UNITED STATES MARINE CORPS

Semper Fidelis

16 June 98

Dr Kolars:

Here is updated version of paper. Thanks for all your help.

[redacted]

P.S.

We are still trying to find money to publish this. NDU press will do it with the money in hand.

Brian Shaw will continue in my absence.

Security Implications of the Southeast Anatolia Project

THE EUPHRATES TRIANGLE

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The Euphrates Triangle

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May 1, 1998

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I. INTRODUCTION AND EXECUTIVE SUMMARY:

For more than 4,000 years, lands irrigated by the Tigris and the Euphrates have been the scene of violent conflict. History has been shaped by geography and in particular, access to water. The Southeast Anatolia Project in Turkey (referred to as the "GAP", from the Turkish words Guneydogu Anadolu Projesi) is a major reclamation and hydropower project that has been a government priority since 1961. When complete, the project will consist of twenty-one dams, and irrigate an additional 1.7 million hectares of land in southeast Turkey. The GAP has direct consequences for Iraq and Syria, both countries are heavily dependent on the waters of the Tigris and the Euphrates. The impact of the GAP could ultimately reduce the flow of fresh water to Syria and to Iraq (Kolars and Mitchell 1991). These transboundary water issues have the potential to further de-stabilize an already tense region as the GAP is approaches full development in the next twenty years.

In a 1988 article in *US News and World Report*, author R.Z. Chesnoff described a frightening scenario:

> November 12, 1993. War erupted throughout the Middle East today in a desperate struggle for dwindling water supplies. Iraqi forces, attempting to smash a Syrian blockade, launched massive attacks on the Euphrates River valley. Syria answered with missile attacks on Baghdad. (Chesnoff 1988)

The scenario depicted by Mr. Chesnoff has not occurred, some ten years after the dire prediction. But the security conditions in the Tigris-Euphrates Basin are unstable, and the potential for "water wars" is still present. Resource scarcity is an important factor in any security analysis, and the realm of environmental security is subject to renewed debate in the US. (Butts, 1997)

This paper will explore the relationship between regional security and the river environment of the Tigris-Euphrates Basin. The focus will be on Turkey, because a review of Turkish history, politics, and military capability is central to an understanding of the security issues concerning the GAP. This will be a three-part analysis looking at the causes of regional instability:

1. First, a review of historical patterns of water use in the region, agriculture, and development of hydroelectric power. This will include a description of the GAP in terms of geography, engineering, power capacity, and irrigation potential.
2. Next, the security relationship between Turkey and its neighbors, Syria and Iraq

will be analyzed. This will include the balance of power and the recent history in terms of bilateral relationships. There will be a description of the current state of Turkish politics and Turkey's special role in the NATO alliance in view of its strategic position. The question of Kurdish nationalism will be considered and the relation of the conflict to regional water issues.

3. The final part of the analysis will consider the regional security implications of the current Turkish policy and proposed action in completion of the GAP. Part of this will be a review of the international law that applies to transboundary water use. The report will conclude with recommendations for US/NATO policy and technical initiatives with a goal of avoiding future conflict.

Relationships and external issues in the Tigris and the Euphrates Basin are substantially defined by water. While the Euphrates River connects all three riparian states, political and historic relationships remain bilateral. These three bilateral relationships form a triangle that is linked by the river. The Euphrates connects these bilateral relationships into a series of conflicts and rivalries. They can be visualized in the following way.

Bilateral Relationship	***Principle Characterizing Issue***
Turkey/Iraq	Oil vs. Water
Iraq/Syria	Regional Ascendancy
Turkey/Syria	State Response To Regional Insurgencies

While in many ways oversimplifications, these relationships form the basic framework for any potential water-management regime.

Issues between Turkey and Iraq are centered on the concept that water and oil are resources distributed by God (Allah) and this distribution reflects endowment. Turkey sees Iraq's demands in terms of a regional *quid pro quo* of oil for water. If Iraq is willing to provide equivalent resources of oil, water can be provided in return. The basic principle of the Harmon Doctrine where the upstream riparian owns the water and controls its distribution (Lowi, 1993) is often cited by Turkey. Iraq claims Prior Appropriation rights to historical use of the Euphrates and sees no ties whatsoever with oil resources.

Issues between Iraq and Syria are historical competitions over regional strength and authority. Both political systems and leaders are striving to represent a Middle East agenda. The 1975 escalation and tensions over the reduction of the Euphrates flow devolved to a Syria – Iraq conflict that reflected a struggle for power and control much more than over the water itself. While Turkey controlled a significant part of the flow quantity, Turkey was noticeably absent from the conflict.

Finally, Syria has been an active supporter of several insurgency groups directed at the destabilization of the Turkish state. Most visible and successful of these groups, the PKK has had Syrian shelter and support for many years. The tensions over Kurdish nationalism and Turkish sovereignty dominate the relationships between Turkey and Syria. Arab and Israeli issues dominate the regional relationships and provide an impediment to an agreement on water. In the region of the Euphrates River and the GAP project, support of destabilizing elements dominates the relationship.

Security in the Tigris Euphrates Basin is complex, and a casual analysis often raises more questions than it answers. During the author's travel through the region in the summer of 1997 a lack of reliable data was apparent. The parties have taken dramatically different positions on water questions. At the conclusion of this paper there will be an attempt to answer six critical questions:

1. When will the GAP be fully developed, and when will it begin to take a toll of downstream neighbors? As part of this question, will the GAP, as designed and fully constructed, cause a downstream water shortage during normal use or under conditions of drought?

2. What is Turkey's real ability to use the GAP as an instrument of foreign policy? Can the flow of water leaving Turkey be manipulated? If so, how quickly and what impact will it have on hydropower generation and irrigation systems in the region? Under what conditions might the Turks take this action?

3. What is the potential for an agreement on allocation of the waters of the Tigris and Euphrates? Will international law provide guidance or assistance in reaching an agreement?

4. Instability analysis: What is the potential for Iraq and Syria to use the GAP as a *cause celebre* or *causus belli?* What is the likelihood of these countries to develop a united front towards Turkey? Would Iraq or Syria act unilaterally? In other words, what is the potential for conflict? Militarily, what is the likely outcome of a conflict?

5. What are the alternative scenarios for regional tension and instability over water, looking ahead to the year 2010? Considering all the factors cited above, what is the most probable scenario in 2010?

6. What should be the direction of US foreign policy in support of peace in the region, and a basin wide water allocation arrangement?

II. GEOGRAPHY AND HISTORY:

History has been said to begin in the Tigris-Euphrates Basin. Some believe it to be the location of the original Garden of Eden, the ancient Cradle of Civilization in the Middle East. The Tigris and the Euphrates are born in modern Turkey, in the highlands where rain and snow are plentiful. The Euphrates is longer than the Tigris, and flows through Syria and Iraq to the head of the Gulf where it joins the Tigris as the Shat-Al-Arab. The Tigris has a greater total volume and flows directly from Turkey to Iraq, where it obtains additional flows from the Zagros Mountains of Iran. (Figure1).

The Tigris and the Euphrates lie in a transition zone between humid continental and desert climates. Like the Nile, they are "exotic rivers" that derive their waters from outside the region through which they flow. The source of the Tigris/Euphrates system is in the highlands of Eastern Anatolia (modern central Turkey) which receives large amounts of rain and snow. Most of the downstream region (modern Syria and Iraq) receives insufficient rainfall to sustain rain-fed agriculture, but the rivers convey surplus water to zones of deficit. Farming first developed in the more humid zones but then moved to river valleys in the arid zone where crops could be grown under cultivation with the benefit of irrigation.

As early as the fourth millennium B.C. agricultural settlements and basic irrigation networks were part of the Mesopotamian landscape (Hillel 1994). The Sumerians and Babylonians used the water of the Euphrates, and documents from the time of Hammurabi the Babylonian lawgiver refer to maintenance of the irrigation systems. The Bible provides early history of conflict over water in the "land of Canaan.". One of the first references is in Genesis 21, with Abraham reproaching Abimelech because of the well that Abimelech's servants had taken from Abraham's servants. There is also a description of the dispute over Isaac's wells (Genesis 21), and many of the names of wells in this region have been retained as place names in Israel today.

The early inhabitants of the region revered water. The springs of water seemed to be alive, and inspired divine and animistic associations. The Mesopotamians had a creation myth based upon a battle of the gods to create a firmament from the sea. The word for water in classical Persian (and the first word in the Persian dictionary) is *ab*. From that word came the words *abad* meaning abode and *abadan* meaning civilized.

Arab culture arose out of life in the desert, where competition over a limited

Fig 1

Middle East

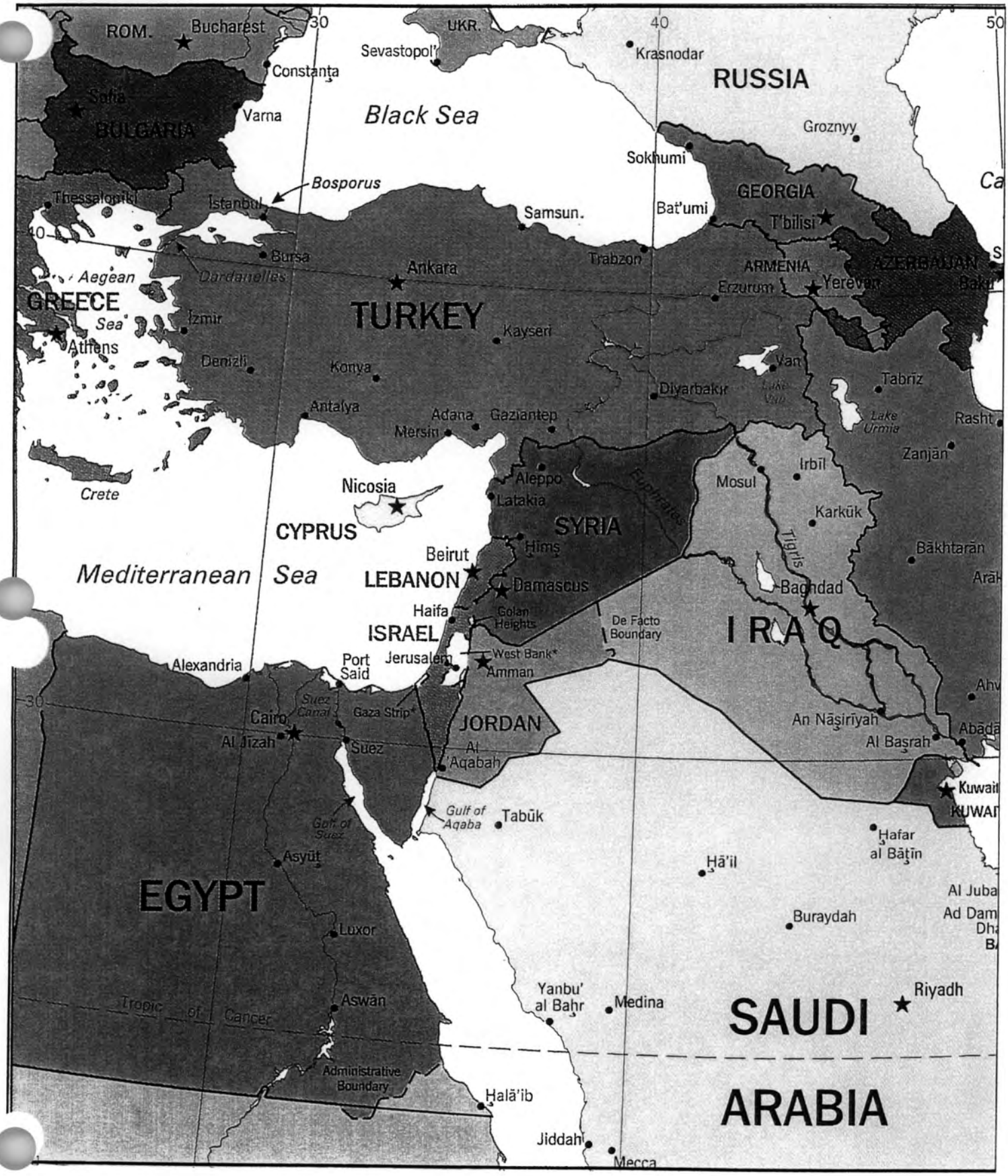


Fig. 1

resource is fundamental. Water is often associated with the myth of the amniotic fluid that nurtures life. Water is a major theme in the Koran, with numerous references to the words water, river, fountain, spring and cloud. The use of fresh water for ceremonial ablution and purification prior to prayer is essential to Muslim religious practice.

The early history of the basin included major environmental setbacks. Agricultural success was often followed by an insidious cycle that was probably unavoidable (Hillel 1994). This cycle consists of taking arid land, irrigating, and producing high yields, continued irrigation to maintain production leading to salination and degradation, which with further excess irrigation leads to infertile soils. This soil degradation was caused by silting, waterlogging and salination. The process was particularly apparent in southern Mesopotamia (modern Iraq) in the time of the ancient Sumerians and Babylonians. We owe much to these civilizations, the Sumerians invented writing and developed sailboats and wheeled vehicles, among many other accomplishments. However, the Sumerians brought about their own decline by causing the degradation of their soils. Deforestation and overgrazing caused increased runoff, resulting in a destabilization of riverbeds and clogging of irrigation works. A greater problem was salination, caused by the increased use of irrigation water and return flows into groundwater. The result is waterlogging, or the unnatural rising of the water table that will destroy crops in poorly drained lands. The loss of agricultural lands ultimately contributed to population movement and an overall decline in Sumerian civilization.

Much of the Euphrates irrigation system was destroyed during the Mongol invasion of the thirteenth century. In the following years the system was rendered useless by neglect, abandonment and the breakdown of central government administration. Large tracts of land that had been productive in antiquity returned to desert. By the nineteenth century, much of the neglected land had been reclaimed, due to government controls and rebuilding of irrigation works. This effort continues today with ambitious irrigation plans throughout the Tigris-Euphrates watershed. However poor drainage in modern Syria and Iraq has led to salination, thus continuing the cycle.

In the Twentieth Century, during the period of the British and French Mandates, there were consultative committees established over the use of the two rivers, but water use was not sufficiently competitive to raise the potential for conflict. France and Turkey signed a series of treaties between 1921 and 1926, but the terms were vague and neither party seemed intent on developing the waters of the two rivers. Iraq was the first of the three countries to seek development of the waters of the basin. Two treaties were developed between Iraq and Turkey, one in 1930 when Iraq was still under the British Mandate and another in 1946, after independence. Turkey consented to Iraq's construction of dams in Turkey to regulate the flow of the rivers in Iraq, but they were never built. Iraq might argue today that the effect of these treaties was Turkish acceptance of Iraq's vested right

to receive its established uses.

Water resources investigations in Southeastern Turkey were initiated with establishment of hydrometric stations on the Euphrates River in 1936 and the Tigris in 1947. In the following years topographical and hydrologic surveys were conducted. Reconnaissance studies were completed in 1958 and initial plans were developed for three dams on the lower Euphrates and five dams on the Tigris with a total irrigation area of 20,000 hectares. The State Hydraulic Works Department (DSI) prepared studies to assess the energy potential in 1963 and the first major dam (Keban) entered into operation in 1974. This was the beginning of a program that would come to be called the Southeastern Anatolia Project, with the Turkish Initials G.A.P (Guneydogu Anadolu Projesi) .

In the past ten years, the conflict related to oil in the Middle East has largely obscured a much older and more acute problem of resource scarcity. Although some countries in the Middle East are oil rich, they are all water poor and getting poorer. Water scarcity is compounded by serious environmental problems renewing the ancient cycle of deforestation, desertification, soil erosion, salination, and the contamination of water supplies. Increased water demands for hydropower and irrigation in the years ahead may reach crisis proportions without an allocation agreement between riparian nations. This is particularly true in the Tigris-Euphrates Basin where population growth and projected demands on the rivers will eventually exceed capacity.

III. GAP PROJECT DESCRIPTION

The Vision of the GAP

Turkey is divided into seven geographical regions. Of these, the poorest and least developed is the Southeast Anatolia region, which is composed of the provinces of Adiyaman, Gaziantep, Batman, Diyarbakir, Mardin, Siirt, and Sirnak. The heart of Southeast Anatolia is a uniformly stark and wild landscape, within which are nestled the teeming cities of Diyarbakir, Urfa, Gaziantep, and Mardin. Except for the western areas of the region, history and progress seem to have bypassed both the inhabitants and the land.

The Ottoman Turks were not noted for their economic abilities, and Ataturk's early constitutional republic, founded in 1923, was saddled with crippling debt and failed economic policies. Much like their Communist neighbors to the north, the early Turkish republicans choose to develop their country in economic and social terms with structured government programs. The first Turkish Five-Year Plan in 1934 was designed to set up light industry near the base areas of native raw materials. The second plan, in 1939, focused on heavy industry. In the 1950's, the government's

economic policies attempted to revive agriculture by bringing mechanization to Turkey. The results of these policies were generally successful in moving the primitive Turkish economy into the twentieth century. But, in practical terms, these economic and agricultural plans tended to develop the western areas of the country. And so, while Thrace, the Aegean areas, and the Anatolian heartland of Turkey gained much, the Southeast Anatolian region fell farther behind, as did the expectations and the hopes of the populace.

The Turkish government in Ankara was aware of what was happening in the rural Southeast, and the limited opportunities facing the inhabitants. The solution was a long-held dream dating back to the Ottoman Empire. In the 1930's, President Kemal Ataturk proposed the construction of series of dams with the idea of harnessing the mighty Tigris and Euphrates Rivers. Both of these rivers originated in the rugged mountains overshadowing Southeast Anatolia and poured millions of gallons of cold, clean water through the area. However, a lack of money combined with the rigid structure of the existing five-year plans made such a project seem impossible. Politicians periodically attempted to secure funds for development but failed in the face of more pressing economic priorities. It was not until the 1960's that the idea of developing these two rivers became politically viable.

By the second half of this century, Turkey was looking for sources of electrical power and at the same time was reaching the limits of agricultural development. The time had finally come to convert the Ottoman dream into a viable concept for development. The realization itself was the child of the longtime Turkish leader, Suleyman Demirel, a member of the intellectual elite of Turkey. Demirel was a university graduate who was trained as an engineer and who, in his early years, had worked on Turkey's hydroelectric dams. After entering politics, he maintained an active interest in Turkey's water projects. A born survivor, Demirel was perennially in the government, either as Prime Minister or as President, for more than forty years.

Ataturk's vision for the taming of the Tigris and Euphrates was uncomplicated and was predicated on a series of dams, which would produce hydroelectric power and unlimited water for irrigation. For fifty years, these dams were the central and immutable intellectual bedrock of the vision. Under Demirel's leadership, however, the transition from a limited scope hydroelectric project to a unified, multi-agency plan for regional and national development achieved its own identity. The modern vision, which is now inseparable with the name of Demirel, is more than just dams and irrigation ditches – the "GAP" symbolizes the hope of the future for Turkey.

The development of the Southeast Anatolia Project (GAP) represents the single issue with universal political appeal within Turkey. The GAP represents a source of great national pride; it is financed without the benefit of international financial organizations or the World Bank. This self-sufficiency leads to a heightened sense of national pride, a focus for the industrialization of the nation,

significant influence in the region and a great degree of independence of action and control over the project. The GAP is intended to bring industrialization and growth to a poor region of the country. It sends electricity to population centers and adds to the agricultural export base of Turkey. Not the least in importance, it provides hope to for the large Kurdish minority in that area. There is something in this vision for almost every citizen of Turkey. Thus, the GAP Project is a tremendous source of pride at almost every level of Turkish Society. During the author's travels to Ankara, Adana, and across Southeastern Anatolia in July of 1997, there were few negative comments. The attitude is best summarized by Ataturk's words emblazoned across the Ataturk Dam curtain in huge letters: *"Ne Mutlu Turkum Diyene,"* or "Lucky is the one who says he is a Turk".

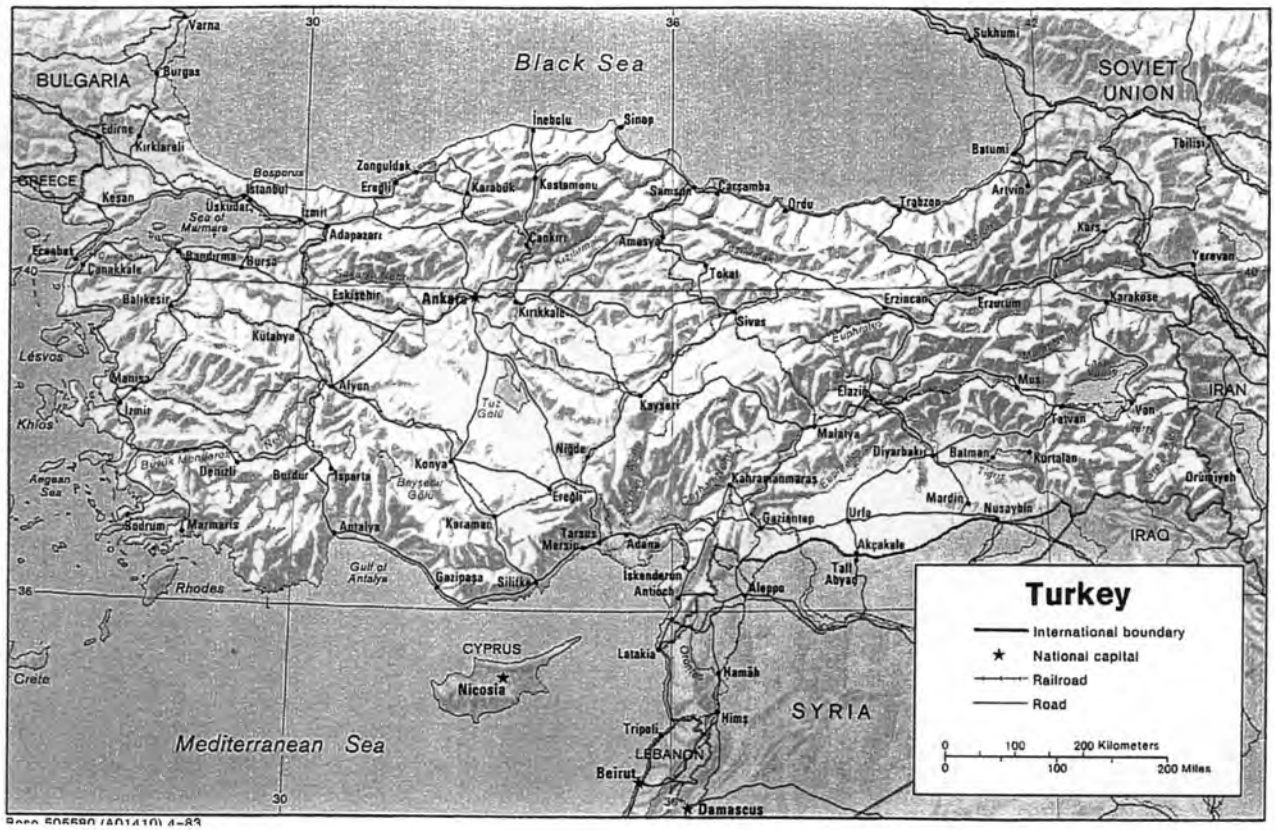
Scope of the Project

The GAP is a large scale and multi-sector regional development project with major implications for the region. It is one of the major river basin development projects in the world and the largest and most comprehensive project ever carried out in Turkey. The project is in Southeastern Turkey and includes eight provinces covering an area about the size of the State of Kentucky. The scale can be seen by viewing a map of Turkey superimposed over a map of the eastern US. (Figure 2). It covers an area corresponding to 10% of Turkey's total population as well as surface area (Pamphlet #1, 1996) The project area includes 41% of the total watershed of the Tigris and Euphrates River within Turkey, and when fully developed it will provide irrigation for 1.7 million hectares of land corresponding to 20% if the irrigable land in Turkey. The GAP Master Plan indicates the areas currently under development. (Fig. 3)

The GAP includes 13 major irrigation and hydropower schemes that involve the construction of 22 dams and 19 hydroelectric power plants on the Tigris and the Euphrates. The GAP will eventually double Turkey's hydroelectric capacity that existed in 1984 and the GAP complex is expected to generate 22 billion KWH. In July 1997 the GAP hydroelectric production was estimated to be about 90% of capacity, but the irrigation infrastructure was estimated to be less than 10% complete. The immediate economic benefit of power generation was a strong motivation to keep those aspects of the project on track. Because the GAP is internally financed, limits on financial aid for the irrigation projects required a scaling back of completion plans. A recent local newspaper report estimated that the GAP irrigation system could take another 70 years to complete.

Positions of the Three Euphrates Riparian Nations

While 28% of the Euphrates basin lies in Turkey, 17% in Syria and 40% in Iraq, approximately 89% of the Euphrates mainstream water originates in Turkey, Syria contributes 11% and Iraq, none. The consumption of Euphrates water is inversely proportional to contributions: Syria and Iraq are using 21% and 44%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BULGARIA
SOVIET UNION
GREECE
Mediterranean Sea
CYPRUS
SYRIA
LEBANON
IRAN
IRAQ
Varna
Burgas
Edirne
Kirklareli
Bosporus
Istanbul
Kesan
Uskudar
Sea of Marmara
Izmir
Adapazarı
Bandırma
Bursa
Çanakkale
Eceabat
Balıkesir
Eskişehir
Ankara
Kütahya
Lésvos
Manisa
Alyon
Izmir
Khios
Aegean Sea
Denizli
Bozdur
Isparta
Konya
Sodrum
Marmaris
Antalya
Kuramaz
Gulf of Antalya
Gazipaşa
Silifke
Rhodes
Crete
Nicosia
Latakia
Tripoli
Beirut
Damascus
Hamah
Hims
Aleppo
Tall Abyad
Akçakale
Urfa
Gaziantep
Adana
Tarsus
Mersin
İskenderun
Antioch
Niğde
Ereğli
Kayseri
Tuz Gölü
Beyşehir Gölü
Kırıkkale
Çankırı
Amasya
Tokat
Sivas
Erzincan
Erzurum
Karakose
Yerevan
Kars
Batumi
Tbilisi
Artvin
Trabzon
Ordu
Çarşamba
Samsun
Kastamonu
Karabük
Zonguldak
Ereğli
İnebolu
Sinop
Sukhumi
Elazig
Mus
Van
Tatvan
Malatya
Diyarbakır
Batman
Kurtalan
Mardin
Nusaybin
Kahramanmaras
Orumiyeh
Turkey
International boundary
National capital
Railroad
Road
0 100 200 Kilometers
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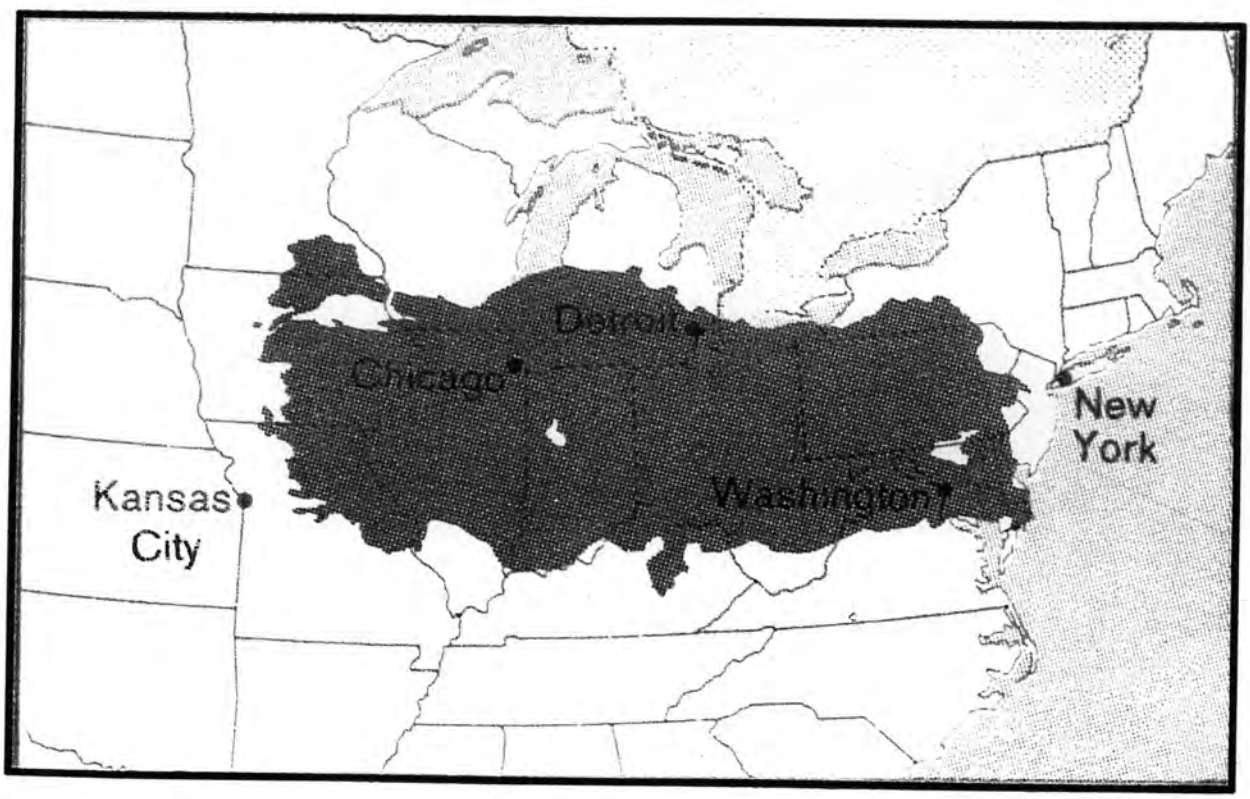

Detroit
Chicago
New York
Kansas City
Washington

Fig 2

GÜNEYDOĞU ANADOLU PROJESİ THE SOUTHEASTERN ANATOLIA PROJECT

GAP BÖLGE KALKINMA İDARESİ BAŞKANLIĞI
GAP REGIONAL DEVELOPMENT ADMINISTRATION
1/2.250.000

25 0 25 50 75

- National Border
- GAP Region Border
- Provincial Border
- Motorway Under Construction
- Projected Motorway
- State Highway
- Secondary Road
- Railway
- Projected Railway
- Province Centre
- District Centre
- Airport
- In Operation
- Under Construction
- In Planning and Final Plan Stage
- In Reconnaissance and Master Plan Stage
- Underground Water Irrigation
- Irrigation Canal
- Tunnel
- Pumping Station
- Diversion Dam
- Power Station

	ha (net)
CURRENT IRRIGATION	80010
Hacıhıdır Irrigation	2080
Silopi-Nerdüş Irrigation	2740
Besni-Keysun Irrigation	2400
Nusaybin Irrigation	7500
Devegeçidi Irrigation	7500
Silvan Irrigation	8790
Ceylanpınar Irrigation (İkicırcıp)	27000
Akçakale Irrigation	15000
Suruç Irrigation	7000

	ha (net)
IRRIGATION UNDER CONSTRUCTION	9142
Çınar-Göksu Irrigation	3582
Garzan-Kozluk Irrigation	3700
Derik-Dumluca Irrigation	1860

	ha (net)
THE LOWER EUPHRATES PROJECT	706281
A. Urfa-Harran Irrigation	141835
B. Mardin-Ceylanpınar Gravity Irrigation	185639
C. Mardin-Ceylanpınar Pumped Irrigation	149000
D. Siverek-Hilvan Pumped Irrigation	60105
E. Bozova Pumped Irrigation	69702
SURUÇ-BAZİKİ PROJECT	146500
ADIYAMAN-KAHTA PROJECT	77824
A. Çamgazi Irrigation	6536
B. Other Irrigation's	71288
ADIYAMAN-GÖKSU-ARABAN PROJECT	71598
GAZİANTEP PROJECT	89000
A. Hancağız Irrigation	7330
B. Kayacık Irrigation	13680
C. Kemlin Irrigation	1969
D. Other Irrigations	66021

	ha (net)
DİCLE-KRALKIZI PROJECT	126080
BATMAN PROJECT	37744
GARZAN PROJECT	60000
CİZRE PROJECT	121000
A. Silopi Irrigation	32000
B. Nusaybin-Cizre-İdil Pumped Irrigation	89000

Source : General Command of Maping 1/500.000 Scale Maps; DSİ's Dated 1.7.1994 GAP Development Plan

GENERAL COMMAND OF MAPPING 1995

14

Fig 3

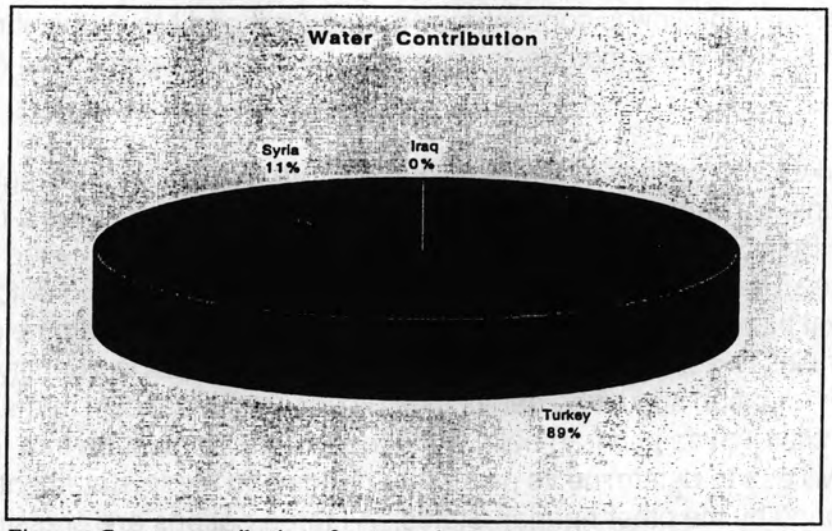


Figure 4 Country contribution of water to the Euphrates River

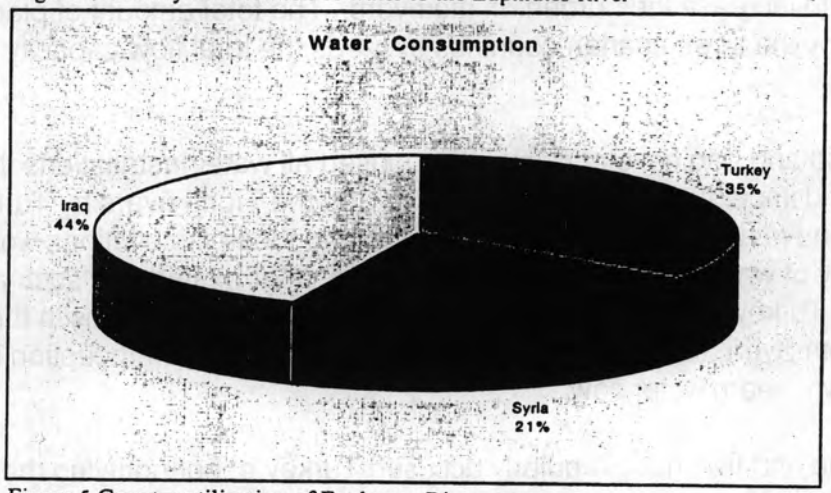


Figure 5 Country utilization of Euphrates River water

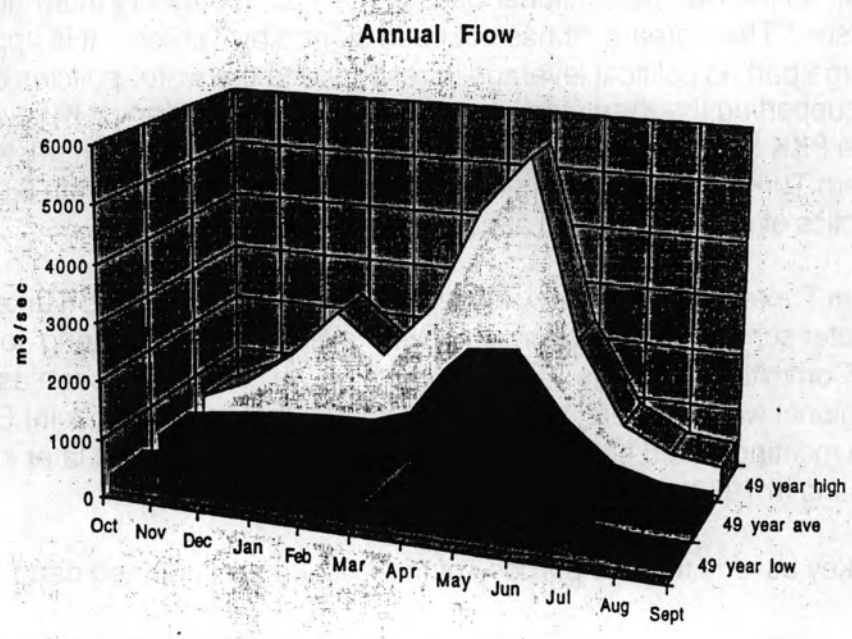


Figure 6 Seasonal variation of flow in the Euphrates River

respectively, with Turkey using only 35% (Figure 4 and 5). In addition, water flow is highly seasonal, the flow is concentrated during April and May. July through November are low water months, in dry years the river flow can all but cease (Figure 6).

Turkey approaches its water resources from a position of strength. It relies on a principle similar to the "Harmon Doctrine" which views water as a natural resource. Both Syria and Iraq argue that the amount of water released by Turkey is inadequate. They rely on claims of prior appropriation and seek to enforce the requirement that Turkey not do "significant harm" to its downstream neighbors. Turkey refuses to agree with this approach and argues that the quantity of the water needed for irrigation should be determined by applying identical criteria to all of the three countries. Syria and Iraq believe that each country must be free to choose the criteria it will use to determine its own water needs and these statements should not be questioned by the other riparian States. All three nations are pressing ahead with plans to increase the burden on the rivers. The total amount of planned water utilization by the three riparian countries exceeds the total flow capacity of the Euphrates.

Syria and Iraq have consistently opposed all water installations that had been planned and implemented on the Euphrates and the Tigris rivers by Turkey. Their objections have all focused on the perception that those installations would reduce the quantity of water flowing to their countries. A clear example of such attitudes can be seen in Turkey's construction of the Keban and Karakaya dams in the 1960s and 1970s. Both Syria and Iraq challenged the projects from their inception based on loss of downstream water flow.

Syria and Iraq have regularly accused Turkey of not notifying them in advance about the planned water installations in conformity with the proposed "Convention on the Non-navigational Uses of the Transboundary International Watercourses." This agreement has not been signed by Turkey. It is apparent that Syria, in large part as political leverage in response to the water policies of Ankara, has been supporting the Kurdistan Workers Party, (PKK) a Marxist Kurdish militant group. The PKK has conducted both terrorist and military actions in eastern and southeastern Turkey and according to Ankara, has claimed more than 6,000 lives through tactics of intimidation and attack on civilians.

From Turkey's point of view, all necessary data pertaining to Turkey's planned water schemes, have been conveyed to Syria and Iraq during Joint Technical Committee meetings. This mechanism, which was foreseen as a forum to discuss regional water matters, was set up with the Protocol of the Joint Economic Committee meetings, held between Turkey and Iraq in 1980. Syria later joined this group meeting in 1983.

Turkey asserts that the purpose of the existing and planned dams on the

Euphrates and the Tigris rivers is to contribute to its own energy and irrigation needs. These will also control the variance in water flows, avoid floods, and prevent surge conditions downstream. As mentioned before, the seasonal flow of these rivers fluctuates greatly ranging between 150-200 cubic meters per second (CMS) in summer months to spring surges reaching levels of 5000 CMS or more (Figure 6). Turkish dams on the Euphrates River are generally excellent water management installations due to their effective reservoirs, low evaporation losses and their geographical and topographic characteristics. The large fluctuations have been regulated by the construction of dams on the Euphrates River in Turkey. Turkey argues that this will benefit the downstream nations who will receive more consistent flow.

In 1987, during the filling of the lake behind the Ataturk Dam, Turkey agreed with Syria to provide a minimum of 500 cubic meters per second (CMS) at the point where the Euphrates enters Syria. This was designed to be a temporary measure only but has assumed greater importance in the absence of a comprehensive agreement concerning water allocation. Turkey has stated its commitment to providing the 500 CMS flow, and considerably more has been flowing for the past three years. (Figure 6)

In terms of water quality, no comprehensive study has ever been completed, and Turkey maintains that the GAP will have no significant environmental impact on the downstream neighbors. But there is great concern about water quality in the Arab countries, where the waters of the Tigris and Euphrates are considered the life blood. If the Arab countries have data to support their claims of deteriorating water quality, they have not made it available to interested parties outside the Arab world. This contributes to an atmosphere of charge and denial, with little hard evidence available to support the positions of either side.

IV. POLITICAL FACTORS

Regional Politics

The regional political climate of the riparian nations in the Tigris - Euphrates basin can only be described as complex. The area seems to act as a magnet for diverse forces of democracy, totalitarianism, religious fundamentalism and militarism. Additionally, the cast of important regional leaders runs an equally full gamut of diversity. The exploitation of natural resources is a matter of government policy, and there is little of what could be described as an environmental ethic. This volatile combination provides an obstacle to regional cooperation and dialogue. The main issues fostering the preservation of the current political climate of mistrust, doubt, and hate are:

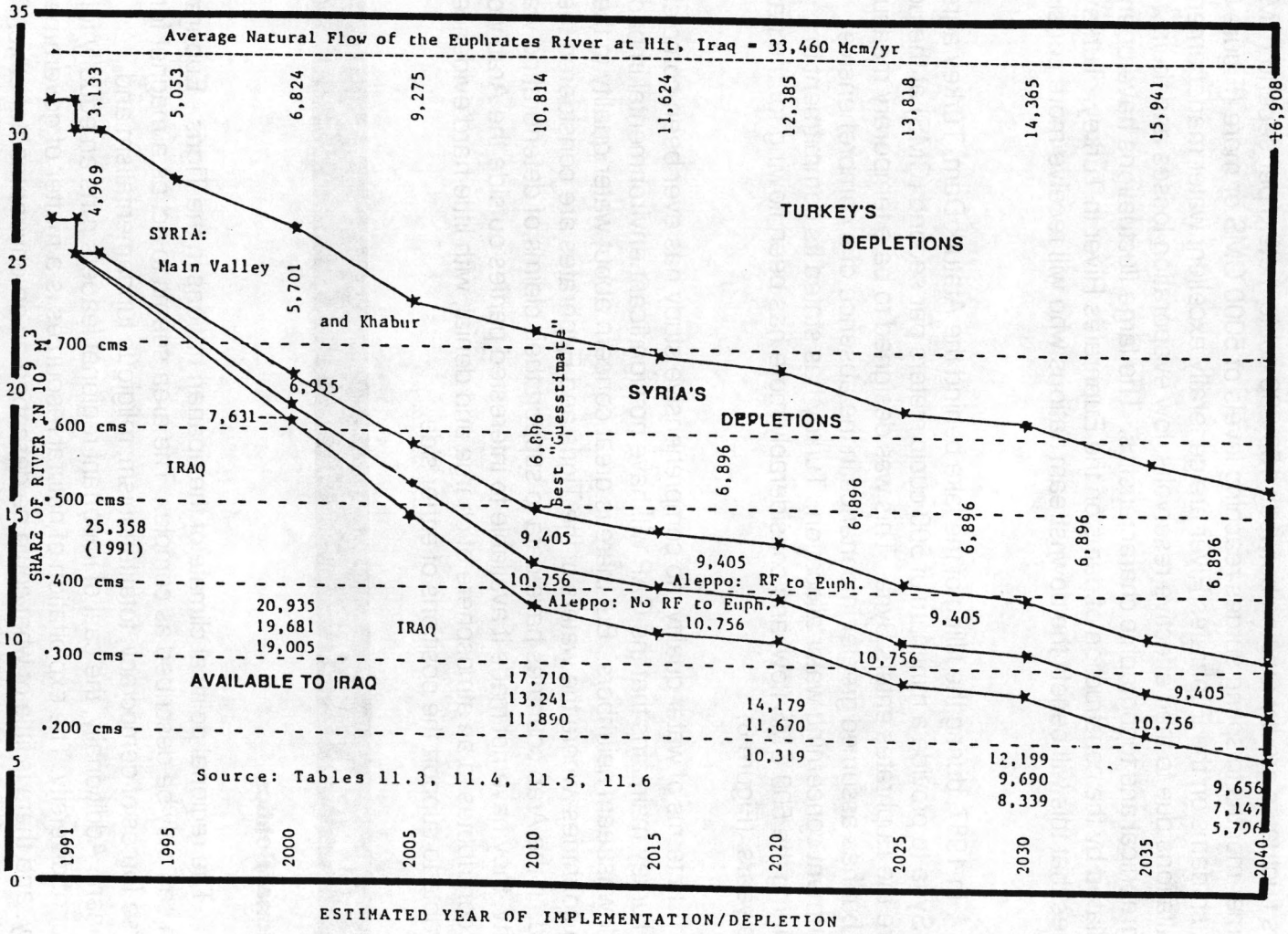

Average Natural Flow of the Euphrates River at Hit, Iraq = 33,460 Mcm/yr
3,133
5,053
6,824
9,275
10,814
11,624
12,385
13,818
14,365
15,941
16,908
4,969
SYRIA:
Main Valley
and Khabur
5,701
TURKEY'S
DEPLETIONS
700 cms
600 cms
500 cms
400 cms
300 cms
200 cms
SHARE OF RIVER IN 10^9 M^3
SYRIA'S
DEPLETIONS
6,955
7,631
IRAQ
25,358
(1991)
6,896
best "Guesstimate"
6,896
6,896
6,896
6,896
9,405
9,405
10,756
Aleppo: RF to Euph.
Aleppo: No RF to Euph.
10,756
9,405
10,756
9,405
10,756
20,935
19,681
19,005
IRAQ
AVAILABLE TO IRAQ
17,710
13,241
11,890
14,179
11,670
10,319
12,199
9,690
8,339
9,656
7,147
5,796
Source: Tables 11.3, 11.4, 11.5, 11.6
1991
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
ESTIMATED YEAR OF IMPLEMENTATION/DEPLETION

Fig. 7

1. The resilience and continued survival of Saddam Hussein's government in Iraq, which continues to act as a destabilizing influence in the region. The embargoed condition of the Iraqi state impedes economic development and
2. has a direct economic impact on Turkey. This particularly affects Southeastern Turkey through which vital petroleum flowed westward before the Gulf War. The Iraqi government continues to pit Kurd against Kurd in Northern Iraq and also to support the PKK. The active enforcement of the No-Fly Zone over Northern Iraq by the US is unpopular with some Turkish political parties.
3. The Syrian government's long-standing support for international terrorism and its quest for regional ascendancy, especially the provision of training and safe havens for the PKK, continues to affect regional security. While Turkey enjoys civil relations with Syria, support to the PKK overshadows all dialogue. Syria's recent military cooperation with Greece also complicates matters. While not directly linked to the Tigris and Euphrates water issue, the Mid-East Peace Process exercises a significant effect on the willingness of Syria to deal with western countries.
4. The membership of Turkey in NATO and Turkey's friendship with the United States continue to alienate her from her Arab neighbors. This alignment, combined with Turkey's geographic position and desire to gain entry into the European Union, serves notice on her Mid-East neighbors that Turkey is clearly in the European and Western camp. While the Refah Party seeks to change these positions, this is the most likely direction for Turkey in the near future.
5. Islamic fundamentalism is a factor that continues to affect the political climate in the region. The challenge of reactionary Islam to secular government cannot be ignored by any of the region's countries, including those governed by totalitarian regimes. Revival movements are growing in strength and stature and pose a challenge to modernization and cooperation.
6. The growing military strength of the countries in the region tends to destabilize the area. The continued quest by Syria, Iraq, and Iran for weapons of mass destruction, including nuclear and chemical weapons deliverable by intermediate range missiles, is deeply disturbing to countries of the region, particularly Israel.
7. The absence of an effective economic, political, or military regional framework of any kind works to obstruct dialogue. The isolation and restrictions imposed by both internal and external forces combines to make international solutions to regional problems difficult. Political progress and dialogue in many cases is conducted in a bilateral or trilateral forum.
8. While not directly affecting the Tigris-Euphrates Basin, the issues of Greece and Cyprus afflict almost every interaction between Turkey and her neighbors. The ever-present problem of the Aegean Sea territorial questions and that of the Turkish minority on Cyprus clouds the Turkish perception of the world and reciprocally taints the world view of Turkey. In September

1997, Turkey withdrew (for the first time in the history of the alliance) from the annual NATO Exercise Dynamic Mix 97 because of a disagreement on Greek participation in the exercise.

Turkish Politics

Turkey's heritage of secular democracy results from the reforms of Kemal Ataturk and enables Turkey to be an integral part of European and NATO affairs. The Turkish people vote in overwhelming numbers (approximately 70%) in favor of center or rightist parties that support pro-European positions and westernization. Since the death of Prime Minister Ozal, these parties have been in a state of disarray and internecine political strife makes them unable to form a workable coalition capable of effective government. This situation not only cripples progress but gives strength to the growing minority of Turks who desire to return to pre-Ataturk times of Islamic law and tradition. The recent fundamentalist government led by Prime Minister Erbakan of the Refah, or Welfare Party, attempted to move Turkey towards an easing of the restraints put on religion by the Ataturk constitution. The two moderate political leaders, Mrs. Tansu Ciller and Mr. Mesut Yilmaz, have long been at odds in the struggle for the reins of power and incapable of forming a coalition government which can successfully implement their agendas. Both 1996 and 1997 were marked by strong signals from the Turkish General Staff against the de-secularization of the Turkish state advocated by Mr. Erbakan. The Turkish General Staff regards itself as the guardian of the Turkish constitution and the continuation of the Turkish state as created by Ataturk.

In the spring of 1998, Turkey's 55th government is at the helm in Ankara, and is led by a minority coalition under Mesut Yilmaz. The Yilmaz government succeeds the government of Welfare Party Prime Minister Necmettin Erbakan, who unsuccessfully attempted to steer Turkey towards a return to traditional Islamic mores. A military coup by the Turkish General Staff was thought to have been narrowly avoided by the resignation of Prime Minister Erbakan.

Turkey is a republican parliamentary democracy, which has enjoyed civilian rule for the better part of this century. Most Turks are conservative, secular, and regard themselves as Europeans. Turkey's political parties reflect these beliefs accordingly. Almost all Turks believe in the fundamental strength of the Ataturk constitution and in the need for a strong military defense. The principal differences between parties relate to economic, social, and religious issues. ("Turkey" 1993) The principal parties active in the Turkish political process are:

1. The True Path Party, or DYP, led by the American-educated Tansu Ciller. The party inherits the intellectual concepts of Turgut Ozal, who led the country out the military coup of 1980. The DYP platform rests on private enterprise, the deregulation of the economy, a strong defense, the maintenance of excellent relations with the United States,

and on accession of Turkey into the European Union. In the mid-90's charges of corruption and mishandling of government funds have seriously weakened the effectiveness of the DYP.

2. The Motherland Party, or ANAP, under Prime Minister Mesut Yilmaz, currently heads the Turkish government. A pro-western, pro-democratic party, which is closely akin to the DYP, the ANAP supports privatization of the economy, improved human rights, support for organized labor, and land reform. While supporting NATO, the ANAP also supports the development of ties to the Middle East and other Muslim nations.
3. The Social Democratic Populist Party, or SHP, is a left leaning party which supports a planned and controlled economy. This party also supports rural development and social projects. The SHP favors the maintenance of ties to NATO and the United States, and posits that Turkey's interests are inherently tied to Europe. In the left center of the spectrum is the Republican People's Party, or CHP, which sees foreign policy as inseparable from defense policies, and favors political reform.
4. The Welfare Party, or RP (Refah Party in the Turkish language), sometimes called the Prosperity Party, is increasingly the party of the jobless and poor, who wish for a return to precepts of Islamic law and state support for the Islamic religion. The RP supports collective working arrangements between employers and employees, the prioritization of rural and agricultural policies, gathering financial investment and support from other Muslim countries, developing an awareness of Turkey's Islamic heritage and culture, and government incentive plans for industry. The RP was closed by the Turkish Constitutional Court on January 16, 1998 and its leaders prohibited from engaging in politics for a period of five years.

Of significance to the Turkish military, most pro-western Turks, and to the United States and Europe, is the Welfare Party's public position on the role of Islam in government and the cultural fabric of society. Many in the West fear the establishment of an Islamic government akin to that of Revolutionary Iran. This is not necessarily the position of the RP. The RP would like Turkey to return to a condition of state support for Islam, and a return of the people to a more traditional recognition of Islamic values. The RP does not advocate the overthrow of the constitution, nor does it advocate the setting up of a fundamentalist Islamic republic. It does support an increase in Koranic schools, a reduction in European cultural influence, and state support for the Islamic clergy. The RP also favor the development of strong ties to Turkey's Islamic neighbors with Turkey fulfilling the leadership role. The future of the RP is now in doubt with the decision of the Constitutional Court to close the party. The legal basis of the decision was the RP opposition to the secular tenets of the Turkish Constitution. Action against the RP is sure to cause controversy and dissension in Turkey and former party members will not simply be content to join

other parties.

Iraq and Syria

Iraq is essentially a dictatorship and there is no practical opposition to the government of Saddam Hussein. Iraqi politics are dominated by Saddam Hussein and his Ba'thist regime, which represent the Sunni Muslim population of the country. Hussein's internal policies have been aimed at the suppression of the majority Shi'ah Muslim population and at the containment of Kurdish separatism. Eventually, Hussein seeks to regain complete control of the country and to reestablish Iraq as a regional power. In economic and political terms, the Baghdad regime aims at the continued survival of the state in the face of international sanctions and embargoes.

Because of the unpredictability and aggressiveness of Saddam Hussein, Iraq is classified by the United States as a "Rogue Regime." In response, the United States is identified by the regime as imperialist and anti-Iraq. This polarity makes diplomatic relations between the United States and Iraq problematic. Turkey, on the other hand, enjoys limited but practical relations with Iraq. This is based in large measure on the availability of Iraqi oil, badly needed by energy poor Turkey. The trend in relations between Turkey and Iraq seems to be moving towards the re-establishment of functional relationships.

Syria remains firmly in the hands of President Hafiz al-Asad and his Ba'thist Party. Traveling through Syria in July 1997 the Pictures of Asad and his sons were observed everywhere, and virtually every car has large posters of Assad on the back windshield. Asad is committed to responding to the Israeli challenge with Syria as the dominant leadership force in the Arab world. Syria actively supports Hizbollah and Palestinian attacks on Israel and in Lebanon. Asad's hard line positions have preoccupied United States diplomats for many years and have worked to obstruct the Mid-East Peace Process. Presenting a challenge to Israel continues to dominate Syrian politics. While Syria has somewhat strained relations with Turkey, interest in the northern frontier clearly takes a much lower priority in Syrian foreign policy.

It is important to note that Syria joined the 1991 coalition against Iraq and sent troops to fight in the liberation of Kuwait, reflecting the poor bilateral relations between the two countries. Asad and Saddam Hussein may be seen as competitors in the struggle for regional ascendancy and leadership on the Arab world. There are reported to be deep personal animosities between the two. It is doubtful that this level of conflict will change in the near future, not before there is a change in the current regimes.

The Role of the Turkish Military in Turkish Society

The role of the Turkish military in Turkish society cannot be overemphasized.

All Turkish men serve an obligatory period of national service, the duration of which may last up to eighteen months. This aspect of Turkish life, coupled with highly visible military garrisons in all Turkish cities and towns serves to reinforce the Turkish consciousness with a constant awareness of the nation's military forces. The Turkish military is a part of mainstream Turkish life and society in a way that is unique among the member states of the NATO Alliance. Likewise, the importance of the role of the military in Turkey's government cannot be overstated, and simply put:

> *"The mission of the Turkish Armed Forces is to defend and to protect the Turkish land and the Turkish Republic, the characteristics of which are defined in the constitution, against all internal and external threats."* ("Turkey" 1993)

This broad-based mission is derived from the section of the Turkish constitution on national defense. Any internal or external threat to the Turkish Republic falls within the interest and with the authority of the military.

The most powerful man in Turkey is the Chief of the Turkish General Staff. Although the President of the Turkish Republic is nominally the Commander-in-Chief of the armed forces, in practicality this role falls to the Chief of the Turkish General Staff. The Chief of the Turkish General Staff is ranked third on the official protocol list in Ankara, directly behind the President and the Prime Minister, and the civilian Minister of Defense is ranked a lowly thirteenth. Unlike his American counterpart, the Turkish Chief of the General Staff directly commands the nation's land, sea, and air forces, as well as the General Command of the Gendarmerie. Turkey has a Ministry of Defense, but this office fills a procurement and fiscal function rather than exercises oversight over structural, operational, or strategic matters.

The Turkish General Staff (TGS) exercises enormous influence over Turkish foreign policy, especially in areas affecting sovereignty or territorial rights issues. Cases in point are the Aegean Sea disputes and Cyprus, which directly reflect TGS military positions. There is almost no doubt that the TGS would influence any future riparian agreement regarding the Tigris and Euphrates Rivers. All Turkish governments are dependent upon the good will of the military and especially on the TGS interpretation of that government's execution of its constitutional responsibilities. During the course of the Turkish Republic, there have been three military coups after which the control of the government has been returned to civilian control. The recent demise of the Erbakan government bears testimony to the seriousness of the Turkish military's faithfulness to its mission to safeguard both the republic and the constitution.

V. ECONOMIC FACTORS:

Economic Potential of the GAP for Turkey

While the GAP is primarily a regional plan, in its secondary and tertiary effects, the GAP is designed to contribute to the solution of many of Turkey's problems. The project has both near-term, as well as long-term rewards, some of which will not be realized until well into the next century. According to the GAP Action Plan, there are six objectives:

1. To revive regional economies, while speeding up land development and agricultural expansion, in order to increase employment,
2. To prioritize completion of infrastructure projects in major cities designed to improve the quality of life and infrastructure with a view towards attracting industry and investment,
3. To build the infrastructure necessary to support the agricultural industry, including small scale industrial projects,
4. To improve the physical capabilities of education and public health facilities and services,
5. To improve main transportation arteries from east to west, including regional roads and airport development,
6. To extend maximum support to control erosion, and enhance forestry and pasture improvement works.

For the people in the Southeast Anatolia region, completion of the GAP means direct employment opportunities for up to 200,000 persons, the irrigation of huge areas of cropland, clean drinking water, modern schools and hospitals, a new university, an international airport, and a vastly improved infrastructure of roads, railways, and electrical grid. This process will occur over an extended time and in incremental steps. It is a proposed long-term solution to regional problems. In the near-term, the area shows evidence of a bustling and developing economy as money pours into the building of the complex of dams, hydroelectric plants, and regional population centers of Turkey.

For the larger question of the benefits to Turkey as a whole, the GAP offers a great deal of potential good. First, the project will eventually provide as much as 25% of Turkey's hydroelectric power. This is an important cornerstone for the continued development of Turkey's industrial base and is a critical consideration for the energy poor country. Second, Turkey is poised on the brink of becoming a major regional economic power, and the development of the Southeast Anatolia region potentially forms a conduit to markets in the Mid-East. This conduit has obvious value, if in the future, relations with Iraq, Iran, and Syria normalize. Third, because the GAP is a planned endeavor, the agriculture corps and industrial plants being established in the region should compliment, rather than compete with, the rest of

the Turkish economy. Optimally, this self-balances an economy, which is geographically and structurally concentrated in restricted areas. Finally, enlarged opportunities in the region may alleviate or halt the flow of the rural poor from the region to the already dangerously overcrowded cities in the western parts.

Turkey and the European Union

As Turkey enters the final years of the Twentieth Century, its aspirations for a place in the queue lining up for European Union accession appear almost dead. Recent European dissatisfaction with Turkish human rights violations, political repression, and the continuing PKK rebellion continues to provide the EU with enough reasons to keep Turkey at arms length. Regardless of the validity of these issues, they will continue to be used as reasons to deny Turkey even a conditional or associate member status in the economic architecture of the new Europe. Recent pronouncements from Rauf Denktas promising the union the Turkish Republic of Northern Cyprus with Turkey, should the internationally recognized Southern Cypriot state gain EU accession, add fuel to the fire and complexity to the problem. This overall situation is not likely to change in Turkey's favor in the reasonably foreseeable future. In spite of this, Turkey remains committed to greater economic ties with Europe.

The question must surely be asked whether Turkey's alignment towards the United States, or towards any other country for that matter, will shift as a result of repeated EU rejections. As a matter of official policy and practicality, probably not, since Turkey's security concerns would remain largely independent from military linkage to the EU (in its present non-military form). As long as the United States and NATO continue to pour military assistance into Turkey's military machine, without very many restrictions attached, Turkey will likely maintain its current friendly posture towards the US and the west. It is unlikely that EU rejection will force Turkey towards any major change in its present security posture or its present security strategy.

Although many Turkish politicians have tied their parties to the EU wagon, failure to gain EU accession will not result in a failed Turkish economy. Many of the economic reforms put into place to support the EU entry criteria will ultimately work to Turkey's advantage by enhancing the privatization and self-sufficiency of the Turkish economy. While non-accession to the EU will limit and slow Turkish economic development, it can neither halt it nor cripple it. With or without the EU, Turkey will create a stable modern market oriented economy which will prosper regionally. After saying for fifteen years how important EU accession is to Turkish economic development, the real difficulty now will be for the politicians to explain what sacrifices Turkey must endure to compensate for non-accession. Since the government will want to minimize and delay the harmful consequences of

non-accession, there may be increased opportunities for American involvement in future projects. Whether or not there will be increased US opportunities for political influence on the Turkish government remains problematic.

Syrian Economy

In 1990-93 Syria's state-dominated economy benefited from the Gulf war, increased oil production, good weather, and economic deregulation. Economic growth averaged about 10% per year. The Gulf war provided Syria an aid windfall of nearly $5 billion dollars from Arab, European, and Japanese donors. However, the benefits of the 1990-93 boom were not evenly distributed and the gap between rich and poor is widening. A nationwide financial scandal and increasing inflation were accompanied by a decline in GDP growth to 4% in 1994. For the long run, Syria's economy is saddled with a large number of poorly performing public sector firms, and industrial productivity remains low. Oil production is likely to fall off dramatically by the end of the decade. Unemployment will become an increasing problem when the more than 60% of the population under the age of 20 enter the labor force.

Syria has an agricultural based economy that is heavily dependent on the waters of the Euphrates. In the last ten years, Syria has devoted nearly 70% of its agriculture budget to irrigation (Rodriguez, 1996). Government subsidies have encouraged digging of wells and a depletion of available groundwater. Eighty percent of the newly-exploited land in Syria since 1987 has been irrigated by wells supported by government subsidies on fuel for operating pumps. More land has been put into production despite the fact that it is of only marginal value in sustained crop production. In Syria, critical levels of Gypsum cover 21% of the total area and 50% of the fertile Euphrates Basin. The middle and lower Euphrates terraces and adjoining areas are composed of soils with more than 50% gypsum.

Both from a political and economic perspective, food security is a vital strategic goal for Syria. There is a direct link between water, food and industrial expansion, all of which are necessary to support a growing population. In Syria, as with most of the "developing Mediterranean countries", much water is wasted through low water-use efficiency and unrestricted demand (Rodriguez, 1996). There is no useful system of permits or fees for water use in Syria, and the small fees that are charged do not reflect the scarcity of water or the real costs of investment in irrigation structures. Once a farmer is able to dig a well, the water is virtually a "free access" resource. Subsidies on water are provided to offset low farm income brought about by controlled producer prices and an overvalued currency.

Even with its inefficiencies, in the past two years Syria has become a net exporter of grain, but growth in this area has generated problems, one of which is

the lack of proper storage facilities. During the author's trip to Syria in July 1997 there were thousands of tons of grain stored in sacks in the open, subject to the effects of weather and pest contamination. Commerce between Turkey and Syria has been light in recent years, driven in part by poor relations between the two countries.

Iraqi Economy

Economic ties between Turkey and Iraq have historically been strong. During the 1980's the revenue from Iraq's oil pipeline through Turkey was more than one billion US dollars per year. Unlike the water issue, the oil pipeline has tied Turkey and Iraq, and proven to be a more reliable outlet for Iraq than the previous pipeline through Syria. Economic cooperation between Turkey and Iraq was temporarily broken by the Gulf War and the Imposition of UN sanctions. Cooperation and commerce at the border between the two countries was temporarily severed by Turkish participation in Operation Provide Comfort for the Kurds.

Water problems based on construction of the GAP project have been serious, but not sufficient to disrupt the economic dependency between the two countries. (Marr, 1996) Given the bilateral nature of relationships in the region, it is important to note that most of the blame for diminution of Euphrates water flow has been directed by Iraq towards Syria. The potential for increased oil revenue, once the UN sanctions are lifted, places Iraq in a better position than Syria, which is more heavily dependent on agriculture, and the waters of the Euphrates.

Dependence on oil revenues in Iraq resulted in major changes in the economy. In the past three decades, Iraq's agriculture has declined, mainly through neglect, especially after the Iran-Iraq war. Between 1960 and 1989 agriculture slipped from 17% to 5% of the Gross Domestic Product (GDP). Apart from the problems with water quantity from the Euphrates and Tigris, reviving agriculture will be difficult and expensive due to overuse of the land and extensive salination (Marr, 1996). Iraq's oil potential places it in a strong position to resist Turkish leverage on water resources, although its geographic position as the lowest riparian on the Euphrates complicates the issue. This is partially offset by Iraq's control of a number of tributaries of the Tigris, and the ability to transfer water from the Tigris to the Euphrates channel.

VI. MILITARY AND SECURITY FACTORS:

Regional Military Balance

Turkey maintains the largest standing military force in NATO after the United States, numbering 639,000 active duty personnel. The army is organized into four operational land armies: the First Army deployed in Thrace guarding the Turkish

Straits, the Second Army deployed in South East Turkey guarding the Hatay province and the Greater Anatolian Water Project (GAP), the Third Army stationed in the east and watching the Caucasus and the approaches, and the Aegean Army facing Greece and the Aegean. At the tactical level, the Turkish Army is organized into 33 heavy brigades, 13 light infantry or commando brigades, and approximately 13 border defense regiments. In NATO divisional equivalents, this represents a force structure of about 19 NATO divisions. The regular forces are backed up by a 180,000 man Gendarmerie or National Guard that is heavily armed and thoroughly trained in internal security tasks. The continuous campaigns against the PKK are conducted by a special and separate command combining army and Gendarmerie assets. The First Army enjoys the bulk of modernization efforts involving heavy or armored equipment and the anti-PKK forces receive the lion's share of high mobility and air assets. Turkey's Air Force is increasingly capable in both quality of equipment and pilot proficiency and is centrally positioned. The Turkish Navy is the smallest of the services and is focused on the defense of the Turkish Straits and denial of the littoral waters surrounding the country. Turkey is building a national defense industry which currently produces F-16 aircraft, Meko class frigates, FMC armored personnel carriers and will shortly begin producing Abrams main battle tanks.

The Turkish armed forces enjoy a large and modern inventory of equipment, which includes 4,300 main battle tanks, 4,000 other armored vehicles. (Military Balance, 1996-97) It also includes 2400 towed and self-propelled artillery pieces, 434 combat aircraft, 43 attack helicopters, 21 principal surface combatant ships, and 15 submarines. Although much of the equipment dates to the 1960's, it is modernized and qualitatively competitive with neighboring military forces.

Syria possesses large and quantitatively well equipped armed forces numbering 421,000 active duty personnel. (Military Balance 1996-97) The army is organized into three corps, with six heavy divisions, a Republican Guard Division, and a number of heavy and light brigades. The bulk of the army, including its most modern assets, is deployed against Israel. Long considered to be a client state of the former Soviet Union, Syria remains a major recipient of Russian military assistance. However, because of Russia's internal and fiscal problems this program has diminished over the past seven years, leaving Syria with increasingly obsolete material. The Syrian tank inventory and combat aircraft fleet, which are critical elements in fighting a modern war in a desert environment, are fast becoming liabilities rather than assets. The Syrian navy is minuscule and limited to coast defense tasks. The armed forces contain a preponderance of combat heavy units with little back up from logistical and support organizations. As a conscript military force, the Syrian military suffers from a lack of a professional NCO corps. Syria produces no equipment on her own and relies almost 100% on foreign suppliers.

In confrontations with Israel, Syria has performed poorly. Notable disasters include Israeli brigades annihilating complete Syrian armored divisions in the Golan

Heights, and a single-day aircraft loss of 60 modern jets over the Bekka Valley against the Israeli Air Force. However, in each case the Syrian military recovered its strength and remained a regional power. The Syrian forced now includes some 4,600 main battle tanks. Syria also possesses 3,000 other armored vehicles, 2,000 towed and self-propelled artillery pieces, 579 combat aircraft, 100 attack helicopters, 2 principal surface combatants, and 3 submarines. Syria also maintains about 50 SCUD and FROG missile systems.

Although shattered in the Gulf War of 1991, Iraq remains a regional power with a large military machine and reserves of equipment. The Iraqi armed forces contain 382,000 active duty personnel, of whom 350,000 are in the army. The army is organized into seven army corps, including 4 heavy divisions, 13 infantry divisions and 6 Republican Guard Force divisions. The conscript mass of the army is poorly trained and equipped, and the main striking power of the army remains the Republican Guard, which is equipped and trained on a more lavish scale. The army has reconstituted itself after the humiliating disaster in Kuwait and remains a force of regional consideration. In the past several years, the army has shown itself capable of divisional sized operations in Northern Iraq, and major deployments to areas adjacent to Kuwait. Nevertheless, it is doubtful that its fighting efficiency has improved. There are about 45,000 additional personnel dedicated to internal security functions. The Republican Guard remains concentrated in the Baghdad area and central regions of Iraq. The Iraqi Air Force possesses a mixed inventory of Soviet and Russian types, and because of No-Fly Zones enforced by coalition air forces, may only fly over approximately 40% of the land area of Iraq. This restriction combined with a severe spare parts shortage, results in very little training opportunity for Iraqi airmen. The Iraqi navy is non-existent as a fighting force.

Iraqi military performance during the last two decades has been poor. Iraqi armored divisions sent against Israel were rapidly destroyed. Against the Iranians, Iraq enjoyed huge quantitative and qualitative superiority of modern equipment but was only capable of conducting localized attacks against the predominately infantry forces of Iran. Iraq however, did display great determination and a total disregard for losses that enabled it to continue the war against Iran for a period of eight years. The abysmally poor record of the Iraqi armed forces in Kuwait is well known; but the Iraqi high command did show some skill in withdrawing large elements of the Republican Guard out of the Kuwaiti cauldron in the face of absolute allied air supremacy during Operation Desert Storm.

Major equipment holdings of Iraq include 2,700 main battle tanks, 3,000 other armored vehicles, 2,000 towed and self propelled artillery pieces, 350 combat aircraft (with an operationally ready rate of about 55%), 120 armed helicopters, a one principal surface combatant ship. Iraq also maintains about six SCUD missile systems. (Military Balance, 1996-97)

Turkish Military Capability

Turkey is the only major NATO nation that has dramatically increased its military spending during this decade. In 1995 constant prices, Turkey increased its defense spending from a 1985 level of 3,134 million USD to a 1995 level of 5,388 million USD. Turkey restructured its army during the 1990's by eliminating (with some exceptions) the maneuver division from its force structure and replacing them with highly mobile brigades. These brigades are placed directly under corps control with a view towards increasing the agility required to wage modern air - land campaigns. This was combined with a modernization program aimed at matching the organizational structure with more lethal, mobile, and longer ranging systems. The Turkish Air Force also acquired F-16 fighter aircraft and KC-135 aerial tankers. Constant combat action against the PKK has honed the proficiency of both services, particularly in air-ground operations and fire support coordination. Turkey also participated in the UN operation in Somalia and maintains a mechanized brigade in Bosnia-Herzegovina. The cumulative effect of these factors is that Turkish proficiency in tactical and operational techniques are improving annually.

Such sophisticated weaponry and tactical techniques are heavily reliant on an educated and professional force; and therefore, Turkey's ability to conduct complex military operations *en masse* is fragile. There is a growing awareness in the Turkish military of the necessity to transition the force from reliance on conscription to one that relies on a professional corps of non-commissioned officers and a long service soldiery. The current conscripted mass of the Turkish Land Forces is fiercely patriotic, and if history gives any indication of military prowess, is imbued with a fierce fighting spirit. The Turkish military can be expected to field a capable modern force in support of national objectives.

In military terms, Turkey is not totally self-sufficient. Although possessing many of the resources necessary to wage war, Turkey produces almost no petroleum products, and is heavily reliant on foreign sources for major end items of equipment. This condition will continue into the foreseeable future and constrains Turkey's ability to unilaterally wage war. Finally, with interior lines of communications and a central geographic position, Turkey enjoys the potential to shift land and air forces rapidly between regions over well developed transportation systems should an active threat develop. This is less true for the Turkish Navy, which must deal with the Turkish Straits choke point and the narrow Aegean Seas. Overall, in fighting a one front war, Turkish geography is a distinct asset.

Turkish Military Potential

The 1974 American arms embargo imposed on Turkey in the wake of the Cyprus invasion brought home an important point . Reliance on military assistance packages can seriously impair unilateral action. Because of this event, Turkey is rapidly becoming self-sufficient in developing the industrial base necessary to

produce the spare parts and logistical support to keep sophisticated weapons systems operational. The rapidly advancing Turkish industrial base will probably be able to overcome this deficiency sometime in the first quarter of the next century.

It is doubtful whether Turkey will be able to transition from a conscripted military to a professional force at any time in the near future. The need to maintain large numbers of troops in the Southeast, and in Thrace and the Caucasus, make this a difficult task. The American experience in the 1970's was expensive, time-consuming, and took place in a period of a relatively low direct threat to national security. Fielding a professional force is too expensive for Turkey to afford now or in the next several decades.

While Turkey has announced no plan to develop a Rapid Reaction Force, almost every major European nation has already done so, including France, Great Britain, Russia, and Greece. It is well within the capability of Turkey to assemble such a force. Now that the war against the PKK seems to be winding down, and an accommodation with Greece may be on the diplomatic horizon, it is very possible that Turkey will find itself with excess military capacity. The geography of Turkey favors the development of a centrally positioned reserve force and a high quality corps-sized force, equipped with the latest NATO weapons, could easily be fielded on a rapid basis.

The Kurdish Problem

The Kurds are a mountain people who are ethnically and linguistically different from their neighbors. At various times in history, there has been a semi-autonomous state known as Kurdistan; however, the loosely organized and tribal Kurds usually lived under the yoke of the more militarily powerful Persian, Byzantine, Arab, or Ottoman empires. The area inhabited by the Kurdish peoples overlays Southeast Turkey, Northern Iraq, Northern Syria, and Northern Iran. Within those countries, the Kurds account for 17% of the Turkish population, 15-20% of the Iraqi population, 9% of the Syrian population, and 9% of the Iranian population. In an era of easily obtainable weapons and micro-nationalism, the Kurds are a restless and vocal minority in all four of the modern states controlling the area known as Kurdistan and are a source of regional instability.

The total population of Turkish Kurds is about ten million, perhaps half live in the Southeastern Turkey. Unlike their fellow Turkish minority people the Armenians, most Turkish Kurds remained in Turkey during the formation of the modern Turkish state, although there is a substantial Kurdish immigrant worker population in Europe, especially within the Federal Republic of Germany.

In Kemal Ataturk's Turkey, all minority citizens enjoy the same rights as Turks do, all serve in the Armed Forces, and all are politically enfranchised. However, no minority has the right to insist on its own official language, or to advocate a

separatist state, or to teach and practice principles inimitable to the Turkish constitution. Although all Kurds in Turkey are both Turkish citizens and speak Turkish, there is a strong sense of cultural identity among these people. This is especially true among the Kurds living in the underdeveloped villages in the Southeast areas of Turkey. This is far less true of the millions of Turkish Kurds who live in the western industrialized and prosperous regions of the country. The Turkish government asserts that Kurds enjoy the same rights and opportunities as Turks, and, indeed by some estimates, a quarter of the membership of the Turkish parliament is of Kurdish extraction.

It is a cornerstone of Turkish national policy that Kurds must assimilate into mainstream Turkish society. Herein lies the heart of the Kurdish problem in Turkey. A small percentage of Turkey's Kurds refuse to acknowledge this fact and want to establish either a separate Kurdistan (which would also include areas of Syria, Iraq, and Iran), or as a minimum, a semi-autonomous region inside Turkey. Within such an area, the Kurds would be free to use their own language and reestablish their own cultural identity. This extreme position is an anathema to most Turks, and there is strong sentiment that some solution must be found. There has been little progress to date, and although it is no longer illegal to speak Kurdish in Turkey, government efforts to satisfy Kurdish demands remain inadequate.

Within the Southeast Anatolia Region the Kurdish problem is compounded by the problem of land ownership. Many Kurdish farmers rent or sharecrop land owned by one of the small number of families that own huge tracts of the arid, but usable, land. For this reason, many Kurds have left the small villages where their families have lived for centuries. Because of the lack of economic opportunity and political autonomy, a separatist Kurdish movement known as the Kurdistan Workers' Party or PKK established itself in the region. Initially, the PKK was a legitimate political party operating within the legal framework of the Turkish electoral process. The party is now outlawed due to its advocacy of separatism. Since the mid-eighties, the PKK emerged as a military organization and engaged in guerrilla war and terrorism in Southeastern and Eastern Turkey. The Turkish government instituted Emergency Rule in these areas on July 19, 1987, and civil rights are suspended. In these regions Turkish security forces enforce martial law. Turkey reports that since 1987, over 18,000 PKK separatists have been killed, as well as 4,000 civilians, and 4,000 Turkish security forces.

The PKK is led by Abdullah Ocalan, nicknamed APO by the Turkish, who openly resides in Syria. The movement receives funding, training, and support from both Syria and Iran. Further support certainly comes from immigrant Kurds living in Europe and perhaps from other countries as well. The current political voice of the Kurds in the Turkish parliament is the People's Democratic Party, which clings to a tenuous legitimacy. In the first half of 1997, criminal charges were brought against party leaders resulting in the conviction of 31 on subversion charges. By the summer of 1997 the PKK had been largely rendered ineffective, the result of

continuous pressure from the Turkish Army and cross border operations into their strongholds. Attacks within Turkey from the PKK have steadily declined, and they have been relegated to isolated mountainous areas along the southeast border.

Continued fighting between Kurdish factions in northern Iraq is likely to prevent any real progress towards statehood or autonomy. The suppression of the nationalist ideals of the Kurds is the one common policy linking the four nations that have Kurdish minorities, Turkey, Syria, Iraq and Iran.

The War against the PKK

The prosecution of the war against the PKK is directly under the control of the Turkish General Staff. After the institution of Emergency Rule in the Southeast in 1987, a special and separate military command combining army and Gendarmarie units was established. In the early stages of the counter-PKK campaign search and destroy operations, similar to those conducted by the United States in Viet Nam, were carried out. While large numbers of the PKK were killed, the PKK infrastructure remained intact. The Turks then set up a system similar to the protected hamlet concept used in Viet Nam, which employed local men as village guards. Rural populations were also moved into villages for both the ease of protection and to remove local PKK sympathizers from offering assistance to the rebels. With the tacit cooperation of Iraq, Turkey conducted small unit localized cross-border operations to cleanse PKK camps in Iraq.

These measures were only partially successful. By the early 90's, the international community, human rights organizations, and the international news media responded to the situation by publicizing the fight against the PKK in an extremely negative way. Turkey was portrayed, in most cases, as a country with a flagrant disregard for both human rights and the law of land warfare. Within Turkey itself, the press became critical of the government and the military. The war appeared to be going poorly and appeared not to have a favorable outcome in sight. As losses mounted and morale dropped, the Turkish Army began a personnel rotation system of its professional officer and NCO corps into units fighting the PKK.

By 1994, it was apparent that the war against the PKK was stalemating and the frustrated Turkish General Staff approved a much more vigorous campaign plan against the guerrillas. More modern military equipment with enhanced lethality and higher mobility was deployed to the theater, including German armored cars and American attack helicopters. The PKK infrastructure itself was targeted for destruction and determined efforts to cut off the PKK from friendly local villages were instituted. A sophisticated campaign of public information, for both internal and foreign consumption, was developed and put into operation. TGS also picked up the operations tempo or "OP Tempo" of the war to put the PKK under continuous assault. In a major change of significant importance to the successful prosecution of the war, Turkey began large scale cross border operations against the PKK base

camps structure in Iraq. These operations involved up to 35,000 troops armed with tanks and artillery, advancing over 50 kilometers into Iraq, and conducting tactical operations in Iraq for up to three months before withdrawal. These multi-division scale operations were decisive and resulted in the near total destruction of the PKK safe havens and base camp structure in Iraq.

The cumulative effect of these measures was to almost eradicate the PKK from most of the Southeast and to render it incapable of all but extremely small-scale operations. In the summer of 1997, the official TGS position concerning the state of the PKK rebellion in Turkey is that the Turkish military has inflicted a crushing defeat on the PKK. The TGS doubts that the PKK can recover from this disaster. The basis for this claim is the hard core of trained PKK leaders and soldiers that existed in the early 90's has been all but destroyed. Recruitment of motivated and quality recruits into the PKK movement appears to have ceased.

Turkey and Syria

Turkey retains a decisive military advantage over Syria. The effectiveness of the Syrian military continues to degrade as fewer resources are invested in the force over time. This is compounded by the inability of the Russians to continue the massive Soviet military assistance program that delivered huge quantities of up-to-date weapons. In 1995 constant prices, Syrian defense expenditures over the period 1985 to 1995 fell dramatically going from 4,756 million USD to 2,165 million USD. This stark reality particularly affects the modernization and readiness of the force. In particular, the aging tank park, almost one-half of which are T54/T55 variants, constitutes a very serious weakness in war making potential. The Syrian Air Force has received priority in the battle against obsolescence and enjoys a force with a higher percentage of modern weaponry, but remains dependent on large numbers of MiG-21. On paper, Syria remains a regional power, but the reality is that Syria has grave military weaknesses.

Syria has little in terms of industrial base, and has a mostly uneducated population. Additionally, the restrictive policies of the government hinder development and initiative. Syria is now forced to concentrate its scarce resources in essential areas at the expense of others national needs. The future is not bright for the Syrian military, and there is little potential for improvement in their operational posture.

The decreasing conventional military capability of Syria drives its quest to obtain cheap weapons of mass destruction. The existing inventory of SCUD and FROG types of missiles is easily adaptable to the delivery of both chemical and biological weapons. The development of such a capability would dramatically improve Syria's ability to threaten the densely populated state of Israel or the concentrated industrial areas of Turkey.

It is likely that Syria will choose to continue to invest in high profile weapons systems such as modern aircraft and surface-to-surface or surface-to-air missiles which will lend the appearance of a capable military force. The mismatch of a small numbers of modern systems overlaid on a foundation of more numerous older weapons will also continue to afflict the Syrian military machine. The most probable loser in such a case will be the infantry, artillery, and tank arms of the Syrian army, which will become less capable over time.

Turkey and Iraq

Turkey retains a significant military advantage over Iraq, but the impact of the Gulf War on the Iraqi military is diminishing. Iraq's military expenditures, in 1995 constant dollars, dropped from a 1985 level of 17,573 million USD to a 1995 level of 2,748 million USD. This is due to the effects of the UN embargo that impedes Iraq's ability to export oil. This severely limits the ability to purchase and import weapons. Overall, the Iraqi military machine has regained a certain amount of prestige by simply surviving the Desert Storm onslaught of overwhelming coalition forces. In choosing to fight, it retained its self-respect, and this has certainly been an important factor in rebuilding the force.

The Iraqi military has been allowed to quietly rebuild itself after the devastating defeat suffered in Kuwait on 1991. In particular, the successful withdrawal of large elements of the Republican Guard enabled the Iraqi's to maintain a hard nucleus around which to reconstitute their military capability. They have maintained the basic structure of a conscript regular army and the more lavishly equipped and better-trained Republican Guard. The severe losses suffered in Kuwait have probably widened the gap in capability between the regular army and the Republican Guard, with the army coming off the poorer.

The return of the Iraqi aircraft inventory from its wartime refuge in Iran has allowed Iraq to reconstitute its air forces. Pilot proficiency and operational readiness of aircraft remain weak. In political terms, Iraq suffers under a UN embargo, restrictive No-Fly Zones enforced by coalition aircraft, and a rigid UN inspection regime aimed at its programs to develop weapons of mass destruction. While this detracts significantly from overall military readiness, these international restrictions act as an assault on national pride and serve as a rallying point for Iraqi nationalism. It is matter of some debate whether these actions actually strengthen Saddam Hussein's regime, rather than weaken it. In any event, Iraq does not lack evidence of hostility by the international community towards the government and the people.

The Iraqi military's deployment is multi-faceted and reflects the instability of the regime. In addition to guarding the frontier, quelling resurgent Kurdish rebels in the north, a portion of the armed forces are deployed for internal security purposes in or near large cities and population centers. Even during the Gulf War, a portion of the Republican Guard was withheld in the Baghdad area for this purpose. The real

striking strength of the Iraqi military is therefore not deployable in its entirety and any assessment of its potential must weigh this fact.

Although close international inspection and scrutiny, as well as combat losses in the Kuwaiti theater, have dramatically reduced inventories, Iraq almost certainly retains some form of chemical capability which could be employed by missile, artillery, or aircraft systems.

Iraqi military strength is now relatively stable. All gains made since the Gulf War have been organizational in nature and have involved restructuring or cross-leveling available weapons systems. Tactical training is minimal because of the shortage of replacement parts and systems. The Iraqi military machine is more of a force-in-being rather than an operational capability that can be employed to further national aims. The Iraqis are probably at the limit of their capability with existing stocks of weaponry and further improvements in military capability are doubtful.

It is doubtful that the international community will normalize relations with Iraq in the near future. In the event that this were to occur, Iraq would again have access to the world arms market and would again enjoy the benefits of oil revenues. Iraq would certainly take immediate steps to upgrade and increase its decaying military capability and would probably seek to rebuild its missile force, its integrated air defense system, and its main battle tank inventory.

The 1975 Incident between Syria and Iraq

In the mid-1970s both Turkey and Syria completed several dams on the Euphrates River and began filling the reservoirs. Beginning in late 1973 and reaching maximum fill rates in 1975, the flow of the Euphrates River was significantly reduced as it entered Iraq. The filling of the Keban Dam in Turkey and the Euphrates ("Ath-Thawrah") dam at Tabqa in Syria occurred during severe drought conditions. While Iraq protested the constriction of river flow, it wasn't until mid 1974 that Syria agreed to an additional flow of 200 cubic meters per second (CMS). However the following year the Iraqi Irrigation Minister protested that the Euphrates River flow reached a record low flow rate, at one point reaching 197 CMS. In March of 1975, land under cultivation in the basin was only 4% of its previous total. The Iraqi News Agency reported that the Iraqi Federation of Peasant Associations and Agricultural Cooperatives sent cables of protest to leaders in Syria and Iraq. Their communication was a call for "swift action" by their country to prevent the death of crops and livestock and hardship for "millions of peasants." The perception was that Syria was withholding additional water from Iraq's allocation.

The Syrian government then denounced an Iraqi request for the Arab League to meet to discuss a charge that Syria was withholding this Euphrates water from Iraq. The Syrians said the water question was technical in nature and did not require discussion by Arab ministers. At this point Iraq requested Arab League

intervention. Syria countered that less than half of its flow was coming from Turkey and pulled out of the committee formed by the League. In response to threats from Iraq, Syria closed the Iraqi consulate in Aleppo and expelled its personnel.

In July of 1975, Iraq protested to the Arab League against "continued Syrian encroachments" on the Iraqi border. The government also charged that Syrian border forces ambushed Iraqi traffic and tried to obstruct the building of an Iraqi frontier post. Iraq demanded that the Arab League seek an immediate end to the "Syrian violations of Iraqi territory."

In response to the assassination of Syria's military attaché in Baghdad, Syria expelled Baghdad's military attaché from Damascus and closed down the office saying the killing was carried out by Iraqi agents. In August, demonstrations were held in Aleppo (Syria) to protest water shortages followed by a two week campaign by Syria charging Iraq with causing a water shortage in Aleppo by demanding too much water from Syria. Iraq indicated that the Syrian shortage is "part of a political game" and said the real problem in Syria is the buildup of sediment behind the Euphrates Dam. It was asserted that Syria lacks the technology to remove silt from reservoirs and therefore must compensate by keeping the water level behind dams at a level higher than agreed with Iraq.

The Iraqi government issued a protest to Syria charging that Syrian warplanes were violating Iraqi airspace in both August and September. Syria closed its airspace as both countries mobilized troops and equipment to positions near the Syrian/Iraqi border. Only mediation by Saudi Arabia with the assistance of the Soviets prevented armed conflict. While the tensions were diffused, the management of the Euphrates River system has not been formalized and remains at best, bilateral. The resolution of this incident only addressed river flow amounts between Syria and Iraq during this reservoir-filling episode, and did not involve the uppermost riparian state, Turkey.

Turkey against a Hostile Alliance?

The possibility of an alliance composed of Syria and Iraq, or alternatively Syria, Iraq, and Iran, aligning against Turkey is sometimes hypothesized. Based on the current ill-will between Baghdad and Damascus, and the historical burden and mistrust created by the 1975 incident and the 1991 Gulf War, an alliance between these countries is highly unlikely. To add Iran to such a strategic Arab partnership is even less probable. Iran is not part of the Arab world, and Iran and Iraq recently fought a bloody war. The issues between them are by no means settled.

It has been suggested that there is some measure of popular support within these countries for an alliance. But there is much mistrust, and under their current political leaders, it is unlikely that these countries would unite. This is not to say the

countries may not have common foreign policy objectives, especially with regard to Turkey, Israel, and the West. An article in the Arabic News in July, 1997, a potential alliance between Baghdad, Tehran and Damascus was discussed. The purpose would be to confront growing military cooperation between Turkey and Israel. An Iraqi opposition leader was quoted: "Tehran and Damascus have no faith in the Iraqi regime, which deals with this issue only as a tactic."

The possibility Syria, Iraq and/or Iran of forming a common military alliance is even less likely. The requirements to link command and control assets into an effective combined arms effort is presently beyond the capability of these three nations. Turkey has a far superior military establishment and is backed by the NATO alliance, including the US. Turkeys geographical position presents a distinct advantage to the Turks, with centralized lines of communication and a mobile reaction capability. The formidable logistic requirement to sustain a force beyond their own borders presents another deterrent to an attack by the nations from the south. There is currently no credible threat of coordinated military action against Turkey from its neighbors to the south.

Vulnerability of the GAP to Terrorism or Sabotage

Tom Clancey's novel "Acts of War" is based upon a scenario in which Syrian Kurds blow up the Ataturk Dam in an effort to achieve their political objectives. This results in a huge flood and brings the Middle East to the brink of a regional war. A small Turkish military helicopter is hijacked by the terrorists and a satchel charge with four sticks of dynamite is thrown onto the wall of the dam, the entire structure is quickly brought down. But the Ataturk Dam is an earthen structure so large and dense that it would take a tremendous amount of conventional explosive, properly placed, to inflict any damage. The dam is now guarded by two companies of Turkish Army commandos. Even with the technical and military expertise of a "first world" power like Russia or the US, the obstacles of doing serious damage to the massive structure of the Ataturk Dam are formidable.

By way of comparison, the British experience during the Second World War offers some concept of what it takes to bring down a large dam (Richards, 1974). In early 1943, the British Air Staff was seized with the idea that the sudden destruction of the Ruhr dams would result in catastrophic downstream flooding while simultaneously crippling Germany's hydroelectric power system, which was vital for the production of war materials. To accomplish this objective, Number 617 Squadron, Royal Air Force, later famously known as the "Dam Busters", was chosen for special training in low-level night attacks on dams. The fascinating and heroic story of the attacks and will not be repeated here, a popular movie was produced in Britain in 1950, and is available on a classic vidoeptape. The bombs were huge, each contained 9,250 pounds of RDX high explosive. They were shaped like depth charges, designed to sink 40 feet below the surface of the water before detonating. There, at the bottom of the dam, these bombs would explode with irresistible

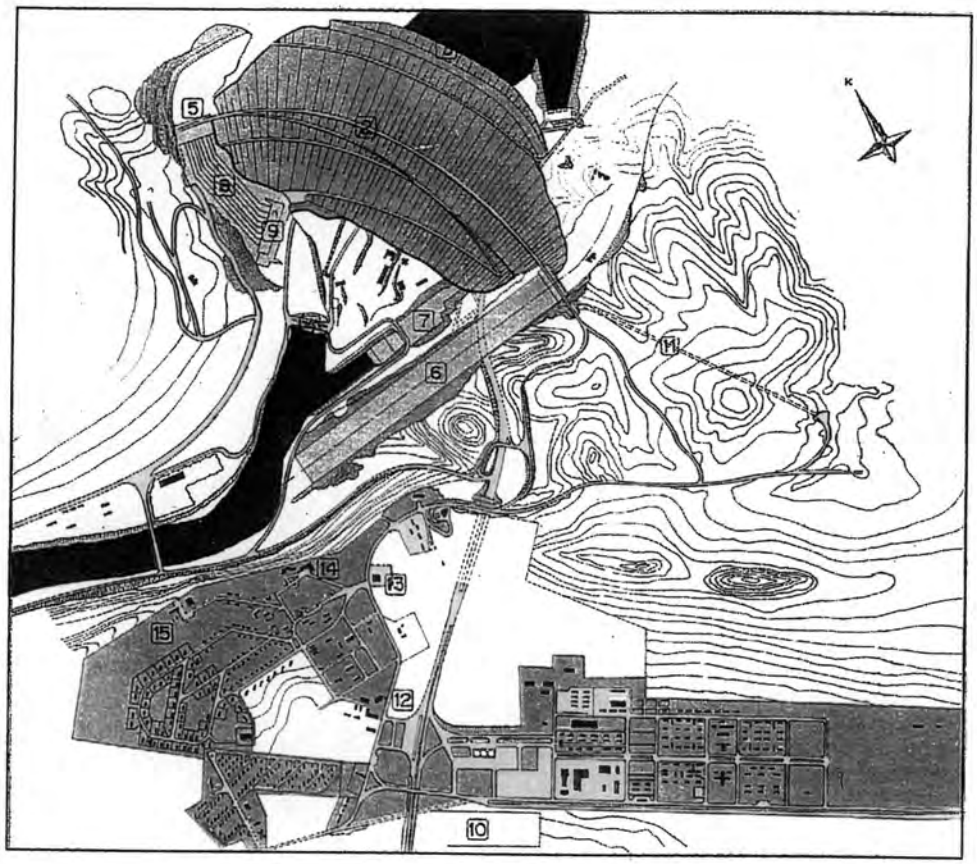
concessive force, magnified by the incompressibility of water, forming what was called a *water-hammer.*

The British planned to attack the dams at the end of the spring run-off when the dams were at their fullest. The first target was the Mohne Dam, which was constructed of limestone rubble with a concrete apron on the front face. The dam was 25 feet wide at the top and 112 feet wide at the base. On the night of May 16th 1943, four of the huge bombs, delivered to the same point on the rear side of the dam in immediate sequence, were required to open a breach in the structure. Later that night, multiple bomb hits were also required to open a similar breach in the Eder Dam. The sixteen four-engine Lancaster bombers, each carrying a single huge bomb, expended all of their weapons in these two attacks. The squadron was unable to execute its third attack planned for that night on the Sorpe Dam. Eight Lancasters were shot down.

. The British experiences dramatically show the inherent structural strength of dams in relation to the power of huge volumes of explosives dropped on or adjacent to them. It is unlikely that any such attack would significantly damage a structure such as the Ataturk Dam. The Ataturk Dam is 15 meters wide at the top and over 800 meters wide at the base, (Figure 7) and contains a hardened center. In volume of construction material it is at least ten times the size of the Mohne Dam. It is unlikely that, for the foreseeable future, precision delivered munitions such as cruise missiles or smart penetration bombs would be acquired by a potential enemy for use against the Turkish dams. The tremendous earthen volume of the Ataturk Dam would present a formidable obstacle even to the most sophisticated weapons.

Perhaps the most likely threat against the GAP itself, or any of its components, is that of sabotage or a small scale attack directed against a technical facility, such as a power generation station, water tunnel, or a portion of an irrigation complex. While many of these facilities currently lack publicly visible security measures, it is logical to assume that the responsible authorities in Turkey have developed security plans for key asset and site protection. An article in the April 20, 1998 edition of US News and World Report ("Water Bombs") described possible efforts of the PKK to sabotage the Birecik dam now under construction in Turkey. The recent publicity will likely contribute to heightened Turkish security measures. The threat of an effective terrorist attack against GAP infrastructure is low, and Turkish security is likely to deter small scale sabotage.

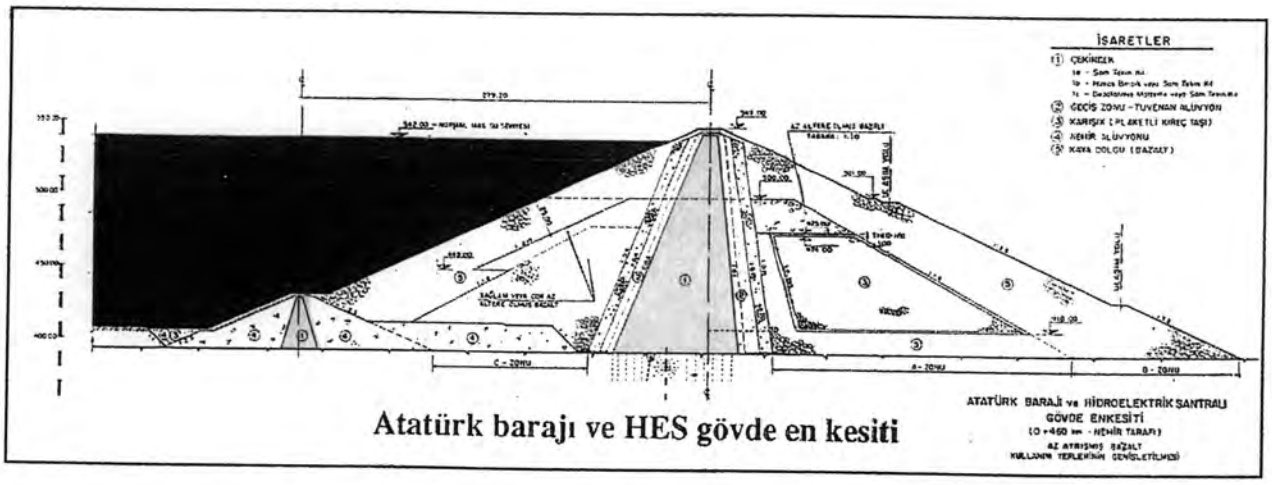
Fig. 8



ATATÜRK BARAJI
VE
HİDROELEKTRİK SANTRALI
GENEL VAZİYET PLANI

1. Fırat Nehri
2. Baraj Kreti
3. Ön Batardo
4. Mansap Batardosu
5. Su Alma Yapısı
6. Dolusavak
7. Derivasyon Tünelleri
8. Cebri Borular
9. Santral
10. Şalt Sahası
11. Enjeksiyon Galerisi
12. Okul
13. Cami
14. DSİ İdare Binaları
15. DSİ Sitesi

DSİ Teknoloji D. Bşk.
Basım ve Foto-Film Şb.Md.
ANKARA—1997



Atatürk barajı ve HES gövde en kesiti

Fig 8

VII. INTERNATIONAL LAW:

The Application of International Law

Contemporary international law governs relations between states (nations), international organizations, as well as certain relations between states and individuals. The conduct of states is governed by many factors, and international law is only one of them. Social, political, economic, military or other factors may be determinative, and states may take action even when contrary to international norms. As a general rule, international courts do not have compulsory or automatic jurisdiction to deal with international legal disputes. For example, jurisdiction of the International Court of Justice (ICJ) in the Hague is dependent upon acceptance of jurisdiction by the parties to the dispute. International law is not relevant solely in international courts. States rely upon it in their diplomatic relations, in their negotiations, and in their policy making. States defend their actions and policies by reference to international law and challenge the conduct of other states in reliance on it. In reviewing the positions of the riparian states in the Tigris-Euphrates watershed, it is important for policy makers to understand the applicable law, in the event of conflict the parties are certain to rely on the law to justify their positions.

There are four fundamental sources of international law, a summary can be found in the rules applied in the International Court of Justice.

1. international Treaties and Conventions
2. international custom or "customary international law"
3. general principals of law recognized by civilized nations
4. judicial decisions and teachings of highly qualified writers of the various nations.

General principles developed by advisory bodies have no direct legal effect, and are referred to as "soft law." Customary international law develops over time as the practice of nations and eventually becomes binding on all, whether or not the respective nations are party to a formal agreement. Treaties and conventions, on the other hand, are the primary evidence of international law when there is a dispute, and will generally be given precedence when in conflict with a provision of "customary " law.

International Water Law

International water law with respect to rivers is of relatively recent origin, prior to World War I the law developed primarily to resolve disputes concerning freedom of navigation (Wolf, 1997). Since that time, there have been a number of attempts to provide a framework for increasingly intensive water use, focusing on general guidelines which could be applied to the world's watersheds. The concept of a "drainage basin," for example, was accepted by the International Law Association

(ILA) in the Helsinki Rules of 1966, which also provide guidelines for the reasonable and equitable sharing of a common waterway, Article IV of the Helsinki Rules describes the principle:

> 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 then lists eleven factors which must be taken into account in defining what is reasonable and equitable. There is no hierarchy to these components of reasonable use, rather they are to be considered as a whole. One important shift in legal thinking in the Helsinki Rules is that they address the right to beneficial use of water, rather that to water *per se*. The Helsinki Rules have been used only once to help define water use -- the Mekong Committee has used the Helsinki Rules definition of "reasonable and equitable use" in formulation of their Declaration of Principles in 1975, although no specific allocations were determined.

When the United Nations considered the Helsinki Rules in 1970, some states (Brazil, Belgium, China, and France) objected to the prominence of the drainage basin approach, which might be interpreted as an infringement on a nation's sovereignty. Others, notably Finland and the Netherlands, argued that a watershed was the most "rational and scientific" unit to be managed. Others argued that, given the complexities and uniqueness of each watershed, general codification should not even be attempted. On December 8, 1970, the United Nations General Assembly directed its own legal advisory body, the International Law Commission (ILC) to prepare a draft Codification of the Law on Water Courses for Purposes other than Navigation.

It is testimony to the difficulty of marrying legal and hydrologic intricacies that the ILC, despite an additional call for codification at the U.N. Water Conference at Mar de Plata in 1977, took 21 years to complete its Draft Articles. Problems both political and hydrological slowed the process: in a 1974 questionnaire submitted to member states, about half the respondents (only 32 of 147 nations responded by 1982) supported the concept of a drainage basin (e.g. Argentina, Finland and the Netherlands), while half were strongly negative (e.g. Austria, Brazil, and Spain) or ambivalent. "Watercourse system" connoted a basin, which could be viewed as a threat to national sovereignty. In 1994, more than two decades after receiving its charge, the ILC adopted a set of 32 draft articles. In 1997 the articles were adopted by the UN General Assembly as "The Convention on Non-Navigational Uses of International Watercourses."

The Convention includes language very similar to the Helsinki Rules, requiring riparian states along an international watercourse in general to communicate and cooperate. Provisions are included for exchange of data and information, notification of possible adverse effects, protection of eco-systems, and emergency situations. Allocations are dealt with through equally vague language.

"Equitable and reasonable use" within each watercourse state, "with a view to attaining optimal and sustainable utilization thereof and benefits therefrom," (Article 5) is balanced with an obligation not to cause "significant harm" (Article 7). Reasonable and equitable use is defined similar to the Helsinki Rules, to be based on seven relevant factors. The factors are: hydrogeology and meteorology; existing and planned uses; environmental sensitivity; quality control requirements; socio-economic implications; water conservation practices; artificial recharge potential; and comparative costs and implications of alternative sources of supply. The text of the ILC articles does not mention a hierarchy of these factors, although Article 10 provides that, "in the absence of agreement or custom to the contrary, no use...enjoys inherent priority over other uses," and that, "in the event of a conflict between uses..[it shall be resolved] with special regard being given to the requirements of vital human needs."

Problems arise when attempts are made to apply the ILC language to specific water conflicts. For example, riparian positions and consequent legal rights shift with changing boundaries, many of which are still not recognized by the world community. Furthermore, the rules provide a balancing test more appropriate for the courtroom than the politically charged atmosphere of international water disputes. A balancing test requires some third party, such as an arbitrator, watermaster, or court, to resolve the issues. In water basins without such a regime, balancing tests are not particularly useful.

The uncertainty in international water law is compounded by the fact that cases are heard by the International Court of Justice (ICJ) only with the consent of the parties involved, and no practical enforcement mechanism is available. A state with pressing national interests can therefore disclaim entirely the courts jurisdiction or findings. Considering these limitations it is hardly surprising that the ICJ has only recently decided its first case regarding international water law.

Rights-Based Criteria: Hydrography vs. Chronology

Certain water law principles have been claimed regularly by riparians in negotiations, often depending on geographic location in the watershed. Claims for water rights are based either on hydrography, i.e. from where a river or aquifer originates and how much of that territory falls within a certain state, or on chronology, i.e. who has been using the water the longest. National positions are usually extreme, the "doctrine of absolute sovereignty" is often initially claimed by an upstream riparian. This principle is referred to as the Harmon Doctrine for the US attorney-general who suggested this stance in 1895 regarding a dispute with Mexico over the Rio Grande. This theory holds that a state has absolute rights to water flowing through its territory. The doctrine was eventually rejected by the United States, itself a down-stream riparian of several rivers originating in Canada. It was never implemented in any water treaty, with the rare exception of some internal tributaries of international waters. It has never been cited as a basis for judgment in

any international water case. It was explicitly rejected by the international tribunal (predecessor to the ICJ) in the Lac Lanoux case in 1957.

The down-stream extreme riparian nation often asserts the extreme "doctrine of absolute riverain integrity," which suggests that every riparian is entitled to the natural flow of a river system crossing its borders. This principle has reached acceptance in the international setting as rarely as absolute sovereignty. In an arid or exotic (humid headwaters region with an arid down-stream) watershed, the down-stream riparian often has older water infrastructure which must be defended. The principle that rights are acquired through older use is referred to as "prior appropriation," that is, "first in time, first in right".

These conflicting doctrines of hydrography and chronology clash along many international rivers, with national positions usually defined by relative riparian positions. Down-stream riparians, such as Iraq and Egypt, often receive less rainfall than their up-stream neighbors and have historically depended on river-water for the life of the nation. As a consequence, modern "rights-based" disputes often take the form of upstream riparians such as Ethiopia and Turkey arguing in favor of the doctrine of absolute sovereignty, with downstream riparians taking the position of prior appropriation.

Work of the International Law Commission

In transboundary water negotiations extreme positions leave very little room for bargaining. Under the right conditions, and through good faith effort of the parties, positions become moderated and most states eventually accept some limitation to both their own sovereignty and to the river's absolute integrity. One of the few international water cases led to the disavowal of the legal principles of absolute sovereignty and absolute riverain integrity. This was the Lac Lanoux case. In the early 1950's, France, citing absolute sovereignty, proposed diverting water from the Carol River, which crosses from the French into the Spanish Pyranees. The water would flow across a divide towards the Font-Vive for hydropower generation, and there was an offer for Spain to be compensated monetarily. Spain objected, citing absolute riverain integrity and the existing irrigation needs on its side of the border. Even when France agreed to divert back first the water needed for Spanish irrigation, then *all* of the water being diverted, through a tunnel between the divide, Spain insisted on absolute riverain integrity, claiming it did not want French hands on its tap. Both absolute principles were effectively dismissed when a 1957 arbitration tribunal ruled in the case that "territorial sovereignty...must bend before all international obligations," effectively negating doctrine of absolute sovereignty, while admonishing downstream state from the right to veto "reasonable" upstream development, negating the principle of natural flow or absolute riverain integrity. This decision made possible the 1958 Lac Lanoux treaty (revised in 1970), in which it is agreed that water is diverted out-of-basin for French hydropower generation, and a similar quantity is returned before the stream reaches Spanish territory.

A concept of limited territorial sovereignty reflects rights to reasonably use the waters of an international waterway, yet with the acknowledgment that one should not cause harm to any other riparian state. In fact, the relationship between "reasonable and equitable use," and the obligation not to cause "appreciable harm," is the more-subtle manifestation of the argument between hydrography and chronology. As noted above, the Convention includes provisions for both concepts, without setting a clear priority between the two. The relevant articles are:

Article 5: Equitable and reasonable utilization and participation

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 and sustainable utilization thereof, and benefits therefrom, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse.

Article 7: Obligation not to cause significant harm

Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

Article 10: Relationship between different 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.

Not surprisingly, up-stream riparians have advocated that the emphasis between the two principles be on "equitable utilization," since that principle gives the needs of the present the same weight as those of the past. Likewise, down-stream riparians have pushed for emphasis on "no significant harm," effectively the equivalent of the doctrine of prior appropriation in protecting pre-existing use. The World Bank, which must follow prevailing principles of international law in its funded projects, recognizes the importance of equitable use in theory but, for practical considerations , gives "no appreciable harm" precedent -- it is considered easier to define -- and will not finance a project without the approval of all affected riparians. This was the reason that Turkey was required to finance and construct the GAP development using its own resources.

As legal principles for sharing scarce water resources evolve over time, they can eventually reach the status of customary international law. But in the realm of transboundary waters, the general lack of acceptance and the use of a balancing test makes the process more difficult. In the absence of a treaty or basin wide agreement the arguments still emphasizes the *rights* of each state, and rests on the fundamental dispute between hydrography and chronology. The parties positions are driven more by geography, economics and politics than refined legal principles. Use of the terms "reasonable," "equitable," and "significant" guarantee that each riparian party will have a legal theory to support its position, even when extreme. One author, an attorney who has studied the situation in the Tigris Euphrates basin extensively, has stated that the Turkish position is "flatly wrong" and believes that the weight of legal authority supports the Arab downstream riparians (Delapenna 1996). But a fair reading of the Draft ILC Rules supports the Turkish position that the down stream riparians can not put the waters to equitable use, at least in comparison to Turkey. Of course the equation could change in the future in the event of a water shortage and "significant harm" to the downstream users. The fact that Turkey has not signed the ILC Draft makes no significant difference, since the Draft probably reflects customary international law. The failure to sign provides at least one advantage to Turkey. It reduces the chance that a dispute will become internationalized, and that some outside agency will have control over what the Turks consider to be their own natural resource.

The Danube River Case

An important trans-boundary river case was recently decided by the International Court of Justice in the Hague, and it may provide precedent for future international disputes in similar cases. The Gabcikovo-Nagymaros dam project on the Danube River was the subject of a 1977 treaty between Hungary and Czechoslovakia. The agreement provided for a joint system of dams along the portion of the Danube that forms a natural border between the countries. The Soviet Union supported the original agreement, in part to improve relations between the two countries. Conditions have changed since that time, including the dissolution of the Soviet Union and the breakup of Czechoslovakia into two republics.

Since the 1980s the dam project has sparked controversy and protests over the threat to the Danube's unique wetland ecosystem and one of the largest high quality underground water reserves in Europe. Hungary backed out of the project but Slovakia diverted the Danube into its own territory on an alternative "Variant C" project in 1992. It Danube flows at the diversion through a concrete canal , and at peak periods water flows through turbines at Gabcichovo. The Nagymaros dam was to have been the Hungarian portion of the project down stream in Hungary.

As a result of the unilateral move by Slovakia, both Slovakian and Hungarian experts say that significant and possibly irreversible environmental damages have occurred on the Hungarian island and beauty spot, Szigetkoz and the Slovak's Zitny

Ostrov. The threatened area also provides 45 percent of Hungary's drinking water, and a comparable amount for the Czech and Slovak Republics. Continued operation of the Slovak diversion threatens to pollute and deplete this supply. By diverting the Danube from its natural bed, water flow in the portion of the original river bed below the diversion has been reduced to 10 percent of its average 2000 cubic meters per second. This has caused water levels to drop by three meters, narrowing the river and causing sedimentation to increase. The chemical and biological nature of the river's dense side branch has changed. The river is increasingly losing its ability to clean itself, posing problems in disbursing such pollutants as agricultural runoff.

A decision by the court was rendered on 25 September 1997, but it is not expected to fully resolve the issues between the parties. The ICJ ruled that Hungary violated international law by abandoning the 1977 treaty with Slovakia to build the system of dams and hydroelectric power stations. But the court also said that Slovakia was also wrong in pressing ahead with the project and diverting the waters of the Danube from Hungary into Slovakia.

Newly independent Slovakia has invested considerable resources and time in the project and will be reluctant to give up what is perceived as a symbolic achievement for a country that has limited energy resources. From the stand point of Hungary, more than just environmental issues are at stake, and the Hungarian position before the court was to seek an order that would require Slovakia to return a substantial portion of the water to the natural riverbed. Even with a favorable ruling Hungary would not necessarily achieve its goals, since the ICJ has no direct mechanism to guarantee compliance.

Law and Politics: Can international law be used to find a solution?

Political and economic factors will heavily influence the positions of states on an important issue of international law. In July of 1997, 103 nations had signed the 1994 ILC draft protocol, but Turkey was conspicuously absent. One of the principal objections of Turkey was the Article 7 provision not to "cause significant harm", it is certain that this provision would be used as a weapon by Syria or Iraq in the event of declining water supply or a deterioration in water quality. Syria signed the protocol, but it is much more difficult to determine the official Syrian position on the subject, in view of the tightly controlled and censored Syrian bureaucracy. During a visit by the author to Syria in July 1997 it was very difficult to obtain information or to determine the official Syrian position on the water issue. Water information and policy is treated as a state secret, and the Syrians hold their cards close to their vests. This is true even though there is a strong legal argument that could be made on their behalf. (see Dellapenna, 1996, note 244)

In contrast to Syria, Turkey has a strategy and conducts a public information campaign on the subject. When visiting public officials in Turkey a foreign visitor is provided with two glossy pamphlets that provide the facts (from a Turkish

perspective) and concisely state the official position. The pamphlets makes the point that Turkey is not "water rich", comparing the per capita per year amount available in some countries of 10,000 cubic meters, to Turkey's 1,830 cubic meters. The argument is also made that Turkey can make the highest "optimal" use of available waters for the benefit of the entire region (Pamphlets #1 and #2, Turkish Ministry of Foreign Affairs). Finally, the pamphlet contains a summary of International Water Law and why Turkey's position is reasonable under the current state of the law. Although the pamphlets can be subject to criticism on the facts and the law, they provide a valuable insight into Turkey's position on a matter of national security.

Although the legal enforcement mechanisms are questionable, we should nevertheless look to international law to provide a framework for possible settlement of the dispute concerning the Tigris and the Euphrates. The rule of law can provide a basis for negotiations, and ground rules should be known by policy makers well before a crisis develops.

VIII. INFORMATION AND TECHNOLOGY:

Information confers power and this inspires a strong tendency to own or control it. This is particularly true in areas of the world that are not water rich, where water information is treated as a state secret. Under these conditions, the potential for instability and conflict tends to rise. The solution begins with good information combined with an effective system for collecting, processing and managing the information (Naff 1997).

A lack of attention to the facts (in this case water data) can easily undermine any agreement on water allocation, even if the parties are able to sign the document (Kolars, Yale 1997). There is one infamous example of this situation in the 1929 agreement between eight riparian states in the US concerning the Colorado River. The framers of the pact assumed that the dependable yield of the river to exceed sixteen million acre feet. It was later determined that the average annual yield is considerably less, requiring a re-negotiation of the river compact.

The vast majority of studies which address water resources technology focus on either enhancing supply or reducing demand. They make recommendations for the use of desalination, pipelines, Medusa bags (giant bags towed by seagoing tugs), or drip irrigation. But technology can be used as a tool for international water management of entire watersheds, using a combination of remote sensing techniques and radio-operated monitoring and control structures. This technology offers powerful options to help reduce the political resistance to shared management of international waters.

Environmental Intelligence

In 1995, the Department of Defense (Principal Undersecretary for Environmental Security) cosponsored a conference on environment and national security with the Intelligence Community. It was determined that the Intelligence Community has the infrastructure to gather information, and the ability to perform integrated analysis on the linkages between environmental problems and other instability factors, providing advance indications and a warning system. In a speech to the World Affairs Council in 1996, former-Central Intelligence Agency Director, John Deutch, discussed the importance of environment to the CIA.

> "National reconnaissance systems that track the movement of tanks through the desert, can, at the same time, track the movement of the desert itself, see the sand closing in on formerly productive fields or hillsides laid bare by deforestation and erosion. Satellite systems allow us to quickly assess the magnitude and severity of damage. Adding the environmental dimension to traditional political, economic, and military analysis enhances our ability to alert policy makers to potential instability, conflict, or human disaster, and to identify situations which may draw in American involvement."

The Intelligence Community has produced maps for environmental purposes depicting environmental contamination at military bases. In a unique exchange, the U.S. and Russia produced maps showing environmental conditions at military bases. The Russians mapped Elgin Air Force Base in Florida and the U.S. mapped Yeysk Air Base in Russia. Vice President Gore and Prime Minister Chernomyrdin exchanged these maps in January 1996 at a meeting of the Gore- Chernomyrdin Commission. These derived products were prepared exclusively from classified assets. This technology will support a system of warning mechanisms for potential crises, and the Central Intelligence Agency recently announced the establishment of a section devoted to environmental matters.

IX. THE IMPACT OF THE GAP WHEN COMPLETED:

Political and Social Impact

The GAP has enormous political and social significance for Turkey and the entire region. For Turkey it offers a long-term solution to the Kurdish problem. The social issues notwithstanding, many Turks believe that the problems of the Kurdish minority are economic in nature. Many Turks conclude that the completed GAP will finally equalize the economic imbalance causing many rural Kurdish families to live in conditions of extreme poverty, and it is hoped that increased levels of prosperity will eliminate the dissatisfaction of Turkey's Kurds. The improvements to the region's education, health services, and employment opportunities contained in the GAP Action Plan are the operative agents to begin this process. The final integration of economically empowered Kurds into a healthy Turkish economy may take centuries

and represents long-term thinking in the extreme. Even if only partially successful, it will assist in an eventual solution to the region's political troubles.

Environmental Impact

Dams and man-made diversions have profound impacts on the quality of waters throughout the river system. Water emerging from a dam is not the same as water entering the reservoir. Discharge from a dam may create significant temperature changes, sediment load variations, dissolved salt load, organic content and, more than any other effect, significantly different water volumes. All of these conditions have the potential to affect the environmental quality and condition of the Tigris-Euphrates River system in Turkey as well as downstream water systems in Syria and Iraq.

Changes in river flow alone can have drastic environmental consequences. Rivers deprived of significant sediment content will begin to scour and erode beaches and shorelines. Not only does the river channel change but also the clarity of the water changes allowing significantly increased amounts of sunlight and subsequent algae growth. In other situations, as dams reduce peak flows, irrigation canals siphon off annual discharge and the ability of rivers to carry away silt and dissolved material, clogging channels and creating choked river systems with little or no flow and greatly reduced clarity. For example, due to decreased flow form diversion and confinement, the Rio Grande River has deposited enough sediment to elevate portions of its channel above the surrounding flood plain.

Water quality is a significant issue below dams. (Collier, Webb, and Schmidt, 1996) Both the structure itself and the associated applications of the impounded water can dramatically alter the quality of the downstream resource. For example, the combination of reservoir evaporation and additional contributions of dissolved minerals in surface runoff can significantly increase salinity. Because the source of outflow commonly is derived from the deepest portions of the reservoir, dissolved oxygen critical for aquatic life is drastically decreased. Organic chemical concentrations usually abruptly rise from surface runoff and return flow to the river from intense agricultural activities. Riparian vegetation systems, both on shores as well as in the river can be altered and existing ecosystems displaced or destroyed. Entire fisheries can be eliminated by simply altering the thermal profile of the river.

The development of the GAP and downstream river diversion systems has, and will continue to have significant consequences along the entire reach of the river system. The GAP alone will initiate significant changes that will become even more apparent over time. In addition to the Turkish hydropower projects, it must be stressed that the Syrian and Iraqi development may have even greater impacts on water quality and associated ecosystems. As these dams are developed downstream in regions of little to no recharge the effects will be pronounced. For example, the gypsum content of the substrata in Syria may contribute significant

dissolved sulfates to water in reservoirs. In addition, the river system shape and form is strikingly different between Turkey and its downstream riparian neighbors. The resulting broad shallow reservoirs and resulting high rates of evaporation will strikingly increase the salinity of water leaving these systems.

There have never been and it is highly unlikely that there will ever be proper Environmental Impact Statements (EIS) conducted for water control structures in any of these countries. The purpose of an EIS, at least in the US, is to provide environmental information before the decision to proceed is made. There is no comparable legal requirement in Turkey. A lack of environmental planning may give rise to degraded quality of life, degraded agricultural performance and heightened tensions in this volatile region. Past tension and military mobilizations have occurred over the quantity of water in the Euphrates River. As the quality of the water continues to degrade, the impact of the changes are likely to be widespread. The potential for large-scale population impacts in Iraq and Syria is significant.

Because of the current lack of surface return flow along the majority of the cultivated reach of the Euphrates River, the water quality at the point of entry of the Euphrates into Syria is reasonably good and likely to remain so for the near future. There are as yet no major factories or cities on the main stream of the Euphrates in Turkey. But an accurate picture of water quality in the region is currently unavailable. When Turkey reaches full irrigation of the Harran Plain and other irrigation units south and east of Sanliurfa, a significant amount of agricultural runoff will drain down the Balik and Kabur Rivers into the Euphrates below the Tabqa Dam in Syria. There is also the potential problem of movement of groundwater from Turkey into Syria as part of return irrigation flow. This is likely to increase problems of waterlogging in the region and increase the amount of dissolved organic chemicals. (Kolars Sept. 1997) Water quality issues may eclipse those of water quantity in the years ahead.

X. CURRENT US/NATO SECURITY STRATEGY:

Current US Security Interests and Strategy

United States security interests in this area of the Mid-East, which includes Turkey, Syria, and Iraq, are described in the Institute for National Strategic Studies' *1997 Strategic Assessment:*

- Ensuring a free flow of oil at reasonable prices,
- Ensuring the survival of Israel and moderate Arab governments,
- Preventing a violent Arab-Israeli conflict,
- Maintaining a regional balance favorable to United States interests,
- Ensuring access to strategic lines of communications,

- Maintaining the Mid-East Peace Process,
- Isolating Rogue Regimes,
- Controlling the spread of Weapons Mass of Destruction,
- Defending humanitarian values,
- Protecting Americans from terrorism and unconventional weapons, and
- Preserving stability in crucial regions.

American interests must be further defined because of Turkey's NATO and European connections which affect Turkey's place in the world. Relevant United States security interests in Europe identified by the Institute for National Strategic Studies are:

- Sustaining Deep Historic Ties,
- Avoiding Re-division of Europe into Hostile Blocs,
- Sharing with Europe the Burdens of World Responsibility, and
- Preserving the Unity and Effectiveness of the Western Alliance.

The Institute for National Strategic Studies also describes "Flashpoints" which illustrate the diverse circumstances which could lead to conflict. Flashpoints are not probabilities, but are rather a calculation of risks and circumstances which destabilize an area or situation. The highest prospect for an "intense military conflict" in the next decade is the outbreak of hostilities between regional powers. The Institute identifies the following Flashpoints involving Turkey, Syria, or Iraq:

- Turkey and Greece, especially in terms of a conflict damaging the NATO Alliance; and also Cyprus and Aegean sovereignty issues,
- The Southern Rim, including radical Islam, renegade regimes, demographic pressures, water rights, and terrorism,
- Acquisition of Weapons of Mass Destruction (WMD) by Iraq or Iran or the Rogue Use of WMD,
- *Turkey under Islamist Rule,*
- *Conflict in the Middle East over Water Scarcity,*
- *Instability Exacerbated by Land Scarcity, Soil Erosion, and Deforestation*
- Syrian-Israeli Confrontation, and
- Iraqi Military Threat (emphasis supplied)

President Clinton's *A National Security Strategy for a New Century*, published in May 1997, defines three core objectives for the United States National Security Strategy, these are:

- To enhance our security with effective diplomacy and with military forces ready to fight and win.
- To bolster America's economic prosperity, and
- To promote democracy abroad.

The policy for the implementation of the first core objective (Enhancing Security) requires elaboration, since this American national security objective directly relates to this study. The United States must be able to:

- Shape the international environment through Diplomacy, through International Assistance, through Arms Control, through Nonproliferation Initiatives, and through Military Activities, and
- Respond to Crises.

The foundation of the national security strategy of the United States is built upon two pillars; the first: continuous engagement, and the second: implementation of a security strategy which strengthens and adapts security relationships with key nations while creating new relationships when necessary. In relation to the area affected by this study, this means an active American interest in the Middle East Peace Process, and American support for the enlargement and adaptation of NATO. It also means continued American readiness to deter threats and demonstrable willingness to engage in crisis response, and American leadership to exert international pressure to influence rogue states and de-escalate regional tensions.

A secure and stable Turkey is in the US national interest, Turkey is the southern bastion of NATO and it borders three states that may pose a threat to the US, Iraq, Syria and Iran. US strategy has been to preserve the unity of the NATO alliance, and this has been difficult with the continuing difficulties between member states Greece and Turkey. US policy in the region has been to maintain close ties to Turkey, shaping the environment with international assistance, arms control, non-proliferation initiatives, and isolation of rogue states that support terrorism or violate international law. The US has not taken an active role in Euphrates water issues between Turkey, Syria and Iraq, despite the potential for conflict. The Middle East peace process and resolution of the conflict over Cyprus provide higher priorities for US foreign policy.

NATO Security Strategy

At the strategic level, the current NATO security strategy for the Europe is to safeguard the security and territorial integrity by political and military means. This includes mutual cooperation-operation among members and cooperation and dialogue with non-members. After the dissolution of the Warsaw Pact, NATO acknowledges no desire or threats capable of direct military confrontation with the Alliance. This absence of an acknowledged threat has been replaced by the acknowledgment of regional instabilities and risks. The Alliance is moving forward with a triple-pronged strategic concept for the emerging world order that rests upon:

- Dialogue: The establishment of regular diplomatic liaison and military contacts with an exchange of views and information on security policy issues.
- Cooperation: Prevention of crises but, should they arise, assurance of their effective management.

- Collective Defense: Maintenance of an adequate military capability and clear preparedness to act collectively with a common defense.

At the theater level, Allied Forces Southern Europe (AFSOUTH) is NATO's headquarters controlling the Southern Region and is responsible for an area of responsibility including the Mediterranean basin, Italy, Greece, and Turkey, as well as an area of interest including the Mid-East, North Africa, and the Caucasus and Caspian regions. The Commander-in-Chief (CINC) of the Southern Region views regional instability as the primary enemy peace in the area. With this in mind, AFSOUTH bases its regional strategy on readiness to meet all Article 5 contingencies, increasing the military-to-military contact and partnership programs, I and maintaining core competencies as NATO adapts and enlarges.

The Role of Turkey in the NATO alliance

Turkey is a strategically important linchpin of the NATO alliance. For almost forty years, the Turkish Straits (the Bosporus and the Dardanelles) were designated by the Supreme Allied Commander, Europe (SACEUR) as one of the most important strategically vital points in Europe; the retention of which was essential for the prosecution of a successful defense against the Soviets. Turkey would also have absorbed the offensive power of Rumania, Bulgaria, and perhaps up to s many as forty Soviet divisions as well. As the alliance changed in the 90's, so too did the definition of strategic interests. NATO's long-standing General Defense Plans for the conventional defense of Europe were replaced in the lexicon of the planning world by Contingency Operations Plans and by Reinforcement Plans. While the active threat of the Warsaw Pact dissolved, leaving the northern Alliance countries without a direct military opponent, NATO's southern flank, with Turkey in particular remained facing severe regional instability. For this reason, SACEUR designated South Eastern Turkey as one of several areas within Allied Command Europe that would continue to receive priority military planning efforts.

NATO Collective Defense: Article 5

The Article 5 section of the 1949 North Atlantic Treaty is the operative agent for the collective and mutual defense of Alliance members. It posits that an attack against one represents an attack against all, and it binds members to come to the aid of another. Article 5 states:

> " *The parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective defense recognized by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with other Parties, such as action as it deems necessary, including the use of armed force, to*

restore and maintain the security of the North Atlantic area.

Such armed attack and all measures taken as a result thereof shall immediately be reported to the Security Council. Such measure shall be terminate when the Security Council has taken measures to restore and maintain international peace and security."

When Turkey signed the Protocol to the North Atlantic Treaty on the Accession of Greece and Turkey in London on October 22, 1951, supplementary language included the following protocol amending Article 6 of the North Atlantic Treaty as follows:

"For the purpose of Article 5, an armed attack on one or more of the Parties is deemed to include an armed attack on:

- *on the territory of any of the Parties in Europe or North America, on the Algerian Departments of France, on the territory of Turkey or on the islands under jurisdiction of any of the Parties in the North Atlantic area north of the Tropic of Cancer.*
- *on the forces, vessels, or aircraft of any of the Parties, when in or over these territories or any other in Europe in which occupation forces of any of the Parties were stationed on the date when the treaty entered force or in the Mediterranean Sea or the North Atlantic area of the Tropic of Cancer."*

It is significant to note that Turkey is the only member state which has territory specifically mentioned, other than the Algerian departments of France, in the North Atlantic Treaty.

While the leadership of the NATO Alliance is increasingly aware of, and is moving towards, non-Article 5 contingencies and out-of-area operations, the Article 5 paradigm remains constant throughout all NATO statements, documentation, publications, and planning processes. At the 1997 Madrid Summit, the Alliance essentially revalidated the importance of collective defense guaranteed under Article 5 of the North Atlantic Treaty by extending membership invitations to Poland, Hungary, and the Czech Republic.

Would Article 5 be invoked to defend Turkey in the event of an attack provoked by Turkey's monopolization of the waters of the Euphrates? Unless the actions of Turkey were clearly unjustified, or in violation of international law, it seems certain that Article 5 would apply. In view of these treaty obligations, it is important to develop an informed US/NATO policy concerning water issues between Turkey, Syria and Iraq.

XI. ANALYSIS AND CONCLUSIONS:

Over the past ten years it has been popular for authors in the United States to write about the "War Over Water" which presumably was just around the corner (Cooley 1984). Others pursued the same theme and described the coming conflict (Starr and Stoll, 1984). King Hussein of Jordan was quoted as saying that the only *Causis Belli* he could imagine that would involve Jordan would be water. What is the basis for these dire predictions? If they are right, why has not such a war already occurred? Are "water wars" inevitable?

The potential impact of Turkish water policies in the region presents a classic study in environmental security. Water has been the spring of life in this region since Biblical times, and scarcity will remain an issue in the years ahead. Fresh water (who has it, who needs it) could approach access to oil in its effects on US and NATO security strategy (Butts 1997). But water is just one factor in a complex web of relationships between the nations in the region. If the nations go to war, water is unlikely to be the primary cause in the next ten years.

While the Euphrates River connects all three riparian states, political and historic relationships remain bilateral, and triangular relationship presents a useful analogy. The three bilateral relationships form a triangle that is centered on the river. The Euphrates connects these bilateral issues into a series of conflicting and competing relationships. The parties have taken extreme positions on the water question, and a climate of distrust prevents a real dialogue.

Historical animosities between the Arabs and the Turks should be understood as part of this equation. Acts of repression and torture during the Ottoman occupation are not easily forgotten. The Turks often view their neighbors to the south as less industrious and wasteful of the water resources available. The willingness of the parties to enter good faith negotiations over water must be viewed through this lens. In the Arab countries the issue of water quality has assumed even greater importance than that of water quantity. There is a grave (and justifiable) concern that development of GAP will degrade water supplies in Syria and Iraq, at the same time that there are more people with increased dependence on the water. But Syria and Iraq seem to be unwilling to provide water quality data to support their objections, which weakens their position. The Turks have done a much better job in terms of international public relations on the water issues, and the plight of the Arab states is not widely known.

The question of who is "water rich" illustrates the difficulty in obtaining reliable data that can be agreed upon by all the parties. Turkey maintains that water rich countries have more than 10,000 cubic meters (CM) per person per year available, and Turkey has only 1830 CM per person, compared to Syria with 1420 CM. (Pamphlet #1). In a document produced in Syria, Turkey is listed as having 3520

CM per person per year and Syria only 610 CM per year available (Rodriguez, 1996). The disparity in the data can be explained by the different methods of computation. It is generally accepted that about 100 CM per person per year is the minimum essential for personal and domestic needs (Kolars 1997). But the parties will base their "needs" in the basin on water required for irrigation and other uses that are very subjective. In many water poor countries in the Middle East the difference can be made up by importing food and running desalination plants. In some countries oil revenue can be used to make up for the lack of water. In less developed countries like Syria, the agricultural economy and historical water dependency leaves them in a more vulnerable position. For Iraq, the period of unimpeded oil revenues resulted in neglect of agriculture, and it has been difficult to re-establish this sector since the imposition of the oil embargo.

Geographically, Turkey is in the strongest position to assert its sovereign rights over the waters of the Euphrates. Turkey has a reasonable level of support in the current state of international water law. The law is based on a balancing test that provides leeway to the riparian state to use and develop waters with a view towards "optimum utilization." Geography has endowed the Turks not only with physical control of the headwaters, but more arable land, and superior geography for storing the water behind dams. In Syria and Iraq the man-made lakes are more shallow, and subject to greater loss through evaporation. The land irrigated in Syria and Iraq is less suitable for agriculture, and this could be a factor in a determination of equitable use. On the other hand Iraq has the strongest legal argument in terms of prior use, with historic diversions dating back to antiquity. And Syria can rely on the principle of equitable sharing, and the requirement to cause no significant harm. International law provides a theory for all the riparians.

Water plays a significant role in Arab/Israeli relationships. Part of the Oslo agreement that forms the basis for the current peace plan provides for Jordan River water allocation between Israel and its neighbors. Water issues in the Tigris-Euphrates Basin are not directly tied to the Arab Israeli peace process. But the current state of affairs between the Palestinians and Israel, with a heightened level of mistrust, can do nothing but poison the relationship between Turkey and its Arab neighbors to the south. During the author's visit to Syria in July 1997, official news focused on Syrian support of the Palestinians, and the "Turkish-Israeli military alliance", referring to the defense cooperation agreement between the two countries.

In researching water issues in this region the lack of reliable water related data becomes apparent. Even in Turkey, the availability of modern data management techniques is limited. In July 1997 a senior surveyor in the GAP administrative office in Ankara had no computer and was unfamiliar with satellite imagery or modern Global Information Systems (GIS). Without reliable data that can be shared by the parties, the prospects for an agreement on water allocation will remain out of reach. There is a growing consensus among water experts, The World Bank, and the UN Development Programme that a real-time

hydrometeorological data system is essential. If the nations could be persuaded to share only stream flow, precipitation, groundwater level, and selected water quality measurements, enormous collective benefits would accrue (Naff 1997). But the climate of mistrust in the region is likely to hamper such an effort in the near term.

The current relationship between Syria and Turkey is burdened with the issue of state response to regional insurgencies and especially by Syrian state support to the PKK. Will this continue well into the next century? If the Turkish government is correct in its assessment that it is successfully eradicating the Kurdish insurgency, the answer is no. But in a historical context, this is an unlikely outcome. The damage inflicted on PKK movement is devastating and this will result in the appearance of a military victory. Still, it is unlikely that the PKK will be entirely eliminated in the next ten years. The presence of Abdullah Ocalan in Damascus obviates the Turkish position.

How will water issues affect the Syrian -Turkish relationship? Unless there is a major change in Syrian leadership or foreign policy objectives, Syria will likely continue to support terrorism and the PKK. If this the case, then the PKK will quietly rebuild itself under Syrian protection until it is again ready to engage the Turkish military. But the economy in the Kurdish areas of Turkey is about to change, as the near-term impact of the GAP is felt. The Harran Plain irrigation project should soon create more jobs and improve living conditions for the people of Southeast Anatolia. As the standard of living of the predominately Kurdish local population increases, we can expect reduced support for Kurdish separatists. Without the support of the local population, the PKK cannot expect to operate successfully. This is not to say that the PKK as a strictly terrorist organization cannot continue to operate within Turkey, but the possibility of long term success will certainly decrease. Because of its support for the Hizbollah and the Palestinians, Syria will likely continue its policy of state-sponsored terrorism.

For Syria, the goal of peace with Israel will require more than just the return of the Golan Heights, stability in the region requires economic dividends. In the past ten years Syria has accelerated the process of economic reform in an effort to encourage foreign investment. Agriculture and irrigation are receiving top priority, and electrical power generation is crucial if these plans are to succeed. This underscores the importance of Euphrates water and the heavy dependence on the river. Total water supplies are adequate for now, but Syria is already facing a deficiency, particularly in the cities, because of inadequate delivery systems. Syria has a history of problems with irrigation and hydropower management; waste and inefficiency have been compounded by a tightly controlled central government. If the Middle East peace process stays on track, and PKK influence continues to decline, relations between Turkey and Syria are likely to improve. This could improve the climate for a possible water allocation agreement.

For Iraq, geography has left the nation in a vulnerable position in terms of

water supply. In a chart produced by Kolars (Figure 6), depletions from the Euphrates in Turkey and Syria are projected through the year 2040. In a "worst case" scenario, the flow of the river entering Iraq would be less than 200 cubic meters per second (CMS), less than one sixth of the average estimated natural flow. This would also be less than one third of the 500 CMS minimum tacitly agreed by Turkey for release into Syria. But history shows (the 1975 incident) that the blame for reduced water supply is directed more at Syria than Turkey. And the relationship between Turkey and Iraq has been defined more by oil than water. Iraq's oil potential places it in a strong position to resist Turkish leverage on water resources, although its geographic position as the lowest riparian on the Euphrates complicates the issue. The situation is ameliorated somewhat by the fact that Iraq controls the left bank tributaries of the Tigris. Despite concern over water supply, indications point to improved relationships between Turkey and Iraq in the next ten years (Marr 1996).

After a review of the political, economic, military and environmental factors, tentative answers can be provided to the questions posed at the beginning of this paper. Some factual questions underlie the issues: When will the GAP be fully developed, and when will it begin to take a toll on downstream neighbors? Will the GAP, as designed and fully constructed, cause a downstream water shortage during normal use or under conditions of drought.

There are many measures of GAP development, water storage capacity, power production and irrigation infrastructure are three of the most important yardsticks. The five main dams and their reservoirs are 99% complete in terms of storage capacity. In July of 1997, during a site visit to the Ataturk Dam, it was reported that the lake was still below capacity due to settling of the of the earthen dam construction material. Power generation was then at about 95% capacity. One power generation unit was still under construction at the foot of the Sanliurfa Tunnel. But irrigation and its infrastructure are seriously behind schedule, estimates during interviews with Turkish officials in July 1997 indicated that it is less than 10% complete. This was supported during the author's travel across the length Southeastern Anatolia, where visits to areas that showed green colors of "GAP irrigation" on the official GAP 1996 map were still dry or dependent on primitive groundwater pumping techniques.

The GAP has been developed almost entirely without outside funding, and Turkish economic difficulties have contributed to major delays in development of the GAP irrigation infrastructure. There has not been the same emphasis as compared to power production, without the potential for immediate economic return. The Nippon Koie Co., which has been conducting GAP planning, estimates that the training of farmers in the proper use of water and equipment can bring only about 1,000 new ha. into development each year. Since there are approximately 1 million hectares scheduled for irrigation with Euphrates water, at that rate it could take a

thousand years for the GAP to be fully developed. An article in an Ankara newspaper in July 1997 estimated that at the current rate of investment it would take 70 years to fully develop the GAP in terms of irrigation and agricultural production. Whatever the delay it could benefit the downstream riparians, since it will postpone the inevitable loss of water and slow the potential for downstream pollution from return flow.

The GAP itself is unlikely to cause a water shortage in the next ten years, under conditions of normal and anticipated use. The impoundments have in fact improved year-round flow conditions to the benefit of Syria and Iraq. However, a combination of drought conditions, increasing demand and other factors during the next ten years could still create severe hardship on the downstream riparians. The most probable source of increasing demand would be independent, non-regulated, agricultural diversions, and this is difficult to predict. For Syria and Iraq, water quality will become a more important issue as irrigation systems come on line and return flow to the rivers brings higher levels of contamination.

During a field visit to the GAP in the summer of 1997, and in interviews with GAP officials, there were a number of statements that Turkey would not have the ability to dramatically alter the flow of the Euphrates once the GAP is operational. This raises an important factual question: What is Turkey's real ability to use the GAP as an instrument of foreign policy? Can the flow of water leaving Turkey be manipulated? If so, how quickly and what impact will it have on Turkish hydropower generation and irrigation systems?

Turkey will have only a limited ability to use the GAP as an instrument of foreign policy in the years ahead. Turkey will increasingly depend on the smooth, regulated and efficient functioning of the GAP system and would have to disrupt its own economy and electric generation to punish the downstream riparians (Kolars, Sept. 1997). Turkey is fuel short and is highly dependent on the electrical power generation of the GAP. Imported oil and coal make up for much of the remaining power generation.

Turkey must maintain a careful balance of hydropower production against delivery of water for irrigation needs. This is particularly true for the Ataturk Dam that generates a large quantity of electric power, which is in turn spread through a grid that supports the rest of Turkey. The irrigation water offtakes are primarily through the Sanliurfa Tunnel to the Harran Plain. Excessive water removed to irrigation is unavailable for power generation at the Ataturk Dam. Also, excessive downstream release would lower the water levels below the Sanliurfa offtakes. Manipulation of water levels would have an immediate impact on power production and the impact on irrigation and crops would be dependent on seasonal variables. There is normally an excess of water for crops in the early summer and a shortage in the autumn. Another factor would be any condition of drought or heavy precipitation.

An essential factor in any Turkish manipulation of water levels or downstream flow would be the requirement to impound water behind the dams within Turkey. This would require a reduced volume in advance; the three major reservoirs, Keban, Karakaya and Ataturk have a total capacity of 88.9 billion cubic meters (BCM). The two other dams, Biricek and Karkamis, have negligible importance and serve mainly as surge controls for the Ataturk Dam. Of the 88.9 BCM main storage, 42.1 BCM (47%) is dead storage and can be ruled out of the scenario. Dead storage is that amount of water that is stored below the level of the exit channels. The remaining 46.8 BCM live storage (52.6%) is not necessarily available for "punishing" downstream users since most of it has to be maintained for power production and irrigation offtakes. Any effort to manipulate water levels would require substantial advance preparation and would have direct internal consequences for Turkey. It is not simply a matter of "turning off the spigot." If there were any attempt to hold back significant amounts of water, there would first have to be a significant draw down of live storage and this would be easily detectable by watching water levels within the reservoirs. This makes the availability of remote sensing and information technology even more important as a predictor of potential conflict.

Even if Turkey could manipulate water levels, under what conditions would it undertake such action? One scenario would be in response to terrorist activity originated in Syria or Iraq. If there were to be a major conflict between Turkey and its southern neighbors, water could conceivably be used as weapon in response to perceived aggression. But Turkey would have to weigh the use of the "water weapon" against the negative impact on its own economic, irrigation and power capability. Water is only one factor in a complex web of relationships between Turkey and its neighbors.

What is the potential for an agreement on allocation of the waters of the Tigris and Euphrates? Will international law provide guidance or assistance in reaching an agreement?

Fundamental differences work against cooperation in the Basin. The Turks maintain that there is a single basin of the Tigris and the Euphrates, thereby arguing that shortages on the Euphrates should be made up by diversions from the Tigris. Iraq is already conducting such a project, but the Arabs insist that there are two basins and demand their fair share of the waters of the Euphrates.

International law can provide some basic guidelines, but all the opposing parties can find a principle to their liking. A water allocation agreement is more a matter of political will than international law. Although the legal enforcement mechanisms are questionable, we should nevertheless look to international law to provide a framework for possible settlement of the dispute. The rule of law can provide a basis for negotiations, and ground rules should be known by policy makers well before a crisis develops. Reduced water supplies could ultimately be

a factor in pushing the parties to the negotiating table.

Instability analysis: What is the potential for Iraq or Syria to use the GAP as a *cause celebre* or *causus belli.* What is the likelihood of these countries to develop a united front towards Turkey with respect to water policy? In other words, what is the potential for regional conflict? Militarily, what is the likely outcome of any conflict? The following scenario is a hypothetical series of events based on unclassified portions of an annual NATO exercise.

Conflict Scenario 2010:

The attention of the world focuses on South Eastern Turkey and the crises brought about by regional water shortages. American and NATO security strategies have failed to achieve their desired objectives, and as a last resort the North Atlantic Council begins formal meetings to discuss NATO responsibility to honor its Article 5 treaty obligations. As diplomacy fails, a long predicted Flashpoint erupts involving water scarcity in the Tigris-Euphrates Basin.

Iraq and Syria experience instability and internal crisis. Both regimes experience problems in maintaining control and are challenged by internal opposition forces. This occurs against the backdrop of a severe drought, lasting three years, which would ultimately reduce the flow of the Tigris and Euphrates Rivers by as much as 50%. This is compounded by the effects of a fully functioning GAP system, which further reduces downstream water flow. After economic and political difficulties, Syria and Iraq use the riparian rights issue as a *causus belli* to plan and execute an invasion of Turkey. Although not actually allied, Syria and Iraq enjoy a co-belligerent relationship.

NATO intelligence assets detect hostile forces moving northward and massing in assembly areas that directly threaten Turkey. Turkey requests assistance under the provisions of Article 5 of the North Atlantic Treaty. After lengthy deliberations, the North Atlantic Council authorizes the deployment to Turkey of Allied Reaction Forces. Turkish forces are brought to a high state of readiness and NATO headquarters in Turkey are placed on a war footing. At this stage deterrence is the primary NATO strategy.

After allied forces arrive in Turkey, the hostile states launch a massive armor-heavy attack northward into Turkey. The immediate enemy objectives are thought to be Gaziantep and Mardin, with follow-on attacks to seize the areas surrounding the Ataturk and Keban dams. Simultaneously, enemy air and missile strikes target the seaports of Iskenderun and Mersin, and the airfields Incirlik and Adana. Enemy Special Forces also attempt to interdict the road and rail network leading into the operational area.

Turkey immediately transfers control of her forces to NATO. The Turkish Second Army defending Southeastern Turkey commands two active corps and arriving NATO reinforcements are placed under its command. Turkey begins to transfer inter-army reinforcements from the Turkish First and Third Armies to the southeast.

NATO air reinforcements and lightly equipped NATO immediate reaction land forces pour into Turkey. The Second Army is badly battered but conducts an orderly fighting retreat making the enemy pay dearly for each step northward. After a week of heavy combat, the reinforced Turkish Second Army stabilizes the front, but leaves the enemy in control of a huge salient which includes the cities of Gaziantep, Urfa, and Mardin. The enemy also controls most of the Harran Plain. The enemy first echelon is now too weak to continue the advance and relentless allied air attacks have successfully impeded the northward advance of additional enemy follow-on forces.

At this point, a holding action is underway for about sixty days. This is the time that it could take for the NATO ACE Rapid Reaction Corps (ARRC) to prepare, move by sea and air, and deploy into assembly areas in Turkey. Fully assembled, the ARRC would have combat forces roughly equivalent to the American Seventh Corps in Desert Storm. By this time, a US Marine Expeditionary Force (MEF) would probably be operational in Hatay province. In the Batman area, a corps-sized body of heavy Turkish brigades transferred from the other Turkish armies would be assembled and operational. Planning and preparations for the NATO counter attack would be completed with the objective of restoring the integrity of the Turkish border.

At about three months into the war, Allied forces launch a massive encirclement campaign against the hostile force main body in Turkey. As Allied air forces isolate the battlefield, the ARRC and the MEF sweep in from the west, as Turkish forces sweep through Mardin from the east. The ARRC destroys the enemy operational reserve in a dramatic meeting engagement in the Harran Plain, shortly after which contact is made with Turkish forces, thus completing the encirclement. Utterly defeated, the hostile states ask for a UN brokered cease fire, as NATO forces restore the Turkish border and eliminate isolated pockets of resistance including the last vestiges of the enemy armies in Turkey. A difficult and bloody campaign, but the allied forces prevail.

Conclusions:

Relationships in the Tigris and Euphrates Basin in the years ahead will be continually influenced by water. While the Euphrates River connects all three riparian states, political and historic relationships remain bilateral. These three bilateral relationships form a triangle that is linked by the river. The Euphrates connects these bilateral relationships into a series of conflicts and rivalries.

Issues between Turkey and Iraq will be based on a number of issues, and water will be increasingly important in the next ten years. Turkey and Iraq have many common interests, there is a natural economic link based upon the delivery of oil and the potential for commerce. They also share a common desire to restrain the Kurdish nationalism that threatens to divide both countries. Water presents only one component of a complex relationship.

Issues between Iraq and Syria are historical competitions over regional strength and authority. Both political systems and leaders are striving to represent a Middle East agenda. The 1975 escalation and tensions over the reduction of the Euphrates flow devolved to a Syria – Iraq conflict that reflected a struggle for power and control much more than over the water itself. While Turkey controlled a significant part of the flow quantity, Turkey was noticeably absent from the conflict. Another escalation between Syria and Iraq may occur before Turkey is threatened, and the strong military position of Turkey should continue to provide a deterrent.

Syria's active support of several insurgency groups is an issue even more visible than water scarcity. The tensions over Kurdish nationalism and Turkish sovereignty dominate the relationships between Turkey and Syria. Arab and Israeli issues dominate the regional relationships and provide an impediment to an agreement on water. In the region of the Euphrates River and the GAP project, support of destabilizing elements continue to dominate the relationship. Security in the Tigris Euphrates Basin is complex, but some predictions can be made after reviewing the historical, political, economic and military factors.

There will be a continuing effort by Iraq and Syria to use water in the Basin as a *cause celebre*, and US policy should recognize that the rhetoric is bound to increase. But it is unlikely that conditions will give rise to a "water war" in the region in the next ten years because water is only one of a number of factors that contribute to instability. Syria and Iraq have already learned to cooperate with respect to water. The bilateral agreement includes a 42%-58% allocation of water flowing in the Euphrates from Turkey. Nevertheless, there are still significant animosities between the Syrian and Iraqi leadership that work against a real alliance. Turkey will retain the military advantage in any potential conflict, even in the case of a combined attack by its southern neighbors. The conflict scenario described above indicates the level of support available to assist Turkey repel any aggression. Turkey's NATO status and the threat of retaliation will continue to deter Syria and Iraq from military adventurism. The likely result of any conflict would be in favor of Turkey and the NATO alliance.

Considering all the factors cited above, and the triangular regional relationship, what is the most probable scenario in 2010? Under the best case scenario, we find a lessening of tensions in the Middle East, with an improvement in the Arab-Israeli peace process. Rainfall and river flow conditions remain stable, and

the GAP development continues to lag behind in irrigation potential, reducing the short-term impact on water quantity and quality. Iraq without is welcomed back to the community of nations and economic activity resumes with Turkey. The Syrian economy improves and there are no incidents involving PKK terrorism that cause a major deterioration of relations with Turkey.

In a best case scenario, the three riparian nations would have a meeting of the minds diplomatically and politically. Increased pressure on the watershed can sometimes motivate the parties to realize that cooperation is in the best interest of all concerned. An external agency such as the Gulf Cooperation Council could become involved, particularly if there is a perception that the waters of the Gulf were threatened by diminishing flow or high pollution levels from the Tigris and Euphrates. Increased use of information technology could assist the parties in obtaining the necessary date to reach an agreement on water allocation.

In the most likely case, NATO and American security strategies support the current balance of power that the region currently enjoys. For an improved climate, the Ba'thist regime of Saddam Hussein would probably have to be replaced by a moderate government willing to repair the diplomatic damage inflicted by its predecessor. There would also need to be some measure of success in the Mid-East Peace Process, which would enable Syria to move towards a more moderate position in regional affairs. Finally, Turkey would have to display a new willingness to engage in diplomatic exchanges in which national sovereignty issues are discussed and at risk.

Turkey can be expected remain a reasonably stable democracy despite periodic efforts by Islamic interests to regain power. The PKK will continue to decline in influence, the beginnings of economic development will reduce the PKK power base further. Turkeys relations with Iraq will improve slowly, with or without Saddam (Marr 1996). The delay in GAP development will give more breathing room to the downstream neighbors, but increasing demands on the waters of the Euphrates will continue to maintain a degree of instability. (Kolars, Yale University Paper, 1997) The parties are unlikely to reach an agreement on water allocation. Except for a drought or some combination of destabilizing events, water is not likely to become the primary causal factor to ignite a conflict between the riparian states in the next ten years. This should not be a reason for the US to ignore the problem, because US interests are served by maintaining a proactive stance in the region.

Conflict over water in the region has been predicted for more than 15 years, but no war has occurred. One reason is simply the clear military advantage enjoyed by Turkey and her NATO allies. The "conflict scenario" above describes the likely result of a major military conflict. This scenario does not take in to account another potential destabilizing factor. The proliferation of weapons of mass destruction, with the necessary delivery vehicles, would greatly complicate the analysis. Looking beyond 2010 is more speculative. Increasing demands on

the rivers and a shifting military balance could make the Tigris-Euphrates Basin a much more dangerous place.

What direction should US foreign policy take to support peace in the region? Here are the recommendations.

XII. RECOMMENDATIONS:

1. The Need for Reliable Data. There is a serious deficiency in terms of reliable data on water supplies in the Tigris Euphrates Basin. There must be an increased use of intelligence assets and information technology to monitor and assess water shortage and potential conflict in the region. The US should take the lead with a joint technical team, under the leadership of the State Department, to gather objective data on water flow, topography, irrigation, hydrology and consumption rates for now and projected ten years into the future. (Naff 1997) The technology is here, it needs to be directed to this strategically important region.

2. Technical Assistance. The US should offer to provide increased technical assistance to Turkey and Syria to assist in implementing improved methods of reclamation and irrigation. The nations of the Tigris-Euphrates are making the same mistakes that were made in the US earlier this century. (Collier, Webb and Schmidt, 1996). The US Bureau of Reclamation and other US agencies have the technical expertise to assist, and US efforts could provide major returns in environmental security. This type of foreign aid is non-threatening, and can help lay the foundation for a comprehensive water allocation agreement.

3. Academic Exchange. Academic programs can often provide a basis for dialogue where official meetings are burdened by political posturing. There may be a higher probability of success at "second track " negotiations, and there is an informal international network of water experts who continue with unofficial dialogue (Kolars, unpublished, 1997). One example of an international meeting was held in Ankara in 1994, it had the financial support of a German foundation, and a volume of academic papers was produced that included a wide range of perspectives (Bagis 1994). Academic or other second track activities can pave the way for official meetings and a possible basin-wide agreement.

4. Creation of a Single Coordination Authority Within the US Government. One of the difficulties in formulating US policy for the Tigris-Euphrates region is that the rivers literally cut across major geographic areas of responsibility. Turkey is considered as part of Europe and the West, Syria and Iraq are in the Middle East. For US military planning, Turkey is within the geographic sector of the US European Command (EUCOM) while Iraq is in the region assigned to the US

Central Command (CENTCOM). Developing a coherent policy under these conditions is difficult. The same problem exists in the US State Department, where Middle East water issues receive great attention. This is justifiable in light of the importance of the Middle East peace process. But Tigris-Euphrates water issues could very well move to center stage, and the US should be prepared. A single Coordinating Authority could assemble the necessary data and make recommendations for the development of an informed US strategy.

5. A New Security Strategy. NATO and the US must develop a security strategy to evaluate and reduce the potential for regional conflict based on water shortage in the Tigris Euphrates basin. There should be renewed diplomatic efforts to encourage the parties to reach a negotiated solution to regional water issues. Although separate from the Middle East peace process involving Israel, an agreement between the three riparian states of the Tigris and Euphrates would reduce tensions and provide a basis for further dialogue. The US could play a pivotal role in breaking the impasse between Turkey and Syria on water supplies. (Lawson 1996) In the absence of an agreement, Turkey deserves US support because of its important position as a bastion of the NATO alliance. Any assessment of the security implications of a potential water shortage must be viewed through this lens. A stable, prosperous and secure Turkey is clearly in the US (and NATO) strategic interest.

6. Military Considerations. In the event of a US or NATO deployment to the region, political and cultural sensitivities to the water situation should not be overlooked. Dams, hydroelectric and irrigation facilities are viewed as sensitive security facilities. In addition, there should be no assumption that available water supplies are potable, there is little available data but increasing salinity or other contamination may be present. With an informed and proactive US foreign policy in the Tigris-Euphrates Basin, we can hope that a large scale deployment will not be necessary.

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