entity from its sources to its mouth from the natural point of view. However, this entity is artificially divided by boundaries of riparian states and different parts of the same watercourse enter different riparian states' fields of sovereignty. For that reason, every riparian state has sovereign rights on parts of the watercourse flowing through its boundaries.<sup>8</sup> This is "a question which shall never arise in connection with a national river which lie wholly from its sources to its mouth within the boundaries of the one and the same state."<sup>9</sup>

<sup>7</sup> From an interview with Gün Kut, İstanbul, August 17, 1995, 18.00 (GMT).

<sup>8</sup> Cem Sar, **Uluslararası Nehirlerden Endüstriyel ve Tarımsal Amaçlarla Faydalanma Hakkı**, Ankara: S.B.F. Yayınları, 1970, p. VII.

<sup>9</sup> Mohamed El Mor, "Water Resources in the Middle East", Paper Submitted to **The Conference on the Middle East Water Crisis: Creative Perspectives and Solutions**. Waterloo: University of Waterloo, May 7-9, 1992, p. 1.

While international law has some difficulties arising from artificial cases on the one hand, the question of the utilization of the waters of international watercourses has acquired considerable importance with the application of scientific methods to the utilization of waters of international watercourses, on the other. As Samir Ahmad has pointed out:

*...the new trend towards the construction of dams, reservoirs, canals and the like have shown that the problem of proper utilization of the waters of international watercourses is no less important than the problem of navigation; hence the increasing need for the formulation of precise rules governing the new problem.*<sup>10</sup>

In many regions of the world, many water disputes had arisen in the past on the utilization of international watercourses. "All those disputes were settled by the goodwill of the concerned parties, either by political ways or by adjudication."<sup>11</sup> Here, a question arises when we see that those disputes were settled by political ways and by adjudication. This question is that whether watercourse disputes are *legal* or *political* disputes.

As Yüksel İnan pointed out, "an international dispute is a conflict among states on the legal or material points of a concern, or differences of opinion on legal views or material interests."<sup>12</sup> In practice, international disputes are twofold: legal disputes and political disputes.

In legal disputes, the conflicting parties have to base their claims to the *accepted principles* of international law. The dispute arises on "the differences of opinion in which rule of international law has to be applied to a [particular] case, or in what manner the rule has to be interpreted."<sup>13</sup>

In political disputes, the parties are in a conflict concerning their *material* interests. Namely, an international dispute is political, if;

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<sup>10</sup> Samir Ahmad, "Principles and Precedents in International Law Governing the Sharing of Nile Waters" in **The Nile: Sharing a Scarce Resource**, (eds. P.P. Howell and J.A. Allan), Cambridge: Cambridge University Press, 1994, p. 351.

<sup>11</sup> Yüksel İnan, "Legal Dimensions of International Watercourse (Euphrates and Tigris)" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, p. 223.

<sup>12</sup> *Ibid.*, p. 224.

<sup>13</sup> *Ibid.*

- 1- The dispute falls within the areas not yet organized by international law, or within the domestic jurisdiction of the state.
- 2- The dispute concerns the amendment of the rules of international law;
- 3- The dispute concerns the sovereignty or the vital interests of the state<sup>14</sup>

As explained above, all kinds of disputes in international relations are not accepted as legal disputes. Legal disputes may be settled by the parties through legal ways, such as arbitration or judicial settlement, or even by political ways according to the article 33(1) of the UN Charter.<sup>15</sup> In political disputes, the parties to the dispute may settle it by political ways; such as negotiation, good offices, mediation and conciliation. In addition, inquiry (fact finding) commissions are also useful mechanisms in settling political disputes among the parties.<sup>16</sup>

The law of the non-navigational uses of international watercourses is still at an early stage of development, as explained above. Since there does not exist generally accepted principles on this branch of international law, disputes among parties are tried to be solved by political means, depending on the political, economic and strategic powers of the parties. For that reason, it could be easily said that disputes on international watercourses are political disputes in general, and since there does not exist bilateral and/or multilateral agreements among riparian states for the compulsory settlement of disputes on international watercourses, riparian states should settle their dispute by negotiations and other peaceful political means according to the well-known rule *sic utere tuo ut alienum non laedas*. As Elizabeth Picard has pointed out:

*For more than a century, the rule followed by international fresh water law had been the principle of a territorial sovereignty of each between riparian states, according to the doctrine Harmon of absolute sovereignty of the state. By doing so, international law considered a river shared by several riparian states as a transboundary river. It applied the principles confirmed in the various nineteenth century international ...*

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<sup>14</sup> *Ibid.*

<sup>15</sup> Article 33(1) of the UN Charter reads as follows: "The parties to any dispute, the continuance of which is likely to endanger the maintenance of international peace and security, shall, first of all, seek a solution by negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own choice."

<sup>16</sup> İnan, *op. cit.*, p. 224-225.

*conferences ... on international relations. And used to promote the rule sic utere tuo ut alienum non laedas (use for ourselves as far as you do not spoilt others). Such a rule involved mutual consideration for each between riparian states who should negotiate on a bilateral basis.*<sup>17</sup>

Fortunately, the international community is slowly heading towards some general principles and common rules, mainly embodied in;

1- The rules adopted in 1966 by the International Law Association (ILA), known as *The Helsinki Rules on the Uses of Waters of International Rivers*, and;

2- The 1994 Report of the International Law Commission (ILC) concerning *The Law of the Non-Navigational Uses of International Watercourses*,

These documents are of legal importance and "they are a strong indication of the present collective search for new acceptable rules."<sup>18</sup>

## **2.2. The Major Concepts Applicable to International Watercourses**

One of the most important issues in the development of a comprehensive body of international law applicable to international watercourses is that of defining the physical or geographical scope of an international watercourse and the establishment of a precise legal definition of international watercourses and agreement on the degree of sovereignty which states have over them. Especially, "developing an appropriate concept is important because it has implications on the legal rules and principles that would be applicable to international watercourses."<sup>19</sup>

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<sup>17</sup> Elizabeth Picard, "Aspects of International Law of the Water Conflict in the Middle East" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, p. 214.

<sup>18</sup> *Ibid.*, p. 215.

<sup>19</sup> Imeru Tamrat, "Constraints and Opportunities for Basin-wide Cooperation in the Nile: A Legal Perspective", Paper Submitted to **The International Conference on Water Resources in the Middle East: Legal, Political and Commercial Implications**, London: SOAS, November 19-20, 1992, p. 2.

As it was aforementioned, provisions on the non-navigational use of international watercourses is at the early stage of development. For that reason, as Natasha Beschorner has pointed out:

*There is no consensus on terminology, i.e., whether watercourses flowing across territorial boundaries should be referred to as international or transboundary rivers, or international river basins or international river systems, much less on the appropriate definition of shared aquifers.*<sup>20</sup>

States were reluctant to consider international watercourses as natural hydrological units due to the earlier assertion of states of exclusive sovereign right over the parts of international watercourses flowing within their national territories. The term *international rivers* used in the 1815 Final Act of Congress of Vienna limited the definition of the geographical scope of international watercourses to rivers that separate or traverse the territory of two or more states. These traditional concepts as *international rivers*, *successive rivers* or *boundary rivers* have focused only on the main channel of an international watercourse. These concepts have also excluded from their scope tributaries and groundwater resources and ignored "the interconnection of an international watercourse to other parts of the environment thereby hindering the acceptance of the legal unity of an international watercourse system."<sup>21</sup>

During the past two decades, the international law has slowly progressed from these traditional concepts to a new one. According to Imeru Tamrat:

*The increasing realization of interdependence among watercourse states and the recognition of an international watercourse as a physical unity with the basin being an interdependent system capable of causing changes in water and water use within the basin, has led to the emergence of the acceptance of the legal unity of an international watercourse.*<sup>22</sup>

This new concept is the concept of the *international drainage basin*. The 1966 Helsinki Rules, adopted by the International Law Association (ILA) put the concept of the international drainage basin to the center of the codification of international rules and principles on international watercourses. "The drainage basin approach recognizes the

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<sup>20</sup> Natasha Beschorner, "Water and Instability in the Middle East", *Adelphi Papers*, No. 273, London: The International Institute for Strategic Studies, Winter 1992, p. 62.

<sup>21</sup> Tamrat, *op. cit.*, p. 3.

<sup>22</sup> *Ibid.*

unity of the hydrographic system which encompasses the entire watershed area comprising, amongst others, lakes, tributaries and groundwater systems."<sup>23</sup> According to article 2 of the Helsinki Rules:

*An international drainage basin is a geographical area extending over two or more States determined by the watershed limits of the system of waters, including surface and underground waters, flowing into a common terminus.*<sup>24</sup>

Likewise, a basin state is defined as "... a State the territory of which includes a portion of an international drainage basin."<sup>25</sup>

In 1986, the scope of definition was widened by the ILC to include basins which are completely underground, being composed exclusively of international aquifers. Article 1 of the 1986 Seoul Rules on International Groundwater states that:

*The waters of an aquifer that is intersected by the boundary between two or more states are international groundwaters if such an aquifer with its waters forms an international basin or part thereof. Those states are basin states within the meaning of the Helsinki Rules whether or not the aquifer and its waters form surface waters part of a hydraulic system flowing into a common terminus.*<sup>26</sup>

Nonetheless, the interconnectedness of water resources in a common basin, be they surface or underground, is the focal point of the concept.

In 1991, the International Law Commission (ILC), which had been working on the issue since 1970s, prepared a set of Draft Articles on the Law of the Non-Navigational Uses of International Watercourses, and some articles of the Draft were modified when it was read secondly in 1994.<sup>27</sup> The Draft Articles have adopted alternative terminology to

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<sup>23</sup> *Ibid.*

<sup>24</sup> ILC, **Report of the Committee on the Uses of the Waters of International Rivers**, ILC: London, 1967; also see Appendix C for the full text.

<sup>25</sup> Article 3 of the Helsinki Rules.

<sup>26</sup> See Appendix E for the text of the 1986 Seoul Rules on International Groundwater.

<sup>27</sup> For the full text of the Draft Articles, see ILC, **Draft Articles on the Law of the Non-Navigational Uses of International Watercourses and Commentaries thereto**, Adopted on the Second Reading by the ILC at its 46th Session, May 2-July 22, 1994; also see Appendix E for the same full text.

the ILA's drainage basin by utilizing the term *international watercourse*. The term seems to reflect "the compromise between those states seeking the application of the international rules and principles to a wider geographical scope and those who prefer a narrower concept."<sup>28</sup> Nonetheless, the substantive definition of the term would appear to be identical to the drainage basin concept. According to article 2(b) of the Draft Articles:

*Watercourse means a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus.*<sup>29</sup>

An international watercourse is "a watercourse, parts of which are situated in different States."<sup>30</sup>

The unity of definition in two aforementioned important documents of international law, i.e. 1966 Helsinki Rules and 1994 Draft Articles, points to an important consensus regarding the identification of the basic unit of analysis for lawyers, hydrologists and others.<sup>31</sup>

However some states are against a unique concept applicable to international watercourses. They call attention to the dangers in considering watercourse systems within the scope of a unique concept without regarding their distinct characteristics.<sup>32</sup>

### 2.3. Legal Doctrines of Water Utilization

Legal literature implies five general doctrines, regarding states' rights to international watercourses. A brief survey of these doctrines will be presented in the following sub-headings to underline the legal viewpoints related to use and distribution of international watercourses.<sup>33</sup>

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<sup>28</sup> Housen-Couriel, *op. cit.*, p. 3.

<sup>29</sup> See, Appendix E.

<sup>30</sup> Article 2(a) of the Draft Articles.

<sup>31</sup> Housen-Couriel, *loc. cit.*

<sup>32</sup> Hüseyin Pazarcı, *Uluslararası Hukuk Dersleri: II. Kitap*, Ankara: Turhan Kitabevi, 1990, pp. 270-271.

<sup>33</sup> Hisham Zarour and Jad Isaac, "Nature's Apportionment and the Open Market: A Promising Solution Convergence to the Arab-Israeli Water Conflict", Paper Submitted to The



### 2.3.1. The Doctrine of Absolute Territorial Sovereignty

The doctrine of Absolute Territorial Sovereignty (ATS) holds that all water resources are the sovereign property of the riparian state, and the riparian state has the absolute freedom to utilize the water flowing in its territories regardless of any effects upon lower riparian states.<sup>34</sup> According to the doctrine, any restriction upon the sovereignty of a riparian state means a diminution of its sovereignty to the extent of its restriction.<sup>35</sup>

The best-known proponent of this outdated doctrine was US. Attorney-General Judson Harmon, who explained it in a well-known commentary submitted to his government during the course of the Rio Grande dispute between USA and Mexico in 1895.<sup>36</sup> Actually, the background of the ATS doctrine dates back 1851. For the first time, the German lawyer Johann Ludwig Klüber explained it in his book called *International Law* in 1851. However, all writers, who support ATS doctrine, rest their views on Harmon's opinion.<sup>37</sup>

Concerning groundwater, the doctrine is explicitly stated in the British legislation organizing water rights. Article 66 of the British Law of Torts on Disturbance of Water Rights states that:

*There is, however, no right to the continued flow of water which runs through natural underground channels, which are undefined or unknown, and can only be ascertained by excavation.*<sup>38</sup>

In his explanation of the law, the British solicitor Sutton clarifies that:

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**Conference on the Middle East Water Crisis: Creative Perspectives and Solutions,** Waterloo: University of Waterloo, May 7-9, 1992, p. 14.

<sup>34</sup> *Ibid.*

<sup>35</sup> Gerhard Hafner, "The Application of the Optimum Utilization Principle to the Euphrates and Tigris Drainage Basin", Paper Submitted to **The International Conference on Transboundary Waters in the Middle East: Prospects for Regional Cooperation.** Ankara: Bilkent University, September 2-3, 1991, pp. 2-3.

<sup>36</sup> Housen-Couriel, *op. cit.*, p. 7.

<sup>37</sup> Sar, *op. cit.*, pp. 105-106.

<sup>38</sup> Zarour and Isaac, *loc. cit.*; quoted from R. Sutton. **A Summary of the Law of Torts or Wrongs Independent of Contract by Sir Arthur Underhill.** Butterworth: London (1946).

*The owner of land containing underground water, which percolates by undefined channels, or defined but unascertained channels, has the right to divert or appropriate the water within its own land so as to deprive his neighbor of it, whether by intercepting and stopping its flow to his neighbor's land, or by causing it to drain away from his neighbor's land instead of remaining there. The same rule applies to common surface water rising out of spongy or boggy ground and flowing in no defined channel. If the law were otherwise, no man could safely drain or sink a well in his own land.<sup>39</sup>*

Because of the obvious extremism of this doctrine, authorities in international water law, as well as the normal practice of most peace-loving nations, have generally rejected the ATS doctrine over shared international watercourses.<sup>40</sup> Even the United States, who invoked this doctrine, does not regard it anymore.

### 2.3.2. The Doctrine of Absolute Territorial Integrity

On the other end of the scale, there exists another extreme doctrine, the doctrine of Absolute Territorial Integrity (ATI). According to this doctrine, a lower riparian state has absolute and immutable sovereign rights over water that it has historically used as it flowed through its territory.<sup>41</sup> An upper riparian state may not use waters flowing within its lands in a way that could be detrimental to other riparian states,<sup>42</sup> and it does not have the right to alter the flow of the water in a way that would interfere with the use of the lower riparian state. Otherwise, this is considered a violation of the lower riparian state's territorial integrity.<sup>43</sup> For that reason, the utilization of waters by the upper riparian states depends on the consent of the lower riparian. This doctrine was supported only by the terminus states, e.g. Iraq.<sup>44</sup>

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<sup>39</sup> *Ibid.*

<sup>40</sup> Hillel I. Shuval, "Approaches to Resolving the Water Conflicts Between Israel and her Neighbors: A Regional Water-for-Peace Plan", *Water International*, No. 17, 1992, p. 136.

<sup>41</sup> *Ibid.*

<sup>42</sup> Zarour and Isaac, *op. cit.*, p. 15.

<sup>43</sup> Shuval, *loc. cit.*

<sup>44</sup> Inan, *op. cit.*, p. 231.

The leading person, who applied the ATI doctrine to international water resources for the first time, was the Swiss lawyer Max Huber.<sup>45</sup> Another supporter of the ATI doctrine is the British lawyer Oppenheim.<sup>46</sup>

To sum up, the ATI doctrine brings forth the following results:

- 1) The upper riparian state cannot make any alteration in the physical nature of an international water resource, which parts of it flow in the lower riparian state's territory.
- 2) The lower riparian state has the veto right in the utilization of an international water resource by the upper riparian state.
- 3) The existing and the future utilization of an international water resource by the lower riparian state has to be protected.<sup>47</sup>

It is realized that the ATI doctrine is completely in favor of lower riparian states. As they did in the Harmon Doctrine, experts in international law likewise reject the doctrine and, it does not form part of present international law.

### **2.3.3. The Doctrine of Limited Territorial Sovereignty**

Midway between the two above-mentioned extreme doctrines, there exists a third and a moderate doctrine which is the prevailing doctrine in international law today. This is the doctrine of Limited Territorial Sovereignty (LTS). According to this doctrine, a riparian state is not permitted to utilize the water of an international water resource, flowing in its territories, in a way which causes harm to the reasonable utilization by other riparian states. The doctrine has gained the support of many international arbitration awards, state practices, resolutions of international institutes and many writers.<sup>48</sup>

In the current era, in which the concept of peaceful cooperation among states over the use of shared resources is becoming the normative pattern in international relations, new views of international water law have developed. More recent concepts are, those of

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<sup>45</sup> Sar, *op. cit.*, p. 217.

<sup>46</sup> *Ibid.*, p. 218.

<sup>47</sup> *Ibid.*, pp. 221-222.

<sup>48</sup> Zarour and Isaac, *loc. cit.*

*equitable apportionment* and *community of interest*, based on the emerging LTS doctrine on the international water resources. This more enlightened and cooperative approach is summed up in the Helsinki Rules recognizing the legitimate rights and needs of both the upper and lower riparian partners. Article 4 of the Helsinki Rules states that "Each state is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the waters on an international drainage basin."<sup>49</sup>

It is generally agreed by experts in international water law that the principles of the Helsinki Rules apply to shared ground water no less than shared surface water resources, but some nations have not accepted this position. On the other hand, the LTS doctrine also takes part in the 1994 Draft Articles of the ILC Article 5(1) of the Draft Articles states that "Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner..."<sup>50</sup>

#### **2.3.4. The Doctrine of Community Co-riparian States**

The fourth doctrine on the utilization of international water resources is the doctrine of Community Co-riparian States (CCS). According to the CCS doctrine, the riparian states have to ignore political divisions in order to achieve maximum utilization of international water resources.

However, achieving this requires the existence of a high level integration and communication among the riparian states. This state of affairs exists only in few parts of the world. Although the CCS doctrine is highly tentative, "the doctrine's application difficulties are increased by the absence of a rational measure to determine what the maximum utilization of a given water resource is."<sup>51</sup> For these reasons, the doctrine is not yet considered as a part of customary international law.

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<sup>49</sup> See Appendix C.

<sup>50</sup> See Appendix E.

<sup>51</sup> Zarour and Isaac, *loc. cit.*

### 2.3.5. The Doctrine of Correlative Rights

The fifth doctrine on the utilization of international water resources is the doctrine of Correlative Rights. In certain United States jurisdictions, the doctrine of Correlative Rights has been applied to ground water utilization, and may be extrapolated to international basins. In California, for example, a landowner's use of groundwater is limited "...to amounts that he can beneficially use on his own land and subject to the corresponding rights of other landowners sharing the same aquifer."<sup>52</sup> Surplus water may be appropriated by any user in the basin. By this way, the most efficient utilization of joint water resources is realized. "This doctrine may become decisive in international watercourses where water stress has reached the critical point."<sup>53</sup>

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To sum up, it could be stated the law of the non-navigational uses of international watercourses currently contains a number of legal doctrines regarding states' rights to international watercourses. Of the five reviewed here, the LTS doctrine is more widely accepted by state practice, in treaties, and in the opinions of experts and scholars. "The parameters of its application are subject to ongoing debate in the scholarly literature."<sup>54</sup>

At the first glance, it could be seen that these five doctrines are political in character rather than being legal. Although the general approach of states are political, their efforts are in the direction of searching for legal support for their theses in such international conflicts.<sup>55</sup>

Generally, upper riparian states support ATS doctrine and favor concluding treaties within the context of this doctrine by the free wills of the parties. On the other hand, lower riparian states support the ATI doctrine which considers the absolute and immutable rights of the lower riparian states. As a result, the solution of conflicts depends on the position and bargaining powers of the parties and on the international conjuncture.<sup>56</sup>

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<sup>52</sup> Housen-Couriel, *op. cit.*, p. 8.

<sup>53</sup> *Ibid.*

<sup>54</sup> *Ibid.*

<sup>55</sup> Kut, "Ortadoğu'da Su Sorunu ve Türkiye", p. 113.

<sup>56</sup> *Ibid.*

Most documents relating to this situation emphasize "the need and obligation of reconciling the rights and interests of the riparian states on the uses of the international watercourses."<sup>57</sup> Nevertheless, the general aim of international law is to provide a peaceful solution of conflicts and disputes. For that reason, this emphasis coincide with the general aim of international law.

## 2.4. The Principles on the Law of International Watercourses

As of 1996, there does not exist a comprehensive set of international principles applicable to the non-navigational uses of international watercourses that establishes the rights and obligations of the riparian states. Different principles exist in most bilateral and multilateral treaties dealing with the subject. This is because of different needs of the riparian states and different features of each watercourse.<sup>58</sup>

Since there does not exist a comprehensive set of principles on the law of the non-navigational uses of international watercourses, concerned states have to clarify their respective rights and obligations by an agreement, concluded among themselves, which will take into account the various principles of the law of international watercourses in order to utilize the watercourse efficiently.<sup>59</sup>

These various principles are divided into two groups: the first one is the group of general binding principles derived from public international law; and the second is the group of other principles which apply specifically to shared resources.<sup>60</sup>

### 2.4.1. General Binding Principles

First group of principles are based on the practice of states derived from treaties and agreements, the authoritative pronouncements of governmental and non-governmental fora,

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<sup>57</sup> Hafner, *op. cit.*, p. 3.

<sup>58</sup> İnan, *op. cit.*, p. 229.

<sup>59</sup> *Ibid.*

<sup>60</sup> Housen-Couriel, *op. cit.*, p. 9.

and of the experts, the generally accepted principles of international law governing the development, use and conservation of the shared water resources.<sup>61</sup> These general principles are without question binding on states.

Beginning with the principle of the *obligation not to cause harm*, the general binding principles will be studied in the following sections.

### a. The Obligation Not to Cause Harm

The obligation not to cause harm is one of the generally accepted principles of international law applicable to international watercourses. Riparian states sharing an international watercourse or basin are under an obligation not to cause each other significant harm, regarding both water quantity and quality. This principle stems from the broader proposition of *sic utere tuo ut alienum non laedas* stated by the ICJ in the Corfu Channel case of 1949, i.e., use for ourselves as far as you do not spoliolate others. Regarding this proposition, a riparian state may not utilize an international watercourse within its territory in such a way that harm is caused to the interests of another riparian state. The harm caused to the interests of another riparian state, however, must be *significant*, which Dante A. Caponera states as:

*...it must have an impact of some consequence, in order to constitute transgression of an interest protected at international law. The complementary doctrine of good neighborliness requires, in fact, states to tolerate inconsequential or minor interferences.*<sup>62</sup>

In some instances, a reference to this principle is indirectly made through the application of equitable and reasonable utilization, or in any other manner consistent with the principle of equitable and reasonable utilization.<sup>63</sup> For example, in the Helsinki Rules of the ILA, this principle has taken its place within the context of water pollution in an

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<sup>61</sup> Dante A. Caponera, "Legal and Institutional Concepts of Cooperation", Paper Submitted to **The International Conference on Transboundary Waters in the Middle East: Prospects for Regional Cooperation**, Ankara: Bilkent University, September 2-3, 1991, p. 33.

<sup>62</sup> *Ibid.*

<sup>63</sup> Hafner, *op. cit.*, p. 8.

international drainage basin, which form only a particular case of the general principle. According to article 10(1) of the Helsinki Rules:

*1. Consistent with the principle of equitable utilization of the waters of an international drainage basin, a State:*

*(a) Must prevent any new form of water pollution or any increase in the degree of existing water pollution in an international drainage basin which would cause substantial injury in the territory of a co-basin State;*

*(b) Should take all reasonable measures to abate existing water pollution in an international drainage basin to such an extent that no substantial damage is caused in the territory of a co-basin State.<sup>64</sup>*

This specific scope is exceeded in 1994 Draft Articles elaborated by the ILC. In article 7(1) of the Draft Articles, the principle is handled in more general terms. It states that:

*Watercourse states shall exercise due diligence to utilize an international watercourse in such a way as not to cause significant harm to other watercourse states.<sup>65</sup>*

## **b. The Right to an Equitable and Reasonable Share in the Utilization of Waters**

As it is mentioned earlier, states sharing an international watercourse have the right to use the waters therein. Each sharing state's own right is equal to the rights of the other sharing states. Within these circumstances, since all the sharing states' equal rights cannot be satisfied completely, some adjustment is necessary. In the absence of specific conventional rules, such adjustment is done *on the basis of equity*, as article 5(1) of the Draft Articles of the ILC spelled out as:

*Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by*

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<sup>64</sup> See Appendix C.

<sup>65</sup> See Appendix E.



*watercourse States with a view to attaining optimal utilization thereof and benefits therefrom consistent with adequate protection of the watercourse.*<sup>66</sup>

As it is clarified in the article, equitable and reasonable use refers to the "optimum achieved by the uses, the individual state's right to maximum use, ... and an equitable apportionment."<sup>67</sup>

As it is understood from the same article, sharing of international watercourses should be equitable and reasonable. It means that a riparian state should not cause *harm to the reasonable utilization* of other riparian states in utilizing the waters of an international watercourse. That is, equity and rationality are the appropriate basis for the allocation of water.<sup>68</sup>

However, it must be noted that, the word *equitable* is not synonymous with *equal*. "If the two words were synonymous", as Hisham Zarour has pointed out, "the problem would be merely a matter of arithmetics, so that, for example, Israel, Jordan, Lebanon, the Palestinian West Bank and Syria would each have a 20 percent share of the flow of the Jordan River."<sup>69</sup>

The terms equitable and reasonable share have already found wide usages in international law. However, "these terms allow a great deal of latitude for interpretation, making it difficult to actually detect progress in a quest for objectionable determinants."<sup>70</sup> For that reason, a number of prestigious international institutions have formulated lists of the factors which should be considered relevant for allocating water shares equitably and rationally. The Helsinki Rules of the ILC, the UNEP recommendation of 1978 and, more recently, the Draft Articles of the ILC include these factors which are relevant for equitable and reasonable utilization of waters.

Article 5 of the Helsinki Rules enumerates those relevant factors for equitable and reasonable share as:

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<sup>66</sup> *Ibid.*

<sup>67</sup> Hafner, *op. cit.*, p. 5.

<sup>68</sup> Zarour and Isaac, *loc. cit.*; quoted from IPCRI, **Roundtable Forum of Water Scientists - Meeting 13**, Israel / Palestine Center for Research and Information, January 1992.

<sup>69</sup> *Ibid.*, p. 17.

<sup>70</sup> *Ibid.*, p. 15.

- a) *The geography of the basin, including in particular the extent of the drainage area in the territory of each basin State;*
- b) *The hydrology of the basin, including in particular the contribution of water by each basin State;*
- c) *The climate affecting the basin;*
- d) *The past utilization of the waters of the basin, including in particular existing utilization;*
- e) *The economic and social needs of each basin State;*
- f) *The population dependent on the waters of the basin in each basin State;*
- g) *The comparative costs of alternative means of satisfying the economic and social needs of each basin State;*
- h) *The availability of other resources;*
- i) *The avoidance of unnecessary waste in the utilization of waters of the basin;*
- j) *The practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and*
- k) *The degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.<sup>71</sup>*

It must be noted that, each of these relevant factors are to be considered together in equitable and reasonable utilization of the waters of an international watercourse, and "the weight to be given each factor is to be determined by its importance in comparison with that of other relevant factors."<sup>72</sup>

The Rules on International Groundwater<sup>73</sup>, drafted by the ILC and published in 1986 augment the Helsinki Rules. They impose the principle of equitable utilization on aquifers as well as surface waters, and emphasize the hydraulic interdependence of the two types of basin waters.<sup>74</sup>

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<sup>71</sup> See Appendix C.

<sup>72</sup> Article 5(3) of the Helsinki Rules.

<sup>73</sup> See, Appendix E; see especially article 2 of the Rules.

<sup>74</sup> Housen-Couriel, *op. cit.*, p. 11.

Article 6 of the Draft Articles of the ILC also lists factors relevant to equitable and reasonable utilization. These factors are the same as those of listed in article 5 of the Helsinki Rules. The difference between two articles is that, in the article 6 of the Draft Articles, it is underlined that watercourse states shall, when the need arises, enter into consultations in a spirit of cooperation for equitable and reasonable utilization of the waters of an international watercourses.

However, it must be noted that because international water law provides large margins in the evaluation of individual state's rights on an international watercourse and because it is not able to draw sharp limits on the utilization of the waters by each state, "the final definition depends on a mutual exchange of information of the states involved about their interests and needs."<sup>75</sup>

### **c. The Obligation to Inform, to Consult and to Engage in Good Faith Negotiations**

As aforementioned, one of the fundamental duties of states is to refrain from utilizing the waters of an international watercourse in a manner causing significant harm to another state on the same watercourse. This duty entails in practice that a riparian state, planning to carry out a water development project by using the waters of an international watercourse, must inform other riparian states about these projects which may have a significant adverse effect on their respective interests.<sup>76</sup> The principle of the obligation to inform is supported by state practice and is recognized by IIL, ILA and ILC<sup>77</sup>

According to article 29 of the Helsinki Rules:

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*2. A State, regardless of its location in a drainage basin, should in particular furnish to any other basin state, the interests of which may be*

<sup>75</sup> Hafner, *op. cit.*, p. 7.

<sup>76</sup> Caponera, *op. cit.*, p. 34.

<sup>77</sup> Raj Krishna, "International Watercourses: World Bank Experience and Policy", Paper Submitted to **The International Conference on Water Resources in the Middle East: Legal, Political and Commercial Implications**, London: SOAS, November 19-20, 1992, p. 23.

*substantially affected, notice of any proposed construction or installation which would alter the regime of the basin in a way which might give rise to a dispute as defined in article XXVI. The notice should include such essential facts as will permit the recipient to make an assessment of the probable effect of the proposed alteration.*

*3. A state providing the notice referred to in paragraph 2 of this article should afford the recipient a reasonable period of time to make an assessment of the probable effect of the proposed construction or installation and to submit its views thereon to the State furnishing the notice....<sup>78</sup>*

On the other hand, articles 11 to 19 of the Draft Articles of ILC also enunciate the same principle. According to article 12:

*Before a watercourse State implements or permits the implementation of planned measures which may have a significant adverse affect upon other watercourse States, it shall provide those States with timely notification thereof. Such notification shall be accompanied by available technical data and information in order to enable the notified States to evaluate the possible effects of the planned measures.<sup>79</sup>*

The timely notification, mentioned in article 12, must be given at the earliest possible stage and a reasonable period of time of six months be allowed for a response. This could be extended for a period not exceeding six months in case of a special difficulty.

The Helsinki Rules and the Draft Articles of the ILC also includes provisions about negotiations, concerning planned measures, among riparian states. Articles 30 to 36 of the Helsinki Rules put negotiations and good offices in the center of procedures for the prevention and settlement of disputes among riparian states. Article 17 and 33 of the Draft Articles of the ILC also pay attention to the importance of consultations and negotiations concerning planned measures and in the settlement of disputes. Both studies underline that the consultations and negotiations shall be conducted on the basis that each riparian state must in good faith pay reasonable regard to the rights and legitimate interests of the other riparian states.

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<sup>78</sup> See Appendix C.

<sup>79</sup> See Appendix E.

Engaging in good faith negotiations is also important in order to get foreign aid for the construction of installations on an international watercourse. According to an international tradition, foreign credit agencies require an agreement among the riparian states or the consent of the lower riparian states in order to provide credit to the upper riparian state for the construction of such installations.<sup>80</sup>

This tradition found expression in the judgment of the international arbitral tribunal in 1957, in the *Lake Lanoux Case* between France and Spain. The tribunal rejected the absolute sovereignty of the upper riparian states, and implied that the lower riparian states also have sovereign rights over the parts of watercourses within their territories, in order to achieve equitable utilization of those waters.<sup>81</sup>

One of the recent examples of this tradition is the construction of Keban Dam for the purpose of generating hydroelectric energy. When Turkey started to construct this dam on the Euphrates River in 1966, Syria and Iraq opposed to this project. Thereupon, Turkey gave a verbal guarantee to Syria and Iraq, in 1966, to let sufficient amount of water to those lower riparian states during impounding, in order to get a credit of \$ 40 million. This guarantee was integrated to a written protocol which was signed with USAID, an international finance agency, in Ankara on August 31, 1966. According to the protocol, Turkey would let the amount of 350 cum (cubic meters) water per second to these states from the Euphrates River. This amount was amended as 400 cum/sec. and later as 450 cum/sec., according to the consensus reached among Turkey, Syria and Iraq respectively.<sup>82</sup>

#### **d. The Optimum Utilization Principle as a Combination of Binding General Principles**

The principle of optimum utilization is "water-borne" insofar as it has mainly been pronounced in the context of the non-navigational uses of international watercourses.<sup>83</sup>

The principle of optimum utilization is sometimes conceived as the ultimate goal of the equitable and reasonable sharing of the uses in one or the other formulation. Already as

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<sup>80</sup> Inan, *op. cit.*, p. 228.

<sup>81</sup> *Ibid.*

<sup>82</sup> *Ibid.*

<sup>83</sup> Hafner, *op. cit.*, p. 1.

early as 1971, this objective can be found in the preparatory documents for the Stockholm Conference on Human Environment.<sup>84</sup> This idea was then endorsed by recommendation 51 of the Conference in a slightly, but significantly modified version according to which "the basic objective of all water resource use and development activities from the environmental point of view is to ensure the best use of water and to avoid its pollution in each country."<sup>85</sup>

Other documents emphasizing the principle of optimum utilization are the Resolution of the Institut de Droit International adopted at the Salzburg Meeting in 1961. The preamble of the resolution states that "the maximum utilization of available natural resources is a matter of common interest". The Helsinki Rules of the ILA does not explicitly refer to this principle. Only the commentary on article 4 which lays down the right to an equitable and reasonable share, refers to it and construes equitable sharing so as to reflect the objective of maximum profit. Unlike this document, article 3 of the Charter of the Economic Rights and Duties of the States clearly specifies the optimum use as the objective to be achieved by the cooperation of states in the exploitation of natural resources shared by them<sup>86</sup> being subject to the legitimate interests of the other states. More recently, the ILC incorporated a reference to this principle in article 5 of the Draft Articles as mentioned above.

The basic idea of the principle of optimum utilization is that no state can make use of its resources in a discretionary manner. There exists a certain expectation among the states that where several states are entitled to the use of the same natural resources and where the different uses are likely to become mutually incompatible, states are under a duty to restrict their uses in the interest of those of other states. Though sometimes the principle of optimum utilization is referred to, the various regimes developed so far use equity or equitable nature of the use as main criterion relevant for shared utilization, hardly indicating how this equity should be interpreted.

Applied to international watercourses, a generalized form of those regimes would entail that no riparian state is permitted to use the resources of this watercourse within its territory at its discretion but, under certain conditions, has to restrict it in the interest of the community of the riparian states.

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<sup>84</sup> A CONF. 48/7. 80

<sup>85</sup> Hafner, *op. cit.*, pp. 7-8.

<sup>86</sup> GA A/RES/3281 (XXIX)

Actually, the principle of optimum utilization does not form part of existing international law. Even the Special Rapporteur of the ILC on the draft rules of the non-navigational uses of international watercourses reported that this principle met with certain objections in the Commission and that state practice has not yet established a duty "to participate affirmatively in effectuating the more rational development of shared water resources."<sup>87</sup> Thus, this principle which due to the particularities of international law and international relations escapes any further definition is to be viewed as a progressive element of international law, whose legal force still depends on its future incorporation in an international treaty or in state practice.

Most difficulties to attain an equitable sharing of the water usages including their optimum utilization are evidently prompted by a lack of communication facilitating common assessments, by the disintegrated situation of world community and the obstacles to transboundary transferability of economic goods and by a lack of confidence among states.

It is therefore necessary to build an institutional bridge which would enable the states to overcome these difficulties in the interest of more efficient use of the water resources so that a corresponding duty under general international law is conceivable. And there is hardly a regime on an international watercourse without certain institutionalization to produce that which the PCIJ in the River Oder case called the common interests of the riparian states.

Such institutions could take different forms reaching from a rather decentralized to a more centralized form being empowered to take binding decisions. As Gerhard Hafner has pointed out, their main functions, irrespective of the form, could be:

- to enable communication between the states as the primary duty,
- to enable a harmonization of the evaluation of the uses and the benefits reaped therefrom so that the various actual or potential uses can be compared on the basis of common criteria,
- to decide on the actually admissible utilization,
- to enable a transfer of rights with the aiming at achieving an increased benefit,

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<sup>87</sup> Hafner, *op. cit.*, pp. 16-17.

- to anticipate possible conflicts and disputes over various uses and,
- to decide these disputes.<sup>88</sup>

As the special rapporteur of the ILC points out, such an institutional system is inevitable should optimum management be ensured.<sup>89</sup>

#### **2.4.2. Other Principles of the Law of International Watercourses**

Apart from general binding principles, there are other principles of international water law. These could be listed as follows:

- 1) The international drainage basin is the critical unit for cooperation in the management of shared water resources.
- 2) Surface and groundwater are to be treated in a comprehensive and holistic manner.
- 3) Benefits deriving from the use of resources in the international drainage basin are subject to equitable and reasonable distribution among basin states.
- 4) No single existing use of water resources necessarily takes precedence over another. However, present uses have priority over future uses.
- 5) Prior notice of projected water works which are liable to affect other basin states should be given by the initiating state.<sup>90</sup>

#### **2.5. The Major Codification Efforts on the Law of International Watercourses**

As it is aforementioned, there is no satisfactory body of international law to deal with the issue of international watercourses, although in most cases states agree on a *modus*

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<sup>88</sup> *Ibid.*, pp. 21-22.

<sup>89</sup> *Ibid.*

<sup>90</sup> Housen-Courel, *op. cit.*, pp. 12-13.



*vivendi* based on loosely defined principles of equitable utilization and good neighborliness.<sup>91</sup>

International codification efforts are under way to develop rules applicable to the non-navigational use of international watercourses, but these rules have not yet been finalized.

Many intergovernmental and non-governmental organizations have had occasion to deal with issues which arise through the common use of water resources by several states, especially in the past three decades. Outstanding among the contributions which these groups have made are the 1961 International Regulations Regarding the Use of International Watercourses for Purposes Other Than Navigation, codified by the Institute of International Law; the 1961 Resolution Concerning the Utilization of Non-Maritime Waters for Purposes Other Than Navigation, also of the Institute; the 1966 Helsinki Rules on the Uses of Waters of International Rivers, which are the product of the many years of work by the International Law Association; the 1977 Mar del Plata Action Plan of the UN Water Conference; the ILA's "Complementary Rules" of 1986; and that organization's Seoul Rules on International Groundwater of the same year. Most recently, the International Law Commission has drafted rules on international water use. Several specialized agencies of the UN (the IBRD, the FAO, the WHO and the IAEA) have also contributed much to the evolution of international water law, in a variety of contexts. Finally, a number of important cases have been decided by international tribunals.<sup>92</sup>

Of these organizations, works of two, namely the International Law Association (ILA) and the International Law Commission (ILC) will be examined.

### 2.5.1. Works of the International Law Association

One of the best known quasi-public studies of the law on the non-navigational uses of international watercourses was by the International Law Association, a nongovernmental organization of legal experts which was founded in 1873.<sup>93</sup>

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<sup>91</sup> Beschorner, "Water and Instability in the Middle East", p. 6.

<sup>92</sup> Housen-Couriel, *op. cit.*, p. 6.

<sup>93</sup> Joseph W. Dellapenna, "Building International Water Management Institutions: The Role of Treaties and Other Legal Arrangements", Paper Submitted to **The International**

In 1954, the Association undertook to codify the law relating to shared uses of international water resources. At its 52nd Conference in Helsinki in 1966, the ILA approved a set of draft Articles on the uses of waters of international rivers, and resolved that these should bear the title of the *Helsinki Rules on the Uses of Waters of International Rivers*. The Helsinki Rules were the first attempt by any international organization to codify the entire law of international water resources.<sup>94</sup> The Rules, which have commanded a large degree of approval, adopted the basic principle of the equitable utilization of the waters of an international drainage basin, and broke new ground in certain respects, for example in the proposed rules to deal with pollution and floating timber. At least the draft Articles reflect an enlightened appreciation of the new problems connected with regulations for the waters of international rivers and drainage basins.<sup>95</sup>

The Helsinki Rules center on the concept of international drainage basins (watersheds extending two or more states) as an indivisible hydrologic unit on the basis of which planning must occur to assure the maximum utilization and development of any portion of its rivers, as stated in article 2 of the Rules. However, the Helsinki Rules deal with surface water resources. But what about the unit with which international law deals when it comes to rights to groundwater resources? In 1987 an additional legislative initiative of the ILA clarified that the international drainage basin may be completely underground.

The Helsinki Rules give utmost importance to equitable share. However, equitable share does not mean distribution by equal share in a quantitative manner, but by fair shares which can be decided by the factors enumerated in article 5. The Helsinki Rules promoted four major principles applicable to water resources, which have since been under discussion at the ILC:<sup>96</sup>

1- *Prior use is not paramount*: It is only related to historical conditions which the local states did not master at the time and which confer no legitimacy. In any case, prior use remains a *de facto* not a *de jure* condition. In deciding which utilization and which projects should be encouraged, all factors must be weighed.

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**Conference on Water Resources in the Middle East: Legal, Political and Commercial Implications**, London: SOAS, November 19-20, 1992, p. 13.

<sup>94</sup> *Ibid.*

<sup>95</sup> J. G. Starke, *An Introduction to International Law*, London: Butterworths, 1977, p. 225.

<sup>96</sup> For a detailed explanation, see Picard, *op. cit.*, pp. 218-219.

2- *Social and economic needs should be taken into account whenever discussing new projects or new claims within a drainage basin:* One important point is that dividing and sharing have to be made on a dynamic basis, i.e. by taking into account recent technical progress, social mobility and, moreover, population variable.

3- *Comparative costs of alternative resources are to be taken into account, which could facilitate an equitable sharing agreement, but should not be considered an alternative to equitable distribution:* According to this principle, in no case should the providing or selling of fresh water by an upstream riparian be considered an alternative to fare sharing between all riparians.

4- *There must be avoidance of appreciable harm among riparians:* No riparian can deny water to a co-riparian if that denial causes appreciable harm, and water must be reallocated in order to stop the infringement. Of course, the riparian causing the infringement would contend that it would be appreciably harmed by reallocation. In that case, both claims must be examined and ways found to balance the relative harm injured by each of the riparians.

The Helsinki Rules have no binding character, but represent an important indication of the status of international water law at the time. They are principally a reflection of state practice in the form of mere recommendation.<sup>97</sup> However, states, while trying to settle an international watercourse dispute, should also take into consideration the 1966 Helsinki Rules of the ILA as guiding principles.<sup>98</sup>

The ILA has continued to draft rules relating to water-centered activities not addressed directly by the Helsinki Rules, including flood control (1972), pollution (1972 and 1982), navigability (1974), the protection of water installations during armed conflicts (1976), joint administration (1976 and 1986), flowage regulation (1980), general environmental management concerns (1980), and groundwater (1986).<sup>99</sup>

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<sup>97</sup> Hasret Çomak, "International Law Issues: Euphrates/Tigris Water-Course System, *Diş Politika*, Vol. 5, No. 2, 1991, p. 2.

<sup>98</sup> İnan, *op. cit.*, p. 234.

<sup>99</sup> Dellapenna, *op. cit.*, p. 14.

## 2.5.2. Works of the United Nations

The study of the UN on the legal disputes relating management and utilization of international watercourses started in the United Nations in 1959. Until 1970 no particular development has been achieved other than a report submitted by the Secretary General to the General Assembly. In 1970, United Nations General Assembly assigned to the ILC the task of codification and progressive development of the law regarding the non-navigational use of international watercourses.<sup>100</sup> Since 1959, the ILC has been drafting principles on the non-navigational use of international watercourses.

On June 27 1991, at its 43rd session, the ILC adopted provisionally on the first reading a set of thirty-two draft articles on the non-navigational uses of international watercourses. This marked a successful conclusion of the major part of the commission's endeavor at the modification and progressive development of international law relating to the sharing, management and conservation of international watercourses or the non-navigational uses of international watercourses.<sup>101</sup>

During its 46th session which was concluded on July 22, 1994 in Geneva, the ILC, having completed its second reading of the Draft Articles, has decided to submit them to the UN General Assembly. The key concept of *appreciable harm* of the previous Draft has been changed into *significant harm* in the second reading of the Draft Articles and this change constitutes a very important development. Thus, the level of accountability for an upper riparian state which may have caused damage to the lower riparian state is raised from the degree of appreciable harm to significant harm. In other words, by raising the threshold, it has been recognized that the damage caused to the lower riparian state should be significant.<sup>102</sup>

Another important development which took place during the 46<sup>th</sup> session of the ILC is the discussion concerning the subject of *confined groundwater* not related to an international watercourse. It was agreed in the ILC that codification efforts should continue

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<sup>100</sup> The Ministry of Foreign Affairs of the Republic of Turkey, **Water Issues Between Turkey, Syria and Iraq**, Ankara: The Ministry of Foreign Affairs, 1995, p. 41.

<sup>101</sup> Awn Al Khasawneh, "The International Law Commission and Middle East Waters", **International Law Commission**, 1991, p. 1.

<sup>102</sup> The Ministry of Foreign Affairs of Republic of Turkey, *op. cit.*, pp. 42-43.

in order to determine the rules related to confined groundwaters which have nothing to do with international watercourses.<sup>103</sup>

The 1994 ILC Draft Articles text contains 33 articles. Articles 1 to 4 came under Introduction. Articles 5 to 10 relate to equitable and reasonable utilization and participation, obligation not to cause significant harm to other watercourse states, general obligation for cooperation between watercourse states, regular exchange of data and information among states, and relationship between uses. Articles 11 to 19 primarily focus on the obligation of states to give prior notification and undertake necessary consultation and negotiations with other concerned states on proposed new uses or changes in existing uses. Articles 20 to 26 can be considered to be the environmental section of the draft. This part is concerned specifically with protection and preservation of ecosystems, prevention, reduction and control of pollution, introduction of alien or new species, and protection and preservation of the marine environment. Articles 27 to 28 are on harmful conditions and emergency situations. Articles 29 to 33 deal with joint management, regulation of the flow of waters, protection, maintenance and safe operation of installations, facilities and other works, international watercourses and installations in time of armed conflict, indirect procedures, data information vital to national defense and security, and non-discrimination in terms of access to judicial and other procedures, and settlement of disputes.<sup>104</sup>

In the ILC, there is a strong objection to the use of the phrases *shared resources* and *common resources*.<sup>105</sup> So, ILC has categorically refused, since the beginning, the idea that an international watercourse is a natural resource which can be shared.<sup>106</sup> The draft articles accept the principle of equitable and optimum utilization of international watercourses instead of their partition among upper and lower riparian states.<sup>107</sup>

As a critical point, the use of the term international watercourses represents a shift of emphasis from a concentration on rivers only to the wider subject of all transnational

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<sup>103</sup> *Ibid.*, pp. 43-44.

<sup>104</sup> Asit K. Biswas, "Management of International Water Resources: Some Recent Developments" in *International Waters of the Middle East from Euphrates-Tigris to Nile*, (ed. Asit K. Biswas), Oxford: Oxford University Press, 1994, pp. 198-199.

<sup>105</sup> Ali L. Karaosmanoğlu, "A Report", *Roundtable Discussion on Transboundary Watercourses*, Ankara: Bilkent University, November 26-27, 1990, p. 5.

<sup>106</sup> The Ministry of Foreign Affairs of Republic of Turkey, *loc. cit.*

<sup>107</sup> *Cumhuriyet*, 19/02/1995.

waterways, whether these be rivers, or lakes, canals, dams, reservoirs, and other surface waters. An international drainage basin is embraced by the term, that is to say an integrated area drained by a single river system passing through two or more states. Each international drainage basin would thus seem to require its own peculiar, workable set of rules for co-basin states, rather than the application of global rules formulated in the abstract for all international watercourses.<sup>108</sup>

The most notable feature of the Draft Articles is that they expressly provide for their eventual adoption in a *Framework Convention* and not, for example, in a General Convention. Namely, the draft will constitute general residual rules that can be adjusted and applied through more specific agreements between watercourse states. Within this context, article 3(1) of the Draft notes that:

*Watercourse States may enter into one or more agreements, hereinafter referred to as "watercourse agreements", which apply and adjust the provisions of the present articles to the characteristics and uses of a particular international watercourse or part thereof.*<sup>109</sup>

This decision was taken during the rapporteurship of the second Special Rapporteur, Professor-now Judge-Schwebel of the International Court of Justice. The reasoning behind this approach is given as the fact that watercourses vary enormously in their geographical and hydrological features and in the human needs they serve through some common watercourses features exist. Thus the Commission sought to reconcile the reality of physical diversity on the one hand with essential unity on the other through a framework approach that sets the general rules and applies in the absence of more specific agreements but which expressly allows for more tailor-made solutions to suit the peculiarities of individual watercourses.

Suitable to above expressions, the ILC agreed to recommend to the General Assembly that the finalized text of the Draft Articles constitute a *Framework Convention*. It is agreed that at the beginning of its 58th session, on October 7-25, 1996, the Sixth Commission shall convene as a Working Group of the Whole for three weeks to elaborate a Framework Convention on the Law of the Non-Navigational Uses of International Watercourses on the basis of the Draft Articles. The member countries will present their legal views on these Draft Articles until July 1, 1996. It is estimated that the adoption and

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<sup>108</sup> Starke, *loc. cit.*

<sup>109</sup> See Appendix E.

entering into force of the Framework Convention may take a couple of years. When it enters into force, the Framework Convention will not have direct effects in solving possible disputes between the countries utilizing the same international watercourse. It will be up to the signatory states to be inspired in any future agreement from the provisions of the Framework Convention, since it is assumed that these rules and principles constitute the latest legal norms, supported by the international community, relating the utilization of the international watercourses.<sup>110</sup>

There is no question that the Draft Articles are a step in the right direction in terms of much-needed codification. However, it is the first step of a long process and many issues need to be resolved if the Draft Articles are to be used for conflict resolution by states sharing the various international watercourses.

## **2.6. Bilateral Treaties on the Euphrates-Tigris Basin**

Because of the lack of rules and principles or custom, there is no other means for states concerned to clarify their respective rights and obligations except by treaties. Numerous bilateral and multilateral treaties have thus been concluded among interested states. Such treaties form a formidable reference tool of state practice, including an indication of major trends in the legal regime of international watercourses. For that reason, rights and obligations in the water resources shared by Iraq, Syria and Turkey accrue from bilateral treaties concluded among them. In the following sub-sections these bilateral treaties will be examined.

### **2.6.1. Between Turkey and Syria**

The first bilateral treaty between Syria and Turkey was concluded on October 20, 1921.<sup>111</sup> Article 12 of the Treaty speaks about water apportionment and water supply for the city of Aleppo, without going into detail.<sup>112</sup>

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<sup>110</sup> The Ministry of Foreign Affairs of Republic of Turkey, *op. cit.*, pp. 44-45.

<sup>111</sup> This Treaty was concluded by France on behalf of the mandated Syria.

<sup>112</sup> Caponera, *op. cit.*, p. 5.

Another treaty, the Convention of Friendship and Good Neighborliness with protocol and notes, was signed on May 30, 1926, between France (for Syria) and Turkey. Article 13 of the Convention relates to water supply again for Aleppo and for irrigation.<sup>113</sup> This article confirms the Article 12 of the 1921 Treaty.

The third treaty is a Protocol delimiting the border between Syria and Turkey of May 3, 1930<sup>114</sup>, signed between France and Turkey, which is a report to the League of Nations of the Mandate. It deals with, among other things, equitable utilization with respect to navigation, fishing industrial and agricultural uses of common waters. The validity of these provisions has been questioned by Syria.<sup>115</sup>

The fourth treaty between Turkey and Syria is the 1939 Agreement. According to the 1939 Agreement, the waters of the Orontes River (1,200 mcm/yr in average) and Afrin River, where Turkey is a lower riparian, should be shared equally. But in reality, almost no water is let to Turkey by Syria due to its utilization. For that reason, those rivers became almost dry in the Turkish territory.<sup>116</sup>

As far as the current situation is concerned, there is not a precise regulation between Turkey and Syria on the Euphrates-Tigris basin. Yet, a *Protocol on Matters Pertaining to Economic Cooperation*<sup>117</sup> was signed in July 17, 1987 until a final solution be found. According to Article 6 of this Protocol, Turkey accepted to release a yearly average of more than 500 cum/sec water from the Euphrates River. The details of this Protocol will be examined in the Chapter IV.

## 2.6.2. Between Turkey and Iraq

The relations between Iraq and Turkey with regard to the water resources of the Euphrates and Tigris rivers and tributaries are governed by the relevant protocol annexed to

<sup>113</sup> *Ibid.*

<sup>114</sup> For the full text of the Treaty, see İsmail Soysal, *Türkiye'nin Siyasal Andlaşmaları, I. Cilt (1920-1945)*, Ankara: T.T.K., 1983, pp. 385-390.

<sup>115</sup> Caponera, *loc. cit.*

<sup>116</sup> İnan, *op. cit.*, p. 236.

<sup>117</sup> Official Gazette, *Protocol on Matters Pertaining to Economic Cooperation between The Republic of Turkey and The Syrian Arab Republic*, October 7, 1987, pp. 5-9.



the 1946 Treaty of Friendship and Good Neighborly Relations.<sup>118</sup> The Treaty was signed on 10 May, 1946, and came into effect on 10 May 1948. It contains, among other protocols, a Protocol on Flow Regulation of the Tigris and Euphrates Rivers and of Their Tributaries.<sup>119</sup> The Protocol provides a framework for the two parties to deal with their respective interests in the above water resources. From the standpoint of Iraq's own interests, Iraq is assured under the Protocol:

- a) of access to Turkey by Iraqi technicians for purposes of surveys and investigations instrumental in the construction of dams, in the installation of measurement and recording facilities and other works needed for the regulation of the flows of the above watercourses in the interest of Iraq (Preamble, Art. 1);
- b) of Turkey's commitment to install and operate permanent flow measurement facilities, and to transmit periodically the readings and recorded data to Iraq (Art. 3);
- c) of Turkey's commitment in principle to accept construction of flow regulation works needed in the interest of Iraq on Turkish territory (Art. 4);
- d) of Turkey's commitment to inform Iraq of projects for water works on any of the Protocol watercourses, and to consult with Iraq with a view to accommodating the interests of both countries (Art. 5);

To implement the arrangements provided for in the above Protocol, a Committee for the Regulation of the Flows of the Tigris and Euphrates Rivers was provided for within the framework of the Mixed Economic Commission for Cooperation. Such Commission is envisaged by a separate Protocol annexed to the 1946 Friendship Treaty. The Commission and Committee had not been set up for long years. In 1980 a Joint Technical Committee on Regional Waters was established between Iraq and Turkey within the framework of the Iraqi - Turkish Technical and Economic Cooperation. During the first meeting in May, 1982, both states agreed to invite Syria. This country has accepted the previous

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<sup>118</sup> For the text of the Treaty, see UN Treaty Series XXXVII (1949), pp. 256-287.

<sup>119</sup> Caponera, *op. cit.*, p. 25-26; quoted from United Nations, **Legislative Texts and Treaty Provisions Concerning the Utilization of International Rivers for Other Purposes than Navigation**, UN Doc. ST/LEG/SER. B/12 (1963), p. 376.

deliberations, and Syria has been participating in the Committee's work since September, 1983. The Joint Technical Committee is not at work since June 1993.<sup>120</sup>

It may be said that the 1946 Treaty constitutes a good basis for ensuring optimal cooperative arrangements in water management between the two countries and the most equitable and reasonable use of available waters.<sup>121</sup> But as İsmail Soysal<sup>122</sup> has pointed out, the Treaty must be updated according to the present needs of the two states. According to Soysal, the 1946 Treaty is forgotten by the two states. There is a need to revise the Treaty. Recent developments on GAP Project and some provisions, for example, provisions on electrification, could be added in order to make the Treaty more capable.<sup>123</sup>

### 2.6.3. Between Syria and Iraq

On December 23, 1920, mandated Syria (i.e. France) and mandated Iraq (i.e. Great Britain) signed a treaty whereby Syria undertook to do nothing that might substantially alter the flow of the Euphrates.<sup>124</sup>

In 1962, Iraq and Syria agreed to exchange information on discharge and river levels, and a joint technical commission was established to gather information. Iraq raised the issue of its acquired rights to a fixed share of the river, but it is not clear that Syria recognized them. Thus, as of the early 1960s, the riparians had entered only into bilateral understandings that did not specify rights to shares, quality of the water, or seasonal flows. In that sense they were non-binding.<sup>125</sup>

Beginning in 1966, Syria and Iraq began a series of bilateral negotiations. In these negotiations, Iraq reiterated its claim to acquired rights in a fixed share of the Euphrates

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<sup>120</sup> *Ibid.*

<sup>121</sup> *Ibid.*, p. 32.

<sup>122</sup> Retired Ambassador. The Director of the Foundation for the Middle East and Balkan Studies (OBİV).

<sup>123</sup> From interview with İsmail Soysal, İstanbul, July 27, 1995, 08.30 GMT.

<sup>124</sup> John Waterbury, "Dynamics of Basin-Wide Cooperation in the Utilization of the Euphrates", Paper Submitted to **The Conference on the Economic Development of Syria: Problems, Progress, and Prospects**, Damascus, January 6-7, 1990, p. 15.

<sup>125</sup> *Ibid.*, pp. 15-16.

discharge. This notion is at the heart of what any downstream state will try to establish as a binding commitment. Syria, by contrast, has argued that potential needs must be weighed against acquired rights, and, in the 1966 talks, rejected the Iraqi claim to acquired rights. In 1967, however, Syria accepted that Iraq was entitled to 59 per cent of the flow of the river at the Syrian-Iraqi border, which, in normal years, would be about equivalent to the absolute quantity that Iraq claimed its share. A variant of this apportionment was discussed in 1967 and 1968, whereby Iraq would receive two thirds of the flow in normal years, but that the proportions would be reversed in favor of Syria in apportioning excess flow. However, by 1968 no accord had been formalized and Iraq protested to both Syria and Turkey their pursuit of major hydraulic projects (Tabqa and Keban respectively) in the absence of a basin-wide accord. In 1971, there was another round of fruitless talks between Syria and Iraq.<sup>126</sup>

1972 and 1973 saw other rounds of unproductive negotiations. In two of them, Iraq approved agreements reached but Syria declined to sign agreements. Also Soviet mediation in negotiations proved unsuccessful, because of Syria's claiming that the figures on which the Soviet report was based were inaccurate. By this time the reservoirs at both Keban and Tabqa dam sites had begun to fill, threatening to reduce Iraq's flow unacceptably. In 1974, Syria agreed to release in the month of June a minimum of 90 cum/sec, 110 cum/sec in the first ten days of July, and the entire flow of the river net of agricultural needs in Syria thereafter. Iraq and Syria held no further talks after November 1974.<sup>127</sup>

In 1980 all three riparians agreed to establish a technical commission for the exchange of information which will be mentioned in Chapter IV.

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As a conclusion it could be said that there are no comprehensive rules applicable to all international watercourses, but there are certain principles of international law applicable to this field. Some international institutions try to codify a set of rules applicable to international watercourses. Although there are some agreements among the riparian states, as in the case of Turkey, international watercourse disputes can only be settled by the goodwill of the parties, taking into account the principles of equity and all relevant factors affecting it.

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<sup>126</sup> *Ibid.*, p. 17.

<sup>127</sup> *Ibid.*, pp. 17-18.

### III. AN OVERVIEW OF MAJOR INTERNATIONAL WATERCOURCES IN THE MIDDLE EAST

More than any other region in the world, the Middle East presents itself as an area of contradictory values, and the core of continuous conflicts and antagonism. Water in that region is the most problematic issue due to the scarcity of water resources, and necessity to administer their uses to satisfy health, energy, science, industry and transportation interests.<sup>128</sup>

Middle East in general is a region of relatively acute water shortages. In 1990, the per capita availability of water from existing natural sources in Israel was 470 cum/yr, in Jordan 260 cum/yr, in the Yemens 240 cum/yr, in the U.A.E. 190 cum/ye, in Saudi Arabia 160 cum/yr and in Kuwait less than 10 cum/yr.<sup>129</sup>

The historically rooted competition for shares of the finite water resources of the Middle East has greatly intensified in recent years as per capita use in modernizing urban areas has steadily increased and governments have undertaken large-scale development projects to irrigate additional acreage and to generate hydroelectric power to meet the demands of the burgeoning populations. Population growth in the region, as it was shown in the Table 3.1, is among the highest in the world. By the year 2000 the population in the Middle East will increase by 55 per cent, or another 120 million persons. The populations of Iraq, Syria, Jordan and Saudi Arabia have been growing at a rate of 3.5 to 4 per cent per year (as against a worldwide average of 1.8 per cent), while the rate in Lebanon, Turkey and Kuwait have been well over 2 per cent.<sup>130</sup>

<sup>128</sup> El Mor, *loc. cit.*

<sup>129</sup> Frederick W. Frey, "The Political Context of Conflict and Cooperation over International River Basins", Paper Submitted to **The International Conference on the Middle East Water Crisis: Creative Perspectives and Solutions**, Waterloo: University of Waterloo, May 7-9, 1992, p. 1.

<sup>130</sup> George E. Gruen, **The Water Crisis: The Next Middle East Crisis?**, California: Simon Wiesenthal Center, 1991, pp. 39-40.

**Table 3.1**  
**Population Growth in the Middle East Countries (in millions)**

<b>COUNTRY</b>	<b>1960</b>	<b>1990</b>	<b>2020*</b>
<b>Turkey</b>	28	56	84
<b>Iran</b>	22	55	106
<b>Egypt</b>	26	52	86
<b>Sudan</b>	11	25	55
<b>Iraq</b>	6.9	19	45
<b>Saudi Arabia</b>	4.1	14	40
<b>Syria</b>	4.6	13	31
<b>Yemen A.R.</b>	4	9.2	25
<b>Yemen P.D.R.</b>	1.2	2.5	5.8
<b>Israel</b>	2.1	4.6	6.6
<b>Jordan</b>	1.7	4	9
<b>Lebanon</b>	1.9	2.7	4.5
<b>Kuwait</b>	0.28	2	3.6
<b>U.A.E.</b>	---	1.6	2.6
<b>Oman</b>	0.51	1.5	4.2
<b>Bahrain</b>	0.16	0.52	0.94
<b>Qatar</b>	0.045	0.37	0.78
<b>TOTAL</b>	<b>114</b>	<b>263</b>	<b>509</b>

\* Forecasted population.

Source: T. B. Evans. "Engineering and Water Shortages in the Middle East". **The Conference on the Water in the Middle East: Legal, Political and Commercial Implications**. SOAS: London (November 19-20, 1992), p. 5.

There are four distinct river systems in the region: the Jordan, the Nile, the Orontes and the Euphrates-Tigris Basins. Each river system provides water for a different combination of countries.

This chapter examines the above-mentioned river systems of the region, except the Euphrates-Tigris Basin. In the first section (3.1), the Jordan Basin was studied. The section includes the hydrological features of, the major hydraulic works and water management

plans on, and the positions of the riparian states on the Jordan Basin. The same sub-sections lie for the Nile Basin in the second section (3.2), and for the Orontes Basin in the last section (3.3).

### 3.1. The Jordan Basin

Of the rivers in the region, it is the Jordan River which to date has caused the greatest difficulties. This is partly because of the sheer pressure on resources, but also because the four countries with land in the watershed -Lebanon, Syria, Jordan and Israel have effectively been on a war footing against each other since 1948.<sup>131</sup>

#### 3.1.1. The Hydrology of the Jordan Basin

The Jordan River is about 320 km long, and the basin is differing between 11,500 sq km<sup>132</sup> and 18,300 sq km<sup>133</sup> according to various resources. The total annual flow of the Jordan system, without loss to evaporation or extraction for irrigation, is 1,850 mcm/yr; the actual usable amount is 1,400 mcm/yr.

##### a. The River System

Fifty-four per cent of the total area of the Jordan River lies in Jordan, 29.5 per cent in Syria, 10.5 per cent in Israel and 6 per cent in Lebanon. Only 3 per cent lies within Israel's pre-1967 boundaries, the extra 7.5 per cent resulting from its occupation of the West Bank.<sup>134</sup>

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<sup>131</sup> Peter Beaumont, "Transboundary Water Disputes in the Middle East", Wales: University of Wales, 1992, p. 7.

<sup>132</sup> John Bulloch and Adel Darwish, **Water Wars: Coming Conflicts in the Middle East**, London: Victor Gollancz Publications, 1993, p. 40.

<sup>133</sup> Frederick W. Frey and Thomas Naff, "Water: An Emerging Issue in the Middle East ?", **The Annals of the American Academy**, No. 482, November 1985, p. 67.

<sup>134</sup> Bulloch and Darwish, *loc. cit.*

The headwaters of the Jordan lie in Syria and Lebanon. The Jordan River originates in the southwestern Anti-Lebanon range, on the Mount Hermon. The river flows through Lebanon, Syria, Israel and Jordan. The discharge that feeds the upper part of the Jordan River is derived principally from a group of springs located on the western and southern slopes of the Mount Hermon.<sup>135</sup>

On the basis of the nature of the hydrology, hydrogeology and water use, the Jordan River system may be classified into three sections, namely: (1) Upper Jordan River: Headwaters-Huleh Valley-Lake Tiberias; (2) Yarmouk River; (3) Lower Jordan River: Main stream-Dead Sea.<sup>136</sup>

The Upper Jordan River system has three major headwater streams: (i) the Dan, (ii) the Hasbani, (iii) the Baniyas, (iv) the Huleh Valley and (v) the Lake Tiberias or the Sea of Galilee.<sup>137</sup>

The three streams -the Hasbani, Dan and Baniyas- unite in northern Israel. The Hasbani is fed from a series of springs in southern Lebanon, and then flows south into Israel. The largest and most reliable contribution to the waters of the Jordan is made by the Dan, while the third tributary the Baniyas rises on the southern slopes of the Mount Hermon in Syria.<sup>138</sup>

Geography makes the Golan a particularly important region as far as water resources are concerned.<sup>139</sup> This is particularly true of the area of the Mount Hermon. Also, the Baniyas Spring, a major Jordan River source, is located on the lower slopes of the Golan, thus enhancing the latter's importance.<sup>140</sup>

The waters of the Upper Jordan flow southwards to the Huleh basin, which used to be one of the greatest wetlands of the Middle East. Many of these wetlands were destroyed

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<sup>135</sup> Masahiro Murakami and Katsumi Musiake, "The Jordan River and the Litani" in **International Waters of the Middle East: From Euphrates-Tigris to Nile**, (ed. Asit K. Biswas), Oxford: Oxford University Press, 1994, p. 118.

<sup>136</sup> *Ibid.*

<sup>137</sup> *Ibid.*, p. 121.

<sup>138</sup> Beaumont, "Transboundary Water Disputes in the Middle East", pp. 7-8.

<sup>139</sup> Muhammad Muslih, "The Golan: Israel, Syria, and Strategic Calculations", **The Middle East Journal**, Vol. 7, No. 4, Autumn 1993, pp. 628-629.

<sup>140</sup> *Ibid.*, p. 621.

by the Israelis in the mid 1950's when they were drained to form farm lands. Between the Huleh Basin and the Lake Tiberias the river falls about 270 m. Lake Tiberias forms the largest freshwater storage facility along the river with a capacity of 400 mcm.<sup>141</sup>

The second section, which is the Yarmouk River, originates on the southeastern slopes of the Mount Hermon in a complex of wadis, which are located in Syria. The main trunk of the Yarmouk forms the present boundary between Syria and Jordan for 40 km before it becomes the border between Jordan and Israel. It enters the Jordan River 10 km below the Lake Tiberias. The Yarmouk is one of the most important sources of the Jordan River and contributes 40 per cent of the total flow with an annual flow of ranging respectively among 400 mcm/yr,<sup>142</sup> 475 mcm/yr,<sup>143</sup> and 500 mcm/yr.<sup>144</sup>

South of its confluence with the Yarmouk, the Jordan flows, partially filling the Rift Valley, which is the third section. For the first 40 km, the river forms the international boundary between Israel and Jordan, where it forms the present cease-fire line. The Jordan here flows through the deepest portion of the Rift Valley to enter the Dead Sea at 401 m below sea level, the lowest point of the earth. Various salt springs rise in the lower valley; the remaining tributaries are seasonal wadis.<sup>145</sup>

Apart from the Jordan River, there are regional aquifers in the region that contribute the outflow of the Jordan River. These are mainly the West Bank Aquifer and the Gaza Aquifer.

## **b. The West Bank Aquifer**

The West Bank is one of the few areas with adequate rainfall -varying from 700 mm/yr in Ramallah to 100 mm at the Dead Sea. On the mountains, the average rainfall is 600 to 700 mm/yr on the western slopes, and 450 mm decreasing to 250 mm/yr on the

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<sup>141</sup> Beaumont, "Transboundary Water Disputes in the Middle East", p. 8.

<sup>142</sup> Murakami and Musiaka, *op. cit.*, p. 123.

<sup>143</sup> Caponera, *op. cit.*, p. 6.

<sup>144</sup> Natasha Beschorner, "Prospects for Cooperation in the Jordan River Basin" in **The Middle East and Europe: An Integrated Community Approach**, (ed. Gerd Nonneman), London: Federal Trust for Education Research, February 1992, pp. 147-149.

<sup>145</sup> Caponera, *loc. cit.*



eastern slopes and in the Jordan Valley. Average rainfall in the West Bank is 600 mm/yr, and 70 per cent of the land surface receives more than 300 mm/yr, the amount defined by the U.N. authorities as the aridity threshold. According to Jeffrey Dillman, of Berkeley, California, "the total water inventory of the West Bank is 850 mcm/yr, of which 620 mcm is easily usable." That is about half that of pre-1967 Israel.<sup>146</sup>

Whereas, according to other sources, the amount of groundwater in the West Bank is disputed. Israeli sources claim that West Bank annual renewable water resources amount to about 120 mcm/yr, equivalent to the current annual consumption level. Jordanian sources claim there is a 630-775 mcm/yr surplus on the West Bank.<sup>147</sup>

The West Bank aquifer begins in the territory of the West Bank, before flowing underground into Israel proper. There are three main aquifers in the West Bank, one in the north, one in the west and one in the east. The West Bank aquifer supplies 25-40 per cent of Israel's waters, while underground resources, waste-water reclamation, catchments, saline springs, and other sources provide the remainder.<sup>148</sup>

According to the West Bank Data Project's *The West Bank Handbook*, "The main water potential of the West Bank, shared with Israel, is exploited to its limit, in a ratio of 4.5 per cent to the West Bank and 95.5 per cent to Israel."<sup>149</sup>

According to Aaron T. Wolf, the total consumption within the West Bank is 35 mcm/yr, mostly from wells, for Israeli settlements, and 115 mcm/yr, from wells and cisterns, for Palestinians.<sup>150</sup>

There is a wide disparity between water allocation to Israelis and Palestinians on the West Bank. West Bank Palestinians consumed 119 cum per capita and Israeli settlers 354 cum per capita in 1990.<sup>151</sup>

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<sup>146</sup> Bulloch and Darwish, *op. cit.*, p. 44.

<sup>147</sup> Naff and Matson, *op. cit.*, p. 48.

<sup>148</sup> Joyce R. Starr, "Water Wars". *Foreign Policy*, No. 82, Spring 1991, p. 24.

<sup>149</sup> Joyce R. Starr and Daniel C. Stoll, *U.S. Foreign Policy on Water Resources in the Middle East*, Washington: C.S.I.S., 1987, p. 7.

<sup>150</sup> Aaron T. Wolf, "A Hydropolitical History of the Nile, Jordan and Euphrates River Basins" in *International Waters of the Middle East: From Euphrates-Tigris to Nile*, (ed. Asit K. Biswas), Oxford: Oxford University Press, 1994, pp. 31-32.

<sup>151</sup> Beschorner, "Water and Instability in the Middle East", p. 13.

Even before 1967, Israel was exploiting the western and northern aquifers almost to the maximum by pumping water from points within its borders. It tapped the Northern basin from Beit Shean, taking some 110 mcm, and the western basin from the Yarkon, taking some 310 mcm. West Bank surface run-off provided another 30 mcm, bringing the pre-1967 total to about 450 mcm. At this stage water drawn locally from the western aquifer was about 24 mcm, mainly through natural springs, wells and boreholes.<sup>152</sup>

Israel took control of the West Bank and Gaza in 1967, including the recharge areas for aquifers that flow west and north from the West Bank to Israel, and east to the Jordan Valley. The entire renewable recharge of these first two aquifers is already being exploited and the recharge of the third is close to being depleted as well. According to Aaron T. Wolf, the annual safe yield and current use of these aquifers are as follows:<sup>153</sup>

**Table 3.2**  
**The Annual Safe Yield and Current Use of the Aquifers of the West Bank and Gaza**

	Yield (mcm/yr)	Consumption (mcm/yr)	
		Israel	Palestinians
Western aquifer	320	300	20
Eastern aquifer	125	25	50
Northern aquifer	140	120	20

Source: Aaron T. Wolf, "A Hydropolitical History of the Nile, Jordan and Euphrates River Basins" in **International Waters of the Middle East: From Euphrates-Tigris to Nile**, (ed. Asit K. Biswas), Oxford: Oxford University Press, 1994, p. 31.

In the Palestinian territories, groundwater represents the chief and most important resource of fresh water supply, but they use only a small proportion of total groundwater reserves. The Israeli authorities restrict Palestinian use of water so that the water can flow into Israel, where it can be pumped out. Israel restricts licenses for new drillings for agriculture because of lack of water. By refusing permits for Palestinians wells in the West Bank, Israel is able to take 80 per cent of this aquifer supply.<sup>154</sup> According to Hisham

<sup>152</sup> Judith Perera, "Water Politics", **The Middle East**, February 1981, p. 54.

<sup>153</sup> Wolf, *loc. cit.*

<sup>154</sup> Rustom Irani, "Water Wars", **New Statesman and Society**, May 3, 1991, p. 24.

Zarour and Jad Isaac, at present, Palestinians are not allowed to use more than 210-220 mcm/yr.<sup>155</sup>

West Bank Palestinians obtain their water through pre-1967 wells at no charge and through the Israeli water carrier for a fee. Some Israeli authorities claim that Israeli settlers and Palestinians in the territories pay the Israeli government equal rates for water. Palestinians charge that the Israeli government subsidizes water for the settlers, who use more than their fair share.<sup>156</sup>

To summarize, accurate statistics for the West Bank are difficult to find, with Israelis and Palestinians producing figures to support their own cases. Yet it does seem clear that Israel has been over-extracting West Bank water. Palestinian farmers say they have noticed a steady decline in the quality of water they get from their wells, and believe this is owing to consistent over-exploitation by Israel over the past two decades, with an extraction rate exceeding the natural recharge rate, which allows salinity and pollution from fertilizers to lower water quality. A large increase in the amount of fertilizer used has also contributed to the problem.<sup>157</sup>

### c. The Gaza Strip

What is bad in the West Bank is usually worse in Gaza; and water, or rather the lack of it, is no exception. The Gazans, like the West Bankers, get a little domestic water from Israel's national carrier but most of their meagre supplies come from a sand-and-sandstone aquifer that has been grossly exploited and is in a badly dilapidated state. The Gazans pump out about twice as much as can be safely withdrawn. The over-pumped aquifers bringing all the problems associated with low water quality and scarcity -water-borne diseases, the absence of proper sewage disposal, the impossibility of normal domestic hygiene.<sup>158</sup>

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<sup>155</sup> Zarour and Isaac, *op. cit.*, p. 9.

<sup>156</sup> Starr, *op. cit.*, p. 26.

<sup>157</sup> Bulloch and Darwish, *op. cit.*, p. 45.

<sup>158</sup> *Ibid.*, pp. 35-36.

The heavy use of pesticides and fertilizers in the Gaza Strip also presents a potential source of groundwater pollution.<sup>159</sup> As Joyce R. Starr pointed out, Gaza's water will be unusable by the year 2000, when its population will approach 1 million.<sup>160</sup>

On the other hand, Gaza is not considered part of the Israeli water network, although Israeli settlements, in the Qatif block, are supplied by pipeline from inside the Green Line (approximately 3 mcm/yr). Gazan water consumption, particularly for irrigation, has been restricted by Israeli policies.<sup>161</sup>

After giving the hydrological details about the Jordan River, we can examine major hydraulic works and water-management projects on the Jordan Basin.

### 3.1.2. Major Hydraulic Works and Water-Management Projects on the Jordan Basin

The importance of water to Israel was recognized by the Zionists long before the establishment of the state in 1948. "The whole economic future of Palestine is dependent upon its water supplies for irrigation and for electric power," the leading Zionist Chaim Weizmann wrote in a letter to British prime minister Llyod George in 1919. "The water supply must mainly be derived from the slopes of the Mount Hermon, from the headwaters of the Jordan River and from the Litani."<sup>162</sup>

Many attempts have been made to draw up a region-wide water management plan for the Jordan basin and a system of water allocation that is acceptable to all parties, "either on the basis of the principle of equitable apportionment or on proposals made by a third party." Their acceptance, partial or total, and their actual development has been very much influenced by the political events. All joint schemes proposed have been victim to Arab-Israeli or Syrian-Jordanian enmity.<sup>163</sup> In the absence of multilateral agreements the states concerned have undertaken their own water-management projects.

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<sup>159</sup> Starr and Stoll, *op. cit.*, p. 8.

<sup>160</sup> Starr, *op. cit.*, pp. 25-26.

<sup>161</sup> Beschorner, "Water and Instability in the Middle East", pp. 14-15.

<sup>162</sup> Angus Hindley, "The Source of Regional Conflict ?", *MEED*, January 31, 1992, p. 12.

<sup>163</sup> Starr, *op. cit.*, p. 27.

The following pages try to explain these proposed water-management projects.

### a. The Rutenberg Concession and the Ionides Plan

Two important water-related events highlight the British Mandate of Palestine, 1922-1948, the Rutenberg Concession and the Ionides Plan. In 1926, the British High Commissioner granted the Jewish owned Palestine Electricity Corporation, founded by Pinhas Rutenberg, a 70 year concession to utilize the Jordan and Yarmouk Rivers' water for generating electricity. The concession denied Arab farmers the right to use the Yarmouk and Jordan Rivers' water upstream of their junction for any reason unless permission was granted from the Palestine Electricity Corporation. Permission was never granted.<sup>164</sup>

On the other hand, in 1937, the government of Great Britain assigned M. Ionides, a hydrologist, to serve as the Director of Development for the East Jordan Government. His actual task was solely to conduct a study on the water resources and irrigation potentials of the Jordan Valley Basin. This study served as a main reference in the preparation of the proposed United Nations Partition Plan of Palestine.<sup>165</sup>

Published in 1939, the Ionides Plan suggested three recommendations. First, Yarmouk flood waters were to be stored in the Lake Tiberias. Second, the stored waters in the Lake Tiberias plus a small quantity (1.76 cum/sec) of the Yarmouk River water, diverted through the East Ghor canal, were to be used to irrigate 75,000 acres (300,000 dunums) of land east of the Jordan River. And finally, the secured irrigation waters of the Jordan River System, estimated at a potential of 472 mcm/yr, were to be used primarily within the Jordan Valley Basin. Since the Jordan and the Yarmouk Rivers were at that time still under the authority of the Palestine Electricity Corporation, the plan was difficult to implement.<sup>166</sup>

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<sup>164</sup> Jad Isaac and Leonardo Hosh, "Roots of the Water Conflict in the Middle East", Paper Submitted to **The Conference about The Middle East Water Crisis: Creative Perspectives and Solutions**, Waterloo: University of Waterloo, May 7-9, 1992, p. 3.

<sup>165</sup> *Ibid.*

<sup>166</sup> *Ibid.*

Israelis were not satisfied with the findings and recommendations of Ionides. Their aspiration to utilize the Jordan River Basin for the irrigation of the Negev and the southern parts of Palestine were fulfilled by Walterclay Lowdermilk. Lowdermilk was commissioned by the United States Department of Agriculture to conduct such a study.<sup>167</sup>

### **b. The Lowdermilk Plan**

Lowdermilk devised a plan calling for the irrigation of the Jordan Valley in 1944. These are summarized in Lowdermilk's book, called *Palestine: Land of Promise*. In striking contrast to the Ionides plan, Lowdermilk concluded that 1,800 mcm of water is available in the Jordan Basin for the purpose of irrigation. A canal was recommended to connect the Mediterranean Sea with the Dead Sea. Also, an authority similar to the Tennessee Valley Authority should be formed to assume full control over all activities concerning water resources. Such water management would ideally ensure adequate water resources and job opportunities for 4 million new Jewish immigrants besides the 1.8 million Arabs already living in Palestine and East Jordan at that time.<sup>168</sup>

Control over the proposed project should be solely in the hands of Jews, with a limited amount of input allotted to the United Nations. Arabs unable or unwilling to live under such conditions were to be transferred to areas near the Euphrates and the Tigris Valleys.

Lowdermilk's plan and suggestions were enthusiastically embraced by influential Israelis. Technical experts were subsequently contracted to implement and interpret this plan into feasible schemes. James B. Hays was selected for this assignment.<sup>169</sup>

### **c. The Hays Plan**

The first formal Israeli plan to develop the Jordan Valley's water resources was James B. Hays' 1948 plan, *TVA on the Jordan, Proposals for Irrigation and Hydro-Electric*

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<sup>167</sup> *Ibid.*, pp. 3-4.

<sup>168</sup> *Ibid.*

<sup>169</sup> *Ibid.*

*Development in Palestine.* As it is aforementioned, the Hays Plan was an elaboration of proposals for water management in the Jordan Valley put forward by Lowdermilk.<sup>170</sup>

The Hays Plan of 1948 called for half of the Yarmouk River water to be diverted into the Lake Tiberias, replacing water diverted from the upper Jordan River, as outlined in the Lowdermilk plan. Two additional stages were suggested to be implemented in the future, although not stated, they most likely included the diversion of the Litani River water into geographical Palestine to be used for Israeli projects.<sup>171</sup>

#### **d. The MacDonald Plan**

On the other hand, the first formal plan for water management put forward by Jordan in the post-1948 period was presented by Sir M. MacDonald and Partners in March 1951.<sup>172</sup> During the 1948 war, the Rutenberg electricity generating plant was destroyed by the Israeli army in an attempt to avoid exclusive Arab control over the use of the Jordan and the Yarmouk Rivers. The war forced great number of Palestinian refugees to flee and settle in the eastern part of the Jordan Valley. The Jordanian government and UNRWA (The United Nations Relief and Works Agency) agreed to develop irrigation schemes in the area to assist Palestinian refugees to cultivate the land and resettle. For this purpose, the Jordanian government commissioned a British consultant, Sir Murdoch MacDonald, to conduct a study on their behalf.<sup>173</sup>

The MacDonald Plan called for a dam on the Yarmouk at Maqarin, with a second dam at Addassiyah providing gravity flow into the East Ghor canal along the Jordan Valley. This scheme would give hydroelectric power for both Syria and Jordan, and irrigate 60,000 dunums (about 20,000 acres) in Syria and five times that area in Jordan.<sup>174</sup>

The MacDonald Plan was finalized in 1951. It is considered a compliment to the Ionides Plan. The plan called for Jordan Basin water to be exclusively used for irrigation of

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<sup>170</sup> David M. Wishart, "The Breakdown of the Johnston Negotiations over the Jordan Waters", *Middle Eastern Studies*, Vol. 26, No. 1, January 1990, p. 537.

<sup>171</sup> Isaac and Hosh, *loc. cit.*

<sup>172</sup> Wishart, *loc. cit.*

<sup>173</sup> Isaac and Hosh, *op. cit.*, p. 5.

<sup>174</sup> Bulloch and Darwish, *op. cit.*, pp. 50-51.

both banks of the Jordan River by storing surplus water from the Yarmouk River in the Lake Tiberias and constructing canals down both sides of the Valley. Arabs were uneasy with the suggestion of the storage of water in the Lake Tiberias, as they were in previous plans.<sup>175</sup> Therefore, Arabs favored the plan put forth by the American engineer M. E. Bungler.

### e. The Bungler Plan

The Bungler Plan addressed several of Jordan and Syria's needs and intended to resolve, to some extent, the Palestinian refugee problem by increasing the productivity of available agricultural lands in the East Jordan Valley and parts of Syria. Bungler identified a suitable location for the construction of a water storage dam along the Yarmouk River as the Maqarin area, where three valleys join together. The impounded water would be diverted to another dam at Addassiyah into gravity flow canals along the East Ghor area in the Jordan Valley. The plan included two hydroelectric generating plants at the site of the two dams to supply water and electricity to both Jordan and Syria.<sup>176</sup>

To implement the Bungler Plan, Syria and Jordan agreed in June 1953 on joint use of Yarmouk River water. As soon as work began in July 1953, Israel vocalized its concern about increasing Arab control over the area's water resources. Israel objected on the grounds that the original Rutenberg Concession gave it exclusive rights to the Yarmouk River, stemming from the British decision in 1926 to give Pinhas Rutenberg a seventy-year concession to use the Jordan and Yarmouk to produce hydroelectric power.<sup>177</sup>

In the same month that engineers prepared to start work on the Maqarin dam -July 1953- Israel began diverting the waters of the Jordan into its new national carrier at Jisr Banat Yaqub, again in a demilitarized zone awaiting final apportionment. Now it was Arab's turn to protest, and in September Syria took the issue to the U.N., just as it had done over the Israeli actions in the Huleh marshes. Then, Syria protests had been brushed aside, but this time the Syrian case was accepted and Israel was ordered to stop work. Israel ignored that order, and only in November 1953, when the USA threatened to cut off aid

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<sup>175</sup> Isaac and Hosh, *loc. cit.*

<sup>176</sup> *Ibid.*

<sup>177</sup> Bulloch and Darwish, *loc. cit.*



funds, did it finally obey. It was forced to move the intake for its national carrier to Eshed Kinrot on the Lake Tiberias, where salinity was higher and hydroelectric power had to be used to pump the water to the carrier.<sup>178</sup>

Perhaps to show that it was even-handed, the USA then cut off funding for the Bunger Plan, forcing Jordan to abandon that project altogether. The Bunger Plan quickly died, and the Syrians and Jordanians partially diverted the Yarmouk's flow for a brief time to irrigate farm lands in the eastern part of the Jordan Valley.<sup>179</sup>

## f. The Israeli Seven-Year Plan

As a continuation of the Lowdermilk-Hays Plan, the new government of Israel, soon after the war of 1948, began to prepare practical plans for the utilization and control of the area's water resources. A *Seven Year Plan*, approved publicly in 1953, centered around the diversion of the Jordan River water south toward the Negev desert and establishing a unified and comprehensive water network that would cover all parts of Israel.<sup>180</sup> It allocated one third of the flow of the Litani to Israel and proposed storage of Upper Jordan waters in the Lake Tiberias.<sup>181</sup>

In July 1953, Israel began construction on the intake of its National Water Carrier at Gesher B'not Ya'akov, north of the Sea of Galilee and in the demilitarized zone. Syria deployed its armed forces along the border and artillery units opened fire on the construction and engineering sites. Syria also protested to the UN and, though a 1954 resolution for the resumption of work by Israel carrier a majority, the USSR vetoed the resolution. The Israelis then moved the intake to its current site at Eshed Kinrot on the north-western shore of the Sea of Galilee.<sup>182</sup>

The period between October 1953 and July 1955 was negotiating and bargaining stage over the Jordan River system. By the end of 1955, the Johnston Plan became more

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<sup>178</sup> *Ibid.*

<sup>179</sup> John K. Cooley, "The War over Water", *Foreign Policy*, No. 54, Spring 1984, p. 14.

<sup>180</sup> Isaac and Hosh, *op. cit.*, p. 4.

<sup>181</sup> Beschoner, "Prospects for Cooperation in the Jordan River Basin", p. 150.

<sup>182</sup> Wolf, *op. cit.*, p. 20.

favorable to Israel, whose share rose to 450 mcm while Jordan's shares dropped to 720 mcm.<sup>183</sup>

### g. The Johnston Plan

When the Israeli national carrier was inaugurated in 1953, just as Jordan was being prevented from carrying out the Bunger Plan, President Eisenhower realized that the USA was becoming increasingly involved in the hydro-politics of the region, and so appointed Eric Johnston as a special ambassador with the task of mediating between the two sides and of hammering out a comprehensive plan for the development of the Jordan River system.<sup>184</sup> The Plan was based on the philosophy of the TVA, i.e., taking the water where it is available and bringing it to where it is needed, irrespective of political boundaries.<sup>185</sup> The plan's starting principle was that any solution must be "equitable, economic, and efficient".

Johnston carried a plan entitled *The Unified Development of the Water Resources of the Jordan Valley Region* to officials in Israel, Jordan, Syria, Lebanon, and Egypt in October 1955. Referred to variously as the Main Plan, the Unified Plan, and the Johnston Plan, Johnston's proposals were composed by the Boston firm, Charles T. Main, Inc., under TVA authorization.<sup>186</sup>

Integrated regional planning for irrigation and power projects was the essential idea of the Main Plan. The Main Plan included small dams on the Hasbani, Dan and Baniyas, a medium size (175 mcm storage) dam at Maqarin, additional storage in the Sea of Galilee, and gravity-flow canals down both sides of the Jordan Valley. But Main rejected the Bunger idea of using the Maqarin dam for irrigation and did not even mention power development in Lebanon or use of the Litani River.<sup>187</sup> Namely, the Main Plan excluded the

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<sup>183</sup> Isaac and Hosh, *op. cit.*, p. 6.

<sup>184</sup> Bulloch and Darwish, *op. cit.*, pp. 51-52.

<sup>185</sup> Caponera, *op. cit.*, p. 7.

<sup>186</sup> Wishart, *op. cit.*, p. 538.

<sup>187</sup> Sara Reguer, "Controversial Waters: Exploitation of the Jordan River: 1950-1980", *Middle Eastern Studies*, Vol. 29, No. 1, January 1993, p. 56.

Litani and described only in-basin use of the Jordan River water. Preliminary allocations gave Israel 394 mcm/yr, Jordan 774 mcm/yr, and Syria 45 mcm/yr.<sup>188</sup>

The Main Plan attempted to reconcile, on the basis of practicality and economy, proposals made specifically for the benefit of Israel or Jordan, because each would divert a disproportionate quantity of the water at the expense of the other.

Besides proposing a number of dams, on the rivers Hasbani, Dan and Baniyas, on the Lake Tiberias and Yarmouk (Maqarin) and the draining of the Huleh swamps, the Johnston Plan allocated water to the riparian states on the basis of strict quotas.<sup>189</sup> Also a three-member neutral engineering board was agreed upon to supervise everything, including a compromise plan for storing water in the Lake Tiberias.<sup>190</sup>

Johnston worked until the end of 1955 to reconcile these proposals in a Unified Plan amenable to all the states involved. His dealings were bolstered by a US offer to fund two-thirds of the development costs, and given a boost when a land survey of Jordan suggested that the country needed less water for its future needs than was previously thought.<sup>191</sup>

Johnston addressed the objections of both sides, and accomplished no small degree of compromise, although his neglect of groundwater issues would later prove an important oversight. Though they had not met face to face for these negotiations, all states agreed on the need for a regional approach. Israel gave up on integration of the Litani, and the Arabs agreed to allow out-of-basin transfer. The Arabs at first objected, but finally agreed, to storage at both the Maqarin Dam and the Sea of Galilee so long as neither side would have physical control over the share available to the other. Israel objected, but finally agreed, to international supervision of withdrawals and construction.<sup>192</sup>

The technical committees from both sides accepted the Unified Plan, and the Israeli cabinet approved it without vote in July 1955. President Nasser of Egypt became an active advocate because Johnston's proposals seemed to deal with the Arab-Israeli conflict and the Palestinian problem simultaneously. Despite the forward momentum, the Arab League

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<sup>188</sup> Wolf, *op. cit.*, pp. 21-22.

<sup>189</sup> Beschoner, "Prospects for Cooperation in the Jordan River Basin", p. 150.

<sup>190</sup> Reguer, *op. cit.*, pp. 69-70.

<sup>191</sup> Wolf, *loc. cit.*

<sup>192</sup> *Ibid.*

Council decided not to accept the plan in October 1955, and the momentum died out. In a 1955 letter lobbying against acceptance of the plan, the Arab Higher Committee for Palestine explained part of the underlying reluctance to enter into agreement.<sup>193</sup>

**Table 3.3**  
**Development of Johnston Plan 1953-1955**

Country	Johnston (1953)		Arab (1954)		Cotton (1954)		Revised (1955)	
	Water	Area	Water	Area	Water	Area	Water	Area
Jordan/ Palestine	774	490	861	490	575	430	720*	
Syria	45	30	132	119	30	30	132	119
Lebanon	--	--	35	35	450.7	350	35	35
Arab States	819	520	1,028	644	1,055.7	810	887	
Israel	394	420	200	234	1,290	1,790	450*	
<b>TOTALS</b>	<b>1,213</b>	<b>940</b>	<b>1,228</b>	<b>878</b>	<b>2,345.7</b>	<b>2,600</b>	<b>1,337</b>	

Water = million cubic meters

Area = thousands of dunums

\* = an estimate

Source: Jad Isaac and Leonardo Hosh, "Roots of the Water Conflict in the Middle East", Paper Submitted to **The Conference about The Middle East Water Crisis: Creative Perspectives and Solutions**, Waterloo: University of Waterloo, May 7-9, 1992, p. 6.

The Johnston Plan failed for several reasons. Israel was reluctant to provide the requisite funding or consider a solution which excluded the waters of the Litani or accept an allocation which was lower than that which would receive under its own plans, especially if the Upper Jordan diversion scheme went ahead; it was also reluctant to accept international intervention in this matter, the Israeli Cabinet refused to ratify the proposals. The Arab states, particularly Jordan, opposed the plan as they felt the waters of the Jordan should be allocated to meeting the needs of the Palestinian refugees in Jordan rather than to irrigation of the Negev. Public opposition in Jordan was considerable and the plan was also denounced by the Chamber of Deputies in Lebanon. Furthermore, little external pressure

<sup>193</sup> *Ibid.*, pp. 22-23.

could be exerted on the Arab states to accept the plan. The Johnston proposals were in no way binding in international law.<sup>194</sup>

According to one explanation, The Technical Committee of the Arab League forwarded the Unified Plan to the Political Committee of the Arab League. On October 11, 1955, it failed to win approval and the matter was referred back to the Technical Committee until a plan that better protected Arab interests could be devised.<sup>195</sup>

According to another explanation, Stevens suggests that since the plan held out benefits for Israel, it could not be supported by the Arab states. Lebanon also had reservations about the plan since Beirut's role as a port city might be threatened if the Johnston negotiations resulted in greater cooperation between Israel and Jordan.<sup>196</sup>

According to Naff and Matson, the Arab "non-adaption" of the plan was not a total rejection; while they failed to approve it politically, they were determined to adhere to the technical details.<sup>197</sup>

Although the negotiations undertaken by President Eisenhower's special envoy Eric Johnston in the mid-1950s never resulted in a formal agreement among all the riparians in the Jordan-Yarmouk River basin, it did establish generally agreed guidelines, and it is on this basis that the United States in the 1960s supported the unilateral development plans of both Jordan and Israel, since they were generally consistent with the parameters agreed upon by the technical experts of all the countries.<sup>198</sup> From that time to the present, Israeli and Jordanian water officials have met two or three times a year at so-called "Picnic Table Talks" at the confluence of the Jordan and Yarmouk Rivers to discuss flow rates and allocations.<sup>199</sup>

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<sup>194</sup> Beschorner, "Prospects for Cooperation in the Jordan River Basin", p. 150.

<sup>195</sup> Wishart, *op. cit.*, p. 539; quoted from American Friends of the Middle East Inc., **The Jordan Water Problem: An Analysis of Available Documents**. Washington, 1964, p. 50.,

<sup>196</sup> *Ibid.*, quoted from Georgiana G. Stevens, **Jordan Water Partition**, Stanford: 1965, p. 32.

<sup>197</sup> Naff and Matson, *op. cit.*, p. 41.

<sup>198</sup> Gruen, **The Water Crisis: The Next Middle East Crisis?**, p. 26.

<sup>199</sup> Wolf, *loc. cit.*

After the failure of the Johnston Plan, counterproposals for dividing water shares were put forward -the Cotton Plan for Israel and the Arab's Plan for the Arab countries as a group.<sup>200</sup>

#### **h. The Cotton Plan**

Israel responded to the Main proposal with the Cotton Plan that incorporated many of the Lowdermilk's ideas. This plan called for inclusion of the Litani, out-of-basin transfers to the coastal plain and the Negev, and the use of the Sea of Galilee as the main storage facility, thereby diluting its salinity. It allocated Israel 1,290 mcm/yr, including 400 mcm/yr from the Litani, Jordan 575 mcm/yr, Syria 30 mcm/yr and Lebanon 450 mcm/yr.<sup>201</sup>

The Cotton Plan differed from the Unified Plan in four ways. First, it called for Israel to use one-third of the flow of the Litani River from southern Lebanon. Second, Israel would use Jordan River water along the Mediterranean coast and in the Negev. Third, 50 per cent of the water to be developed would go to Israel rather than the 33 per cent allotted to Israel in the Unified Plan. Finally, the Cotton Plan would cost \$ 470 million versus \$ 121 million for the Unified Plan.<sup>202</sup>

#### **i. The Arab Plan**

In 1954, representatives from Lebanon, Syria, Jordan and Egypt established the Arab League Technical Committee under Egyptian leadership and formulated the Arab Plan. It reaffirmed in-basin use, rejected storage in the Sea of Galilee, which lies wholly in Israel, and excluded the Litani. The Arab representatives also objected to the refugee resettlement as a goal.<sup>203</sup>

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<sup>200</sup> Wishart, *op. cit.*, p. 538.

<sup>201</sup> Wolf, *op. cit.*, p. 22.

<sup>202</sup> Wishart, *loc. cit.*

<sup>203</sup> Wolf, *loc. cit.*

The Arab's Plan differed from Johnston's original proposals on two points. First, the Arab's Plan called for construction of a higher dam at Maqarin than did the Unified Plan. Also, only 20 per cent of the water to be developed would be allocated to Israel, rather than the 33 per cent called for the Unified Plan. Israel was to receive 182 mcm/yr, Jordan 698 mcm/yr, Syria 132 mcm/yr, and Lebanon 35 mcm/yr in addition to keeping all of the Litani. Israel's share of the Jordan's flow under the Arab's Plan was kept so small that little water could have been diverted to the Mediterranean coast and the Negev.<sup>204</sup>

### **j. The Baker-Harza Plan**

The Baker-Harza Plan of 1955 (also known as the Yarmouk-Jordan Valley Project, Master Plan) backed the Maqarin dam proposals and the Lake Tiberias year round storage of Yarmouk waters. The proposers claimed that more water could safely be supplied to Israel than advocated by Johnston as a smaller amount of water could be used to irrigate Jordanian farmland in the Lower Jordan Valley. Like its predecessors, it did not go beyond the theoretical stage.

### **k. The Israeli Ten-Year Plan**

A few months after the Arab League's decision on the Johnston Plan, the National Planning Board of Israel adopted a Ten-Year Plan for unilateral water development. It was based on earlier plans, but special emphasis was put on the National Water Carrier to convey Jordan waters to the Negev. For almost two years the crucial question of the point of diversion was not decided, until November 1958, when on the recommendation of a committee, the Israeli government decided to shift the diversion point from Gesher B'not Ya'akov to Eshed Kinrot at the northwest corner of the Lake Tiberias.<sup>205</sup>

In 1958, Israel reinitiated the National Water Carrier project but with some technical changes. The new plan shifted the diversion point to Eshed Kinrot, at the

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<sup>204</sup> Wishart, *loc. cit.*

<sup>205</sup> Reguer, *loc. cit.*

north-west corner of the Lake Tiberias. The new diversion project was carefully designed in accordance to Israel's water allocation in the Revised Johnston Plan. It also refrained from invalidating its general principles.<sup>206</sup>

In the 1964, Israel finished its project -the National Water Carrier- tapping the Sea of Galilee to channel water as far south as the Negev desert and virtually drying up the southern Jordan River. Jordan and other Arab states were outraged, calling the transfer of water from the Jordan basin a breach of international law. Israel maintains that it has the right to do what it wants with its own water.<sup>207</sup>

The actual amount of water which has been piped along the National Water Carrier has been regarded by Israel as a strategic matter and no detailed figures have been published. It is widely believed though that the capacity of the National Water Carrier is more than 500 mcm/yr. In other words this system is capable of transporting the entire average flow of Jordan water leaving the Lake Tiberias. Such an amount represents about 32 per cent of the total flow of the Jordan.<sup>208</sup>

Conveying water of Cross-Israel Water Carrier coincided with the Second Arab Summit Conference in Alexandria, at which the Arabs voted to begin the Mukheiba dam to hold water diverted from the Baniyas and Hasbani sources. Israel repeated her determination to repel any aggression, for such diversion was intended solely to hurt Israel, and a note was sent to the United Nations asking it to oppose the Alexandria Conference's public announcement of aggressive intent.<sup>209</sup>

## I. The East Ghor Canal Project

Jordan was tacitly observing the Johnston water allocations as she too moved ahead with her unilateral water development plans. The Kingdom of Jordan had been planning Yarmouk River projects since the early 1950s and had established a Development Board to handle the projects. One of them was the East Ghor Canal Project. This project diverts the

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<sup>206</sup> Isaac and Hosh, *op. cit.*, p. 7.

<sup>207</sup> Priit J. Vesilind, "The Middle East's Water: Critical Resource", *National Geographic*, May 1993, p. 59.

<sup>208</sup> Beaumont, "Transboundary Water Disputes in the Middle East", pp. 9-10.

<sup>209</sup> Reguer, *op. cit.*, p. 75.



normal flow of the Yarmouk River through an intake structure leading to a tunnel one km long and 3 m horse-shoe diameter. The water is conveyed in a main canal whose length is 69 km and into this canal the waters for the perennial flow side wadis combine to feed an irrigation and distribution system of about 120,000 dunums. Ultimately, it aims to irrigate over half million dunums and generate electric power of approximately 50,000 kw.<sup>210</sup> Construction began in 1958, and year by year the East Ghor Canal project extended further and further south, enabling the reclamation and irrigation of hundreds of thousands of dunums of land.<sup>211</sup>

Following to the beginning of the construction, Israel closed the gates of an existing dam south of the Sea of Galilee and began draining the Huleh swamps, which lay within the demilitarized zone with Syria. These actions led to a series of border skirmishes between Israel and Syria which escalated over the summer of 1951.<sup>212</sup>

In 1969 Israel bombed the East Ghor Canal in Jordan, keeping it out of order for four years. After secret negotiations between Jordan and Israel in 1969-1970, Israel permitted the repair of the East Ghor Canal while Jordan, in return, reaffirmed its adherence to the Revised Johnston Plan quotas.<sup>213</sup>

Only the East Ghor Canal and a few other minor works had been completed by the time of the Six Day War in 1967, and the two dams on the Yarmouk had not been begun. After the war, the new Israeli positions meant that nothing could be done, and in the absence of any agreement "the project remains on the drawing board."<sup>214</sup>

After the war the Kingdom of Jordan could not resume its development projects, partly because of the activities of the Palestinians who in effect took control of large sectors of the Valley. This resulted in shellings by the Israelis and in late 1970 in a major confrontation between Jordanian army and the Palestinians. After the disturbances died down and the farmers began to return from the highlands where they had taken refuge in

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<sup>210</sup> Caponera, *op. cit.*, p. 9.

<sup>211</sup> Reguer, *op. cit.*, p. 72.

<sup>212</sup> Wolf, *op. cit.*, p. 20.

<sup>213</sup> Isaac and Hosh, *loc. cit.*

<sup>214</sup> Bulloch and Darwish, *op. cit.*, pp. 53-54.

the Valley, the government of Jordan took steps to revive economic activity and resume development efforts.<sup>215</sup>

So desperate was the situation in the Jordan Valley, the most productive area of the country, that Crown Prince Hassan was put in charge of rehabilitating the area and in 1974 produced a new plan, which called for the establishment of a Jordan Valley Commission to oversee all aspects of the region. The East Ghor Canal, which had been silting up, was cleaned, new pressure pipes were installed to irrigate 300,000 dunums (100,000 acres) with water flowing in from the side wadis in the east, and new villages with modern amenities were planned to attract the people back. So far, the Commission -now the Jordan Valley Authority- has been remarkably successful. The King Talal Dam on the Zarqa River -to be 92 meters high and store 37 mcm of water-, on 18 km extension of the canal and a north-south highway have rejuvenated the valley, while King Hussein's careful policies as well as secret US mediation have prevented any further clashes with Israel.<sup>216</sup> The East Ghor Canal was extended southward and is hooked up to the Dead Sea. Farmers returned, induced by promises of continued land reform.<sup>217</sup>

### **m. The Arab Headwaters Diversion Plan**

But Jordan was not only pursuing her unilateral development. As a member of the Arab League, the Jordanians were pulled into participating in the schemes for obstructing Israel's Water Carrier project. Late in 1959 the Arab League began to consider diverting the Jordan's headwaters as the best way to obstruct Israel's development plans. At the first Arab Summit Conference, January 1964, it was decided to implement the diversion plan within a year and a half, and an attempt was made to allot money for it. After Israel began test pumping in May, a second Arab Summit Conference was called in September, at which it was decided to build a dam at Mukheiba on the Yarmouk to store water diverted from the Baniyas and Hasbani.<sup>218</sup>

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<sup>215</sup> Reguer, *op. cit.*, p. 76.

<sup>216</sup> Bulloch and Darwish, *op. cit.*, p. 55.

<sup>217</sup> Vesilind, *loc. cit.*

<sup>218</sup> Reguer, *op. cit.*, p. 73.

In 1965, Syria began building dams to divert water from the Banias and Dan Rivers in the Golan Heights. These headwater diversions threatened to deprive Israel of 35 per cent of its water potential from the Upper Jordan.<sup>219</sup>

Work by the Arabs to divert the Jordan headwaters only lasted half a year. In April Israel hit the diversion works in a series of military strikes. By the time the Arabs met at the Casablanca Summit Conference in September 1965, they had reverted to threats of diversion only, for work in Syria had ceased.<sup>220</sup>

Israeli occupation of the Syrian Golan Heights in 1967 and subsequent control over the Jordan's headwaters in the area led Middle East states to abandon finally regional water projects and focus on the resources within their own frontiers.<sup>221</sup>

## n. The Maqarin Dam Project

In 1976 there was a return to the last major project of the development of the Yarmouk waters: the high dam at Maqarin. The project also includes the construction of a low concrete dam or weir at Adassiya to control and regulate the flow of the water into the tunnel leading to the East Ghor main canal, and to regulate the flow of a percentage of water to the "Yarmouk Triangle."<sup>222</sup>

This project dates back to 1952. In 1952, the Jordanians added a high dam on the Yarmouk River at Maqarin to their plans. The dam was first proposed by Mills Bunger. It was to store the Yarmouk's winter flow and to generate electricity for Syria and Jordan. From the Jordanian and Syrian perspectives, Bunger's proposal was preferable to all earlier plans since it did not involve joint storage of water with Israel in the Lake Tiberias.<sup>223</sup>

In March 1953, Jordan and the UN Relief and Works Agency for Palestine Refugees (UNRWA) signed an agreement to begin implementing the Bunger Plan. The project would open land for irrigation, provide power for Syria and Jordan, and offer

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<sup>219</sup> Isaac and Hosh, *loc. cit.*

<sup>220</sup> Reguer, *op. cit.*, p. 75.

<sup>221</sup> Cooley, *op. cit.*, p. 16.

<sup>222</sup> Reguer, *op. cit.*, pp. 77-78.

<sup>223</sup> Wishart, *op. cit.*, pp. 537-538.

resettlement for 100,000 Palestinian refugees. In June 1953, Jordan and Syria agreed to share the Yarmouk but Israel protested that its riparian rights were not being recognized.<sup>224</sup>

In April 1978, there was a meeting of donors -Britain, the United States, West Germany, the Arab Development Fund- to study the feasibility report. They assigned it to the World Bank for appraisal. The total project would cost \$ 1 billion, and the United States pledged \$ 150 million to it. In October 1979, 15 other prospective donors met in London, agreeing on how to finance the rest. By February 1980, the tender contracts were advertised, with everything set to go. But, as written in the feasibility study, "Construction of the recommended project will require certain political accommodations which could delay its implementation." This referred to the need to receive Israel's approval for the project as part of her rights as a riparian of the Jordan-Yarmouk waters. The World Bank insists on the principle that before water projects are financed, all disputes over riparian rights be settled. When it became clear as soon as the project was publicized in 1978-79 that Israel disputed certain aspects of the proposed dam plan, the World Bank asked the United States to use its good offices to negotiate an indirect agreement between Israel and Jordan. Israel had originally agreed to a Maqarin dam as part of the Johnston plan, albeit a smaller one. According to Sara Reguer;

*In principle Israel still agrees to it, and Israeli officials concede the potential benefits of storing Yarmouk water during winter rains for use during dry summers and droughts. But since the 1950s things have changed. As of today, Israel is probably the only country in the world to exploit almost 100 per cent of her natural water resources. Israel uses about 2,000 mcm annually, and estimates that future net withdrawal requirements will be probably even higher. .... This increase will be difficult to cover. Israel therefore considers of vital importance the yearly difference in what she says she should be getting from the Yarmouk and what Jordan says was agreed upon during the Johnston negotiations. On the other hand, the Yarmouk is really Jordan's only major source of water, and in a country that is expanding as rapidly as she is, and is modernizing as rapidly, every million cubic meter of water per year is of equally vital importance.*<sup>225</sup>

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<sup>224</sup> Wolf, *loc. cit.*

<sup>225</sup> Reguer, *op. cit.*, pp. 78-79.

As the same writer has pointed out that, "the King of Jordan still hopes that the Maqarin Dam on the Yarmouk will be completed, for this is her only feasible means of access to more water in the near future."<sup>226</sup>

**Table 3.4**  
**Proposed Water Development Plans (1939-1964)**

<b>Water Development Plan</b>	<b>Year Proposed</b>
<b>Ionides Survey</b>	1939
<b>Lowdermilk Proposal</b>	1944
<b>Hays Plan</b>	1948
<b>MacDonald Report</b>	1951
<b>All Israel Plan</b>	1951
<b>Bunger Plan</b>	1952
<b>Israeli Seven-Year Plan</b>	1953
<b>Johnston / Main Plan*</b>	1953
<b>Cotton Plan*</b>	1954
<b>Arab Plan (revised)*</b>	1954
<b>Baker-Harza Plan</b>	1955
<b>Unified Plan*</b>	1955
<b>Israeli Ten-Year Plan</b>	1956
<b>National Water Plan</b>	1956
<b>East Ghor Project</b>	1958
<b>Arab Headwaters Diversion</b>	1964

\* Regional Development Plans

Source: United Nations, **Water Resources of the Occupied Palestinian Territory**, New York: United Nations, 1992, p. 17.

### **o. Current Plans and Other Options**

No water plans were devised after the Johnson Plan of 1954. However, many events have taken place, further altering water distribution quotas. Since the 1967

<sup>226</sup> *Ibid.*, p. 82.

occupation of the West Bank, the Gaza Strip and the Golan Heights, Israel vastly expanded its control over water resources in the area, including the Mount Hermon, the West Bank aquifers and the entire length of the Jordan River. As an outcome of the 1982 Israeli invasion of South Lebanon, Israel extended its command even further, to include part of the Litani River. According to Jad Isaac and Leonardo Hosh, "Israel's strategy is to control and derive maximum benefit from all water resources in the occupied territories."<sup>227</sup>

There are some water-management plans, which the riparian states try to achieve independently from each other. These could be summarized as follows:

In 1981, Israel planned a canal through the Gaza Strip linking the Mediterranean and Dead Seas. The Dead Sea catchment area plan provided for draining all the waters from the intermittent wadis around this sea and their utilization for irrigation purposes in the Negev. It was contemplated to substitute those waters with sea water brought in from the Mediterranean; in so doing the utilization of the difference of nearly 400 m in the levels between them would produce electric power.<sup>228</sup>

The proposal was opposed by Jordan because raising the level of the Dead Sea would flood tourist facilities, roads and destroy potash production installations. Jordan subsequently submitted an alternative proposal for a canal to the Dead Sea, from the Red Sea at Aqaba.<sup>229</sup>

Since 1985 a project to pump underground water to the Jewish settlements has been under consideration in Israel. It contemplates the abstraction of 18 mcm of water near Herodion, and three-fourths of this water will find its way to the West Bank.<sup>230</sup>

Rather than continue to reshuffle meagre existing resources, Israeli policy-makers back projects that will increase the overall water supply. Two main approaches have been investigated: importing water from outside the basin, and building Arab-Israeli joint venture desalination plants on the Mediterranean coast. Proposals for out-of-basin transfers include: storing Litani waters in the Lake Tiberias or in a dam on the Yarmouk to supply Jordan and the West Bank; a submarine pipeline from Turkey; a pipeline from the Ceyhan and Seyhan Rivers in Turkey to supply Syria, Jordan and the West Bank; importing Litani

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<sup>227</sup> Isaac and Hosh, *loc. cit.*

<sup>228</sup> Caponera, *op. cit.*, p. 8.

<sup>229</sup> Beschorner, "Water and Instability in the Middle East", *op. cit.*, p. 22.

<sup>230</sup> Caponera, *op. cit.*, p. 9.

water to Israel in exchange for electricity; and, finally, importing Nile water to Gaza through Sinai canal.<sup>231</sup>

Meanwhile, the Syrians, who had access to the Banias springs in 1967, began a series of small impoundment dams on the headwaters of the Yarmouk in their territory in the late 1970s. By August 1988, twenty dams were in place with combined capacity of 156 mcm/yr. That capacity has since grown to 27 dams with a combined storage of about 250 mcm/yr. The Syrians have plans to expand this storage to 366 mcm/yr by 2010.<sup>232</sup>

When we look at Jordan, we see that, the land and water resources of Jordan, capable of sustaining about 1.4 million people, have today about 4 million people dependent on them. The per capita annual share of renewable water resources has dropped from a comfortable 3000 cum in 1948 to about 215 cum in 1992. According to a Jordanian official document,

*.... Irrigation water has been diverted to urban use, and has been partially replaced by treated wastewater at a high environmental cost, and at times, adverse conditions for public health. Groundwater is being abstracted at about 165 per cent of its sustainable yield with visible adverse environmental consequences. [For that reason] expensive basin transfer projects have been implemented to cope with the escalating urban water demand.*<sup>233</sup>

### 3.1.3. The Positions of the Riparian States

It has been contended that the Jordan's river system holds the greatest potential for conflict, and that the unresolved fate of the Palestinians in the West Bank impedes the eventuality of an acceptable formula in an area where Israel draws upward a considerable portion of her water requirements. In consequence of Israel's continuous and ever growing

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<sup>231</sup> Beschorner, "Water and Instability in the Middle East", *op. cit.*, pp. 23-24.

<sup>232</sup> Wolf, *op. cit.*, p. 34.

<sup>233</sup> The Hashemite Kingdom of Jordan, "The Jordanian Perspective: Water", **Middle East Multinational Negotiations Working Group on Water Resources**, Vienna, May 13-15, 1992, p. 1.

needs of water, its eminent control over the resources thereof, has acquired primacy as a strategic factor in her regional policies.<sup>234</sup>

The primary users of the waters Jordan River are Israel and Jordan. Between them, the Jordan River has been extensively exploited; it satisfies about one-half of their combined water demand. The other riparian states are Lebanon and Syria; their use of the Jordan at present is minor in comparison to that of the others, and satisfies about 5 per cent of their total demand for water.<sup>235</sup>

Taking the positions of the riparian states into account, the scene is as follows:

Israel draws 65 per cent of its renewable fresh water from two major aquifers. The rest comes from the Jordan River and its great storage basin, the Sea of Galilee. The Litani River in southern Lebanon has been a temptation, especially since established its security zone there in 1982, but so far Israel has resisted tapping it.<sup>236</sup>

Israel consumes 1,655 mcm of both surface and ground water according to 1991 figures. Of this amount, 950 mcm originates in neighbouring Arab States, Golan Heights and the West Bank. Whereas, only 155 mcm of water originating in the West Bank actually remains there. A considerable amount of this water is consumed by Israeli settlements and kibbutzim inside the West Bank itself.<sup>237</sup>

Israel transfers water from the Jordan basin through the National Water Carrier to western portions of the country. Israel is already using 95 per cent of its renewable resources and consumes five times more water per capita than its neighbours. If estimates are correct, by the year 2000 Israel will face shortages up to 800 mcm/yr.<sup>238</sup>

Owing to the scarcity of water, Israel has pioneered developing plants that thrive in semi-arid conditions and others that can utilize brackish water. Israel has also developed some of the world's most efficient irrigation techniques, replacing traditional gravity flow irrigation by sprinklers and drip irrigation.<sup>239</sup>

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<sup>234</sup> El Mor, *op. cit.*, pp. 2-3.

<sup>235</sup> Naff and Matson, *op. cit.*, p. 27.

<sup>236</sup> Vesilind, *op. cit.*, pp. 60-62.

<sup>237</sup> Isaac and Hosh, *op. cit.*, pp. 7-8.

<sup>238</sup> Starr and Stoll, *op. cit.*, p. 6.

<sup>239</sup> Gruen, *The Water Crisis: The Next Middle East Crisis?*, p. 56.



The water agenda, according to Natasha Beschorner, "is dictated almost entirely by Israel's interests and ambitions, as Israel has assumed de facto sovereignty over the region's river system and much of its groundwater."<sup>240</sup>

Israel regards its water needs as paramount and control over the sources of the Jordan River and key aquifers as a minimum security requirement. Israeli security perceptions remain strongly territorial, and while policy-makers recognize the serious water deficit in Jordan and Gaza and advocate international cooperative water management to ensure quality controls, they also stress that Israel's rightful shares must be preserved.<sup>241</sup>

It is pointed out by international water experts that the Golan Heights and the West Bank are of vital importance for Israel if they are considered from the water resources point of view. This assessment of international experts is confirmed by Israeli officials. If Israel loses its control on these territories during the process of the Middle East Peace Negotiations, this might lead to serious deprivation of water resources for Israel.<sup>242</sup> Although Israeli officials say that they may make some territorial concessions to the surrounding Arab countries, they openly state that the abovementioned water resources are indispensable for Israel.<sup>243</sup>

When we look at Jordan, we see that per capita annual water consumption in Jordan is one of the lowest in the world, approximately 205 cum, but despite this, water demand began to outpace supply in 1987 and municipal rationing was introduced. Jordan's water deficit in summer 1991 was 210 mcm and, on the basis of those trends, was set to increase to 370 mcm by the turn of the century and 550 mcm in 2005.<sup>244</sup>

To meet its growing water needs, Jordan is relying on incremental solutions, including deeper drilling for groundwater sources and relatively expensive technologies like drip irrigation. One promising approach is solar-powered pumping and desalination of

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<sup>240</sup> Beschorner, "Water and Instability in the Middle East", *op. cit.*, p. 66.

<sup>241</sup> *Ibid.*, pp. 22-23.

<sup>242</sup> The Ministry of Foreign Affairs of Republic of Turkey, *op. cit.*, pp. 2-3.

<sup>243</sup> For a detailed explanation, see George E. Gruen, "International Regional Cooperation: Preconditions and Limits" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, p. 273.

<sup>244</sup> Beschorner, "Water and Instability in the Middle East", *op. cit.*, p. 16.

brackish groundwater in the Jordan River valley south of the Dead Sea; but the initial costs of such a scheme are prohibitive for a country in Jordan's economic straits.<sup>245</sup>

On the other hand, Syria utilizes the water of the Yarmouk River, its largest tributary, for irrigation in the Mezerib district before the same river becomes a boundary stream between Syria and Jordan.<sup>246</sup>

The Syrian view is that no negotiations with Israel are possible until Israel withdraws from occupied Arab lands, particularly the Golan Heights. As further preconditions for negotiations, Syria insists that there should be an internationally acceptable delimitation of its border with Israel, and that Palestinian water rights should be restored and hydrological data exchanged.<sup>247</sup>

At present Syria still refuses to participate in any regional discussions until Israel commits itself to withdrawal from the Golan Heights and other occupied territories.<sup>248</sup>

To sum up it could be said that;

Available data indicate that the most immediate water problem in the Middle East occurs in the triangle delimited by Jordan, West Bank, Israel, Gaza and Golan Heights.<sup>249</sup>

The reality is that Israel, the West Bank and Gaza, and Jordan are facing a combined water deficit of at least 300-400 mcm/yr (and some estimate the figures to be as high as 500-600 mcm/yr). This is aggravated by drought conditions. A way must be found to meet this deficit at a cost the parties can afford, through either technological applications or some other measures.<sup>250</sup>

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<sup>245</sup> Starr, *loc. cit.*

<sup>246</sup> Caponera, *loc. cit.*

<sup>247</sup> Beschorner, "Water and Instability in the Middle East", *op. cit.*, p. 25.

<sup>248</sup> Gruen, **The Water Crisis: The Next Middle East Crisis?**, p. 62.

<sup>249</sup> "Cooperation on Water Resources in the Middle East", **Middle East Multinational Negotiations Working Group on Water Resources**, Vienna, May 13-15, 1992, p. 3.

<sup>250</sup> Starr, *op. cit.*, pp. 26-27.

## 3.2. The Nile Basin

The Nile River is the longest river system in the world. In effect it is really two rivers that unite at Khartoum in the Sudan. The Nile River flows 6,695 km from its source in Burundi to its mouth at the Delta in Egypt. It drains 2,978 sq km, almost one tenth of the land area of Africa. Although it is the longest river in the world, the drainage basin of the Nile is only the fourth largest (after the Amazon, Mississippi, and Congo), and at least 32 major rivers carry more water during a year.<sup>251</sup> The Nile and its headwaters flow through nine African states: Burundi, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda and Zaire.

### 3.2.1. The Hydrology of the Nile Basin

According to Joyce R. Starr and Daniel C. Stoll, the average annual discharge of the Nile is approximately 92,600 mcm.<sup>252</sup> Whereas according to Yahia Abdel Mageed, the annual discharge that reaches Aswan in normal years amounts to 84,000 mcm, carrying 59 per cent from the Blue Nile, 14 per cent from the Sobat River, 13 per cent from the Atbara River and 14 per cent from the Bahr el Jebel.<sup>253</sup> For the sake of unification, "84,000 mcm/yr" will be used as the annual discharge of the Nile River in this study.

The complete river is made up of the two sub-basins of the White and Blue Niles, which from nearly separate systems before they merge. The equatorial sub-basin is also known as the White Nile basin or sub-system, and is itself geologically and geographically into two sub-systems of tributaries.<sup>254</sup>

The White Nile has its source in the Lake Victoria on the high plateau of East Africa. From here the river flows north dropping down to the huge swamp areas of the Sudd in southern Sudan. About 28,000 mcm/yr of water enter the Sudd, but owing to the

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<sup>251</sup> Naff and Matson, *op. cit.*, p. 125.

<sup>252</sup> Starr and Stoll, *op. cit.*, p. 10.

<sup>253</sup> Yahia Abdel Mageed, "The Nile Basin: Lessons from the Past" in **International Waters of the Middle East: From Euphrates-Tigris to Nile**, (ed. Asit K. Biswas), Oxford: Oxford University Press, 1994, p. 163.

<sup>254</sup> Bulloch and Darwish, *op. cit.*, pp. 85-86.

high evaporation losses only about half this volume discharges from it. The Sudd swamp also acts as a reservoir which damps down the oscillations in flood flow from the east African plateau. As a result the peakedness of the White Nile regime is reduced. Minimum flow is around 525 cum/sec in April and maximum flow approaches 1200 cum/sec in October/November.<sup>255</sup> The second tributary in this sub-system is the Sobat River, which contributes 13,500 mcm/yr as it joins the White Nile in the south of Malakal.

The Blue Nile rises in the Lake Tana in the highlands of Ethiopia. From here the river follows a gorge-like course to the Sudan plains near Roseires. While flowing through its gorge section the Blue Nile receives water from a number of tributaries. The Blue Nile owes its flow to the heavy rainfall of the summer monsoon. These rains produce very high river flows in August which can be 40 times the minimum flow of April. At Khartoum the two rivers meet and their flow patterns are superimposed to produce the characteristic Nile regime experienced at Aswan in upper Egypt. Here the average annual flow of the Nile is 84,000 mcm/yr. Below the confluence with the Atbara, which adds 12,000 mcm/yr as it joins the main river at Atbara, the Nile does not receive any other major tributary and from here to the Mediterranean coast crosses one of the most deserts areas found on the earth.<sup>256</sup>

### **3.2.2. The Major Hydraulic Works and Water-Management Plans on the Nile Basin**

Until the early years of the twentieth century Egypt and the Sudan were the only ones to make significant use of the water resources of the basin and of the two, Egypt was by far the largest user.

The first hydraulic work undertaken was the Delta Barrage, built in Egypt during the 19<sup>th</sup> Century for rising the level of the water during the low period, but only the natural flow was utilized through it.<sup>257</sup>

Until the early years of the twentieth century there was no water storage facilities along the lower Nile and any water use meant abstracting the water directly from the flowing river. The Aswan Dam, which was built in 1902, provided the first storage

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<sup>255</sup> Beaumont, "Transboundary Water Disputes in the Middle East", p. 3.

<sup>256</sup> *Ibid.*, p. 4.

<sup>257</sup> Caponera, *op. cit.*, p. 13.

facilities on the Nile. However, the volume of water that it stored, 1,000 mcm was very small compared with the average flow of the river of 84,000 mcm/yr.<sup>258</sup>

It was followed by the strengthening of the Delta Barrage and by the building of other barrages at Assiut (1902) and the Esna (1908), with the view of raising the river level and thus providing command to other canals. The Aswan Dam was then heightened (1907-1912) to increase its capacity up to 2,500 mcm.<sup>259</sup>

During this period, the Britain has recognized the importance of the Nile to Egypt and a number of commissions were formed to examine all basin-wide plans about the Nile River. Based on the recommendations of the commissions the 1929 Treaty was concluded in the form of an exchange of notes between the Egyptian Government and the Administration of the Sudan and East Africa, on behalf of the Government of Great Britain.<sup>260</sup>

### a. The 1929 Treaty

The Nile Waters Agreement of May 1929 between Egypt and Britain (representing Sudan, Kenya, Tanzania -then Tanganyika- and Uganda) was based on the assumption that Egypt's utilization rights were paramount. Egypt was allocated 48,000 mcm and the Sudan 4,000 mcm annually. The remaining 32,000 mcm/yr of water were unallocated.<sup>261</sup>

While the 1929 Agreement recognized the need to develop irrigation in the Sudan, it stipulated that any increase in the use of the Nile's waters as a result of such development should not infringe upon Egypt's natural and historic rights. In other words, the 1929 Agreement reflected Egypt's dominant position on the Nile.<sup>262</sup>

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<sup>258</sup> Beaumont, "Transboundary Water Disputes in the Middle East", p. 5.

<sup>259</sup> Caponera, *loc. cit.*

<sup>260</sup> Mageed, *op. cit.*, p. 166.

<sup>261</sup> Paul Howell, "East Africa's Water Requirements: The Equatorial Nile Project and the Nile Waters Agreement of 1929: A Brief Historical Review" in **The Nile: Sharing a Scarce Resource**, (eds. P. P. Howell and J. A. Allan), Cambridge: Cambridge University Press, 1994, p. 85.

<sup>262</sup> Joseph W. Dellapenna, "Building International Water Management Institutions: The Role of Treaties and Other Legal Arrangements", Paper Submitted to **The International**

The 1929 Agreement showed little regard for the interests of the East African countries and stipulated that the East African countries were not to construct any works in the Equatorial lakes without consulting Egypt and the Sudan. The British Government was to use its good offices to facilitate the establishment of over-year storage in the Equatorial lakes, linked with the conservation projects in the Sudd region to increase the Nile's yield in the interests of Egypt.<sup>263</sup>

On the other hand, the rapid growth of the population in Egypt and the need for more irrigation water required the building of the Nag-Hammadi Barrage (1930), the second heightening of the Aswan Dam (1933), and the strengthening of the Assuit Dam (1938), the new Delta Barrage (1940), the strengthening of the Esna (1947) and the Edfina Barrage (1951).<sup>264</sup>

In the Sudan, the Jebel Aulia Dam was completed in 1937 to hold back part of the White Nile while the Blue Nile is in flood. However, since the valley above Jebel Aulia is very flat and open, a great deal of water is lost by evaporation and seepage.<sup>265</sup>

In the 1940s, agreement was reached between Egypt and the British Administration in Uganda territory to establish the Owen Falls Dam at the outlet of the Lake Victoria. The dam could generate hydropower using the natural force of the Lake Victoria, with the arrangements to enable the lake to be used for over-year storage by Egypt in the future.<sup>266</sup>

Egypt was actively involved in the Owen Falls Dam Agreement of 1949 in cooperation with Uganda and agreed to compensate Kenya and Tanzania for any adverse consequences.<sup>267</sup> The Owen Falls Dam was completed in 1954 and it deserved the title of being the first control work on the upper White Nile.

Back to the 1940s; from 1948 a nationalist theory has prevailed in Egypt, according to which all important works on the Nile should be constructed in Egyptian territory, in order to avoid that any works built outside it could serve as a political weapon against it.

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**Conference on Water Resources in the Middle East: Legal, Political and Commercial Implications**, London: SOAS, November 19-20, 1992, p. 34.

<sup>263</sup> Mageed, *op. cit.*, p. 167.

<sup>264</sup> Caponera, *op. cit.*, p. 14.

<sup>265</sup> *Ibid.*, p. 15.

<sup>266</sup> Mageed, *op. cit.*, pp. 167-168.

<sup>267</sup> Beschorner, "Water and Instability in the Middle East", *op. cit.*, p. 57.

Accordingly, the Aswan High dam, with a projected storage capacity of 156,000 mcm/yr, was proposed in 1952 by the new Egyptian government, but debate over whether it was to be built as a unilateral Egyptian project or as a cooperative project with the Sudan was kept out of negotiations until 1954. At the end, in July 1955, the Egyptian Government undertook the study and the building of the High Aswan Dam.

## b. The Aswan High Dam

The construction of the Aswan High Dam was begun in 1959 and completed in 1971. It was designed to protect against floods and droughts, which it did successfully during the 1970s and early 1980s, to generate HEP and extend the irrigated area by 20 per cent. Most importantly, the dam ensures a large measure of Egyptian control over the national water supply, although the dam's economic viability is increasingly questionable.<sup>268</sup> The site itself controversial, given that evaporation rates in the area are among the highest in the world. The accumulation of silt behind the dam has deprived farmers of valuable natural fertilizers and increased river bank and coastal erosion. Also greater demands are being placed upon available water and a system that is already overburdened. Major elements of the irrigation system -particularly pumps and engines- are wearing out. Many regions suffer from inadequate crop production due to water insufficiency in the summer months, and additional land areas have recently been brought under cultivation and require irrigation.<sup>269</sup>

Furthermore, the importance of hydropower in national electricity generation is declining: the dam now accounts for only 22 per cent of total production. As Natasha Beschorner pointed out, many argue that the Aswan Dam has outlived its usefulness as a national prestige project and that it is an obstacle to cooperative development between the riparian states.<sup>270</sup>

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<sup>268</sup> For a detailed explanation see, Ergun Gürpınar (trans.), "Assuan Felaketi", **National Parks and Conservation Magazine**, August 1971, pp. 84-90; and Jonathan Derrick, "Is the Nile Drying Up?", **The Middle East**, October 1987, p. 28.

<sup>269</sup> "Irrigation Project to Boost Crop Yields in Nile River Valley", **Middle East Water and Sewage**, October-November 1981, p. 265.

<sup>270</sup> Beschorner, "Water and Instability in the Middle East", *op. cit.*, p. 49.

On the other hand, the period 1954-58 witnessed further developments: the emergence of plans to extend the irrigated area in the Sudan and build the Roseries dam on the Blue Nile, which required an increase in the Sudan's share of the Nile waters. At the same time, in 1954, the report on the Nile Valley Plan was being written by H. A. Morrice and W. N. Allan, advisors to the Sudan Government. The Nile Valley Plan was a purely hydraulic plan, designed to improve the distribution and utilization of surface water, mainly by means of dams to store that water before it was lost to the sea.

The Nile Valley Plan was primarily an attempt to control the Nile and its tributaries, in order to assure the largest amount of water irrigation, particularly for Sudan and Egypt, and the full development of the hydroelectric potential of the Nile and its tributaries. Due to a lack of information, the plan had to assume the amounts to be abstracted by Ethiopia and the East African territories. According to Yahia Abdel Mageed, "the plan thus lacked economic and environmental dimensions, and all these years it has remained in the archives. However, it is rated as an important scientific contribution still worthy of examination, even in the context of the new environmental complexities."<sup>271</sup>

Meanwhile, in 1955 the East African Nile Waters Coordinating Committee was established to represent the interests of Uganda, Kenya, Tanganyika and to determine a common policy. This consisted of the Ministers who included responsibility for water development in their portfolios in each country, though the conduct of the work involved usually fell to their Permanent Secretaries or their representatives.

Within the basin, the period 1954-58 also witnessed political conflicts between the Sudan and Egypt over the High Aswan Dam Plan and the sharing of water, as it is aforementioned.. Negotiations came to an impasse when the Sudan declared unilateral non-adherence to the arrangements of the 1929 Nile Water Agreement and there was increased pressure for new arrangements to increase the Sudan's share.<sup>272</sup>

### **c. The 1959 Agreement**

As soon as Sudanese independence was assured in 1953, the Sudanese government demanded modification of the 1929 agreement as too restrictive of Sudanese development.

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<sup>271</sup> Mageed, *op. cit.*, p. 168.

<sup>272</sup> *Ibid.*



The Sudan particularly objected to the plans for the Aswan High Dam that would flood parts of the Sudan and also to the requirement of Egyptian approval before new works could be constructed in the Sudan. The outcome was a new treaty ratified in 1959 that settled most outstanding questions between the two countries.<sup>273</sup>

The net total benefit of the Aswan High Dam project, 22,000 mcm/yr, would be divided, giving 7,500 mcm/yr to the Sudan, and sharing equally the 10,000 mcm/yr that would be lost by evaporation at the Aswan reservoir. This new water allocation increased the Sudan's share to 18,500 mcm/yr and Egypt's share to 55,500 mcm/yr.<sup>274</sup>

The 1959 agreement is more comprehensive than previous ones, in that it embodies a scheme for the complete control of the Nile waters as well as complete machinery for the regulation of works needed for the exploitation of the Nile at present and in the future for the mutual interests of the two riparian states. The agreement may be summarized as follows:

First, while it reaffirmed the principles embodied in the 1929 agreement, it also laid down rules for future agricultural development.

Second, the agreement redefined the principle of established rights that had been accepted in previous agreements by allocating to the Sudan a greater proportion of water that before, based on the actual use of water at the time the agreement was concluded. This proportion of allocation is taken to constitute the established rights of the two riparian states. The two parties, however, agreed to review the amounts of water used by each other and to check whether each had actually utilized the water it had derived.

Third, the new arrangements raised the Sudan's share of Nile waters from 1/12 of Egypt's share under the 1929 agreement to 1/3 of Egypt's under the new agreement.

Fourth, the rights of construction of control works, whether undertaken by the United Arab Republic or the Sudan, were specifically defined in the new agreement

Fifth, if any injuries resulted from the control works undertaken by one party to the other, responsibility for the damage would be accepted by the party causing the injury and compensation would be paid to the other. The principle of compensation for damage done

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<sup>273</sup> Dellapenna, *loc. cit.*

<sup>274</sup> Wolf, *op. cit.*, p. 24.

by one riparian state to another has been accepted by other states as binding on riparian states.

Finally, the agreement created a Permanent Joint Technical Committee with powers to draw up unified development plans, to collect data and direct research, to supervise the execution of development plans, to draw up working arrangements and operating control works, to study and recommend measures in the event of an impending shortage of water supply, to study and recommend a unified water policy for the two parties vis-à-vis other riparian states, and the collection of meteorological and hydrological data.

It was agreed that informal technical talks would be initiated between the Permanent Joint Technical Commission, representing the two downstream countries, and the coordinating Nile Water Committee (established for the purpose) representing the East African countries- Kenya, Tanganyika and Uganda. During the talks it became apparent that the Administration had no ready plans to indicate and substantiate the water requirements of those later countries. It was therefore agreed that joint studies would be initiated in the catchments of Lakes Victoria, Kyoga and Albert to determine the water balance of the lake area, obtain the required data and information, and identify the necessary storage work to meet the future demands of the riparian states. Other countries were invited to join in this basin-wide cooperation, including Burundi, Rwanda, Zaire and Ethiopia. All the countries agreed to join in this effort, with the exception of Ethiopia, which opted to join as an observer.<sup>275</sup>

While recognizing the existence of Egyptian "historical rights," the Sudan is not quite happy about the 1959 agreement fixing its share at 18,500 mcm/yr. Over the years Egypt has taken its full share of 55,500 mcm/yr and uses 6,000 mcm/yr from the Sudan's quota, whereas the Sudan has never gotten within 5,000 mcm/yr of its allocation.<sup>276</sup>

Outside the two countries the reactions were of two types. First, the upstream riparian states expressed anger at the fact that they were not consulted about the Agreement and the two downstream countries had divided all the water that reached Aswan between themselves, neglecting their neighbours' legitimate rights on these waters. This created an atmosphere of passive conflict which has prevailed to the present times. On the other hand,

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<sup>275</sup> Mageed, *op. cit.*, p. 170.

<sup>276</sup> Roy Stoner, "Future Irrigation Planning in Egypt" in *The Nile: Sharing a Scarce Resource*, (eds. P. P. Howell and J. A. Allan), Cambridge: Cambridge University Press, 1994, p. 197.

international circles were partly concerned about the environmental implications of the dam and partly about the threats to archaeological treasures, but mainly, as it proved, their reaction was a political one against the Egyptian revolution.<sup>277</sup>

The 1959 agreement between Egypt and the Sudan no doubt created a rift in the Nile riparian relations, particularly with Ethiopia; but on the other hand it created an opportunity to undertake informal technical talks over the requirements of the East African countries which led to cooperation on the Hydromet Survey of the Catchments of the Equatorial Lakes which set the stage for wider cooperation.<sup>278</sup>

#### d. The Hydromet Project

In 1967, Egypt, Sudan, Uganda, Kenya and Tanzania asked the UN Development Programme (UNDP) and the World Meteorological Organization (WMO) to make a survey of the tropical lakes, especially the Lake Victoria, the Lake Kyoga and the Lake Albert. With the assistance of the United Nations Development Programme (UNDP) and with the World Meteorological Organization (WMO) as executing agency, the Hydromet Survey of the Equatorial Lakes was launched in 1967. A Technical Committee was established with representatives from all participating countries. Counterpart staff and counterpart funds were supplied and the project headquarters was established in Entebbe, Uganda. Ethiopia joined as an observer late in 1971. Rwanda and Burundi joined the agreement in 1972 and Zaire in 1974.<sup>279</sup>

This project has resulted in a wealth of data on the levels of water in the lakes, surface and subsurface inflow, rainfall, evaporation from the lakes, etc., and the effects of these on fisheries, navigation and health conditions. A water quality and environmental impact model of the Upper Nile basin has recently been created.<sup>280</sup> According to Yahia Abdel Mageed, "This was one of the most successful institutions of the basin, being the

<sup>277</sup> Mageed, *op. cit.*, p. 180.

<sup>278</sup> *Ibid.*, p. 181.

<sup>279</sup> Fakhry Labib, "The River Nile Waters from Source to Mouth: Between Conflict and Cooperation in Past and Future" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, pp. 371-372.

<sup>280</sup> Caponera, *op. cit.*, pp. 15-16.

first forum for cooperation, despite the fact that in terms of the area it extended only to the lake catchments of the equatorial region."<sup>281</sup>

After its successful completion, the project was extended to a second phase, with further assistance from the UNDP for the formulation of a mathematical model representing the Upper Nile at the Equatorial Lakes. Efforts to extend the model to include other reaches of the river could not be concluded. The Hydromet Project, now fully administered by the Technical Committee and financed by the participating governments, continues to collect hydrometeorological data and carry out analysis. The loans made since late 1970s to develop the Technical Committee into a basin authority and widen the scope of its function seem to have come up against political suspicions that have accumulated over the years.

Meanwhile, Egypt's relations with Sudan improved, and in 1974 an economic integration programme was launched. This programme includes a number of joint water projects to be undertaken mainly in Sudan which should ultimately yield an additional 9,000 mcm/yr for each state.<sup>282</sup>

The biggest of these projects was the construction of the Jonglei Canal in Southern Sudan to prevent water loss through evaporation in the Sudd marshes.

### **e. The Jonglei Canal**

In 1938 the Egyptians presented the British Administration in the Sudan with the plan for the Sudd diversion canal at Jonglei. With the over-year storage in the Equatorial lakes (known as the Equatorial Nile Project) the aim of the canal was to conserve about 7,500 mcm of seasonal water to improve the summer Nile flow at Aswan. The Sudan would get no benefit from these waters, but would be compensated for the disruption caused by the project which would lead to loss of livelihood for some of its people.<sup>283</sup>

In 1945, the British Administration in the Sudan has established the Jonglei Investigation Team to reconsider the Egyptian Project Proposal of 1938. The team came up

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<sup>281</sup> Mageed, *op. cit.*, pp. 170-171.

<sup>282</sup> Perera, *op. cit.*, p. 48.

<sup>283</sup> Mageed, *op. cit.*, p. 167.

with a modified Equatorial Nile Project. While keeping to the original objectives of the project, it modified the storage and regulation of flow from the lakes to ensure minimum disturbances to the swamp regime in southern Sudan and to the prevailing socio-economic subsistence systems associated with it. Whereas the project was shelved.<sup>284</sup>

After launching the Egyptian-Sudanese economic integration programme, in 1976, the two downstream states started to construct the first phase of the Jonglei Canal as the first conservation project to increase the Nile's yield. The project planning and implementation came at a time of heightened environmental awareness. Like the High Aswan Project, the Jonglei Canal received very wide attention within and outside the basin and became highly politicized. The first phase of the project departed very much from the original Equatorial Nile Project. It is confined to a diversion of 20 mcm/day from the Sudd area, without the need for storage in the lakes, with a water benefit of about 5,000 mcm/yr shared equally between the two states.<sup>285</sup>

According to Dr. Botros Boutros Ghali, the harmful effect of instability and the absence of regional cooperation was illustrated by the long-delayed Jonglei project in the Sudan. Designed to cut loss of water through evaporation by draining the Sudd marshes, this 360 km long canal is potentially as important to Egypt as the Suez Canal.<sup>286</sup>

Work on the canal, 267 km of which had already been built meaning two-thirds of the project, was stopped by the SPLA in February 1984 as a result of violent opposition by the local communities who did not want their livelihoods and ways of life changed by the draining of the swamps of the Sudd.<sup>287</sup>

During the 1980s little progress has been made for the coordinated planning and development of the water resources of the Nile basin, even though all countries in the basin would have only to gain from cooperation in its management. Although the situation was

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<sup>284</sup> *Ibid.*, p. 168.

<sup>285</sup> *Ibid.*, p. 171.

<sup>286</sup> Botros Boutros Ghali, "Water Management in the Nile Valley" in **Water Technology International**, (ed. Mary Monro), London: Century Press, 1991, p. 34.

<sup>287</sup> J. A. Allan, "Water in the Arab Middle East: Availability and Management Options" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, pp. 163-164.

as this, environmental and climatic changes of the 1980's have accelerated the need to make economic, political and legal adjustments in the existing Nile allocation regime.<sup>288</sup>

## f. The Undugu Group

In 1983, a consultative body known as the Undugu Group was formed to promote cooperation on wide-ranging issues. It was formed under auspices of the Organization for African Unity (OAU).<sup>289</sup>

Undugu means fraternity in Swahili language. The Undugu Group is an association of the Sudan, Uganda, Zaire, Rwanda, Central Africa, and Egypt, besides Burundi and Tanzania, which have attended as observers. Kenya and Ethiopia have not participated in the annual meetings of the Group, either as full-fledged members or as observers. The group's current membership therefore includes countries of the White Nile Basin.<sup>290</sup>

The general objective of the Undugu Group, as pointed out by Botros Boutros Ghali;

*... is to serve as a forum for the exchange of views and information on issues of common interest to its member states and to contribute to their social and economic development through regional cooperation. Another purpose of the group is to sensitize people in the countries of the region to the importance of the water resources of the Nile River, their development and their joint management.*<sup>291</sup>

At a meeting in Cairo in 1988 Undugu was crystallized as an integrated concept. Permanent membership was accorded to Burundi, Tanzania and Rwanda which has previously attended as observers. Undugu adopted a number of constructive resolutions in many fields of infrastructure such as energy, water resources, transport, communications and tele-communications and improvement of road networks. Cooperation also started between Undugu and other regional organizations such as the Kagera Basin Organization.

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<sup>288</sup> Caponera, *op. cit.*, p. 16.

<sup>289</sup> Starr and Stoll, *op. cit.*, pp. 10-11.

<sup>290</sup> Ghali, *op. cit.*, p. 33.

<sup>291</sup> *Ibid.*

Further trade exchange and cooperation in the fields of information and culture as well as environment preservation have also started.<sup>292</sup>

However, as Fakhry Labib pointed out, "The Undugu Group is facing several obstacles such as Ethiopia's and Kenya's failure to join the group, lack of a summit diplomacy for decision making, shortage of funds and the need for international and regional contributions."<sup>293</sup>

### 3.2.3. The Positions of the Riparian States

Egypt has a long tradition of cultivation in the Nile valley and delta and has pursued ambitious plans for land reclamation outside these areas. Since the late 19th century a number of dams and barrages have been built on the Nile with the aim of regulating the flow throughout the year. Egypt's water policy since 1960s has centered on over-year storage at Aswan.<sup>294</sup>

The Egyptian Foreign Office has always believed that Churchill's idea of the whole of the Nile basin as one hydrological-political unit to be ruled from Cairo should remain the cornerstone of their policy.<sup>295</sup> So, securing the flow of Nile water is one of Egypt's principal strategic concerns, as it is entirely dependent on the river for its water supplies.

For that reason, during the last 30 years Egypt has maintained its position as the dominant economic power in the Nile basin. Per capita GNP in Egypt is over twice that of Sudan and over five times that of Ethiopia. All economies of the Nile basin states are weak and burdened with debt. This situation allows Egypt to go ahead with its own projects, without considering the future requirements of the other co-basin states, and inter-riparian cooperation has so far been limited to Egypt and the Sudan and all international agreements relating to the Nile have given priority to Egypt's historic rights.<sup>296</sup>

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<sup>292</sup> Labib, *op. cit.*, p. 384.

<sup>293</sup> Labib, *op. cit.*, p. 385.

<sup>294</sup> Beschorner, "Water and Instability in the Middle East", p. 49.

<sup>295</sup> Bulloch and Darwish, *op. cit.*, p. 100.

<sup>296</sup> Beschorner, "Water and Instability in the Middle East", p. 57.

Yet, while regional supplies are falling, Egypt's water needs are increasing at an alarming rate because of the country's astonishing population growth. Former Foreign Minister Dr. Ghali noted that Egypt's population was increasing by 1,200,000 each year and that by the year 2010, Egypt and the Sudan would have a combined water deficit of 5,000 mcm/yr.<sup>297</sup>

The Sudan's political interests in basin-wide cooperation are quite different from those of Egypt. From a basin-wide planning perspective, the Sudan has a strong interest in developing cooperative arrangements with Ethiopia.<sup>298</sup>

On December 1991 the Sudan and Ethiopia signed an agreement on peace and friendship that paved way for economic cooperation, particularly over the use of Nile waters. In Article 4.1.5 Ethiopia agreed to participate at a full membership level in basin-wide initiatives as the principal water contributor, while Article 4.1.7 affirmed that the two sides will endeavour towards the objective of achieving the formulation of the Nile Basin Organization taking the interests of all riparian countries with their universal consent. According to Natasha Beschoner, the practical implications of this agreement are not yet clear since neither Egypt nor the Sudan is in a financial position to undertake any major hydraulic works, but it can be interpreted as an assurance by Ethiopia that it respects the riparian rights of its downstream neighbours.<sup>299</sup>

In Ethiopia, there are plans to utilize the waters of the Blue Nile. An example is the Tana Beles irrigation project, diverting the waters of the Lake Tana into the valley of the Beles.<sup>300</sup>

While Ethiopia and other upper riparian states have not yet substantially utilized the Nile waters for irrigation purposes in their territories, they intend to reserve a share of the waters for their own future hydraulic development.<sup>301</sup>

The positions of Zaire, Rwanda, Burundi, Kenya, Uganda and Tanzania are not openly known, and it is suggested that international policy more than technical reasons influence their approach to the Nile problem. Their interests in the Nile waters mainly

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<sup>297</sup> Gruen, *The Water Crisis: The Next Middle East Crisis?*, p. 42.

<sup>298</sup> Caponera, *op. cit.*, p. 21.

<sup>299</sup> Beschoner, "Water and Instability in the Middle East", p. 60.

<sup>300</sup> Caponera, *op. cit.*, p. 14.

<sup>301</sup> *Ibid.*, p. 16.



concern power production and the control of floods. These riparians have not exploited their share of the river system to a significant extent. None of the states concerned has a comprehensive master plan for the use of their water supply.<sup>302</sup> Some proposals have been put forward in Kenya and Tanzania for the utilization of water from the Lake Victoria for irrigation; Kenya and Tanzania could use 1,000 mcm/yr. Burundi and Rwanda do not envisage the exploitation of Nile waters; Zaire is considering using the Nile to create HEP for export to Egypt. None of these projects can be expected to materialize in the short to medium term.<sup>303</sup>

To sum up, it can be said that despite a consensus on the need for equitable and economic water utilization, the prospects for cooperation remain limited. Broadly speaking, there are few economic ties between Egypt, the Sudan and Ethiopia, and even fewer among them and the other riparians, especially Zaire. Agriculture is Nile-dependent in Egypt and the Sudan, but to a lesser extent in Ethiopia and Uganda. Kenya, Tanzania and the other East African riparians are more interested in the river basin for fishing, navigation and power generation, and geopolitically they lean towards Central Africa and the Indian Ocean.<sup>304</sup>

### 3.3. The Orontes Basin

The other main area of controversy is the Orontes Basin. The basin is utilized by Lebanon, Syria, and Turkey, and Syria is the de facto upstream state of the basin.

#### 3.3.1. The Hydrology of the Orontes Basin

The headwaters of the Orontes rise a few kilometers northeast of the headwaters of the Litani River. In both valleys, the principal streams are fed by surface runoff from the Lebanese Mountains on the west and the Anti-Lebanon Mountains on the east, and from

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<sup>302</sup> *Ibid.*, p. 22.

<sup>303</sup> Beschorner, "Water and Instability in the Middle East", p. 55.

<sup>304</sup> *Ibid.*, pp. 60-61.

the groundwater that enters the streams from the thick upper Tertiary alluvial fill on the valley floor, maintaining base flow in times of diminished runoff.<sup>305</sup>

The Orontes flows in Lebanon for about 35 km, where it is known as the Nahr al-Assi (the rebel stream). It then enters a flat plain as it crosses into Syria. Along the western margin of that plain, it flows into the Homs Lake. A short distance downstream from the lake outlet, it flows through the Syrian city of Homs. It then flows through the Syrian city of Hama. It goes on through the canyons at Cheizar, and into the plain of Asharneh, which lies east of the northward extension of the Lebanon Mountains. Between Asharneh and Karkour the Orontes traverses the broad flat Ghab Valley. The Orontes leaves the Ghab Valley before it enters Turkey. It becomes the Syrian-Turkish frontier for about 32 km. Then it swings southwest abruptly at its confluence with the Afrine, which rises on the slopes of southern Turkey, for about 88 km through Turkey before entering the Mediterranean Sea. It ends its meandering 610-km course at the Mediterranean near Antioch.<sup>306</sup>

The annual discharge of the Orontes River at the Lebanese-Syrian border is estimated at 410 mcm/yr, and 1,200 mcm/yr at the Syrian-Turkish border. Ninety per cent of the average annual discharge of the Orontes is used by Syria.<sup>307</sup>

### 3.3.2. The Major Hydraulic Works and Water-Management Projects on the Orontes Basin

Studies by French Mandatory authorities in the early 1930s recognized that the potential of the Orontes in Syria was second only to that of the Euphrates. Plans drawn up then by the *Regie des Etudes Hydrauliques* envisioned the development of three areas along the Orontes: the stretch of the river from Homs to Hama, the Ghab, and the Amuq plain. Work to enlarge the capacity of the Lake Homs and to build a canal from Homs to Hama permitting the irrigation of 20,000 ha was carried out in the late 1930s. In the same period Mandate authorities gave serious consideration to developing the Ghab to resettle

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<sup>305</sup> Naff and Matson, *op. cit.*, p. 115.

<sup>306</sup> *Ibid.*, p. 117.

<sup>307</sup> **Cumhuriyet**, 20/02/1996.

Assyrian refugees from Iraq and Iran, but this scheme was abandoned for political reasons in 1937.<sup>308</sup>

After 1937, the Ghab Project was formulated again in 1950 when Syria requested financing from the World Bank. The plan was to drain a swampy area of 30-32,000 hectares and its conversion into cultivable land, supplied with water for irrigation.<sup>309</sup>

It was the first project on an international river considered by the World Bank. This project was a landmark for establishing the first procedural rules that the Bank was to follow henceforth in financing projects of water resources located on an international stream.<sup>310</sup>

The Bank was satisfied that the project would not affect Lebanon's water supply but deemed that already existing uses in Syria would be severely harmed if Lebanon withdrew a greater amount. On the other hand, it was expected that Turkey would object because it was not in conformity with an agreed settlement of rights on all rivers shared by Turkey and Syria. Turkey also protested a diversion of water from the Afrin. The desire for an overall settlement was the reason for Turkish failure in 1951 to ratify an agreement with Syria which had been negotiated concerning the water of the Jagh Jagh and the Balikh, tributaries of the Euphrates River.<sup>311</sup>

After having received Turkish objection to the project, Turkish and Syrian experts met in Damascus, and their findings were summarized in a Turkish communication. Experts' conclusions were that Turkish territory would be subject to frequent flooding during construction and that the project as it stood would not leave *a drop of water* for Turkey in irrigation seasons. As a result, the meeting ended without an agreement, and the loan for the Ghab project could not be executed for lack of agreement between the countries concerned.<sup>312</sup>

Then, the Syrian government revived plans to develop the Ghab with the creation of the Ghab Project Organization in 1951. Nedeco, a Dutch firm, designed the system and construction of the project's primary installations was carried out from 1955 to 1967 with

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<sup>308</sup> Naff and Matson, *op. cit.*, p. 119.

<sup>309</sup> Caponera, *op. cit.*, p. 3.

<sup>310</sup> *Ibid.*, p. 2.

<sup>311</sup> *Ibid.*, p.3.

<sup>312</sup> *Ibid.*, p. 4.

the help of Bulgarian, Yugoslav, Italian and other companies. The Soviet Union supplied materials for the project, while most of the financing was provided by Syrian capital.<sup>313</sup>

A dam with a 250 mcm capacity at Rastan, another with a 65 mcm capacity at Hilfaya-Mehardeh (20 km north of Hama), a concrete weir at Asharneh, and two large drainage canals running the length of the Ghab (one replacing the meandering bed of the Orontes) comprise the Ghab project's major water works. All were completed by 1961. The primary drainage and irrigation network was completed in 1963, while most of the secondary (56 km) and tertiary (552 km) installations, carrying water to and from individual plots, were in place by 1968. Extension and adjustment of the system, however, has continued to the present.<sup>314</sup>

Apart from the Ghab Project, in Syria there are two dams, namely, Destan and Maherde dams, besides a water regulator in the town of Jisr-Al-Sughur.

Other plans and projects were presented in succeeding years. However, during the last years, Syria and Lebanon have not been in a position to discuss these issues.<sup>315</sup>

### 3.3.3. The Positions of the Riparian States

There are no large scale inter-basin transfers of the waters of the Orontes. The use of this river is accomplished by storage reservoirs, hydroelectric generation, and a system of canals for local irrigation purposes.<sup>316</sup>

The Orontes River is one of the major lifelines for Syria, traversing the length of the heavily populated areas parallel to the country's Mediterranean coast and passing through its third and fourth largest cities. The river generates electricity for these two cities, provides water for domestic consumption and extensive irrigation.<sup>317</sup> In addition, Syria has been using the Orontes River since 1961 for irrigated agriculture in the Ghab Valley.<sup>318</sup>

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<sup>313</sup> Naff and Matson, *loc. cit.*

<sup>314</sup> *Ibid.*, p. 120.

<sup>315</sup> Caponera, *loc. cit.*

<sup>316</sup> Naff and Matson, *op. cit.*, p. 118.

<sup>317</sup> *Ibid.*, p. 121.

<sup>318</sup> Beschorner, "Water and Instability in the Middle East", p. 33.

In Lebanon, the river is intensively utilized for irrigation before it reaches the Syrian border. Before it reaches Homs, there is a small dam (Zeite dam, built in 1988), and then another small dam at Qattinah Lake, originally built by the Romans and subsequently made higher during the French period.<sup>319</sup>

To sum up, it could be said that, both countries, especially Syria, have been intensively utilizing this river for irrigation purposes. As it is aforementioned, Syria has been making use of 90 per cent of the total flow that reaches an annual average of 1,200 mcm/yr at the Turkey-Syria border, leaving only 120 mcm/yr to Turkey.<sup>320</sup>

However, as the Ministry of Foreign Affairs of Turkey pointed out, this amount will further decrease to the range of 25 mcm/yr, if the planned reservoirs of Ziezoun and Kastoun in Syria are built in addition to the existing dams on the river. Already, 80 mcm/yr of water from the Orontes River has been earmarked for the utilization of Lebanon according to the agreement made between Syria and Lebanon on September 20, 1994.<sup>321</sup> That is while Syria accuses Turkey of reducing the amount of the water in the Euphrates, it utilizes almost the whole of the water of the river and releases to Turkey only a small amount of water.

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Within the context of the three basins, it could be said that, in the 1940s and 1950s of this century the different Middle East countries started to develop their water resources for the different uses. In the 1960s and 1970s major projects were carried out including dams and irrigation canals. In the 1980s even marginal resources were developed to satisfy the increasing demand of the fast-growing countries. At present, the main potential sources to increase water supply are non-conventional; wastewater treatment and reuse, desalination of sea water, mining of fossil water and development of deep groundwater and very minor, marginal, costly sources.

On the other hand, water in the Middle East has been regarded by most states as a zero-sum game. Consequently each state has acted to control and use as much water as it can, without regard to the effect on its neighbours. The result has been heightened tensions, which rise the spectre of renewed conflicts. For example, in October 1991, Lieutenant

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<sup>319</sup> Caponera, *op. cit.*, p. 2.

<sup>320</sup> The Ministry of Foreign Affairs of Republic of Turkey, *op. cit.*, pp. 13-14.

<sup>321</sup> *Ibid.*, p. 14.

General Mohammed Tantawi, Egypt's Defense Minister, made it clear that his country would not hesitate to use force if necessary to guarantee a continued supply of Nile water. He also predicted that the struggle for water could lead to future conflicts in the Middle East, "because any attempt to control water resources will be considered a direct threat to the national security of the beneficiary states."<sup>322</sup>

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<sup>322</sup> Gruen, *The Water Crisis: The Next Middle East Crisis?*, p. 2.

## IV. AN INTERNATIONAL WATERCOURSE IN TURKEY: EUPHRATES-TIGRIS BASIN

As well as the Jordan, the Nile and the Orontes Basin, the Euphrates-Tigris Basin is one of the most important river systems of the Middle East, and it is the most important of Turkey.

In this chapter, the Euphrates-Tigris Basin was studied from different perspectives. However, before proceeding into the Euphrates-Tigris Basin, it is useful to give necessary hydrological data about Turkey. Because, as the downstream riparians of the Euphrates-Tigris Basin, namely Syria and Iraq, claims more water from the basin by stressing that Turkey is a country rich in water resources. Furthermore it is not the richest country of the region as will be seen later. Therefore, the hydrological survey of Turkey was examined in the first section (4.1). In the second section, the hydrological features of, and the major hydraulic works and water-management plans on the basin was examined. The third section (4.3) is about the disputes on the Euphrates-Tigris Basin and argument of the riparian states regarding to the basin. The fourth section (4.4) deals with the initiatives of cooperation on the basin. The current situation and the positions of the riparian states on the basin is the subject of the fifth section (5.5).

### 4.1. Turkey: A Hydrological Survey

Certain regions of Turkey have a continental climate with rain throughout the year; others are characterized by a sub-tropical climate with a dry summer. For that reason, the water resources of the country are not evenly distributed. The economically most developed regions like the Marmara and the Aegean are endowed with poor resources.<sup>323</sup>

Annual precipitation in Turkey varies by order of magnitude from about 220 mm/yr in some areas to 2,240 mm/yr in others, or from arid to wet. Water is most plentiful in coastal and mountainous areas, but much of the population and arable land lie elsewhere.

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<sup>323</sup> Organization of Economic Cooperation and Development (OECD), *Environmental Policies in Turkey*, Paris: OECD, 1992, p. 43.

Many areas of the Anatolian plateau get only about 400 mm/yr, just enough for dry farming under existing technology.<sup>324</sup>

Average annual rainfall in Turkey is 642 mm and the country has 26 major river basins. The table below includes these major river basins.

The total amount of precipitation which Turkey gets is 501,000 mcm/yr. Of the 501,000 mcm/yr provided by rainfall, approximately 186,000 mcm/yr is estimated to reach surface waters. Total renewable water resources including groundwater and inflow into the country are about 234,000 mcm/yr. Official estimates put the full development of these resources at 110,000 mcm/yr of utilisable water, or 47 per cent of the annual average of total water resources. Currently, 25,600 mcm/yr of water is being used.<sup>325</sup>

The average amount of water used per capita is 450 cum/yr. Total available average water per capita per year, on the other hand, is 1,667 cum. If all water that flows through the rivers were to be captured and allocated to human use, the annual average per capita would be approximately 3,300 cum.

These figures are not an indication of an abundance of water. In order for a country to be considered to be water-rich, the amount of annual per capita water must be over 10,000 cum.

Malin Falkenmark has developed the concept of the *Water Stress Index* or minimum level of total water resources required by a modern country to survive in an arid zone area.<sup>326</sup> In water-rich areas of the world such as northern Europe, Canada, and the United States, the long term average amount of renewable water resources available for all activities, including urban, industrial, agricultural, hydroelectric, and recreational use is in the range of 2,000-10,000 cum/yr per capita. The *Water Abundance Zone* can be defined as being above 2,000 cum/yr per capita. The *Water Stress Zone*, as suggested by Falkenmark, is below 500 cum/yr per capita of total available water resources.<sup>327</sup>

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<sup>324</sup> Frey, *loc. cit.*

<sup>325</sup> Organization of Economic Cooperation and Development (OECD), *op. cit.*, p. 44.

<sup>326</sup> Shuval, *op. cit.*, p. 134; quoted from M. Falkenmark, J. Lunkqvist and A. Widstrand, **Water Scarcity-An Ultimate Constraint in Third World Development**, Tema V, Report 14, Linköping: University of Linköping, Department of Water and Environmental Studies, 1990.

<sup>327</sup> Shuval, *loc. cit.*



**Table 4.1**  
**Drainage Basins and Annual Average Potential of Turkey**

<b>Basin</b>	<b>Average Annual Discharge (mcm)</b>	<b>% of Potential of Turkey</b>
Euphrates	31,610	17.0
Tigris	21,330	13.1
Eastern Black Sea	14,900	8.0
Eastern Mediterranean	11,070	6.0
Antalya Basin	11,060	5.9
Western Black Sea	9,930	5.3
Western Mediterranean	8,930	4.8
Marmara Basin	8,330	4.5
Seyhan	8,010	4.3
Ceyhan	7,180	3.9
Kızılırmak	6,480	3.5
Sakarya	6,400	3.4
Çoruh	6,300	3.4
Yeşilirmak	5,800	3.1
Susurluk	5,430	2.9
Araxes	4,630	2.5
Konya Interior Basin	4,520	2.4
Great Menderes	3,030	1.6
Lake Van Region	2,390	1.3
Northern Aegean	2,090	1.1
Gediz	1,950	1.1
Maritsa	1,330	0.7
Little Menderes	1,190	0.6
Orontes	1,170	0.6
Burdur Lakes Region	0,500	0.3
Akarçay	0,490	0.3
<b>Total</b>	<b>186,050</b>	<b>100.0</b>

Source: The General Directorate of State Hydraulic Works, 1992 Diary, Ankara: 1993, p. 27.

From here it could be understood that Turkey is not a water-rich country. Although Turkey has at present more water resources than some of its neighbours, it is a candidate for falling into situation in the near future whereby it will not be able to meet its water needs.<sup>328</sup> Table 4.2 shows the forecasted population and water availability in Turkey.

**Table 4.2**  
**The Forecasted Population and Water Availability in Turkey**

Year	Forecasted Population	Average Annual Increase	Water Availability (cum/yr per capita)
1990	56,473,000	actual	3,471
1995	63,300,000	2.4	3,096
2000	69,800,000	2.0	2,808
2005	76,500,000	1.9	2,562
2010	83,400,000	1.8	2,350

Source: Compiled from Tables 5.1 and 5.2 by Özden Bilen and Savaş Uskay, **Comprehensive Water Resources Management, Policies and Issues: A Report to the World Bank**, June 1991, p. 21.

It is anticipated that the consumption of water in Turkey will rise rapidly in the coming years. First, the government is pursuing a set of irrigation programmes the completion of which will increase the demands on the country's water resources. Second, the population is growing at a steady and high rate, generating new needs for water consumption. Third, the country is urbanizing rapidly, a phenomenon which is accompanied by the use of larger quantities of water. And finally, the rapidly expanding industrial base of the country creates new and additional water requirements.

## 4.2. The Euphrates-Tigris Basin

The Euphrates and Tigris Rivers constitute 28.5 per cent of Turkey's total surface water potential, and as such they are of first rank importance among the existing water

<sup>328</sup> Mehmet Gölhan, "Wellcome Address", **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, p. 8.

sources. 90 per cent of the water potential of Euphrates, and 44 per cent of the water potential of Tigris originate from Turkey, essentially from the same basin.<sup>329</sup>

#### 4.2.1. The Hydrology of the Euphrates-Tigris Basin

The combined watershed of the Euphrates-Tigris Basin is split between five countries, namely Turkey, Syria, Iraq, Saudi Arabia and Iran, and four states have riparian interests in the basin, except Saudi Arabia.

The combined flow of the two rivers at approximately 84,000 mcm/yr is the same as the average discharge of the Nile River.<sup>330</sup>

Both the Euphrates and Tigris Rivers rise in the mountains of southeastern Turkey and flow across the progressively drier central lowlands of Syria and Iraq to join to form the Shatt al-Arab at Basra, just above the head of the Persian Gulf.<sup>331</sup>

##### a. The Hydrology of the Euphrates River

The Euphrates River is formed in the eastern Turkey by the confluence of the Karasu and the Murat Rivers 45 km north-west of Elazığ. From that point it descends through the Anti-Taurus Mountains to the Syrian border south of Birecik. After entering Syria, the river occupies an entrenched valley, flowing first south and then southeast into Iraq. Two tributaries which join the main stream from the left bank, the Balikh and Khabur, account for Syria's contribution to the flow of the river. These tributaries, however, receive most of their volume from springs immediately south of the Turkish-Syrian border, and have their catchments almost entirely inside of Turkey. Thus, their flow can be affected by the tapping of aquifers on the Turkish side. John Kolars

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<sup>329</sup> *Ibid.*, p. 9.

<sup>330</sup> Peter Beaumont, "Water: A Resource under Pressure", in **The Middle East and Europe: An Integrated Communities Approach**, (ed. G. Nonneman), London: Federal Trust for Education and Research, 1992, p. 179.

<sup>331</sup> Naff and Matson, *op. cit.*, p. 83.

estimates that as much as 98 per cent of the Euphrates' waters therefore originate in Turkey, rather than the 88 per cent usually assumed.<sup>332</sup>

No further water is added to the Euphrates downstream from the entry of the Khabur at Deir es-Zor, with the exception of irregular and infrequent hydrologic events in Iraq which may add some Tigris water to its flow. At Hit, located 360 km downstream from the Syrian border, the Iraqi portion of the Euphrates enters its alluvial plain. In its trip from Hit to the Gulf, the river loses much of its waters in a series of natural and manmade distributaries. Far downstream near Nasiriyah, the river becomes in part a tangle of channels draining into the Lake Hammar, while the remainder finds its way to the Shatt al-Arab.<sup>333</sup>

The Euphrates and its tributaries drain an enormous basin 444,000 sq km in area, of which 28 per cent lies in Turkey, 17 per cent in Syria, 40 per cent in Iraq and 15 per cent in Saudi Arabia. Approximately 88 per cent of the mean annual flow is generated within Turkey and almost all of the remaining 12 per cent within Syria.<sup>334</sup>

The seasonal and annual flows of the Euphrates and the Tigris Rivers have extremely high variance. At the Birecik gauging station on the Euphrates near the Syrian border, the average annual flow is 31,500 mcm. The lowest flow was in 1973 with an annual flow of 18,800 mcm, representing 62 per cent of the average. On the other hand, the recorded peaks of annual flow were 56,400 mcm and 57,700 mcm in 1969 and 1988, respectively. These represent 185 per cent and 189 per cent of the long-term average.<sup>335</sup>

## b. The Hydrology of the Tigris River

The Tigris River also originates in southeastern Turkey near the Lake Hazar, but much of the potential drainage basin of the upper Tigris is cut off by the trellis development of the upper Euphrates. It then flows southeast to the Turkish city of Cizre

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<sup>332</sup> John Kolars, "Problems of International River Management: The Case of the Euphrates", **International Waters of the Middle East: From Euphrates-Tigris to Nile**, (ed. Asit K. Biswas), Oxford: Oxford University Press, 1994, p. 51.

<sup>333</sup> *Ibid.*

<sup>334</sup> Naff and Matson, *op. cit.*, pp. 83-84.

<sup>335</sup> Kolars, "Problems of International River Management: The Case of the Euphrates", p. 51.

whence it forms the border between Syria and Turkey for 32 km before entering Iraq. The Tigris reaches its alluvial plain midway between Tikrit and Samarra. Unlike the Euphrates, this river receives water from numerous left-bank tributaries which originate in the Zagros Mountains to the east. The Greater Zab, the Lesser Zab, the Adhaim and the Diyala are the most important of these streams and contribute approximately 28,700 mcm annually to the river, about 58 per cent of its natural flow at Qurna. The main stream in Turkey and the Khabur River (not to be confused with the Khabur shared by Turkey and Syria farther west) account for the remaining annual flow of 20,500 mcm/yr.<sup>336</sup>

High seasonal and annual fluctuations are also observed in the Tigris River, as in the Euphrates River. According to the discharge records at Cizre gauging station on the Tigris near Turkey's border with Syria, the annual average flow was 16,800 mcm over the 1969-90 period. The Tigris' annual flow variations are similar to those of the Euphrates. The 1970-75 period experienced a drastic decline in the flow rate, the lowest being in 1973 at 9,600 mcm, corresponding to 58 per cent of the average. On the other hand, 1969 was a peak year with 34,300 mcm measured at Cizre station that corresponding 204 per cent of the annual average.<sup>337</sup>

The proximity of the Tigris' tributary sources in the Zagros Mountains accounts for wide variation in the volume of water carried by the river. When the spring snow-melt is accompanied by heavy rains, the Greater Zab may contribute 65 per cent of the river's volume in April and May. In addition to flood waters lost to distributaries farther downstream, high water is at times diverted from the Tigris into the Thartar depression between it and the Euphrates to the west. Thus, the flow of the main stream varies greatly along its length, as well as seasonally and from year to year.<sup>338</sup>

According to Naff and Matson, the Tigris carries a mean annual discharge of 1,339 cum/sec, equivalent to 42,230 mcm/yr.<sup>339</sup>

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<sup>336</sup> *Ibid.*, p. 52.

<sup>337</sup> Özden Bilen, "Prospects for Technical Cooperation in the Euphrates-Tigris Basin", **International Waters of the Middle East: From Euphrates-Tigris to Nile**, (ed. Asit K. Biswas), Oxford: Oxford University Press, 1994, p. 96.

<sup>338</sup> Kolars, "Problems of International River Management: The Case of the Euphrates", pp. 53-54.

<sup>339</sup> Naff and Matson, *op. cit.*, p. 86.

The Euphrates and the Tigris Rivers merge in the southern Iraq to form the Shatt al-Arab basin. The terminal stretch of this waterway forms the boundary between Iraq and Iran, the latter contributing an important tributary to this boundary stretch, namely the Kharun River.<sup>340</sup>

#### 4.2.2. The Major Hydraulic Works and Water-Management Plans on the Euphrates-Tigris Basin

Turkey, Syria and Iraq have all formulated plans and implemented projects beginning in the early decades of the 20<sup>th</sup> century to achieve flood control on the Euphrates and to use its waters for hydroelectric generation and large-scale irrigation. Planning has been largely on a country by country basis, though there have been technical consultations among the three states since the early 1960s.<sup>341</sup>

The history of Iraq's use of the waters of the Euphrates for irrigation dates back at least 6,000 years, but the river management in Iraq in modern times began with the report of British hydrological engineer William Wilcox to the Ottoman Empire in 1911. His suggestions included the al-Hindiya Barrage on the Euphrates, the Kut Barrage on the Tigris, the Habbaniyah projects, the Thartar project, the Naharavan irrigation project, the Bekhme Dam, and the Mosul Dam. Under the British Mandate (1917-32), which began the collection of pertinent data, a Department of Irrigation was established in 1918.<sup>342</sup>

The Hindiya Barrage, completed in 1913, made it possible to divert river water into reconstructed irrigation canals dating from ancient and medieval times. In the 1950s a second barrage built at al-Ramadi allowed Euphrates flood waters to be diverted to Lake Habbaniyah and the Abu Dibis depression, permitting a measure of flood control. Irrigation projects planned for the area proved unworkable, however, owing to a rapid evaporation rate and a high salt content in the soils of the depression.<sup>343</sup>

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<sup>340</sup> Caponera, *op. cit.*, p. 24.

<sup>341</sup> Naff and Matson, *op. cit.*, p. 92.

<sup>342</sup> Kolars, "Problems of International River Management: The Case of the Euphrates", pp. 82-83.

<sup>343</sup> Naff and Matson, *op. cit.*, p. 89.

In the years that followed, the Kingdom of Iraq created a Board of Development, the Ministry of Development, and the Ministry of Agrarian Reform. An intensive programme of planning followed with the help of foreign firms; however, comprehensive integration of the programme was disrupted by the revolution of 1958.<sup>344</sup>

Agriculture received special attention following the nationalization of the oil industry in 1972 with the establishment of the Higher Agricultural Council, the Land Reclamation Organization and the Ministry of Irrigation. A comprehensive master plan, *General Scheme for Planning and Land Resources of Iraq*, was developed with the help of the Soviet Union from 1970 to 1984. The Master Plan is reported to cover every aspect of land and water use in the country and to project such development and planning up to the year 2000. However, this emphasis was short-lived, and in 1979 Saddam Hussein abolished the Ministry of Agrarian Reform and combined the Ministry of Agriculture and the Ministry of Irrigation with a 30 per cent reduction in staff. Since that time, the Iran-Iraq war and the invasion of Kuwait have diverted attention from agriculture and hydrologic development.<sup>345</sup>

Back to 1950s, the al-Ramadi Barrage was built to divert the floodwaters of the Euphrates into the Habbaniyah Lake and the Abu Dibis depression. It has planned to use this stored floodwater for irrigation, but then it was realized that owing to the high evaporation rates, together with the salt content of the soils in the depressions, the water quality would quickly deteriorate.<sup>346</sup>

Prior to 1960, only Iraq made systematic use of the river's waters. Several studies were made, in particular those by Sir William Willrock, Lord Salter, and Alexander Gibb & Company; projects included the development of the depressions at Bahr al-Milh and Habbaniyah. Recently Iraq has been able to control the river completely from the town of Hit. Several canals, including a big one at Ramadi, have aided Iraq's irrigation and flood control efforts.

Developments on the eastern tributaries of the Tigris must also be considered. Modern irrigation in the area was initiated with the completion of the Kut Barrage in 1939.

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<sup>344</sup> Kolars, "Problems of International River Management: The Case of the Euphrates", p. 83.

<sup>345</sup> *Ibid.*

<sup>346</sup> Peter Beaumont, "The Euphrates River: An International Problem of Water Resources Development", *Environmental Conservation*, Vol. 3, No. 1, Spring 1978, p. 36.

To exploit further the water resources of the Tigris, the Samarra Barrage was completed in 1956 creating the Thartar Lake in a large natural depression near the southern limits of Jazira. Saddam Dam on the Tigris, north of the city of Mosul is one of the largest supplying water to irrigate the northern Jazira region.<sup>347</sup> Next downstream, the Badush Dam, in the design and planning stage, is a safety resort in the event of damage to the Mosul Dam. Work was begun on the Badush in 1988 but it is not yet completed. The multipurpose Fatha Dam below the confluence of the Lesser Zab and the main stream is in the planning stage.<sup>348</sup>

The Main Outfall Drain (the Saddam River or the Third River), 500 km in length, with an average depth of 4 meters and a width of 180 meters, is also of note. This canal is intended to remove excess drainage water from the area between the twin rivers south of Baghdad and to discharge it into the Gulf near the Fao Peninsula after transferring it by siphon across the Euphrates River near Nasiriyah.<sup>349</sup> The Main Outfall Drain was completed in 1992.

Bombing Iraq by coalitions forces during the Gulf War caused extensive damage to Iraq's infrastructure. Only one main water project, the Darbandikhan Dam, emerged relatively unscathed, suffering 50 per cent damage. The Dokan and Haditha Dams were 75 per cent destroyed and the al-Ramadi Barrage, Saddam and Samarra Dams were put out of action altogether. The destruction of dams and pumping installations, water purification plants and power stations has had serious consequences for energy and food production, and for the provision of clean drinking water.<sup>350</sup>

The long-term aim of Iraq's hydraulic projects was to develop new irrigation networks and bring all suitable land under irrigation by the year 2000. Before the Gulf War Iraq had embarked on some studies to develop on some studies to develop sprinkler and drip irrigation systems and build long-term storage dams to offset anticipated reductions in Tigris and Euphrates flows.<sup>351</sup>

<sup>347</sup> Mahmood Clor, "A Land of Milk and Honey ... and Salt", *The Geographical Magazine*, November 1988, p. 35.

<sup>348</sup> Kolars, "Problems of International River Management: The Case of the Euphrates", p. 84.

<sup>349</sup> *Ibid.*

<sup>350</sup> Beschorner, "Water and Instability in the Middle East", p. 36.

<sup>351</sup> Beschorner, "Water and Instability in the Middle East", p. 35.



Syrian utilization of Euphrates' waters prior to the 1950s was slight, if not negligible, until the introduction gasoline pumps for cotton production.<sup>352</sup>

The first major Syrian use of the Euphrates River is the Tishrin Dam with its relatively small holding reservoir, which is 1,300 mcm. The Syrian economy has grown substantially in the past 40 years, with much of the progress attributable to gains in agricultural output through increased irrigation. To continue these gains, Syria began to formulate modern plans for harnessing its section of the Euphrates to produce hydroelectricity and irrigate new farmlands. In April 1966 Syria and the Soviet Union signed an accord to build a dam on the river. The Tabqa Dam, renamed ath-Thawrah (Revolution), was completed in 1973 and began filling during the winter of 1973-74.<sup>353</sup>

The Tabqa Dam was to be the centerpiece of the Euphrates Valley project to irrigate 640,000 ha. However, the schemes in the Tabqa have encountered technical and social problems. The Soviet design of the Tabqa Dam is not appropriate for local topography, hence low flows in summer substantially reduce power generation. This leads to power cuts in the major cities, especially Aleppo and Damascus.

Turkey began to develop plans to utilize the Euphrates at about the same time as Syria. Turkey first became interested in the energy potential of the river. In 1963, feasibility studies for a dam at Keban were completed. Construction began in 1965 and, as in the case of Syria's Tabqa Dam, was completed in 1973.<sup>354</sup>

After that, in 1977 development of the Euphrates and the Tigris Rivers was subsumed under the title Southeastern Anatolia Project (GAP). Those early efforts were followed by more and more sophisticated projects, carried out entirely by Turkish engineers and Turkish construction companies.<sup>355</sup>

GAP area lies in the southeast Turkey, covering eight provinces, corresponding to approximately 10 per cent of Turkey's total population and surface area. The project area

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<sup>352</sup> John Kolars, "Managing the Impact of Development: The Euphrates and Tigris Rivers and the Ecology of the Arabian Gulf - A Link in Forging Tri-Riparian Cooperation" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, p. 135.

<sup>353</sup> Naff and Matson, *op. cit.*, p. 90.

<sup>354</sup> *Ibid.*, p. 91.

<sup>355</sup> Kolars, "Problems of International River Management: The Case of the Euphrates", p. 61.

includes watersheds of the lower Euphrates and Tigris Rivers and the upper Mesopotamian plains. The total surface area is 73,000 sq km, of which 42.2 per cent is cultivated (36 per cent rain-fed farmland), 33.3 per cent pastures, 20.5 per cent forest and bush.<sup>356</sup>

The GAP is the most comprehensive enterprise in Turkey's history, and is considered as *one of the seven wonders of the modern world*,<sup>357</sup> and aims at removing a socio-economic gap between the project area and more developed regions in Turkey. The region's economy is dominated by the agricultural sector and agriculture is largely practiced under rain-fed conditions.<sup>358</sup>

With the GAP Turkey aims to achieve two things according to Doğu Ergil:

1) *To enhance her insufficient development drastically by increasing her agricultural and energy output. In order to accomplish this end she aims to build a viable agro-industrial infrastructure and compensate for the non-existent remittances of what nature has been so parsimonious in supplying oil.*

2) *The Southeast region of Turkey is poor. This poverty aggravates the ethnic sensitivity prevalent in the region. The Turkish Government aims at reducing discontent in the areas where ethnic diversity is dense. An almost crystal-clear equation has emerged before the Turkish administration: It has either to develop the impoverished and troubled East and put an end to regional imbalances and social dislocations or struggle with a lower growth rate and face depletion of resources spent on curbing terrorism.*<sup>359</sup>

In order to improve the economy of the region, mobilization of the water and soil resources on a regional scale has been planned, with the framework of integrated, multi-sectoral regional development. As such, the \$ 31 billion project comprises not only of water resources projects, but also of investments in all development-related sectors such

<sup>356</sup> Olcay İ. Ünver, "Innovations in Water Resources Development in the Southeastern Anatolia Project (GAP) of Turkey" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, p. 27.

<sup>357</sup> Sara Khalili, "The Seven Wonders of the Modern World", **Infrastructure Finance**, Vol. 2, No. 2, Summer 1993, pp. 19-20.

<sup>358</sup> Ünver, *op. cit.*, p. 28.

<sup>359</sup> Ergil, *op. cit.*, pp. 76-77.

as agriculture, energy, transportation, telecommunications, health care, education, urban and rural infrastructure, in an integrated manner.<sup>360</sup>

When the GAP has completed, 1.7 million ha of land will be irrigated and 27 billion kilowatt-hours of electricity will be generated each year. More than 3 million new jobs will be created across the whole country and the per capita income of the backward region will be doubled, according to the economists working full-time on the scheme. There will be 22 major dams, 19 hydroelectric plants and dozens of subsidiary irrigation schemes. But given the continued violence in the region during the 1980s and 1990s, international lenders had no desire to get involved in financing the GAP: every lira had to be found by Turkey itself.<sup>361</sup>

For organizational convenience, the GAP is divided into the Euphrates and the Tigris development plans, of which the Euphrates portion is well under way and the Tigris portion is in the beginning stages.<sup>362</sup> It was intended to be completed by the year 2005, but new estimates extend the target date to as far as 2040.<sup>363</sup>

GAP has raised Syrian and Iraqi anxieties over the availability of water for their own agricultural and industrial projects. Syria and Iraq fear that the Atatürk Dam, the centerpiece of the GAP, could divert most of the Euphrates' flow into Turkey's Urfa Plain, forcing Iraqi and Syrian dependence on Turkish water.<sup>364</sup>

According to the Economist, if GAP has completed, this would reduce the Syria's and Iraq's share of the Euphrates by 40 per cent and 60 per cent respectively. Syria, which is shorter of water than Iraq, would be particularly badly hit.<sup>365</sup>

<sup>360</sup> Ünver, *op. cit.*, pp. 28-29.

<sup>361</sup> Bulloch and Darwish, *op. cit.*, p. 65.

<sup>362</sup> John F. Kolars and William A. Mitchell, **The Euphrates River and Southeast Anatolia Development Project**, Carbondale: Southern Illinois University Press, 1991, p. 19.

<sup>363</sup> Gün Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", **New Perspectives on Turkey**, No. 9, Fall 1993, p. 6.

<sup>364</sup> Starr, *op. cit.*, p. 29.

<sup>365</sup> "Water in the Middle East", **The Economist**, December 23, 1995 - January 5, 1996, p. 58.

### 4.3. Disputes on the Euphrates-Tigris Basin

The disputes on the Euphrates and the Tigris Rivers is related to the location of their basins, since the two rivers remain within the territories of Turkey, Syria and Iraq. Nevertheless, the use of the waters by the three respective countries has been subject to discussions since the dissolution of the Ottoman Empire. "But the real problems emerged when the midstream and upstream countries, Syria and Turkey respectively, initiated projects for developing the waters of the Euphrates in the 1950s."<sup>366</sup>

#### 4.3.1. The Background of the Disputes on the Euphrates-Tigris Basin

Interestingly, concerns over downstream users' reactions to upstream water development projects in the region first emerged in relation to the Orontes River when Syria applied to the World Bank for financing the Ghab Valley draining and irrigation project in 1950. The Bank drew a policy outline keeping in mind that, on the one hand, water rights caused frequent disputes among states sharing a river basin, and on the other, such disputes prevented the application of many vital projects. Accordingly, the Bank felt it was "required to ensure that, for the projects involving international watercourses: a) there was no danger to the project from an upstream riparian, b) a downstream riparian could not lodge a substantive protest with the Bank for helping to finance a project that caused harm to existing uses, and c) neither the upstream nor the downstream riparian could lodge a substantive protest on account of damage to potential uses."<sup>367</sup>

Whereas Turkey objected to the project for technical reasons, Syria withdrew its request for a loan for apparently other concerns. The occasion, however, led to the adoption of an Operational Policy Memorandum by the World Bank, which, by 1965 included a requirement for the Bank Staff to consider the international aspects of projects to be approved, and be satisfied that the riparians reached appropriate agreements precluding any objections by relevant parties.<sup>368</sup>

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<sup>366</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", pp. 3-4.

<sup>367</sup> *Ibid.*

<sup>368</sup> *Ibid.*

The evolution of World Bank policy coincided with major development activities by Turkey and Syria on the Euphrates and by Iraq on the Tigris. Turkey established the State Water Works (DSİ) in 1953 and had been planning to develop the Euphrates waters since the mid-1950s. Arrangements for financing the Keban Dam well under way in the early 1960s. The work started in 1965, and Turkey reached an agreement with USAID with conditions very similar to those required by the World Bank. According to the terms of the agreement, Turkey would try to make necessary arrangements with Syria and Iraq with regard to the initial filling of the reservoir. If such arrangements were not possible by the time of impounding, Turkey would guarantee the release of an agreed upon amount of water downstream according to a program submitted to the creditors. This unilateral guarantee, which initially involved a minimum of 350 cum/s of water, has become the basis for a tense *modus vivendi* between the three countries.<sup>369</sup>

In 1968, Syria started to build the Tabqa Dam on the Euphrates with Soviet assistance. Iraq too, had undertaken the Gharraf Project between the lower reaches of the Tigris and the Euphrates Rivers.<sup>370</sup>

The period 1974-75 witnessed considerable friction between the riparian states over the exploitation of the Euphrates, as both Turkey and Syria embarked on major dam-building projects. The construction of the Keban Dam in Turkey provoked Syrian anxiety and official protest, not because of actual water depletion, but because of the symbolic value of Turkey's demonstration of its ability to control river flows.<sup>371</sup>

The first year that the dams became operational passed without serious incident. Although Iraq experienced a sharp reduction in the discharge reaching its territory and in mid-1974 requested that Syria release an additional 200 mcm of water from Tabqa, Syria acceded to Baghdad's request and no conflict arose. During the second season that the Turkish and Syrian dams impounded part of the Euphrates' spring flood, a major crisis developed between Syria and Iraq that brought the two countries to the brink of war.<sup>372</sup> Iraq accused Syria of reducing the river's flow to intolerable levels, while Syria passed the blame on Turkey. The Iraqi government was not satisfied with the Syrian attitude, and mounting frustration resulted in mutual threats. The water shortage, coupled with the

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<sup>369</sup> *Ibid.*

<sup>370</sup> *Ibid.*, p. 5.

<sup>371</sup> Beschorner, "Water and Instability in the Middle East", p. 39.

<sup>372</sup> Naff and Matson, *op. cit.*, p. 93.

traditional tensions between the two rival Ba'ath parties, brought Iraq and Syria to the brink of armed hostility. Saudi Arabia was called in to mediate as political and economic relations deteriorated rapidly. Following Soviet mediation in June 1975 Syria agreed to release additional water from the Tabqa Dam and in August of that year accepted a Saudi proposal for the proportional division of Euphrates waters, although this was not followed up. Iraq accused Syria of withholding Euphrates waters on several occasions during the drought-prone 1980s.<sup>373</sup>

One year after the crisis, Turkey laid the foundations of the Karakaya Dam and hydroelectric power plant, further downstream from Keban. This second major step in lower Euphrates development scheme had, among its sources of finance, the World Bank. This time, Turkey unilaterally guaranteed a minimum flow of 500 cum/s, "in order to safeguard adequately the interests of the lower riparian states." Karakaya entered service in 1987, while work on the Atatürk Dam (originally planned as Karababa Dam) had been under way since 1983. Around the same time, Syria was involved in studying the feasibility of another major work upstream from the Tabqa, the Tishrin Dam. Thus, consecutive water development projects upstream became nightmares for downstream states throughout the 1970s and 1980s.<sup>374</sup>

The most serious confrontation between Turkey and its downstream neighbours occurred in January 1990 when Turkey began to divert the Euphrates in order to fill the Atatürk Dam reservoir. Syria complained that only one out of eight 100-MW turbines was functioning on the Tabqa Dam. Iraq claimed that the proposed reduction in Euphrates flows would damage irrigation schemes (1, 300,000 ha) and shut down power plants which produced 40 per cent of the country's electricity. Turkey, however, argued that Syria would receive a minimum flow of 120 cum/sec from tributaries below the Atatürk Dam, as well as additional flows at a rate of 750 cum/sec from November 23 to January 13 (Euphrates discharge into Syria averaged 768 cum/sec in this period, so during this and the impounding period the average flow would be 509 cum/sec within the terms of the 1987 Protocol).<sup>375</sup> Table 4.3 shows discharges of the Euphrates River at Turkish-Syrian Border during the initial impounding of Atatürk Dam.

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<sup>373</sup> Beschorner, "Water and Instability in the Middle East", pp. 39-40.

<sup>374</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 5.

<sup>375</sup> Beschorner, "Water and Instability in the Middle East", p. 41.

Turkey also stressed that the impounding was scheduled for the time when Syrian and Iraqi water requirements were lowest, and claimed that the fears disseminated in the Arab media were groundless. The Syrian government protested officially to Turkey and to the Arab League, which consequently called for a just sharing of Euphrates waters and for a reduction in the impounding period. Syrian engineers claimed that the level of the Euphrates fell by 3 meters in January 1990 between the Turkish border and the Lake Assad thus damaging the winter crop and interrupting domestic water supplies to Aleppo, and that Turkey had not provided sufficient technical details about its plans. Turkish engineers contended that they had done everything possible to minimize damage. Turkey at the same time went so far as to send a mission to the Arab countries to explain that the temporary cut of in January 1990 to fill the Atatürk Dam was not a political maneuver to apply pressure on other riparian states.<sup>376</sup>

**Table 4.3**  
**The Euphrates River Discharges at Turkish-Syrian Border During the Initial Impounding of Atatürk Dam**

Period	Discharge (cum/s)	Number of days	Total flow (mcm)
23-30/11/1989	625	8	432
1-31/12/1989	818	31	2,190
1-13/1/1990	740	13	831
<i>23/11/1989-13/1/1990 Subtotals</i>		<b>52</b>	<b>3,453</b>
14-31/1/1990	65	18	102
1-12/2/1990	50	12	52
<i>14/1/1990-12/2/1990 Subtotals</i>		<b>30</b>	<b>154</b>
<i>23/11/1989-12/2/1990 Totals</i>		<b>82</b>	<b>3,607</b>

Source: Ministry of Foreign Affairs of Republic of Turkey, **Water Issues Between Turkey, Syria and Iraq**, Ankara: Ministry of Foreign Affairs of Turkey, January 1995, p. 19.

<sup>376</sup> Ali İhsan Bağış, "Water in the Region: Potential and Prospects - An Overview" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, pp. 21-22.

If abovementioned figures would be given in equations, the following results would be attained:

$$3,607,000,000 / 82 = 43,457,831 \text{ cum} \quad (\text{flow per day})$$

$$24 \times 60 \times 60 = 86,400 \text{ sec} \quad (\text{number of seconds per day})$$

$$43,457,831 / 86,400 = 509.12 \text{ cum/sec} \quad (\text{average discharge})$$

This interruption to the flow of the Euphrates prompted Syria and Iraq to join forces in calling for a tripartite agreement. On April 16, 1990 Syria signed an accord with Iraq on the allocation of Euphrates waters. Syria would receive 42 per cent and Iraq 58 per cent of annual flows, regardless of quantity.<sup>377</sup>

In March and December 1991 Syria protested about temporary reductions in Euphrates flows and reiterated calls for trilateral negotiations on the matter. Syria and Iraq reiterated their call for a trilateral agreement at the meeting of the JTC in Damascus in September 1992, the first since the Gulf War. However, the meeting ended in deadlock.<sup>378</sup>

Between 1992-1995 there was no major confrontation among the three riparian states with respect to the Euphrates-Tigris Basin. Whereas, on the last days of 1995, the tension among the three riparian states increased by the finalization of a credit agreement for the Birecik Dam, an after-bay dam on the Euphrates River. The dispute has led to Syria to start lobbying against Turkey in the Arab League and in the Western countries.

On December 28, 1995 Syria, Egypt and six Gulf Arab states<sup>379</sup> urged Turkey to sign a just agreement with Syria on sharing the Euphrates' water. Foreign ministers of the eight countries criticized Turkey for building dams on the river without consulting with Syria and Iraq. In this so called *Damascus Declaration*, Syria has called for a permanent-water sharing agreement to replace the 1987 Protocol, and also criticized that the GAP has led to a sharp decline in the flow of water to Syria. It was stated on the final communique that "The ministers call upon the Turkish government to stop allowing dirty waters to flow to Syria and to reach a just and acceptable agreement on the sharing of the

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<sup>377</sup> Beschorner, "Water and Instability in the Middle East", pp. 41-42.

<sup>378</sup> *Ibid.*

<sup>379</sup> The six Gulf Arab states were Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.



Euphrates waters."<sup>380</sup> It was the first time that Syria's seven allies, who maintain good relations with Turkey, referred to the dispute in the alliance statements.

Within this context, Turkey issued a demarche to Syria on December 31, 1995 which said that earlier Syrian claims of pollution of the Euphrates' water let downstream to Syria were unfounded. Turkish Foreign Ministry stated also that "At present the GAP is irrigating less than one-tenth of the area that it plans to irrigate. Therefore pollution of water that goes downstream can only be seen in later stages. The Syrian claims are irrelevant."<sup>381</sup>

Indeed, this is not the first time Syria has raised the water issue and it will not be last. Syria, and for that matter Iraq, has been calling for an agreement with Turkey on the sharing of the Euphrates waters for several years. The fact that water is becoming a valuable commodity in the Middle East seems to be adding to the urgency of Syria's concern.

#### **4.3.2. Arguments of The Parties**

In this section, the arguments of the three riparian countries were studied. Because of Syria and Iraq being downstream states, their arguments are similar to each other. For that reason Arguments of Syria and Iraq were analyzed in the same sub-section.

##### **a. Arguments of Syria and Iraq**

Syria and Iraq assert that the Euphrates and the Tigris Rivers are separate entities, and the subject of the talks should be limited to the Euphrates. This is an international river that has to be treated as an integral entity throughout its basin, on the waters of which all riparians have inherent and equal rights that cannot be restricted by territorial sovereignty claims of the upstream states.<sup>382</sup>

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<sup>380</sup> Turkish Daily News, December 30, 1995.

<sup>381</sup> Turkish Daily News, January 3, 1996.

<sup>382</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 10.

From an Iraqi point of view, the early use of the Euphrates and the Tigris Rivers establishes a claim, through prior usage<sup>383</sup> and stresses its water rights acquired over the years and demands that the other riparians respect those rights.

Turkey's decision to proceed with the GAP scheme was perceived as aggressive and insensitive by its downstream neighbours.<sup>384</sup> Regarding the GAP Project, Syria and Iraq are concerned that Turkey might not continue to respect in all situations the engagements taken with regard to the flow of water of the Euphrates and the Tigris. They argue that the tunnel under the Atatürk Dam could be narrowed or completely closed. Syrians and Iraqis consider this to be a potential threat to their countries.<sup>385</sup>

Also according to Doğan Sencer,<sup>386</sup> one of the fears of Syria regarding the GAP is its anxiety that the GAP will pollute the groundwater resources of the region, apart from the Euphrates River.<sup>387</sup>

Syria and Iraq claims that the 1987 protocol is an interim one, and interprets the 500 cum/sec clause as a prelude to a final partitioning of the waters.<sup>388</sup> They insists on increasing the minimum quota to 700 cum/sec -about 70 per cent of the average flow- until a definitive allocation of the Euphrates waters among the riparians are agreed upon.<sup>389</sup>

Indeed Syria's legal position on water rights has not only been ambivalent but also very contradictory. Because it is both an upper and a lower riparian state on different river systems. Syria, the upper riparian on the Yarmouk, has been building a series of dams upstream that have significantly decreased the flow reaching Israel and Jordan. In this context, the Orontes River is in the same situation.<sup>390</sup>

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<sup>383</sup> Kolars, "Managing the Impact of Development: The Euphrates and Tigris Rivers and the Ecology of the Arabian Gulf - A Link in Forging Tri-Riparian Cooperation", p. 134.

<sup>384</sup> Beschoner, "Water and Instability in the Middle East", p. 40.

<sup>385</sup> Helmut van Edig, "Strengthening the Regional Cooperation: The German View" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, p. 420.

<sup>386</sup> Ambassador and the Head of the Department of the Transboundary Rivers at the Ministry of Foreign Affairs of Turkey.

<sup>387</sup> From interview with Doğan Sencer, Ankara, March 21, 1995, 13.30 GMT.

<sup>388</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris, p. 9.

<sup>389</sup> *Ibid.*, p. 13.

<sup>390</sup> Bağış, *op. cit.*, pp. 23-24.

It would be misleading to think of a homogenous Syria-Iraq coalition against Turkey in water issues. In fact, Iraq is critical of Syria's manipulation of the Euphrates, whereas Syria, much more dependent on this river than Iraq, shares the Turkish view that Iraq could compensate the loss in the Euphrates through transfers from the Tigris.<sup>391</sup>

## b. Arguments of Turkey

Turkey's primary argument is based on the standard definition of an international watercourse or river, which involves both a geographic and legal aspect. Theories of international law have been unanimous in recognizing that a river may be international in two ways: either because it separates two or more states and serves as a boundary, or because it crosses successively the territory of two or more states, some upstream, others downstream, in which case the international river is referred as successive. The Euphrates and Tigris are transboundary watercourses and not international watercourses. International watercourses are those whose two banks lie on the territory of two different states and are shared by the littoral states with a median line. A transboundary watercourse, on the other hand, flows through the territory of two or more states. Because of their being transboundary watercourses, they are subject to respective use determined by states' obligation "not to cause significant harm" to others, and the principle of equitable and reasonable use of available waters without prejudice to sovereignty rights.<sup>392</sup>

Within this context, Turkey, in its utilization of the waters of the Euphrates-Tigris Basin, acts in accordance with the ILC principles. For instance, the principle of not causing significant harm to other countries is normally interpreted as not polluting the watercourse. Many of the developed nations have established industries along the watercourse, and even where flow rate is not reduced, these industrial operations frequently result in irreparable pollution damage. By comparison, development efforts within the framework of GAP represent a much better alternative for the downstream states in that an essential quantity of unpolluted water is guaranteed to them. Also, they will be able to reap part of the benefits of this giant development project.<sup>393</sup>

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<sup>391</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 12.

<sup>392</sup> Mehmet Tomanbay, "Sharing the Euphrates: Turkey, Syria and Iraq", **Research and Exploration - Water Issue**, 1993, p. 58.

<sup>393</sup> *Ibid.*

Turkey maintains that the Euphrates and the Tigris constitute a single hydrological system, not only because they join before reaching the Persian Gulf to form the Shatt al-Arab, but also because Iraq uses the waters of both rivers interchangeably through its Thartar Canal Project which transfers the Tigris waters to the Euphrates.<sup>394</sup>

Syria and Iraq fear that Turkey's consumptive use of the Euphrates waters will disrupt both the current consumption patterns and future plans of the two downstream countries. In fact the GAP will not diminish Iraq and Syria's water supply. Turkey is using a small amount of the total debit of these rivers. In the winter and spring months a great deal of this water flows uselessly into the sea and cannot be used by either Turkey, Syria and Iraq. The water that will be dammed is in fact that which runs uselessly into the sea. Because the dams regulate seasonal fluctuations, they will prevent water shortages in downstream regions by changing the uncontrolled virgin flow into an assured continuous flow.<sup>395</sup>

In addition, calculations show that a belt of 30-50 km bordering Turkey and Syria will benefit from this project with minimum investment. Syrians will benefit from the huge Turkish investment projects, without any need to cooperation or agreements.<sup>396</sup>

According to Turkish experts, Syria and Iraq are receiving plenty of water but squandering most of it through traditional and irrational irrigating methods. Moreover, irrigating infertile lands that yield uneconomic amounts of crops is another loss. Hence both of Turkey's neighbours must improve their ways and means of water consumption, then they must come to negotiate for an agreement based on the need and equity.<sup>397</sup>

To sum up, the Turkish arguments could be summarized at the Turkish note below:

*The Euphrates and Tigris watercourses constitute 28 per cent of potential water resources in Turkey and have significant importance for her. Iraq and Syria advocate sharing the water of the Tigris and Euphrates. However, under international law, transboundary watercourses cannot be shared, though they can be utilized in an equitable, reasonable and*

<sup>394</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 10.

<sup>395</sup> Erol Manisali, "Two Cornerstones of Turkey's Foreign Relations: The GAP Project and Cyprus", *Middle East Business and Banking*, Vol. 9, No. 3, March 1990, pp. 8-10.

<sup>396</sup> Norman Frankel, "Water and Turkish Foreign Policy", *Political Communication and Persuasion*, Vol. 8, 1991, p. 285.

<sup>397</sup> Ergil, *op. cit.*, p. 78.

*optimum manner. This is the definition under international law, which considers natural resources like water, oil, mineral etc. to be under sovereignty of the countries concerned. However, Turkey has unilaterally committed itself to release 500 cubic meters a second to Syria and has always honoured its commitment.*

*The construction of dams on the Euphrates is designed to regulate the flow of water, generate electricity and irrigate the land. The function of regulating the flow of water of the dams of the Euphrates not only serves the interests of Turkey, but also contributes to the water needs of neighbouring countries, Syria and Iraq. The velocity of the Euphrates may fall as low as 100 cubic meters per second during the summer while it could reach a maximum of 7,000 cubic meters when the spring snows melt. The existence of the dams enables Turkey to provide a regular flow of 500 cubic meters to its neighbours throughout the year, even during the summers of 1989, 1990 and 1991 when three consecutive droughts were registered. Obviously, the main beneficiaries of this regular flow of water have been Syria and Iraq, who have been provided with enough water by Turkey not to have suffered the severe consequences of the drought.*

*However, it should be noted that Syria and Iraq have in no way contributed to the construction of the dams on the Euphrates but have even tried to prevent the establishment of these dams. Moreover, the entire water potential of the Tigris is used by Iraq by transferring its water to the Euphrates through the al-Thartar canal.<sup>398</sup>*

On the other Turkey states that the PKK terrorism was supported by Syria as the president Süleyman Demirel pointed out very recently.<sup>399</sup> By granting permission the PKK to place in Beqaa Valley, Syria uses terrorism weapon against water issue. Although the PKK operations from the Beqaa Valley continued throughout the late 1980s and 1990s, causing increased agitation in Turkey.<sup>400</sup>

Indeed, Syria's support to the terrorism movements against Turkey dates back from its support to PKK. According to John Bulloch and Adel Darwish:

*President Hafez Assad of Syria decided much earlier that he needed something with which to bargain in his dealings with Turkey and other*

<sup>398</sup> Bulloch and Darwish, *op. cit.*, pp. 68-69.

<sup>399</sup> From a press conference of Süleyman Demirel, *Star TV-Haberler*, June 11, 1996, 21:30 GMT.

<sup>400</sup> Beschoner, "Water and Instability in the Middle East", p. 37.

*countries. So to have some extra cards in his hand, he invited representatives of dozens of different guerrilla factions, liberation movements and dissidents to set up their headquarters in Damascus. Among those who accepted the invitation to go to Damascus quietly put out by Syrian intelligence were young members of Dev Genç and Dev Sol, of the Turkish People's Liberation Army and other small factions of the revolutionary left. In Syria they were given the kind of welcome extended to all other potentially useful organizations. Many of them returned to Turkey once they had completed their first courses in guerrilla warfare, and played their part in gradually turning Turkish cities into urban battlegrounds.<sup>401</sup>*

As a result it could be said that, Turkey is one of the leading advocates of the creation of regional cooperation in economic and technical fields in the Middle East. It considers water to be one of the principal factors in the promotion of such cooperation. In the following section, these initiatives of cooperation will be examined.

#### **4.4. Initiatives of Cooperation on the Euphrates-Tigris Basin**

##### **4.4.1. Trilateral Talks and Bilateral Protocols**

When Turkey's utilization of the Euphrates and the Tigris waters became imminent, efforts to negotiate a settlement accelerated. In December 1980, meeting of the Turkish-Iraqi Mixed Economic Commission, the two sides agreed on the formation of a Joint Technical Committee (JTC), to study matters relating to regional waters, in particular the Euphrates and the Tigris River basins. The first meeting of the JTC was held in May 1982. In 1983, Syria joined the meetings, and from then on the JTC convened on a trilateral basis. However, the JTC has not been able to resolve the underlying political and legal disputes. Syria and Iraq have been demanding an increase of their share from 500 cum/sec to 700 cum/sec, while Turkey has contended that its allocation to them would be more than adequate if they adopted water saving technology, such as drip irrigation, and if

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<sup>401</sup> Bulloch and Darwish, *op. cit.*, p. 65.

Iraq included the Tigris flow in its calculations.<sup>402</sup> Also other issues were whether the Euphrates and the Tigris considered a single system, or if the discussions could be exclusively limited to the Euphrates. Whether, the final objective of the JTC was to formulate a proposal for *sharing the international rivers*, or was to come up with a trilateral regime for determining the *utilization* of the transboundary watercourses.<sup>403</sup>

After 16 technical and two ministerial meetings, the JTC talks came to a deadlock, having failed to produce the outline of its report. The 17<sup>th</sup> meeting, which was supposed to take place in June 1993 in Ankara, was cancelled at the last minute when Syria announced its decision not to attend. The deadlock according to Syria, could only be overcome through political will, since meetings at the technical level proved futile.<sup>404</sup>

"Despite Iraqi and Syrian accusations that Turkey was dragging its feet to gain time to proceed with the GAP, and hence preventing any meaningful progress in the trilateral talks, the JTC meetings were not totally useless" according to Gün Kut:

*First of all, the issues at stake were more complex than they appeared, and the concerns and positions of the parties were openly put on the table at the meetings. Secondly, vital information exchange on the regional waters has been possible, and more importantly, certain proposals were more or less discussed.*<sup>405</sup>

In the meanwhile, Syria, pointing out that Turkey's commitment to release 500 cum/sec of water was a unilateral pledge, wanted a commitment directly addressed to the concerned parties. In July 1987 Turkey and Syria signed a *Protocol of Economic Cooperation* covering a wide range of issues: oil and gas exploration, banking, livestock transport and customs formalities. Water was one of the principal issues in the Protocol. It is important to note that the Protocol was regarded as a temporary arrangement. The text of Article 6 reads as follows:

*During the filling up period of the Atatürk Dam reservoir and until the final allocation of the waters of the Euphrates among the three riparian countries, the Turkish side undertakes to release a yearly average of more than 500 cubic meters per second at the Turkish-Syrian border and in cases*

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<sup>402</sup> Gruen, "International Regional Cooperation: Preconditions and Limits", p. 267.

<sup>403</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 10.

<sup>404</sup> *Ibid.*, p. 8.

<sup>405</sup> *Ibid.*, p. 9.

*where the monthly flow falls below the level of 500 m<sup>3</sup>/sec [cum/sec], the Turkish side agrees to make up the difference during the following month.*<sup>406</sup>

Article 7 stated that Turkey and Syria should work together with Iraq should work together with Iraq to allocate Tigris and Euphrates waters within the shortest possible time. Under Article 9 both states agreed in principle to construct and jointly operate irrigation and HEP projects.<sup>407</sup>

Some writers argue that the *quid pro quo* of this deal is that Syria has to stop supporting the PKK. According to Kamran İnan,<sup>408</sup> "It's a kind of gentleman's agreement, covering large areas, not only concerning water. You might understand that message by itself."<sup>409</sup>

The other protocol was the 1990 Syrian-Iraqi Protocol. The 13<sup>th</sup> meeting of the JTC held in Baghdad on April 17, 1989, provided occasion for this bilateral agreement between Syria and Iraq, according to which 58 per cent of the Euphrates waters coming from Turkey would be released to Iraq by Syria. Syria would be take 42 per cent of the waters. According to Gün Kut, "this agreement, in a sense, complemented the 1987 Turkish-Syrian protocol guaranteeing a minimum flow of 500 cum/sec from the Euphrates waters to Syria, creating a de facto regime."<sup>410</sup>

#### 4.4.2. Peace Water Pipeline Project

On a visit to the United States in the February of 1987, the Turkish Prime Minister Turgut Özal proposed the construction of a huge pipeline to transport water from the Seyhan and Ceyhan Rivers in Turkey to various countries in the Middle East. Naming what he had in mind *The Peace Pipeline*, the Prime Minister suggested that Syria, Jordan, Saudi Arabia and the Gulf States could be supplied with water, especially for their cities.

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<sup>406</sup> Official Gazette, *op. cit.*, p. 6.

<sup>407</sup> *Ibid.*

<sup>408</sup> Turkey's former minister for the GAP.

<sup>409</sup> Rustom Irani, "Water Wars", *New Statesman and Society*, May 3, 1991, p. 25.

<sup>410</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 9.



**Table 4.4**  
**Turkey's Peace Pipeline Scheme**

<b>Western Pipeline</b>		<b>Gulf Pipeline</b>	
<b>Location</b>	<b>Assumed Water Delivered (cum/day)</b>	<b>Location</b>	<b>Assumed Water Delivered (cum/day)</b>
<b>Turkey</b>	<b>300,000</b>	<b>Kuwait</b>	<b>600,000</b>
<b>Syria</b>		<b>Saudi Arabia</b>	
Aleppo	300,000	Jubail	200,000
Hama	100,000	Dammam	200,000
Homs	100,000	Al Khobar	200,000
Damascus	600,000	Hufuf	200,000
	<b>1,100,000</b>		<b>800,000</b>
		<b>Bahrain</b>	
		Manama	200,000
<b>Jordan</b>		<b>Qatar</b>	
Amman	600,000	Doha	100,000
<b>Saudi Arabia</b>		<b>UAE</b>	
Tabuk	100,000	Abu Dhabi	280,000
Medina	300,000	Dubai	160,000
Yanbu	100,000	Sharjah / Ajman	120,000
Jeddah	500,000	Umm Al Quaiwain	
Mecca	500,000	Ras Al Khaimah	
	<b>1,500,000</b>	Fujairah	40,000
			<b>600,000</b>
		<b>Oman</b>	
		Muscat	200,000
<b>Total</b>	<b>3,500,000</b>	<b>Total</b>	<b>2,500,000</b>

Source: Erol Manisalı (ed.). *Turkey's Place in the Middle East*. Middle East Business and Banking Publications: İstanbul (1989), p. 70.

The initial Özal plan envisioned the construction of a major pipeline out of the Adana district in Turkey into Syria. In Syria, the pipeline would separate into two

branches. The western branch, 2,650 km in length from the point of origin, would go through Syria and Jordan, eventually reaching Jeddah and Mecca in Saudi Arabia. It would carry 3.5 mcm of water daily. The smaller eastern branch, on the other hand, would have a total length of 3,900 km from the point of origin. After Syria, it would traverse Jordan, Kuwait, Saudi Arabia, Bahrain, Qatar, the United Arab Emirates, terminating at Oman. Generally referred to as the Gulf Line, this line would transport 2.5 mcm of water daily.<sup>411</sup> Through the Peace Pipeline, Turkey would make more than 2,000 mcm/yr of water available to the countries of the region.<sup>412</sup> The proposed route and the assumed water delivery is given at the table below.

An exploratory study of the feasibility of the Peace Pipeline project has been conducted by the American firm Brown and Root. The Western Pipeline has been estimated to cost approximately US \$ 8.5 billion and the Gulf Pipeline has been estimated to cost approximately US \$ 12.5 billion. All cost were based on 1986 dollars. The average cost of water for the Western Pipeline and the Gulf Pipeline has been calculated at \$ 0.84/cum and \$ 1.07/cum, respectively.

If the cost of producing water through desalination is calculated by assigning an opportunity cost value (i.e. a current market value) to the oil used in the process, it appears that water piped from Turkey is more economical to use than the water produced through desalination process which is estimated to cost around US \$ 5.00 per cubic meter.<sup>413</sup>

While such pipelines are technically feasible, the Arab states have viewed the offer with skepticism and no public avowals of interest. According to John Kolars, "this stems from memories of Ottoman rule as well as practical fears that the pipelines could easily be cut by anyone, including other Arab states."<sup>414</sup>

The Saudis and Kuwaiti officials, fearing to give the Turks a role in and possible control over their water sovereignty, have not accepted Özal's request for both approval

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<sup>411</sup> For a summary, see Gün Kut, "Ortadoğu'da Su Sorunu ve Türkiye", 1991, p. 100.

<sup>412</sup> İlter Turan, "Turkey and the Middle East: Problems and Solutions", *Water International*, No.18, 1993, p. 26.

<sup>413</sup> Turan, *loc. cit.*

<sup>414</sup> Kolars, "Problems of International River Management: The Case of the Euphrates", p. 78.

and investment, on political grounds as well as arguments that the price of water delivered through the pipeline would be too high compared to local desalination.<sup>415416</sup>

Since it is anticipated that Turkey itself would also eventually need all the available water from the Seyhan and Ceyhan Rivers, its willingness to allocate water for use by other countries of the region should be taken as a major gesture of goodwill toward them, and an indication of Turkey's eagerness to contribute to the alleviation of water problems in the region,<sup>417</sup> and also it should be born in mind that exportable water from Turkey is not limitless in quantity. Therefore, Turkey's contribution to region's problem can at best help to cover the deficit for a certain period of time, maybe another 30 years.<sup>418</sup>

#### 4.4.3. The Three-Staged Plan

One of the major obstacles to the efficient use of water in the region is the lack of reliable data on flows, the quality of water and land in the basin areas, current patterns of crops and irrigation, and other similar information. The paucity of reliable information stands in the way of planning the more efficient utilization of water among the riparians of a transboundary watercourse.

To demonstrate its intentions for cooperation on the use of the Euphrates-Tigris Basin, Turkey proposed a plan in the second tripartite meeting at the ministerial level on June 26, 1990 in Ankara. Called the *Three Staged Plan for Optimum, Equitable and Reasonable Utilization of the Transboundary Watercourses of the Tigris-Euphrates Basin*, the plan mainly used the terminology developed by the International Law Commission of the United Nations entrusted with the codification of the Law of the Non-Navigational Uses of International Watercourses.<sup>419</sup>

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<sup>415</sup> Starr, *op. cit.*, p. 28.

<sup>416</sup> *Ibid.*

<sup>417</sup> Turan, *loc. cit.*

<sup>418</sup> Seyfi Taşhan, "Political Aspects of the Water Problem in the Middle East" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, p. 261.

<sup>419</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 12.

The plan is based on two basic principles. First, the Euphrates and the Tigris Rivers will have to be considered as forming one single transboundary watercourse system. Consequently, all existing water resources need not necessarily be derived from the Euphrates, because of the Thartar Canal connection between the two rivers in Iraq.

Second, the inventory of water and land resources should be drawn up and evaluated jointly since methods used in each country for data collection, interpretation and evaluation show disparities. That is, necessary means and measures should be determined to attain the most reasonable and optimum utilization of resources on the previous studies.<sup>420</sup>

The three stages of the plan are as following:

- 1) The first stage of the plan is to make inventory studies for water resources, which will cover the exchange of whole available data including that of evaporation, temperature, and rainfall over various gauging stations. It also foresees the checking of the measurements.
- 2) The second stage is to make inventory studies of land resources, which includes soil classification methods, checking water conditions for projects, and calculating irrigation and leaching water requirements based on the studies carried out before.
- 3) The third stage will be the evaluation of water and land resources, which will discuss and determine the irrigation type and system for the planned projects aiming at minimizing water losses and to investigate the possibility of modernization and rehabilitation of the projects in operation. Also, based on the project-wise studies, each state's total water consumption will be determined.

The plan may not only facilitate negotiations since all parties would now rely on the same sets of data, but it may also be possible to plan for the more efficient use of water. For example, after the preparation of a standardized soil classification of lands which could be irrigated from the waters of the Euphrates and Tigris, it seems reasonable to plan to irrigate higher quality lands irrespective of the country in which they may be located before

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<sup>420</sup> Turkish Daily News, January 3, 1996.

commencing with the irrigation of lower quality lands because the former would produce higher yields using the same amount of water.<sup>421</sup>

However, the plan was rejected by the downstream riparians. One of the reason of the failure of the plan was Syria's refusal to negotiate the Orontes Basin as well as the Euphrates-Tigris Basin.

According to Gün Kut;

*The plan was interesting because, on the one hand, terminology put aside, it carried elements contrary to the essence of Turkey's official position and offered a sort of a concealed compromise. On the other hand, it was a plan one would rather expect from a supragovernmental body that tries to impose a regime on sovereign states, offering them greater benefits in return for limited application of sovereignty rights. In that sense it was surprising that Turkey came up with the offer by itself, but not surprising at all was its non insistence on it when the plan was coolly received by the downstream neighbours.*<sup>422</sup>

#### 4.4.4. Other Projects and Ideas

The Peace Pipeline was the most advanced among a set of ideas proposing to transport water from one Middle Eastern country to others. A suggestion based on the original Peace Pipeline idea was made in 1991 by John Kolars that a Mini-Peace Pipeline be built as far as Jordan, and that such a line use the waters of the Göksu or Manavgat Rivers west of the Seyhan and Ceyhan Rivers.<sup>423</sup>

On the other, Hillel Shuval has suggested an even shorter pipeline which would bring water from Turkey as far as southern Syria. This line would have the advantage of being less expensive and directly involving only two countries.<sup>424</sup>

In addition, The Peace Canal Plan proposal of Boaz Watchel calls for the diversion of 1,100 mcm/yr of water from the elevated Atatürk Dam Lake in the southeastern Turkey

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<sup>421</sup> Turan, *op. cit.*, pp. 25.

<sup>422</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 13.

<sup>423</sup> Kolars, "Problems of International River Management: The Case of the Euphrates", p. 78.

<sup>424</sup> For detailed explain about this proposition, see Shuval, *op. cit.*, pp. 133-143.

(or from the Ceyhan and Seyhan Rivers) to be equally distributed (275 mcm/yr each) to Syria, Jordan, Israel, and West Bank (and Gaza).<sup>425</sup>

On the other hand, some rivers on the Mediterranean Coast of Turkey carry sufficient amounts of excess water that it is possible to build filling stations near where they reach the sea and fill super tankers with fresh water. The tankers would then take the water to the potential users which are likely to be countries in the region. One of these rivers is the Manavgat River. Exporting waters of the Manavgat River is on the agenda, and there are some plans to export water of this river to Greece, Cyprus, Israel and some places in Turkey where there is a deficit of the potable water, like İstanbul, İzmir and other cities of the Aegean region.

Although the transporting of fresh water by ship appears to be an expensive way of procuring water at the moment, as needs in the region intensify, it may become increasingly economical to utilize it as another way of augmenting the available supply of water to some countries.<sup>426</sup>

Additionally, Israel has expressed an interest in the international marketing of the waters of the Seyhan and the Ceyhan Rivers. The issue, brought on agenda during the visit of the Foreign Ministry Undersecretary Onur Öymen to Israel in January 1996, will be discussed further at a technical level.<sup>427</sup>

All these ideas deserve further examination and development. When working on developing them, it is important to remember several constraints, however. First, Turkey cannot increase the amount of water that it can make available to other countries in the region beyond levels which it has volunteered already. Second, Turkey hopes that its efforts will enhance mutual interdependence and peace between the countries of the region. The potential users of Turkish water should be willing to cooperate with Turkey in order to develop formulae for sharing the water before the pipeline projects are implemented. Third,

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<sup>425</sup> For detailed explanation about the Peace Canal, see Boaz Wachtel, "The 'Peace Canal' Plan: A New Model for the Distribution and Management of Water Resources and a Catalyst for Cooperation in the Middle East" in **Water as an Element of Cooperation and Development in the Middle East**, (ed. Ali İhsan Bağış), İstanbul: Ayna Yayınları, 1994, pp. 389-404.

<sup>426</sup> Turan, *op. cit.*, p. 27.

<sup>427</sup> **Turkish Daily News**, January 16, 1996.

it is desirable that Turkish water be available to all countries in the region, and no country should feel left out or deprived of it.<sup>428</sup>

#### 4.5. The Current Situation and the Position of Riparian States on the Euphrates-Tigris Dispute

One of the reasons for both Turkey and Syria looking towards the Euphrates has been the increasing population pressures which the countries of the region have been facing over 1940s.<sup>429</sup> On the other hand, the situation in the Tigris is not as critical as the Euphrates. A much smaller proportion of water is generated in Turkey, only about 45 per cent, and most of the rest comes from runoff from tributaries which flow for most of their courses in Iraq. Turkey's proposed developments on the Tigris are not as large as those on the Euphrates.<sup>430</sup> For a clear mode of vision, water potential of the Euphrates-Tigris Basin and consumption targets of its riparians are given in Tables 4.5 and 4.6.

The problems with Iraq are not as serious as those with Syria. There are several reasons for this. Development of the Tigris River does not have that much potential. This means that most of it will be available to Iraq. Irrigation techniques are more sophisticated in northern Iraq than Syria because 10-15 years ago the Iraqis started working with some Dutch and Turkish firms to improve water and agricultural techniques.<sup>431</sup> Iraq's main problem is water quality rather than quantity. It has relatively abundant water resources, but serious problems with water management and soil salinity have dogged irrigation projects throughout the history of Mesopotamia. During four decades of oil wealth, Iraq gave its water resources and agriculture low priority.<sup>432</sup>

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<sup>428</sup> Turan, *op. cit.*, pp. 28.

<sup>429</sup> Beaumont, "The Euphrates River: An International Problem of Water Resources Development", p. 35.

<sup>430</sup> Beaumont, "Water: A Resource Under Pressure", p. 181.

<sup>431</sup> Frankel, *op. cit.*, p. 279.

<sup>432</sup> Vesilind, *op. cit.*, p. 56.

**Table 4.5**  
**Water Potential of the Euphrates Basin and Consumption Targets of its**  
**Riparians (in mcm/yr)**

Countries	Water Potential		Consumption Targets	
	Quantity	%	Quantity	%
Turkey	31,580	88.70	18,420	35.00
Syria	4,000	11.50	11,300	22.00
Iraq	0	0	23,000	43.00
<b>Total</b>	<b>35,580</b>	<b>100.00</b>	<b>52,920</b>	<b>100.00</b>

Source: Ministry of Foreign Affairs of Republic of Turkey, **Water Issues Between Turkey, Syria and Iraq**, Ankara: Ministry of Foreign Affairs of Turkey, January 1995, p. 7.

**Table 4.6**  
**Water Potential of the Tigris Basin and Consumption Targets of its**  
**Riparian States (in mcm/yr)**

Countries	Water Potential		Consumption Targets	
	Quantity	%	Quantity	%
Turkey	25,440	51.80	6,870	13.00
Syria	0	0	2,600	4.00
Iraq	23,430	48.10	45,000	83.00
<b>Total</b>	<b>48,670</b>	<b>100.00</b>	<b>54,470</b>	<b>100.00</b>

Source: Ministry of Foreign Affairs of Republic of Turkey, **Water Issues Between Turkey, Syria and Iraq**, Ankara: Ministry of Foreign Affairs of Turkey, January 1995, p. 9.

Since these claims are over the average flows of the Euphrates and Tigris Rivers, the combined demands were unrealistic.<sup>433</sup>

It has become fashionable to say that the next war in the Middle East could be fought over water. Squabbling over water is, after all, the ultimate zero-sum game. Yet war is not likely.<sup>434</sup> One reason is that in each of the three most disputed river basins, military

<sup>433</sup> Tomanbay, *op. cit.*, p. 61.

<sup>434</sup> "Parched", *The Economist*, May 12 1990, p. 10.



power is not evenly balanced: one country is strong enough to get its own way, or most of its own way, overriding the grievances of its neighbours. In the Nile and Jordan basins, the dominant countries -Egypt and Israel- are downstream but through dissuasion, threat or military occupation have seen to it that upstream states leave the flow of the water alone. In the third dispute, over the Euphrates, Turkey is upstream -and strong enough to do what it wants despite the protests of downstream Iraq and Syria.

The weaker states which share rivers or the groundwater aquifers resent what the stronger ones are doing. But they can not, because of their weakness, go to war about it. The only country, in the recent past, to have resorted to military action to defend its water supply is Israel, the military supreme.<sup>435</sup>

Additionally, as Ali İhsan Bağış pointed out, Turkey has to pursue a politics that deprive Syria and Iraq from water, in order to break a war over water. Whereas, because of Turkey's engagement in economic relations with Arab countries, it wants to be in good neighbourship with these states.<sup>436</sup>

The downstream states' claims of historical rights, taken together with the subject of negotiations being reduced to the Euphrates alone, are basically designed to preempt the GAP. If one follows the argument to its logical end, the consequences are obvious: the amount of water subject to allocation among the riparians is the amount that remains after acquired rights based on prior usage are deducted. Once current Iraqi and Syrian use of the Euphrates waters before the full implementation of GAP is set aside, the remainder will be shared according to the needs determined exclusively by the individual riparians. Any new project -such as GAP- will then be considered if there is any water available. Thus for Turkey, recognizing the acquired rights of downstream states means that the Euphrates waters could not be used at all for irrigation purposes and fewer dams could be built, which amounts to abandoning the GAP. Turkey's insistence, however, on rational and optimal use of waters while not recognizing the concept of legal rights of riparians on transboundary watercourses, is an attempt to question the efficiency of the downstream countries' water use patterns. Once studied from that perspective, the traditional agricultural policies of both Syria and Iraq, so central to the official ideologies of both countries will be disputed, and their claimed water needs could be challenged. In other words, *sharing* the waters serves Iraqi and Syrian interests, while *optimal and rational utilization* serves those of Turkey.

<sup>435</sup> "Water in the Middle East", *The Economist*, December 23, 1995 - January 5, 1996, p. 57.

<sup>436</sup> Mahmut Bulut, "Su Fırtınası", *Türkiye*, January 12, 1996.

## V. CONCLUDING REMARKS

This chapter consists of the Concluding Remarks. In the first section (5.1), findings of the study were evaluated. Proposals, built on findings, were made in the second section (5.2). In the last section (5.3) a summary of the study was given.

### 5.1. Findings

The following results were founded as findings in the light of the examinations made in the study.

1) The four river systems being studied -the Nile, the Jordan, the Orontes and the Euphrates-Tigris- provide interesting similarities and differences. In the case of the Nile, the two most downstream states, Egypt and the Sudan, have come together on two occasions in the past to decide how to allocate the total water resources of the river. This so far been resolved amicably though the interests of the upstream users have never been considered. These upstream states as yet have made few demands on the waters of the Nile, though this position seems bound to change in the future. It must inevitably mean that Egypt's use of the waters of the Nile will have to be curtailed.

2) Within the Jordan Basin the water sources have been captured and water allocated through military force. One of the states within the basin, Israel, has invaded the lands of adjacent states to capture the headwaters of the Jordan so that it can use all the waters for its own purposes.

3) Within the Orontes Basin, it could be said that, Lebanon and Syria have been intensively utilizing this river for irrigation purposes. As it is aforementioned, Syria has been making use of 90 per cent of the total flow of the river. On the other hand, in the tripartite meetings, Syria strictly opposes to handle the Orontes Basin and the Euphrates-Tigris Basin within the same context. Because, Syria sees Hatay province of Turkey as its own, and beginning talks with Turkey on the Orontes Basin means the tacit recognition of Hatay as a Turkish district.

4) Within the Euphrates-Tigris Basin a state of transition exists. In marked contrast to the main Jordan River riparian states, neither Turkey, Syria nor Iraq is facing an imminent water shortage. Instead, given the extensive irrigation and hydroelectric power projects in hand, the major problems faced arise from management, apportionment and development planning.

More specifically, it was founded that;

5) There are no comprehensive rules applicable to all international watercourses, but there are certain principles of international law applicable to this field. Some international institutions try to codify a set of rules applicable to international watercourses. Although there are some agreements among the riparian states, settlement of international disputes on water issue depends on the goodwill of the parties.

6) Population growth, whether natural or due to immigration is the main reason for the perceived food and water shortage. Historic evidence indicates that the Middle East has never been able to supply food for such a large number of population like that inhabiting the Middle East area nowadays. In former times sickness, epidemics, wars and malnutrition kept the number of population limited to what the environment can provide. Recently, improved health care and food trade set an end to these historic population limiting factors.

The growth of the population in the Middle East, especially in Israel and in Jordan, is creating unusual problems to the governments by increasing the water demand faster than in other regions where more water is available.

Although the situation is like this, population control is still ideologically and religiously controversial. Hence, birth control is not expected to be applied or advanced by the different governments who try to keep a favour under the population at least within this decade.

7) Agriculture has the greatest share in the consumption of water in the Middle East. The widespread irrigation using traditional methods is a very wasteful use of water. Also Syria's antiquated irrigation system, which loses 50 per cent of its water before it reaches the crops, is vastly by salts and fertilizers. What is a matter of urgency is the introduction of irrigation technology which uses smaller volumes of water. In effect this means the utilization of sprinkler systems and trickle and drip irrigation systems. These are expensive in terms of capital to introduce but water volumes used are greatly reduced.

8) Factors of ideology, nationalism, and recent decolonization prevent Middle East states from relinquishing food production and making themselves dependent on food-producing countries with plenty of water. For this reason minimal fees for irrigation levied by Middle East nations, however, do not recover even the costs of operation and maintenance. Israel, Egypt, Jordan, Syria, Tunisia, and Turkey are the only countries in the region that have instituted tariff systems for municipal and industrial water use.

9) Control over water resources has long been regarded by nation states as a vital security interest. This is especially true in the Middle East, where periodic droughts and rapidly growing populations have compounded the problems of scarcity in this largely arid region. As Cengiz Okman pointed out, "the fact causing water to be a factor of instability in the Middle East is the strategic nature of the region and the geographical position of the water."<sup>437</sup>

10) The existence of major political conflicts in the region, the general lack of trust between the various nation-states, the paucity of precedents for intra-regional cooperation to address common problems as well as other factors, constitute a framework within which regional problems are neither conceptualized nor dealt with on a regional basis. Regional plans, ideas taking the region as a basis or regional solutions have generally been offered by outside powers. One of them was the Johnston Plan of the USA about the Jordan Basin. However, the non-recognition of Israel by the Arab states prevented the full realization of the plan.

11) Although cooperation among the riparians is an essential prerequisite for all regional water development projects, such cooperation is very hard to achieve because it means tacit recognition of the legitimacy of various demands. A Syrian-Israeli water agreement would imply Syrian recognition of Israel; a Syrian-Turkish agreement concerning the Orontes River would imply Syrian recognition of Turkish sovereignty over the Hatay region.

12) Because of the conflicting relations of riparian states on the water, international monetary bodies cannot finance water development projects. Facing opposing Iraqi and Syrian demands, Turkey is not able to acquire enough money for the GAP, and is much behind schedule in terms of completing the project.

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<sup>437</sup> Cengiz Okman, "Su Sorunu ve Ortadoğu'da Stratejik Durum", in *Su Sorunu, Türkiye ve Ortadoğu*, (ed. Sabahattin Şen), İstanbul: Bağlam Yayınları, 1993, p. 419.

## 5.2. Proposals

The following items consist of proposals in the light of findings:

1) It is now becoming more clear that economy (family income and life cost), improved living standards and education are the only instruments which can in the next few decades lead to a birth control in the Middle East area. Also societal actions like health and social insurance which can give some guarantees to parents, instead of considering children as their only age security, may alleviate the problems of population growth.

2) The assessment of any project affecting an international river system flow must take into account, inter alia, the relevant population growth and expected need of irrigated land as well as the possible alternatives by rainfed and other sources.<sup>438</sup> Also to maximize the irrigation potential of these basins, many engineering decisions are required, especially regarding the number of dams to be built, of what dimensions, and where.

3) For water efficiency in the Middle East, the Middle Eastern states must give up their food-security policy in agriculture. As Tevfik Okyayüz pointed out:

*The Arabs must their unproductive quest for self-sufficiency in all areas. If every country were self-sufficient, there would be total stagnation, as well as commerce would halt. Interdependence is necessary part of the real world. Let the country who does each function and produces each product the best do it. Then there will be a cooperative exchange of goods to the benefit of everyone.*<sup>439</sup>

4) If advanced technologies are used, the extraction and utilization of water can go up to 80 per cent of the available resources, which would make the per capita annual obtainable share of the Middle East inhabitants by the year 2000 amounts to 800 cum/yr.

Here Israel shows the way: doubling its yield for half the water. It achieved this partly through new methods (drip irrigation and sprinkler systems), partly through changing the crops to be grown, switching from everyday stuff to high-value flowers or vegetables grown under glass.

5) Also waste water is promising, a cheap resource that is almost always truly wasted. A lot of domestic water that is wasted could be saved with better plumbing. Huge

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<sup>438</sup> Hafner, *op. cit.*, p. 12.

<sup>439</sup> Frankel, *op. cit.*, p. 292.

amounts of municipal water, more than half the supply in some cities, is lost either because it is stolen or because it trickles away through leaks in the pipes.

6) Solar power could be applied to other water technologies. In the field of water treatment, researchers have been successful in harnessing solar energy to enhance water-reuse processes. The abundance of solar energy in the Middle East makes it an attractive energy source for regional water facilities, even though many currently available technologies employing solar energy are more expensive than those using oil.

7) For a real breakthrough in the management of the rivers, it is need a single unified body, with legal teeth and the power to enforce its decisions, competent to deal with all aspects of river use. Also a temporary secretariat should be formed to draft an ecological treaty between riparian states, as which was done in the Danube basin.

8) The Middle East states must begin to apply sustainable development of water resources.<sup>440</sup> This could prove success in preserving the quality and the quantity of the waters of the rivers, paving way to prevent the conflicts arising from arguments on the quality of water, as Syria did in the case of Birecik Dam.

### 5.3. Conclusion

As Gün Kut pointed out, "water disputes in the region constitute only one aspect of an otherwise interrelated set of ethnic, religious, economic, strategic, and political conundrum which characterizes the Middle East."<sup>441</sup> All issues are interrelated and that the problems of water resources in the region cannot be tackled independently from other issues. Only through advancement in these issues, can progress be achieved with respect to a solution to water resources problems.

Whereas, on the basis of this state of affairs nothing would prevent all riparian states of Middle East for looking to more far-reaching forms of cooperation with a view of reaching through concerted efforts on optimal utilization of the scarce resources of the entire watercourse systems of the region.

<sup>440</sup> For detailed explanation about the sustainable water management, see Semra Cerit, *Sürdürülebilir Kalkınma Yönetimi*, (Unpublished M.A. Thesis), Malatya: İnönü Üniversitesi, 1994, pp. 95-123.

<sup>441</sup> Kut, "Burning Waters: The Hydropolitics of the Euphrates and Tigris", p. 2.

A prerequisite to have water as an element for peace and security in the Middle East is the creation of mutual understanding regarding the exigencies and needs of the people, and mutual confidence.

As Asit K. Biswas pointed out,

*The root of the English word rival is from the Latin term rivalis, which originally meant using the same stream (rivus). But as the world becomes more interconnected, countries sharing the same river should no longer consider each other as rivals. ... For the future welfare of mankind, the waters of international watercourses should be used optimally for the benefit of the people of all the concerned countries.<sup>442</sup>*

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<sup>442</sup> Biswas, "Management of International Water Resources", pp. 202-203.

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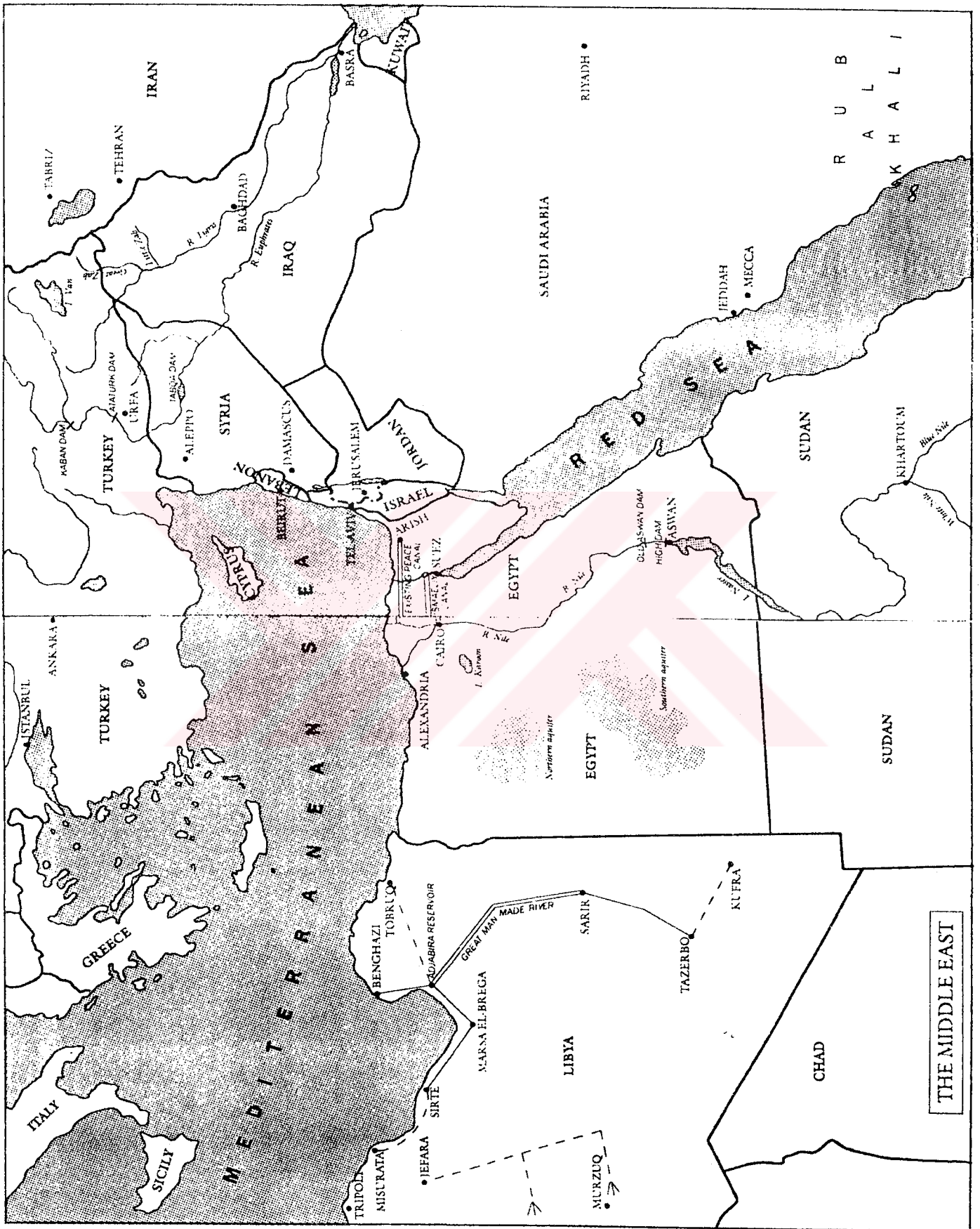
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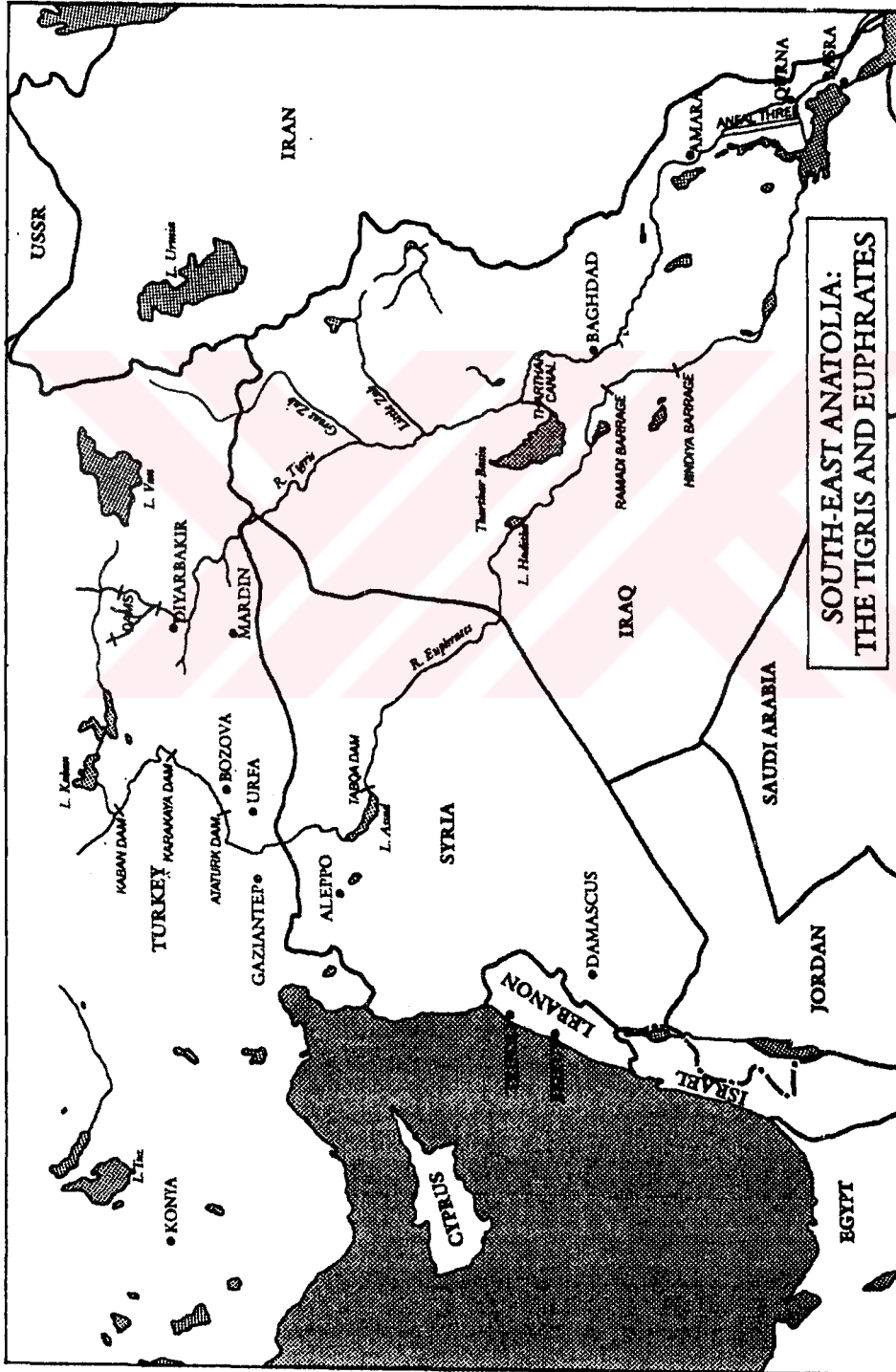




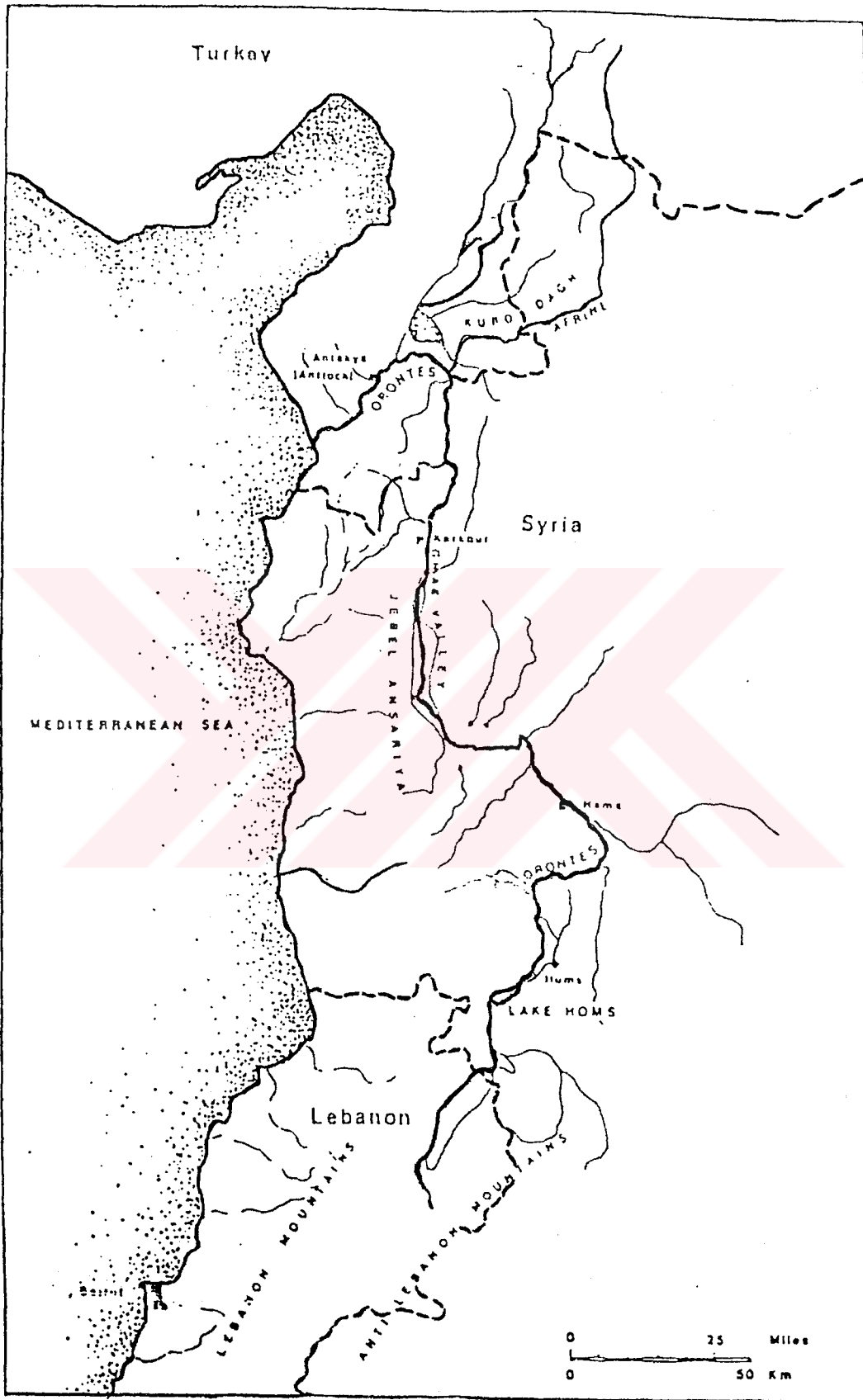
## APPENDICES

Appendix A: Maps

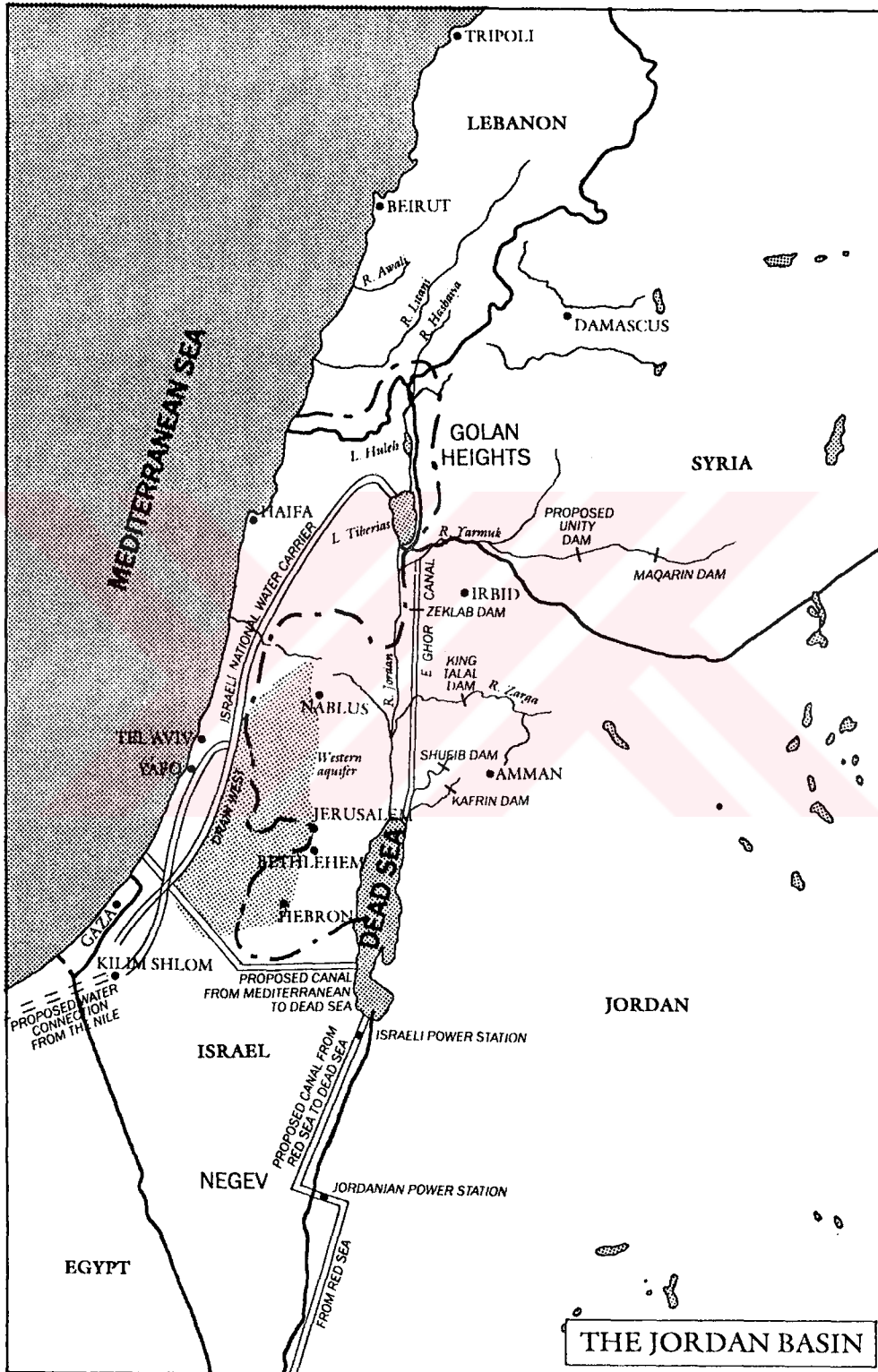




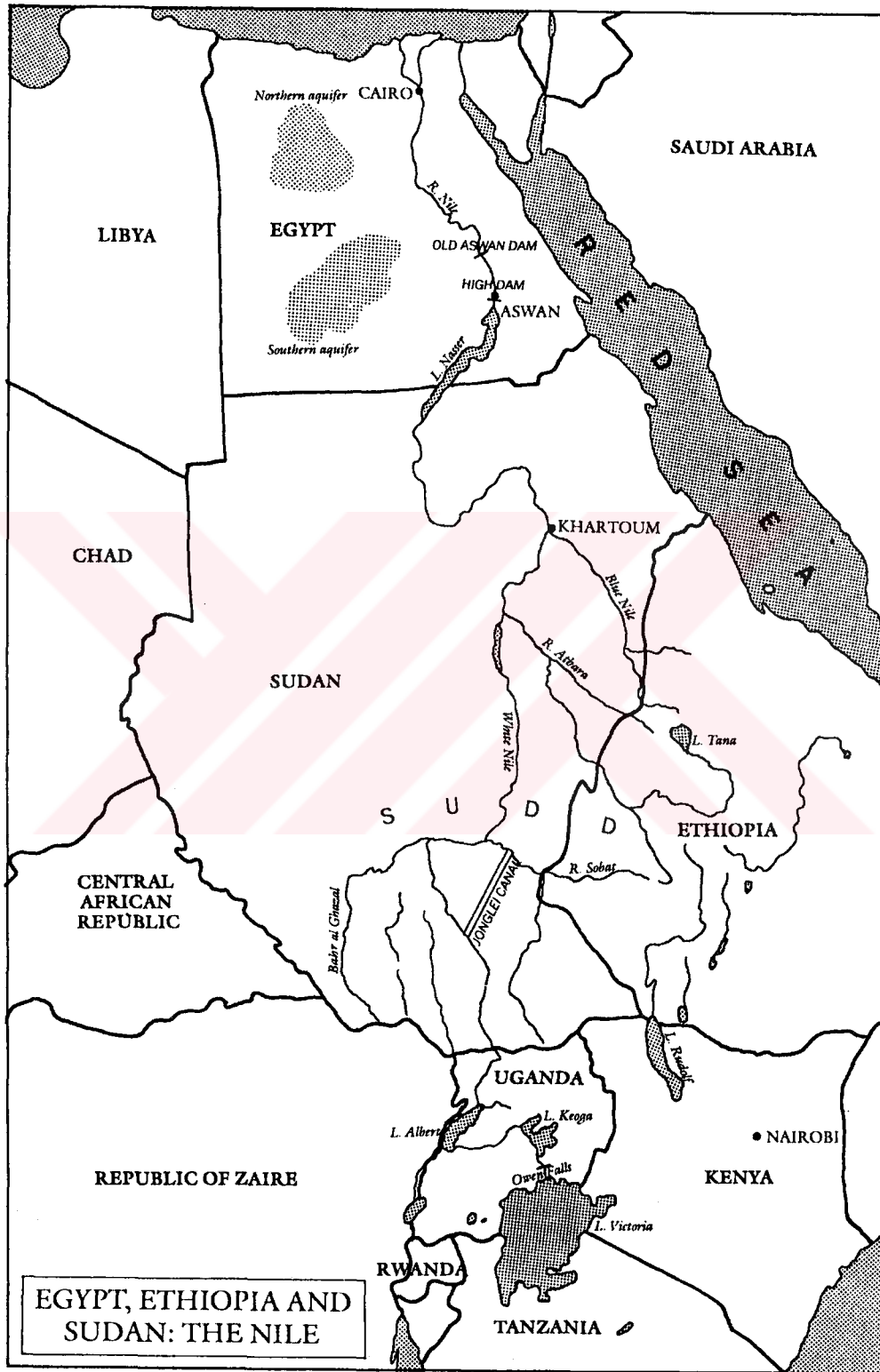




Orontes River



THE JORDAN BASIN



**Appendix B: Main Water - Related Agreements on the International Watercourses in  
the Middle East**

**Nile**

April 15, 1891	U.K.- Italy	Demarcation of spheres of influence in East Africa
May 15, 1902	U.K.- Ethiopia	Irrigation works on the Blue Nile
May 9, 1906	U.K.- Congo	Protecting level of the Lake Albert (upper White Nile)
December 13, 1906	U.K.- France - Italy	Safeguarding British and Egyptian interests in the Nile basin
May 7, 1929	U.K. (Sudan) - Egypt	Nile Waters Agreement
November 23, 1934	U.K. (Tanzania) - Belgium (Rwanda, Burundi)	Kagera River Agreement
May 1949	U.K. (Uganda, Kenya, Tanzania) - Egypt	Owen Falls Agreement
November 8, 1959	Egypt - Sudan	Nile Waters Agreement

**Euphrates-Tigris**

December 23, 1920	U.K.- France	Agreement on utilization of Euphrates and Tigris
March 29, 1946	Turkey - Iraq	Treaty of Friendship and Good Neighbourliness
July 6, 1987	Turkey - Syria	Protocol on Economic Cooperation

**Jordan**

February 3, 1922	U.K.- France	Agreement on the utilization of the Yarmouk River
June 4, 1953	Jordan - Syria	Agreement on the utilization of the Yarmouk River
September 3, 1987	Jordan - Syria	Agreement on the utilization of the Yarmouk River

Source: Natasha Beschorner, "Water and Instability in the Middle East", *Adelphi Papers*, No. 273, London: The International Institute for Strategic Studies, Winter 1992, p. 76.

Appendix C: The Helsinki Rules of the International Law Association on the Uses of  
the Waters of International Waters (1966)

THE HELSINKI RULES ON THE USES OF THE WATERS OF  
INTERNATIONAL RIVERS <sup>a/</sup>  
CHAPTER 1. GENERAL

Article I

The general rules of international law as set forth in these chapters are applicable to the use of the waters of an international drainage basin except as may be provided otherwise by convention, agreement or binding custom among the basin States.

Article II

An international drainage basin is a geographical area extending over two or more States determined by the watershed limits of the system of waters, including surface and underground waters, flowing into a common terminus.

Article III

A "basin State" is a State the territory of which includes a portion of an international drainage basin.

CHAPTER 2. EQUITABLE UTILIZATION OF THE WATERS OF  
AN INTERNATIONAL DRAINAGE BASIN

Article IV

Each basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin.

Article V

1. What is a reasonable and equitable share within the meaning of article IV to be determined in the light of all the relevant factors in each particular case.

2. Relevant factors which are to be considered include, but are not limited to:

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a/ Adopted by the International Law Association at the fifty-second conference, held at Helsinki in August 1966. Report of the Committee on the Uses of the Waters of International Rivers (London, International Law Association, 1967).

- (a) The geography of the basin, including in particular the extent of the drainage area in the territory of each basin State;
- (b) The hydrology of the basin, including in particular the contribution of water by each basin State;
- (c) The climate affecting the basin;
- (d) The past utilization of the waters of the basin, including in particular existing utilization;
- (e) The economic and social needs of each basin State;
- (f) The population dependent on the waters of the basin in each basin State;
- (g) The comparative costs of alternative means of satisfying the economic and social needs of each basin State;
- (h) The availability of other resources;
- (i) The avoidance of unnecessary waste in the utilization of waters of the basin;
- (j) The practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and
- (k) The degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.

3. The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

#### Article VI

A use or category of uses is not entitled to any inherent preference over any other use or category of uses.

#### Article VII

A basin State may not be denied the present reasonable use of the waters of an international drainage basin to reserve for a co-basin State a future use of such waters.

### Article VIII

1. An existing reasonable use may continue in operation unless the factors justifying its continuance are outweighed by other factors leading to the conclusion that it be modified or terminated so as to accommodate a competing incompatible use.
2. (a) A use that is in fact operational is deemed to have been an existing use from the time of the initiation of construction directly related to the use or, where such construction is not required, the undertaking of comparable acts of actual implementation.  
  
(b) Such a use continues to be an existing use until such time as it is discontinued with the intention that it be abandoned.
3. A use will not be deemed an existing use if at the time of becoming operational it is incompatible with an already existing reasonable use.

## CHAPTER 3. POLLUTION

### Article IX

As used in this chapter, the term "water pollution" refers to any detrimental change resulting from human conduct in the natural composition, content, or quality of the waters of an international drainage basin.

### Article X

1. Consistent with the principle of equitable utilization of the waters of an international drainage basin, a State:
  - (a) Must prevent any new form of water pollution or any increase in the degree of existing water pollution in an international drainage basin which would cause substantial injury in the territory of a co-basin State;
  - (b) Should take all reasonable measures to abate existing water pollution in an international drainage basin to such an extent that no substantial damage is caused in the territory of a co-basin State.
2. The rule stated in paragraph 1 of this article applies to water pollution originating:
  - (a) Within a territory of the State, or
  - (b) Outside the territory of the State, if it is caused by the State's conduct.

### Article XI

1. In the case of a violation of the rule stated in paragraph 1 (a) of article X of this chapter, the State responsible shall be required to cease the wrongful conduct and compensate the injured co-basin State for the injury that has been caused to it.

2. In a case falling under the rule stated in paragraph 1 (b) of article X, if a State fails to take reasonable measures, it shall be required promptly to enter into negotiations with the injured State with a view towards reaching a settlement equitable under the circumstances.

### CHAPTER 4. NAVIGATION (Articles XII-XX)

### CHAPTER 5. TIMBER FLOATING (Articles XXI-XXV)

### CHAPTER 6. PROCEDURES FOR THE PREVENTION AND SETTLEMENT OF DISPUTES

#### Article XXVI

This chapter relates to procedures for the prevention and settlement of international disputes as to the legal rights or other interests of basin States and of other States in the waters of an international drainage basin.

#### Article XXVII

Consistently with the Charter of the United Nations, States are under an obligation to settle international disputes as to their legal rights or other interests by peaceful means in such a manner that international peace and security and justice are not endangered.

It is recommended that States resort progressively to the means of prevention and settlement of disputes stipulated in articles XXIX to XXXIV of this chapter.

#### Article XXVIII

1. States are under a primary obligation to resort to means of prevention and settlement of disputes stipulated in the applicable treaties binding upon them.

2. States are limited to the means of prevention and settlement of disputes stipulated in treaties binding upon them only to the extent provided by the applicable treaties.



Article XXIX

1. With a view to preventing disputes from arising between basin States as to their legal rights or other interest, it is recommended that each basin State furnish relevant and reasonably available information to the other basin States concerning the waters of a drainage basin within its territory and its use of, and activities with respect to, such waters.

2. A State, regardless of its location in a drainage basin, should in particular furnish to any other basin State, the interests of which may be substantially affected, notice of any proposed construction or installation which would alter the regime of the basin in a way which might give rise to a dispute as defined in article XXVI. The notice should include such essential facts as will permit the recipient to make an assessment of the probable effect of the proposed alteration.

3. A State providing the notice referred to in paragraph 2 of this article should afford the recipient a reasonable period of time to make an assessment of the probable effect of the proposed construction or installation and to submit its views thereon to the State furnishing the notice.

4. If a State has failed to give the notice referred to in paragraph 2 of this article, the alteration by the State in the regime of the drainage basin shall not be given the weight normally accorded to temporal priority in use in the event of a determination of what is a reasonable and equitable share of the waters of the basin.

Article XXX

In case of a dispute between States as to their legal rights or other interests, as defined in article XXVI, they should seek a solution by negotiation..

Article XXXI

1. If a question or dispute arises which relates to the present or future utilization of the waters of an international drainage basin, it is recommended that the basin States refer the question or dispute to a joint agency and that they request the agency to survey the international drainage basin and to formulate plans or recommendations for the fullest and most efficient use thereof in the interests of all such States.

2. It is recommended that the joint agency be instructed to submit reports on all matters within its competence to the appropriate authorities of the member States concerned.

3. It is recommended that the member States of the joint agency in appropriate cases invite non-basin States which by treaty enjoy a right in the use of the waters of an international drainage basin to associate themselves with the

work of the joint agency or that they be permitted to appear before the agency.

#### Article XXXII

If a question or a dispute is one which is considered by the States concerned to be incapable of resolution in the manner set forth in article XXXI, it is recommended that they seek the good offices, or jointly request the mediation of a third State, of a qualified international organization or of a qualified person.

#### Article XXXIII

1. If the States concerned have not been able to resolve their dispute through negotiation or have been unable to agree on the measures described in articles XXXI and XXXII, it is recommended that they form a commission of inquiry or an ad hoc conciliation commission, which shall endeavor to find a solution, likely to be accepted by the States concerned, of any dispute as to their legal rights.

2. It is recommended that the conciliation commission be constituted in the manner set forth in the annex.

#### Article XXXIV

It is recommended that the States concerned agree to submit their legal disputes to an ad hoc arbitral tribunal, to a permanent arbitral tribunal or to the International Court of Justice if:

- (a) A commission has not been formed as provided in article XXXIII, or
- (b) The commission has not been able to find a solution to be recommended, or
- (c) A solution recommended has not been accepted by the States concerned, and
- (d) An agreement has not been otherwise arrived at.

#### Article XXXV

It is recommended that in the event of arbitration the States concerned have recourse to the Model Rules on Arbitral Procedure prepared by the International Law Commission of the United Nations at its tenth session b/in 1958.

Article XXXVI

Recourse to arbitration implies the undertaking by the States concerned to consider the award to be given as final and to submit in good faith to its execution.

Article XXXVII

The means of settlement referred to in the preceding articles of this chapter are without prejudice to the utilization of means of settlement recommended to, or required of, members of regional arrangements or agencies and of other international organizations.



Appendix D: Complementary Rules Applicable to International Water Resources (1986)

COMPLEMENTARY RULES APPLICABLE TO  
INTERNATIONAL RESOURCES, 1986

(Adopted by the International Law Association at the Sixty-Second Conference Held at Seoul in 1986)

Article I

Substantial injury

A basin State shall refrain from and prevent acts or omissions within its territory that will cause substantial injury to any co-basin State, provided that the application of the principle of equitable utilization as set forth in Article IV of the Helsinki Rules does not justify an exception in a particular case. Such an exception shall be determined in accordance with Article V of the Helsinki Rules.

Article II

Measures within the territory of other basin states

If an undertaking, to be executed by a basin State, requires works or installations within the territory of a co-basin State, or the utilization of water resources in that territory, all questions connected with these measures are to be determined by agreement. The States concerned shall use their best endeavors to reach a just and reasonable agreement in accordance with the principle of equitable utilization.

Article III

Notification and objection

1. When a basin State proposes to undertake, or to permit the undertaking of, a project that may substantially affect the interests of any co-basin State, it shall give such State or States notice of the project. The notice shall include information, data and specifications adequate for assessment of the effects of the project.

2. After having received the notice required by paragraph 1, a basin State shall have a reasonable period of time, which shall be not less than six months, to evaluate the project and to communicate its reasoned objection to the proposing State. During that period the proposing State shall not proceed with the project.

3. If a basin State does not object to the project within the time permitted under paragraph 2, the proposing State may

proceed with the project in accordance with the notice.

If a basin State objects to the project, the States concerned shall make every effort expeditiously to settle the matter consistent with the procedures set forth in Chapter 6 of the Helsinki Rules. The proposing State shall not proceed with the project while these efforts are continuing provided that they are not unduly protracted. If these efforts become unduly protracted, or an objecting State has refused to have resort to third party procedures for settlement of the remaining differences, the proposing State may, on its own responsibility, proceed with the project in accordance with the notice.

The notice and other communications referred to in this Article shall be transmitted through appropriate official channels unless otherwise agreed.

#### THE SEOUL RULES ON INTERNATIONAL GROUNDWATERS, 1986

(Adopted by the International Law Association at the Sixty-Second Conference Held at Seoul in 1986)

##### Article I

##### The waters of international aquifers

The waters of an aquifer that is intersected by the boundary between two or more States are international groundwaters if such an aquifer with its waters forms an international basin or part thereof. Those states are basin States within the meaning of the Helsinki Rules whether or not the aquifer and its waters form surface waters part of a hydraulic system flowing into a common terminus.

##### Article II

##### Hydraulic interdependence

1. An aquifer that contributes water to, or receives water from, surface waters of an international basin constitutes part of an international basin for the purposes of the Helsinki Rules.
2. An aquifer intersected by the boundary between two or more States that does not contribute water to, or receive water from, surface waters of an international drainage basin constitutes an international drainage basin for the purposes of the Helsinki Rules.
3. Basin states, in exercising their rights and performing their duties under international law, shall take into account any interdependence of the groundwater and other waters including any interconnections between aquifers, and any leaching into aquifers caused by activities and areas under their jurisdiction.

### Article III

#### Protection of Groundwater

1. Basin states shall prevent or abate the pollution of international groundwaters in accordance with international law applicable to existing, new, increased and highly dangerous pollution. Special consideration shall be given to the long-term effects of the pollution of groundwater.

2. Basin states shall consult and exchange relevant available information and data at the request of any one of them.

(a) for the purpose of preserving the groundwaters of the basin from degradation and protecting from impairment the geologic structure of the aquifers, including recharge areas;

(b) for the purpose of considering joint or parallel quality standards and environmental protection measures applicable to international groundwaters and their aquifers.

3. Basin states shall cooperate, at the request of any one of them, for the purpose of collecting and analyzing additional needed information and data pertinent to the international groundwaters or their aquifers.

### Article IV

#### Groundwater management and surface waters

Basin states should consider the integrated management, including conjunctive use with surface waters, of their international groundwaters at the request of any one of them.

Appendix E: United Nations Draft Articles on the Law of the Non-Navigational Uses  
of International Watercourses (1994)

UNITED NATIONS

(DRAFT ARTICLES ON THE LAW OF THE NON-NAVIGATIONAL USES OF  
INTERNATIONAL WATERCOURSES ADOPTED ON SECOND READING BY THE  
INTERNATIONAL LAW COMMISSION AT ITS FORTY-SIXTH SESSION)

2 May - 22 July 1994

Part I

INTRODUCTION

Article 1

Scope of the present articles

1. The present articles apply to uses of international watercourses and of their waters for purposes other than navigation and to measures of conservation and management related to the uses of those watercourses and their waters.
2. The use of international watercourses for navigation is not within the scope of the present articles except in so far as other uses affect navigation or are affected by navigation.

Article 2

Use of terms

For the purposes of the present articles:

- (a) "international watercourse" means a watercourse, parts of which are situated in different States;
- (b) "watercourse" means a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus;
- (c) "watercourse State" means a State in whose territory part of an international watercourse is situated.

Article 3

Watercourse agreements

1. Watercourse States may enter into one or more agreements,

hereinafter referred to as "watercourse agreements", which apply and adjust the provisions of the present articles to the characteristics and uses of a particular international watercourse or part thereof.

2. Where a watercourse agreement is concluded between two or more watercourse States, it shall define the waters to which it applies. Such an agreement may be entered into with respect to an entire international watercourse or with respect to any part thereof or a particular project, programme or use, provided that the agreement does not adversely affect, to a significant extent, the use by one or more other watercourse States of the waters of the watercourse.

3. Where a watercourse State considers that adjustment or application of the provisions of the present articles is required because of the characteristics and uses of a particular international watercourse, watercourse States shall consult with a view to negotiating in good faith for the purpose of concluding a watercourse agreement or agreements.

#### Article 4

##### Parties to watercourse agreements

1. Every watercourse State is entitled to participate in the negotiation of and to become a party to any watercourse agreement that applies to the entire international watercourse, as well as to participate in any relevant consultations.

2. A watercourse State whose use of an international watercourse may be affected to a significant extent by the implementation of a proposed watercourse agreement that applies only to a part of the watercourse or to a particular project, programme or use is entitled to participate in consultations on, and in the negotiation of, such an agreement, to the extent that its use is thereby affected, and to become a party thereto.

#### Article 5

##### Equitable and reasonable utilization and participation

1. Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal utilization thereof and benefits therefrom consistent with adequate protection of the watercourse.

2. Watercourse States shall participate in the use, development



and protection of an international watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to cooperate in the protection and development thereof, as provided in the present articles.

#### Article 6

##### Factors relevant to equitable and reasonable utilization

1. Utilization of an international watercourse in an equitable and reasonable manner within the meaning of article 5 requires taking into account all relevant factors and circumstances, including:

(a) geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character;

(b) the social and economic needs of the watercourse States concerned;

(c) the population dependent on the watercourse in each watercourse State;

(d) the effects of the use or uses of the watercourse in one watercourse State on other watercourse States;

(e) existing and potential uses of the watercourse;

(f) conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect;

(g) the availability of alternatives, of corresponding value, to a particular planned or existing use.

2. In the application of article 5 or paragraph 1 of this article, watercourse States concerned shall, when the need arises, enter into consultations in a spirit of cooperation.

#### Article 7

##### Obligation not to cause significant harm

1. Watercourse States shall exercise due diligence to utilize an international watercourse in such a way as not to cause significant harm to other watercourse States.

2. Where, despite the exercise of due diligence, significant harm is caused to another watercourse State, the State whose use causes the harm shall, in the absence of agreement to such use, consult with the State suffering such harm over:

(a) the extent to which such use is equitable and reasonable taking into account the factors listed in article 6;

(b) the question of ad hoc adjustments to its utilization, designed to eliminate or mitigate any such harm caused and, where appropriate, the question of compensation.

### Article 8

#### General obligation to cooperate

Watercourse States shall cooperate on the basis of sovereign equality, territorial integrity and mutual benefit in order to attain optimal utilization and adequate protection of an international watercourse.

### Article 9

#### Regular exchange of data and information

1. Pursuant to article 8, watercourse States shall on a regular basis exchange readily available data and information on the condition of the watercourse, in particular that of a hydrological, meteorological, hydrogeological and ecological nature, as well as related forecasts.

2. If a watercourse State is requested by another watercourse State to provide data or information that is not readily available, it shall employ its best efforts to comply with the request but may condition its compliance upon payment by the requesting State of the reasonable costs of collecting and, where appropriate, processing such data or information.

3. Watercourse States shall employ their best efforts to collect and, where appropriate, to process data and information in a manner which facilitates its utilization by the other watercourse States to which it is communicated.

### Article 10

#### Relationship between uses

1. In the absence of agreement or custom to the contrary, no use of an international watercourse enjoys inherent priority over other uses.

2. In the event of a conflict between uses of an international watercourse, it shall be resolved with reference to the principles and factors set out in articles 5 to 7, with special regard being given to the requirements of vital human needs.

## Article 11

### Information concerning planned measures

Watercourse States shall exchange information and consult each other on the possible effects of planned measures on the condition of an international watercourse.

## Article 12

### Notification concerning planned measures with possible adverse effects

Before a watercourse State implements or permits the implementation of planned measures which may have a significant adverse effect upon other watercourse States, it shall provide those States with timely notification thereof. Such notification shall be accompanied by available technical data and information in order to enable the notified States to evaluate the possible effects of the planned measures.

## Article 13

### Period of reply to notification

Unless otherwise agreed:

(a) a watercourse State providing a notification under article 12 shall allow the notified States a period of six months within which to study and evaluate the possible effects of the planned measures and to communicate their findings to it;

(b) this period shall, at the request of a notified State for which the evaluation of the planned measure poses special difficulty, be extended for a period not exceeding six months.

## Article 14

### Obligations of the notifying State during the period for reply

During the period referred to in article 13, the notifying State shall cooperate with the notified States by providing them, on request, with any additional data and information that is available and necessary for an accurate evaluation, and shall not implement or permit the implementation of the planned measures without the consent of the notified States.

## Article 15

### Reply to notification

1. The notified States shall communicate their findings to the notifying State as early as possible.
2. If a notified State finds that implementation of the planned measures would be inconsistent with the provisions of articles 5 or 7, it shall communicate this finding to the notifying State within the period applicable pursuant to article 13, together with a documented explanation setting forth the reasons for the finding.

## Article 16

### Absence of reply to notification

1. If, within the period applicable pursuant to article 13, the notifying State receives no communication under paragraph 2 of article 15, it may, subject to its obligations under articles 5 and 7, proceed with the implementation of the planned measures, in accordance with the notification and any other data and information provided to the notified States.
2. Any claim to compensation by a notified State which has failed to reply may be offset by the costs incurred by the notifying State for action undertaken after the expiration of the time for a reply which would not have been undertaken if the notified State had objected within the period applicable pursuant to article 13.

## Article 17

### Consultations and negotiations concerning planned measures

1. If a communication is made under paragraph 2 of article 15, the notifying State and the State making the communication shall enter into consultations and, if necessary, negotiations with a view to arriving at an equitable resolution of the situation.
2. The consultations and negotiations shall be conducted on the basis that each State must in good faith pay reasonable regard to the rights and legitimate interests of the other State.
3. During the course of the consultations and negotiations, the notifying State shall, if so requested by the notified State at the time it makes the communication, refrain from implementing or permitting the implementation of the planned measures for a period not exceeding six months.

## Article 18

### Procedures in the absence of notification

1. If a watercourse State has serious reason to believe that another watercourse State is planning measures that may have a significant adverse effect upon it, the former State may request the latter to apply the provisions of article 12. The request shall be accompanied by a documented explanation setting forth its reasons.
2. In the event that the State planning the measures nevertheless finds that it is not under an obligation to provide a notification under article 12, it shall so inform the other State, providing a documented explanation setting forth the reasons for such finding. If this finding does not satisfy the other State, the two States shall, at the request of that other State, promptly enter into consultations and negotiations in the manner indicated in paragraphs 1 and 2 of article 17.
3. During the course of the consultations and negotiations, the State planning the measures shall, if so requested by the other State at the time it requests the initiation of consultations and negotiations, refrain from implementing or permitting the implementation of those measures for a period not exceeding six months.

## Article 19

### Urgent implementation of planned measures

1. In the event that the implementation of planned measures is of the utmost urgency in order to protect public health, public safety or other equally important interests, the State planning the measures may, subject to articles 5 and 7, immediately proceed to implementation, notwithstanding the provisions of article 14 and paragraph 3 of article 17.
2. In such cases, a formal declaration of the urgency of the measures shall be communicated to the other watercourse States referred to in article 12 together with the relevant data and information.
3. The State planning the measures shall, at the request of any of the States referred to in paragraph 2, promptly enter into consultations and negotiations with it in the manner indicated in paragraphs 1 and 2 of article 17.

## Article 20

### Protection and preservation of ecosystems

Watercourse States shall, individually or jointly, protect and preserve the ecosystems of international watercourses.

## Article 21

### Prevention, reduction and control of pollution

1. For the purposes of this article, "pollution of an international watercourse" means any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct.

2. Watercourse States shall, individually or jointly, prevent, reduce and control pollution of an international watercourse that may cause significant harm to other watercourse States or to 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 watercourse. Watercourse States shall take steps to harmonize their policies in this connection.

3. Watercourse States shall, at the request of any of them, consult with a view to establishing lists of substances, the introduction of which into the waters of an international watercourse is to be prohibited, limited, investigated or monitored.

## Article 22

### Introduction of alien or new species

Watercourse States shall take all measures necessary to prevent the introduction of species, alien or new, into an international watercourse which may have effects detrimental to the ecosystem of the watercourse resulting in significant harm to other watercourse States.

## Article 23

### Protection and preservation of the marine environment

Watercourse States shall, individually or jointly, take all measures with respect to an international watercourse that are necessary to protect and preserve the marine environment, including estuaries, taking into account generally accepted international rules and standards.

## Article 24

### Management

Watercourse States shall, at the request of any of them, enter into consultations concerning the management of an international watercourse, which may include the establishment of a joint management mechanism.

2. For the purposes of this article, "management" refers, in particular, to:

(a) planning the sustainable development of an international watercourse and providing for the implementation of any plans adopted; and

(b) otherwise promoting rational and optimal utilization, protection and control of the watercourse.

#### Article 25

##### Regulation

1. Watercourse States shall cooperate, where appropriate, to respond to needs or opportunities for regulation of the flow of the waters of an international watercourse.

2. Unless otherwise agreed, watercourse States shall participate on an equitable basis in the construction and maintenance or defrayal of the costs of such regulation works as they may have agreed to undertake.

3. For the purposes of this article, "regulation" means the use of hydraulic works or any other continuing measure to alter, vary or otherwise control the flow of the waters of an international watercourse.

#### Article 26

##### Installations

1. Watercourse States shall, within their respective territories, employ their best efforts to maintain and protect installations, facilities and other works related to an international watercourse.

2. Watercourse States shall, at the request of any of them which has serious reason to believe that it may suffer significant adverse effects, enter into consultations with regard to:

(a) the safe operation or maintenance of installations, facilities or other works related to an international watercourse; or

(b) the protection of installations, facilities or other works from willful or negligent acts or the forces of nature.

## Article 27

### Prevention and mitigation of harmful conditions

Watercourse States shall, individually or jointly, take all appropriate measures to prevent or mitigate conditions that may be harmful to other watercourse States, whether resulting from natural causes or human conduct, such as flood or ice conditions, water-borne diseases, siltation, erosion, salt-water intrusion, drought or desertification.

## Article 28

### Emergency situations

1. For the purposes of this article, "emergency" means a situation that causes, or poses an imminent threat of causing, serious harm to watercourse States or other States and that results suddenly from natural causes, such as floods, the breaking up of ice, landslides or earthquakes, or from human conduct, such as industrial accidents.
2. A watercourse State shall, without delay and by the most expeditious means available, notify other potentially affected States and competent international organizations of any emergency originating within its territory.
3. A watercourse State within whose territory an emergency originates shall, in cooperation with potentially affected States and, where appropriate, competent international organizations, immediately take all practicable measures necessitated by the circumstances to prevent, mitigate and eliminate harmful effects of the emergency.
4. When necessary, watercourse States shall jointly develop contingency plans for responding to emergencies, in cooperation, where appropriate, with other potentially affected States and competent international organizations.

## Article 29

### International watercourses and installations in time of armed conflict

International watercourses and related installations, facilities and other works shall enjoy the protection accorded by the principles and rules of international law applicable in international and internal armed conflict and shall not be used in violation of those principles and rules.



### Article 30

#### Indirect procedures

In cases where there are serious obstacles to direct contacts between watercourse States, the States concerned shall fulfill their obligations of cooperation provided for in the present articles, including exchange of data and information, notification, communication, consultations and negotiations, through any indirect procedure accepted by them.

### Article 31

#### Date and information vital to national defense or security

Nothing in the present articles obliges a watercourse State to provide data or information vital to its national defense or security. Nevertheless, that State shall cooperate in good faith with the other watercourse States with a view to providing as much information as possible under the circumstances.

### Article 32

#### Non-discrimination

Unless the watercourse States concerned have agreed otherwise for the protection of the interests of persons, natural or juridical, who have suffered or are under a serious threat of suffering significant transboundary harm as a result of activities related to an international watercourse, a watercourse State shall not discriminate on the basis of nationality or residence or place where the injury occurred, in granting to such persons, in accordance with its legal system, access to judicial or other procedures, or a right to claim compensation or other relief in respect of significant harm caused by such activities carried on under its jurisdiction.

### Article 33

#### Settlement of disputes

In the absence of an applicable agreement between the watercourse States concerned, any watercourse dispute concerning a question of fact or the interpretation or application of the present articles shall be settled in accordance with the following provisions:

(a) If such a dispute arises, the States concerned shall expeditiously enter into consultations and negotiations with a view to arriving at equitable solutions of the dispute, making use, as appropriate, of any joint watercourse institutions that may have been established by them.

(b) If the States concerned have not arrived at a settlement of the disputes through consultations and negotiations, at any time after six months from date of the request for consultations and negotiations, they shall at the request of any of them have recourse to impartial fact-finding or, if agreed upon by the States concerned, mediation or conciliation.

## RESOLUTION ON TRANSBOUNDARY CONFINED GROUNDWATER

### The International Law Commission,

Having completed its consideration of the topic on the Law of the Non-Navigational Uses of International Watercourses,

Recognizing that confined groundwater, that is groundwater not related to an international watercourse, is also a natural resource of vital importance for sustaining life, health and the integrity of ecosystems,

Recognizing also the need for continuing efforts to elaborate rules pertaining to confined transboundary groundwater,

Considering its view that the principles contained in its draft articles on the Law of the Non-Navigational Uses of International Watercourses may be applied to transboundary confined groundwater;

1. Commends States to be guided by the principles contained in the draft articles on the Law of the Non-Navigational Uses of International Watercourses, where appropriate, in regulating transboundary groundwater;

2. Recommends States to consider entering into agreements with the other State or States in which the confined transboundary groundwater is located;

3. Recommends also that, in the event of any dispute involving transboundary confined groundwater, the States concerned should consider resolving such dispute in accordance with the provisions contained in article 33 of the draft articles, or in such other manner as may be agreed upon.

## BIOGRAPHY

I was born in 1968 in Razgrat - Bulgaria. I graduated from the primary school in 1979. I attended the secondary school between the years 1979-1982. Then, I attended to the technical school between the years 1982-1985. I entered the university exam in 1985 and I won the International Relations Department of the Faculty of Administrative and Economic Sciences of Marmara University. I graduated from here in 1990. I completed my military service between the years 1990-1992. I entered the International Relations Department of the Institute of Social Sciences of Marmara University. Presently, I am a student of the Intstitute and I work as a research assistant at the Faculty of Administrative and Economic Sciences of Adnan Menderes University.

