

# **Cooperation on Turkey's transboundary waters**

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## Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Motive and main objectives .....	1
1.2	Structure of this report.....	3
<b>2</b>	<b>STRATEGIC ROLE OF WATER RESOURCES FOR THE TURKISH ECONOMY .....</b>	<b>5</b>
2.1	Climate and water resources.....	5
2.2	Infrastructure development.....	7
2.3	Water use per capita and by sectors.....	8
2.4	Strategic role of the Euphrates and Tigris rivers, the key to the Southeastern Anatolia Project .....	9
<b>3</b>	<b>TURKEY'S WATER-RELATED ADMINISTRATIVE SET-UP .....</b>	<b>11</b>
3.1	Water laws and regulations .....	11
3.2	Organisations in the water sector.....	12
3.3	What role can public organisations play in improving trans-boundary cooperation?.....	16
<b>4</b>	<b>TURKEY'S POSITION TOWARDS INTERNATIONAL WATER LAW .....</b>	<b>19</b>
4.1	General principles of international water law.....	19
4.2	Negotiations on the UN Water Convention (1997) .....	20
4.3	Participation in other regional agreements.....	22
<b>5</b>	<b>THE RIVER BASINS.....</b>	<b>25</b>
5.1	The Maritsa basin.....	26
5.2	The Kura-Araks basin.....	38
5.3	The Coruh basin.....	47
5.4	The Euphrates and Tigris rivers .....	55
5.5	The Orontes basin.....	66
5.6	Turkish-Syrian transboundary groundwater resources .....	73
5.7	Cooperation and outstanding issues: similarities and differences.....	76
<b>6</b>	<b>TURKEY: TRADING WATER IN REGIONAL MARKETS.....</b>	<b>79</b>
6.1	The Peace Pipeline Project.....	79
6.2	The Manavgat Water Supply Project.....	80
6.3	National concerns in Turkey over water trade.....	82
6.4	International bearing.....	82
<b>7</b>	<b>CONCLUSION AND RECOMMENDATIONS .....</b>	<b>85</b>
7.1	Controversial issues, hitherto agreements and conflict intensity.....	85
7.2	Recommendations .....	90
<b>8</b>	<b>REFERENCES .....</b>	<b>95</b>
	<b>ANNEX 1 ANALYTICAL BACKGROUND – THE CURRENT DEBATE ON TRANSBOUNDARY WATER ISSUES .....</b>	<b>105</b>
	<b>ANNEX 2 TRANSLATIONS OF BILATERAL WATER AGREEMENTS .....</b>	<b>109</b>

## List of figures, tables, and boxes

Figure 1: Turkey's transboundary watercourses .....	4
Figure 2: Turkey's 26 river basins .....	6
Figure 3: Map of the Maritsa river and its main tributaries .....	26
Figure 4: Map of Kura, Araks, and main tributaries .....	38
Figure 5: Map of the Coruh river and its main tributaries .....	47
Figure 6: Map of Euphrates, Tigris, and main tributaries .....	55
Figure 7: Map of the Orontes river and its main tributaries .....	66
Figure 8: Location of Turkish-Syrian transboundary groundwater resources .....	73
Table 1: Water potential generated in Turkey's transboundary river basins .....	7
Table 2: Multi-purpose water infrastructure in Turkey (in operation and planned, January 2005).....	7
Table 3: Activities of public organisations that impact on transboundary water resources ....	18
Table 4: Cooperational context in the Maritsa basin in brief .....	27
Table 5: Cooperational context in the Kura-Araks basin in brief.....	39
Table 6: Cooperational context in the Coruh basin in brief .....	48
Table 7: Cooperational context on the Euphrates river in brief.....	56
Table 8: Cooperational context on the Tigris river in brief .....	57
Table 9: Cooperational context in the Orontes basin in brief .....	67
Box 1: The Southeastern Anatolia Project (GAP) in brief .....	10
Box 2: Bilateral accords concerning the Euphrates river .....	61

## List of abbreviations

Aarhus Convention	UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (1998)
AMSL	Above mean sea level
Barcelona Convention	Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (adopted 1976, amended and renamed in 1995)
BCM	Billion cubic meters
BfN	German Federal Agency for Nature Conservation (Bundesamt für Naturschutz)
BOT	Build-Operate-Transfer Contracts
BSEP	Black Sea Environmental Programme
Bucharest Convention	Convention on the Protection of the Black Sea against Pollution (1992)
CBD	Convention on Biological Diversity (1992)
DSI	State Hydraulic Works (Devlet Su Isleri)
ECA	Export credit agencies
EIA	Environmental impact assessment
EIEI	Electrical Investigation Administration (Elektrik Isleri Etüt Idaresi)
ESCWA	Economic and Social Commission for Western Asia
Esfoo Convention	Convention on Environmental Impact Assessment in a Transboundary Context (1991)
GAP	Southeastern Anatolia Project (Güneydogu Anadolu Projesi)
GAP RDA	GAP Regional Development Administration
GD DSI	General Directorate of State Hydraulic Works (Devlet Su Isleri)
GDRS	General Directorate for Rural Services (Köy Hizmetleri)
GEF	Global Environmental Facility
GIS	Geographical information system
GOLD	General Organisation for Land Development, Ministry of Irrigation, Syria
GTZ	German Agency for Technical Cooperation (Deutsche Gesellschaft für Technische Zusammenarbeit GmbH)
HEPP	Hydroelectric Power Plant
IHP	International Hydrological Programme of UNESCO
ILA	International Law Association
INWEB	International Network of Water Environment Centres for the Balkans
ISARM	Internationally Shared (Transboundary) Aquifer Resources Management Programme
Istanbul Commission	Commission for the Protection of the Black Sea Against Pollution
IUCN	International Union for Conservation of Nature and Natural Resources/ World Conservation Union
JTC	Joint Technical Committee
KfW	German Bank for Reconstruction and Development (Kreditanstalt für Wiederaufbau)

MAP	Mediterranean Action Plan
MCM	Million cubic meters
MEDASSET	Mediterranean Association to Save the Sea Turtles
MedWet	Mediterranean Wetlands Initiative
MoE	Ministry of Environment and Forestry, Turkey
NATO	North Atlantic Treaty Organisation
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
OSCE	Organisation for Security and Co-operation in Europe
Phare	Programme of the EU to assist the applicant countries of Central and Eastern Europe
Ramsar Convention	Convention on Wetlands of International Importance Especially as Waterfowl Habitat (1971)
SPO	State Planning Organisation (Devlet Planlama Teskilati)
TACIS	The European Union's Technical Assistance to the Commonwealth of Independent States, programme of the EU to enhance the transition process in Eastern Europe and Central Asia
TFDD	Transboundary Freshwater Dispute Database
UN	United Nations
UN Water Convention	United Nations Convention on the Law of the Non-navigational Uses of International Watercourses (1997)
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNECE Water Convention	UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992)
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCD	World Commission on Dams
WFD	EU Water Framework Directive
WHYCOS	The World Hydrological Cycle Observing System

# 1 Introduction

## 1.1 Motive and main objectives

In December 2004, the European Council decided that official accession negotiations with Turkey would commence in October 2005 with full EU membership for Turkey as the possible outcome. With the so-called, Copenhagen Criteria, the EU has developed a set of three key conditions that all candidate countries would be required to meet in order to ensure successful membership. These three Copenhagen Criteria are: (i) institutions guaranteeing democracy, the rule of law, human rights, and minority rights, (ii) the candidate state's need to prove that it has a functioning market economy and is capable of coping with the competitive pressures within the EU, and (iii) the ability to fully implement all obligations of EU membership. Core to these obligations of membership is, the full legal transposition and the practical implementation on the ground of the so called *acquis communautaire*, which is the whole body of EU law in force. One important area of EU legislation deals with environmental issues, and water management is certainly one of the fields that is already largely shaped by a complex body of EU law. The most relevant directive in water management is the EU Water Framework Directive which demands both detailed requirements for national water management and the obligation for EU members to internationally coordinate their activities along river basins in order to achieve the environmental objectives of the directive. Apparently, while Turkey is obliged to develop a national approach to the adoption of the environmental *acquis*, the country's national and transboundary approaches to water management issues will become issues in accession negotiations. Recently, the rather rudimentary cross-border cooperation at the Turkish transboundary waters was already revealed as a problematic and challenging issue in the context of the negotiations.

The European Council's strong attention to transboundary water management within the context of Turkish EU accession was illustrated by the EU-Turkey accession partnership dating from May 2003 (2003/398/EC). In this document, the European Council rated Turkish transboundary water management as a priority that needed short-term effort and improvement. More specifically, the Council's decision determined the short term need for Turkey to 'pursue the development of transboundary water cooperation, in line with the water framework directive and international conventions to which the Community is a party' (2003/398/EC, p. 10 ).<sup>1</sup> The European Commission's 2004 report on Turkey's progress towards accession also underlines the need to step up cross-border water cooperation with the neighbouring countries with regard to the implementation of the water framework directive (European Commission 2004).

Motives for these statements stem from international concerns about unresolved water disputes and potential water conflicts at Turkey's borders, in particular at the Euphrates and Tigris rivers. In the past, Turkey was frequently perceived as a strong upstream riparian that pursues huge water development projects without adequately taking the interests of water-

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1 Within this context the UNECE Conventions on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992) and, Environmental Impact Assessment in a Transboundary Context (Espoo, 1991) should be mentioned.

scarce downstream riparians into account. Several commentators have emphasised the important interdependencies between water scarcity and security issues at Turkey's borders turning transboundary river management into an important issue in a region that is largely blighted by tensed political relations anyway (cf. Lorenz and Erickson 1999). Furthermore, Turkey's attitude towards the development and strengthening of international water law was assessed as being reserved at best, because of the country's reluctance to sign up to international water law conventions (cf. Scheumann 2003, Barandat 1997). Furthermore, while the Organisation for Security and Co-operation in Europe (OSCE) presently considers the promotion of transboundary water cooperation an adequate measure to support good political relations between riparians, Turkey has always expressed reservations and was always absent from OSCE related activities. During the the preparation of the 2002 OSCE Economic Forum on "Cooperation for the Sustainable Use and the Protection of Quality of Water", for instance, the Turkish government has repeatedly stated that it does not consider the OSCE an adequate forum for discussing water issues and is not willing to debate transboundary water issues (OSCE 2002a).

Against this background, the accession partnership and the imminent accession negotiations may provide a promising framework for mutual understanding between the EU and Turkey. In the framework of the general negotiation process, the EU may be in a position to attentively observe the Turkish needs, policies and projections regarding transboundary waters. Moreover, Turkey should be supported in developing and strengthening its capacities to adequately implement the EU environmental *acquis* regarding transboundary rivers, lakes, and groundwater bodies. It may also be worth considering new initiatives to overcome cooperation obstacles and to address the relevant transboundary water issues in a more comprehensive manner.

Germany has always traditionally supported various international initiatives and programmes to facilitate and improve transboundary water management at international rivers and lakes. In 1998, Germany initiated the so-called Petersberg Process in cooperation with the World Bank which started with the Petersberg International Dialogue Forum on Global Water Politics / Transboundary water management and, in the same year, the Berlin International Round Table on experiences with transboundary water management also took place. On both occasions, representatives from various states agreed on the need to improve transboundary water management and to build an institutional, organisational and political environment to facilitate these ideas. A further aim of Petersberg Process was the support of a paradigm shift in the management of water-scarce river basins, where riparian states should be encouraged to focus more on the possible joint environmental and economic benefits from transboundary cooperation instead of disputing the allocation of water resources. Following regional round table talks in the Baltic region and in the Nile basin, the German government also supported the integration of the Petersberg Process into international water policy – see the 2001 Bonn Conference on Freshwater in preparation for the 2002 World Summit on Sustainable Development in Johannesburg. Equally, Germany endorsed the already mentioned choice of water management as a topic for the OSCE (see 2002 OSCE Economic Forum) and the dialogue on the transboundary waters / security nexus for the 2003 World Water Forum in Kyoto. Therefore, with the country's rich experience in promoting international water management, Germany has a particular interest in intensified political dialogue between Turkey and the EU on these issues. Furthermore, Germany is actively involved in the development of water-related infrastructure in Turkey via



financial and technical assistance<sup>2</sup>. Therefore Germany and Turkey already carry out effective and expandable bilateral cooperation in the water sector.

However, international knowledge on the current state of water cooperation and unresolved disputes at Turkish transboundary rivers is lacking. In order to improve the body of information in preparation for intensified dialogue between Turkey and the EU, this study has three major objectives and should contribute to:

- A comprehensive assessment of current use and management of the Turkish transboundary waters including, if available, bilateral or multilateral agreements and organisations,
- An identification of existing and/or potential disputes relating to infrastructure development and other forms of intensified water use,
- Identifications of key elements of EU strategy to support Turkey in further developing a cooperative approach to its transboundary waters,
- Identifications of proposals for an integration of transboundary water issues in the German-Turkish Environmental Cooperation.

However, despite the ambitious objectives of this study, our report has an explorative character. Where not all information could be obtained, the results are rather preliminary. The research was carried out as a desk study. This involved collecting and analysing information (literature, documents, databases etc.) from a variety of sources. For a thorough analysis, all water-related treaties between Turkey and her neighbouring countries were collected and translated into English (see Annex). In addition, some personal communications were carried out with experts and officials.

## 1.2 Structure of this report

In accordance with the objectives of this research project and the political context; our report is structured as follows:

Chapter 2 briefly introduces the importance of water resources for development in Turkey and the adopted water infrastructure development path. On this basis, chapter 3 is dedicated to a rough outline of the Turkish institutional framework for water management in terms of legal provisions and the allocation of competences between various administrations and organisations. Turkey's position relating to basic principles and the development of international water law is the subject of the following chapter (chapter 4).

In the subsequent chapter (chapter 5). we present our findings on cooperation and conflicts at the main important Turkish transboundary waters. In order to have an adequate and meaningful selection of river basins, we carried out pre-screenings of all the water bodies we could get information on with a criteria-based selection of those rivers being the most important for a more detailed analysis in terms of cooperation potential or risk of conflict. Consequently, we have chosen the following basins: Maritsa (riparian states: Greece,

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<sup>2</sup> Both the German Gesellschaft für Technische Zusammenarbeit (GTZ) and the KfW Development Bank are active in Turkey. Further information is available at [http://www.kfw-entwicklungsbank.de/DE\\_Home/Laender\\_und\\_Projekte/Europa32/Trkei79/index.jsp](http://www.kfw-entwicklungsbank.de/DE_Home/Laender_und_Projekte/Europa32/Trkei79/index.jsp); and <http://www.gtz.de/de/weltweit/europa-kaukasus-zentralasien/663.htm>

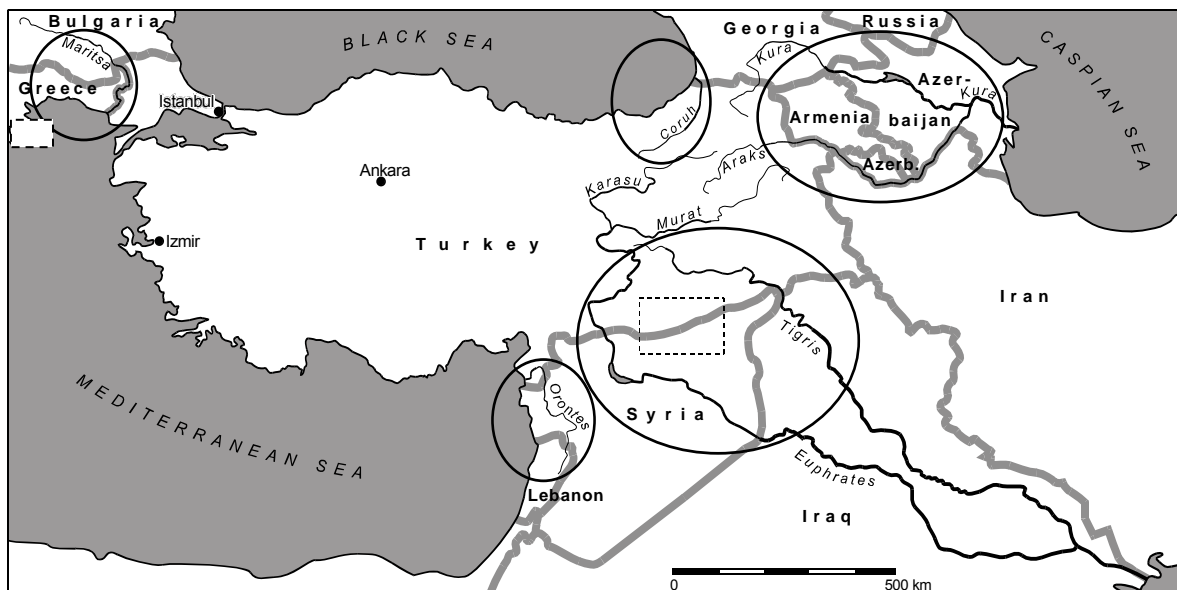
Bulgaria, Turkey); Kura-Araks (Turkey, Georgia, Iran, Azerbaijan, Armenia); Coruh (Turkey, Georgia); Euphrates-Tigris (Turkey, Syria, Iraq); Asi / Orontes (Turkey, Syria, Lebanon), and, finally, shared transboundary aquifers between Turkey and Syria (see Figure 1). Chapter 5 is completed by a cross case comparison of the similarities and differences relating to the water management challenges and the hitherto results of cooperation at the transboundary waters.

Chapter 6 presents the current state of international water trade in the Middle East insofar as Turkey is involved. Finally, we present our main results and derive some policy recommendation in the final chapter, chapter 7.

Annex 1 to this report, gives a general overview of the current debate on transboundary water cooperation as an analytical background to this study. Annex 2 includes English translations of bilateral agreements by Turkey, which involve transboundary water issues. They have been translated for the use of this study.

The Maps presented in this report are not to scale and not exhaustive. They were prepared for this report to provide the reader with a sketch of the respective river basins and to facilitate understanding of the geographic and hydrologic framework conditions described in the text. The maps do not imply the expression of any opinion on the part of the authors and the German government concerning the legal status of any country, territory, city or the delineation of its frontiers and boundaries.

**Figure 1: Turkey's transboundary watercourses**  
( Indicates the area of transboundary groundwater, compare Figure 8 )



## 2 Strategic role of water resources for the Turkish economy

Turkey's water policy can best be characterised by her desire to gain independence from imported energy sources, to increase production levels of agriculture and to achieve food security, to satisfy increasing water demand from industry and urban and rural populations, and to correct regional economic and social imbalances in the country, thus raising the living standard of the population.

Systematic water resource development started in the 1950s with the establishment of the General Directorate of State Hydraulic Works (DSI) (see chapter 4). At that time, the use of agricultural land could not be extended because most of the suitable land was already developed. On the contrary, cultivated land had to be limited due to striking erosion problems. Land with high potential had to be used more intensively through irrigation in order to secure food production and to increase export potential. Approximately 8.5 million ha of land that were estimated to be economically irrigable, but only 1.2 million ha were irrigated in the early 1960s. It was the vast development potential of both the Euphrates and Tigris rivers which, in the 1960s, created the idea of harnessing their waters in a region where nearly one-fifth of Turkey's irrigable land can be found.

The oil crises of the 1970s gave additional impetus to developing the country's hydropower potential. As one representative of the State Hydraulic Works (DSI) quoted: "Since the country suffered badly in the oil crises of the 1970s, the government has embarked upon a programme of indigenous resource development, particularly hydropower and lignite schemes to minimise the dependency of the national economy of imported oil."<sup>3</sup> However, population growth, urbanisation and industrialisation have even widened the supply-demand gap.

While Turkey intends to develop water resources all over the country, the Southeastern Anatolia Project (Güneydogu Anadolu Projesi, GAP) is of particular importance for generating hydropower and producing agricultural commodities. All the more, it is the government's desire to stabilise this under-developed region politically by significantly raising the population's standard of living.

### 2.1 Climate and water resources

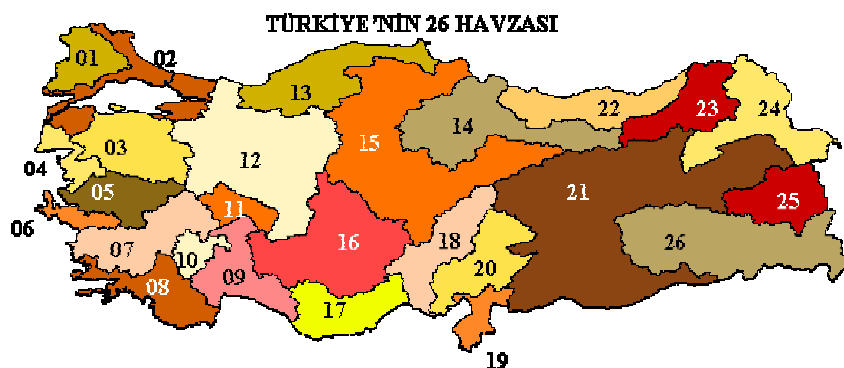
Geographically, Turkey's territory is divided into 26 large river basins (see Figure 2) which show a large variation in average annual precipitation, evaporation and surface run-off parameters. Average precipitation is 643 mm ranging from 250 mm in the south-eastern region to over 3,000 mm in the Black Sea coastal area (Republic of Turkey 2003).

Turkey is a country with considerable water resources. In total, average annual run-off is of

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3 Quoted in International Water Power and Dam Construction, Vol. 44 (12), December 1992, p. 12. Turkey is also developing other renewable energy resources such as geo-thermal power, wind power, biomass energy, but hydropower will provide the greatest share to tackle the energy deficit (Energy Information Administration 2002).

approximately 186 billion cubic meters (BCM) of which 112 BCM could be exploited at reasonable cost. Surface water contributes 98 BCM and groundwater 14 BCM. However,



**Figure 2: Turkey's 26 river basins**

Source: DSI website, no year

Catchment name	Catchment area (km <sup>2</sup> )	Mean annual discharge (BCM) <sup>4</sup>	Contribution to total (%)
(21) Euphrates	127,304	31.61	17.0
(26) Tigris	57,614	21.33	11.5
(22) East Black Sea	24,077	14.90	8.0
(17) East Mediterranean	22,048	11.07	6.0
(09) Antalya	19,577	11.06	5.9
(13) West Black Sea	29,598	9.93	5.3
(08) West Mediterranean	20,953	8.93	4.8
(02) Marmara	24,100	8.33	4.5
(18) Seyhan	20,450	8.01	4.3
(20) Ceyhan	21,982	7.18	3.9
(15) Kızılırmak	78,180	6.48	3.5
(12) Sakarya	58,160	6.40	3.4
(23) Çoruh	19,872	6.30	3.4
(14) Yeşilirmak	36,114	5.80	3.1
(03) Susurluk	22,399	5.43	2.9
(24) Kura-Araks	27,548	4.63	2.5
(16) Konya	53,850	4.52	2.4
(07) Büyük Menderes	24,976	3.03	1.6
(25) Lake Van	19,405	2.39	1.3
(04) North Ege	10,003	2.90	1.1
(05) Gediz	18,000	1.95	1.1
(01) Meriç-Ergene	14,560	1.33	0.7
(06) Küçük Menderes	6,907	1.19	0.6
(19) Orontes	7,796	1.17	0.6
(10) Burdur Lakes	6,374	0.50	0.3
(11) Akarçay	7,605	0.49	0.3
<b>Total</b>	<b>779,452</b>	<b>186.86</b>	<b>100</b>

due to the high population and urban growth rates (4%), many regions of the country (south-east, Marmara, Aegean and Mediterranean) are already facing seasonal or even chronic water shortages therefore necessitating infrastructural development in the water sector.

<sup>4</sup> BCM = billion cubic meters

Table 1 shows the contribution of transboundary rivers to Turkey's available water resources. The Euphrates and Tigris rivers alone account for 28.5 %. At present, Turkey is utilising 39.3 BCM of its overall capacity.

**Table 1: Water potential generated in Turkey's transboundary river basins**

Transboundary river basin	Catchment area in Turkey (km <sup>2</sup> )	Mean annual flow generated in Turkey (BCM)	Share of total usable potential
Euphrates	127,304	31.61	17.0
Tigris	57,614	21.33	11.5
Coruh	19,872	6.30	3.4
Kura-Araks	27,548	4.63	2.5
Maritsa-Ergene	14,560	1.33	0.7
Orontes	7,796	1.17	0.6
<b>Total usable water:</b>	112 BCM		
<b>surface water:</b>	98 BCM		
<b>groundwater:</b>	14 BCM		

Source: DSI website, no year

## 2.2 Infrastructure development

The adoption of the Constitution of the Turkish Republic of 1961<sup>5</sup> paved the way for state-induced economic and social development directed towards overcoming regional imbalances, with the western regions far ahead of the south-eastern and north-eastern provinces. This strategic orientation included the country's water resources being mainly developed from public sources.

**Table 2: Multi-purpose water infrastructure in Turkey (in operation and planned, January 2005)**

	In operation	Planned
<b>Dams</b>	555 Large dams: 212 Small dams: 343	210 Large dams: 86 Small dams: 124
<b>Hydropower plants</b>	135	70
Capacity	12,631 MW	9,447 MW
Annual production	45,325 GWh	31,306 GWh
<b>Irrigation</b> (million ha)	4.89	0.8
<b>Domestic water</b> (BCM)	2.96	1.09
<b>Flood control</b> (million ha)	1.0	0.5

Source: DSI website, no year

5 The 1961 Constitutions of the Turkish Republic was replaced in 1982.

From the 1950s to date, Turkey has made considerable progress in developing its water resources for multiple uses. The construction of dams and reservoirs were the main means of saving water during the short rainfall seasons to facilitate year round availability. Today, an extensive network of dams and reservoirs is maintained of which the larger dams serve multiple purposes (e.g. flood control, irrigation, domestic water supply, hydropower etc.) (see Table 2).

### 2.3 Water use per capita and by sectors

Due to population growth and urbanisation, water and energy demand is expected to increase. According to DSI statistics, **annual per capita water availability** in the year 2000 was 1,500 m<sup>3</sup> with a population of about 68 million. By the year 2030 this amount will decline to 1,000 m<sup>3</sup> per capita/year with an expected population of 100 million (DSI website, no year). The **annual per capita energy consumption**, which is at present far below the world average, is expected to increase from 1,840 kWh (1999) to 6,794 kWh (2020). To achieve this growth rate and reach energy consumption levels of the OECD countries, huge investments are envisaged (Altinbilek, no year).

As of 2003, water use, related to sectors, was as follows: the irrigation sector used 29.3 BCM/year (75%), domestic water 5.8 BCM/year (15%), and industry 4.2 BCM/year (10%). In total, 36% of the usable water potential is utilised.

Although **agriculture's** contribution to the Turkish economy is declining (from 35% in 1970 to 11.5% in 2000), agriculture is still vital to the national economy employing 30 % of the country's work force. Crop production on the 4.85 million ha of irrigated land creates the basis of agricultural exports to European countries and to Near East and North African regions. Export of agricultural and agro-industrial commodities were valued at US\$ 4.4 billion and accounted for 16% of Turkey's total export value in 2001. According to DSI estimates, 8.5 million ha of land is technically and economically irrigable and subject to further development. It is expected that the high share of water consumption in agriculture will decline from 75% at present to 65% through the use of modern irrigation techniques.

**Domestic** water use accounts for 15% of the water resources developed (2003) showing high variations throughout the country. Domestic water use is highest in the Marmara Region, and far below the national average in north-eastern and eastern Anatolia. With more than half of Turkey's population living in urban areas, construction of water supply, sewerage and waste water treatment plants has received high political attention. Population growth together with high internal migration from rural to urban areas over the last 30 years has caused domestic demand to increase. In urban areas, access to a drinking water supply was 83% in 1990 and 81% in 2000; in rural areas, it was 72% in 1990, and 86% in 2000 (Republic of Turkey 2003: 80). Currently, only about 55% of the population living in municipalities with more than 3,000 inhabitants are connected to a sewage system, whereas 36% of the population which usually live in greater metropolitan municipalities, are served by waste water treatment facilities (Republic of Turkey 2003).

The percentage of water use in **industry** has not changed considerably over the past few years, being slightly over 10% (52% from surface water, 48% from groundwater). The major water consuming industries are steel, chemical, paper manufacturing, petroleum refining and agro-industry. In 2000, the greatest industrial demand came from the highly industrialised Marmara Region. Other industrial centres developing in the context of the Southeastern

Anatolia Project will not change the overall percentage of industrial water use, and will only change the regional distribution.

Equally important is Turkey's rising **energy** demand with an annual average growth rate of 7.3%. In 1999, Turkey consumed 118.5 billion kWh, by 2005 this will reach to 195 billion kWh, and by 2010, projections are 285 kWh (Republic of Turkey 2003). In the 1970s Turkey was seriously hit by the energy (oil) crises and after 1997 became an importer of electricity. At present, hydropower provides about 40% of the total power generated, but there is more additional potential. The hydropower share is expected to increase in particular through the construction of power plants on the Euphrates and Tigris (for hydropower potential of river basins, see Orhon 2001).

Based on these overall water use and energy projections, Turkey considers herself not to be a water rich country. With 1,500 m<sup>3</sup> per capita per year (2000) and an expected decline to 1,000 m<sup>3</sup> in 2030, Turkey is moving from a relatively water-rich country to one where water availability will reach critical levels. This projection is why Turkey's major agency for water resource development, the General Directorate of State Hydraulic Works (DSI), argues in response to the World Commission on Dams' (WCD) Final Report that (DSI 2001): "dam construction is a vital and unavoidable program for the country. [...] while the countries being in the leading positions of the [WCD] process have developed their water resources with about the level of 100 %, the prejudiced findings of the report may probably prevent the water resources development projects planned by the developing countries, such as India, Turkey, with the development level of 30%, and China." Turkey, having developed only about 30% of her water potential would be in dire need of producing and providing cheap energy, and improving the living standard of her citizens by providing adequate water (DSI 2001).

While Turkey's major focus is on continuing water resource development because of their economic and social potential, protection of water-based ecosystems in rivers, lakes and deltas, and water pollution control is increasingly acknowledged, but has yet to reach satisfactory levels (Ministry of Environment 1998, Republic of Turkey 2003). However, both Turkey's National Environmental Action Plan and the Eighth Five Year Development Plan give top priority to these issues (State Planning Organisation 1999).

## **2.4 Strategic role of the Euphrates and Tigris rivers, the key to the Southeastern Anatolia Project**

The Southeastern Anatolia Project (Güneydogu Anadolu Projesi, GAP) is Turkey's largest integrated development project and perceived as being vital to the Turkish economy: It has the potential to meet the rising demand for hydropower caused by population growth along with urbanisation and the country's impetus for industrialisation. By the year 2010 the GAP project is expected to generate 27,470 GWh annually with an installed capacity of 7,526 MW. In addition, it will open up new land for irrigation amounting to 1.7 million ha (1.08 million ha on the Euphrates, 600,000 ha on Tigris), accounting for nearly one-fifth of Turkey's irrigable land. This would be accomplished through the construction of 22 dams, 19 hydropower plants, and extensive irrigation and drainage networks. According to one commentator, the importance of GAP for Turkey can be summed up as: "GAP will add 70% to Turkey's existing hydro-electrical output, and add 1.7 million ha to the current 4.5 million ha of irrigated land" (Kibaroglu 2002, see also Box 1).

Importantly, GAP was conceived and implemented as an integrated regional development project in one of the most backward and under-developed regions of Turkey. The basic development objectives of GAP are phrased as: to raise the income levels in the GAP region by improving the economic structure in order to narrow the regional income disparities; to increase the productivity and employment opportunities in rural areas; to enhance the assimilative capacity of larger cities in the region; to contribute to the national objective of sustained economic growth, export promotion, and social stability by the efficient utilisation of the region's resources. To these ends, GAP has shifted from a pure infrastructure development project into a project in support of sustainable development with additional investments made in urban and rural infrastructure, agriculture, transport, industry, education, health, housing and tourism.

Although there are visible economic and social achievements,<sup>6</sup> the GAP project and in particular the construction of large dams has come in for sharp criticism. The objections refer particularly to the resettlement issue, environmental and cultural aspects, and the implications of sharing water with Syria and Iraq (compare Brauer 2001), the latter issue will be discussed in chapter 6.

#### **Box 1: The Southeastern Anatolia Project (GAP) in brief**

The GAP project area lies in south-eastern Turkey, covering nine provinces, corresponding to approximately 10% of Turkey's total population. The project area includes the watersheds of the lower Euphrates and Tigris rivers and the upper Mesopotamian plains. Its centrepiece is the Ataturk Dam, which was completed at the beginning of the 1990s, with a total storage capacity of 48.7 BCM, and an installed electricity-generating capacity of 2,400 MW. There are 13 large sub-projects altogether, seven of which are on the Euphrates river<sup>7</sup> and six on the Tigris.<sup>8</sup> Major works are the Sanliurfa Tunnels, the Birecik and Karkamis dams on the Euphrates and the Ilisu Dam on the Tigris.

GAP's aim is to increase the irrigated land from 2.9% to 22.8% of the total area of the region, which subsequently would lead to a decrease of rain-fed agriculture from 34.3 to 10.7%. With the irrigation systems envisaged, Turkey is determined to develop agriculture and agro-industrial production for export and to raise the standard of living in the region, in that way also stopping migration from the region to metropolitan cities. To achieve these ambitious goals would require putting 100,000 ha into production in the Euphrates basin each year beginning in 1993, and another 60,000 ha per year in the Tigris basin (Ünver et al. 2003).

Due to high investment cost, GAP is considered to be a very costly project: US\$ 32 billion is the estimated total cost of which US\$ 16 billion have been spent so far. Due to the transboundary flows involved, the Turkish Government was not able to secure international finance, an exception being German and Swiss credits which could be obtained for purchasing equipment. The severe economic and budgetary crisis in Turkey along with, for example, the slow pace of land redistribution caused a considerable delay in implementing the projects. Despite these drawbacks, Turkey is persistently pursuing its plans to harness the Euphrates and Tigris rivers. In June 2003, some 215,080 ha had been brought under irrigation. As of 2004, out of 22 dams nine are operating, and out of 19 hydropower plants seven are completed and in operation.

6 See the evaluation of the actual impacts of the Ataturk Dam by Tortajada (2000).

7 The Lower Euphrates Project includes the Ataturk Dam, the Sanliurfa Tunnels and five more sub-projects, i.e. Karakaya, Euphrates Border, Suruç-Baziki, Kahta-Adiyaman, Gaziantep, Gaziantep-Araban.

8 Tigris, Kralkizi, Batman, Batman-Silvan, Garzan, Ilisu, and Cizre.



### **3 Turkey's water-related administrative set-up**

International relations on transboundary water resources are in the realm of the Prime Minister's Office and the Ministry of Foreign Affairs, Department on Regional and Transboundary Waters. Nevertheless, Turkey's water policy and management is subject to various national ministries and executive administrations which are briefly introduced in this chapter. With reference to the topic of this study, and for the sake of simplicity, we focus on those public organisations whose mandates and activities affect transboundary water resources. While this concerns many administrations (see Table 3 at the end of this chapter), some are more relevant than others.

#### **3.1 Water laws and regulations**

The Turkish Constitution of 1982 established the basic principles which govern water resources: water is a public good under the state's trusteeship. The authority to explore and manage water resources is vested in the State. Except for privately owned springs, surface and groundwater resources cannot be owned, but are subject to user rights which are granted for beneficial use only, such as domestic and agricultural use, fishing, hydropower generation, industry and mining, transportation, and medicinal and thermal uses. Assigned user-rights enjoy the right of prior use, and can neither be sold nor transferred. User-rights to water resources in the domain of private law and ownership are subject to title deed registration. Until 1960 this included groundwater resources which were then transferred from the private to the public domain. However, legislation on user rights and ownership is not clear for surface waters.

Turkey has no comprehensive framework water law but numerous laws which regulate public sector activity by, for example, defining the responsibilities for the construction of water networks, operation and maintenance obligations, and their financing. Special legislation on the harmful effects of water have been enacted, for example, for flood control, drainage and sewerage.

In 1982, an Environmental Law was enacted and came into force in 1983. Its basic principle is that citizens as well as the state bear responsibility for the protection of the environment. It requires that all economic activity takes every measure to minimise pollution. In 1988, the Regulation on the Control of Water Pollution put forward principles for the discharge of waste water into surface and ground waters (the polluter pays principle), defined strategies for the protection of water basins where drinking water is generated, and laid down Drinking Water Standards. The 1988 Regulation set ambitious targets but the implementation has always been weak.

Regulation on the Environmental Impact Assessment (EIA) which was issued in 1992 and revised in 1997 is compulsory for all large-scale economic activity. It requires that, for example, storage facilities (dam reservoirs) with a surface area of more than 15 km<sup>2</sup> and more than 100 million cubic meters (MCM) of reservoir volume are subject to full Environmental Impact Assessment studies. EIA studies are also implemented for other infrastructure projects such as irrigation and drainage projects, water supply and sanitation facilities etc. Development projects on agricultural lands, wetlands, lakes, and eco-systems which are rich in biodiversity, as well as lands protected under national law or accord with

international agreements which Turkey signed, are subject to EIA studies. These international agreements are The Barcelona Convention and The Ramsar Convention, which concern the protection of the Mediterranean Sea and the protection wetlands respectively. Turkey has not yet signed the Espoo Convention (1991) which refers to EIA in a transboundary context. However, as EU accession talks progress, Turkey will have to reconsider signing the Espoo, Aarhus and other UNECE conventions.

### 3.2 Organisations in the water sector

While it is sometimes argued that Turkey's administrative set-up for water resources is highly fragmented with overlapping responsibilities, the organisational structure is actually rather not so complex: At the decision-making level, the Prime Minister, the State Planning Organisation (SPO) and ministries are involved; governmental organisations under the ministries form the executive level, and governmental and non-governmental organisations implement, operate and maintain the water infrastructure. The Turkish "water sector" has a distinct pattern:

- Water management is organised along sectoral lines with strong central government organisations;
- Water-related development objectives / goals are part of the government's strategic planning with a central planning organisation (SPO) in place;
- The government has taken the lead in infrastructure development, and financing, to provide water and water-related products (e.g. energy), but there is trend towards greater private sector involvement;
- Managing water and operating water networks is much more decentralised in urban water supply and sanitation and in the irrigation sector;
- Associated with the strategic role water plays for the Turkish national economy, water policy, in terms of funding, puts much more emphasis on water development than on water protection (see chapter 3).

The Turkish administrative system, including the water related institutions, has three administrative levels: the **national**, the **provincial** and the **local level** (i.e. municipalities and villages). Being modelled on the French system, it is highly centralised and linked to strong central government organisations. Administratively, Turkey is divided into 81 provinces with appointed governors, i.e. head of the provincial governments, who are affiliated to the Ministry of Interior Affairs. All ministries and their General Directorates have provincial branches. At the intermediate level, the General Directorates are organised in Regional Directorates covering different service areas.<sup>9</sup> Municipalities are set up in all provincial and district centres. Turkey has 3,228 municipalities of which 16 are structured as "Greater City Municipalities". According to the Turkish Village Law, villages are the lowest administrative units and self-governing autonomous local administrations.

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<sup>9</sup> The Regional Directorates of State Hydraulic Works are organised in a way that their respective jurisdictions cover main river basins.

### 3.2.1 Organisations at the national level

#### The State Planning Organisation

At the national level, the State Planning Organisation (Devlet Planlama Teskilati, DPT) which is under the Prime Minister, is the strategic organisation established to guide economic and social development through each of the Five Year Development Plans in which experts from all ministries participate.<sup>10</sup> Each Five Year Plan is a basic planning instrument which defines investment priorities and the allocation of resources for public investment. The Eighth Five Year Development Plan (2001 – 2005) emphasises the necessity of striking a balance between ecological stability and economic growth, and calls for new regulations to increase the efficiency of the EIA process. Under the Eighth Five Year Development Plan, the most important policy is to increase the ratio of population with access to basic infrastructure facilities. To this end, an integrated planning approach and harmonisation among the organisations involved is strongly emphasised with respect to the construction of municipal water supply, sewerage and treatment facilities.

#### The General Directorate of State Hydraulic Works

The General Directorate of State Hydraulic Works (Devlet Su Isleri, DSI) was founded in 1953 as a legal entity and later on annexed to the Ministry of Energy and Natural Resources.<sup>11</sup> The organisation and general procedures were based on The U.S. Bureau of Reclamation with a clear mandate to plan and manage the nation's overall water resources. The DSI is the primary executive state water agency. It is organised along the 26 major river basins in the country with Regional Directorates (see Figure 2) being responsible for preparing master plans which set priorities for the development of water resources in the respective basins. Priority projects are submitted to the State Planning Organisation for their incorporation into each of the Five Year Development Plans and into the annual investment programmes.

The DSI plays a leading role in coordinating water sector planning. Any agency and private party is obliged to cooperate with the DSI and must obtain prior DSI approval for the source and volume of water to be used by each project and individual. As the licensing authority, it approves both the use and the extraction rate of water for different purposes including groundwater.

The law establishing the DSI define the DSI as the main state agency to develop surface and groundwater resources, to make optimal use of them and to develop them in a way as to achieve optimum benefit. The DSI is empowered to plan, design, construct and operate dams, hydroelectric power plants and domestic water and irrigation schemes (Bayazit and Avci 1997). Its mandate and responsibilities includes the construction of protective facilities for flood and torrent hazards; the construction of irrigation and drainage networks; land reclamation and the drainage of swamps; the construction of hydropower generation facilities; the improvement of the navigability of rivers; the provision of water supply for cities

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10 SPO was established in 1963 after the adaptation of the new constitution of 1961.

11 The DSI's activities are based on Law No. 6200 (establishing law); Law No. 167 (Groundwater Law); Law No. 1053 (Domestic Water Supply Law for Settlements over a Population of 100,000). Note, the DSI for some years acted under Ministry of Public Works and Settlement, but for the most part and under current legislation it is attached to the Ministry of Energy and Natural Resources.

with more than 100,000 inhabitants, provided that the government has authorised the DSI and that the concerned city council also approves.

In terms of number of personnel, the DSI is the state's most powerful organisation with 25,000 employees, of which 5,000 are engineers and technical personnel. With respect to its investment budget, it receives around 30% of the National Investment Budget. At the end of 2002, the DSI had completed 203 large dams (most of them multi-purpose), more than 368 small dams, and had developed irrigation schemes covering an area of 2.7 million ha of land.

Since the mid-1980s, the DSI has had an in-house unit dealing with environmental issues, mainly monitoring water quality in rivers and lakes, and issuing environmental impact assessment studies which became mandatory from 1992 onward for, for example, dams, irrigation and drainage projects of a defined size.

While the DSI plays a major role in water resource planning and development, operation and maintenance of water infrastructure for different purposes has been transferred from the DSI to the private sector and to various types of water user organisations.<sup>12</sup> This refers, for example, to the management of irrigation and drainage schemes in 1.4 million ha of land, i.e. almost 90% of all DSI developed schemes, which were originally transferred to irrigation associations (Scheumann et al. 2002), and to water supply systems, which after construction, are transferred to municipalities.

Greater private sector involvement is hoped in order to construct and operate drinking water plants based on Build-Operate-Transfer (BOT) contracts. Under a BOT contract, the private sector finances, builds and operates a new facility in accordance with performance standards set by the government. The government retains ownership, and the facility is reverted to the state after an operation period of typically 10 to 20 years. Despite the Turkish government's guarantee to repay 85% of the construction costs, few BOT contracts have been signed (one is the drinking water plant in the city of Izmit) (Bennett et al. 1999).

### **The General Directorate for Electrical Investigation Administration**

The first agency responsible for streamflow measurement, hydropower planning and design was the Electrical Investigation Administration (Elektrik Isleri Etüt Idaresi, EIEI), founded in 1935. The General Directorate of EIEI is affiliated to the Ministry of Energy and Natural Resources and the main agency responsible for hydrometric measurement (part of its responsibility lies with the DSI). The EIEI conducts studies and surveys to explore the country's hydropower potential, approves planning at all stages including final project designs of dams and hydropower plants on rivers.

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<sup>12</sup> Types of water user organisations are Irrigation Associations (Municipal Law No. 1580), Municipal Organisations (same law); Village Organisations (Village Law No. 442), and Surface and Groundwater Cooperatives (Cooperatives Law No. 1163).

### **The General Directorate for Rural Services**

In 1960, Law No. 7457 established the General Directorate for Soil and Water which in 1985 was reconstituted as the General Directorate for Rural Services (Köy Hizmetleri, Law No. 3202) under the Ministry of Agriculture, Forestry and Rural Affairs. From 1993 until recently, the GDRS operated under the Prime Minister's Office. In March 2005 the GDRS was abolished, and its tasks and responsibilities transferred to a related division in the Ministry of Agriculture and Rural Affairs.

The agency was concerned with soil surveys and soil conservation; on-farm development activities including on-farm drainage construction; the construction of small dams / reservoirs, and the construction of minor surface and groundwater irrigation schemes (with a capacity of less than 500 l/sec) which are turned over to autonomous farmers' associations or groundwater cooperatives respectively. In large-scale public irrigation schemes which are constructed and managed by the DSI, the GDRS was responsible for all on-farm development activities, i.e. land levelling, construction of field canals, on-farm irrigation and surface and tile drainage infrastructure. Since 1964, the GDRS has also been responsible for supplying domestic water to villages and rural households either from surface water or ground water, regardless of geographic location.

### **The Bank of Provinces**

The General Directorate of the Bank of Provinces (İller Bankası) was established in 1933 and restructured in 1945 under the then Ministry of Public Works and Resettlement with a mandate to assist all municipalities, irrespective of size, in the financing and construction of infrastructure for water supply (drinking water), sewerage and waste water treatment. Financing is largely provided by the central government through the Municipalities Fund of the Bank, and by external financing institutions (e.g. the German Bank for Reconstruction and Development, European Investment Bank, Worldbank). Its duty is to allocate funds and loans to local governments for water supply, sewage network and treatment facilities, and to implement the projects. At present, the bank is being restructured to be a financing institution without the responsibility of implementing the projects.

### **The Ministry of Environment and Forestry**

In 1991, the Ministry of Environment replaced the Undersecretary for the Environment, which led to the diversification of the Ministry's responsibilities and to an expansion of its staff (in 2002: 800 employees of which 500 work in provincial branches). This also led the administration's empowerment concerning the implementation and enforcement of policies for the protection and conservation of the environment. However, the Ministry of Environment has limited resources and limited competence (OECD 2005).

The mandate of the Ministry covers issues such as appropriate land use, protection of natural resources, and prevention of pollution. Its departments that are concerned with water resources are the Directorate General of Prevention and Control of Environmental Pollution (Water Department), the Directorate General of Environmental Protection (Sensitive Eco-Systems Protection Department) and the General Directorate of Environmental Impact Assessment and Planning. The Authority for Special Protected Areas is affiliated to the Ministry and is responsible for protecting and managing the natural and environmental values of 14 Special Protected Areas. In 2003, the Ministry of Forestry and its General Directorate of

National Parks, Game and Wildlife were merged with the Ministry of Environment, and is now called the Ministry of Environment and Forestry.

The provincial branches of the Ministry are responsible for taking measures in order to prevent and minimise pollution, to inspect any activity that might threaten the ecology and cause sea pollution. The Ministry's provincial branches inspect whether discharge of waste water from industry and domestic sources into rivers comply with legal standards. The Ministry has recently started to publish provincial "state of the environment" reports.

### **3.2.2 Water-related responsibilities of provincial governments**

The Ministry of Interior provides administrative control of regional administrations. With the recent Province Special Administration Law No. 5302 dated March 4, 2005, some provisions of the previous Law 3360 (1987) were amended. These legislatures enable provincial governments to be responsible for, for example, providing water supply and sewerage services in regions out of the executive mandate of the municipalities.

### **3.2.3 Water-related responsibilities of local governments**

The Municipal Law of 1930 assigns numerous powers and duties to the municipalities<sup>13</sup> which are, for example, the construction of water supply and sanitation systems, collection of waste water and the operation of waste water treatment facilities. Following the completion of the infrastructure, the Bank of Provinces transfers the facilities to the municipalities, which then takes over operation and maintenance. Only in the 16 metropolitan areas (or "Greater City Municipality") such as Istanbul, Ankara, Adana, Izmir etc. is operation institutionally separated from the municipalities and managed as a public utility (see, for instance, the General Directorate of Istanbul, Su ve Kanalizasyon Idaresi, Law No. 2560), while operation in other municipalities is implemented by the municipal departments and financed out of the municipalities' budgets.

Provisions for the financial autonomy of the municipalities and to increase their revenues are planned for inclusion in the revised Law for Local Authorities. (Okumus 2002: 16) This is crucial, since the delegation of central power to municipalities needs to be backed by sound resources.

Villages, i.e. the lowest administrative units, are self-governing autonomous local administrations. Village mayors and village councils may decide on, for example, the construction of drinking water wells.

## **3.3 What role can public organisations play in improving trans-boundary cooperation?**

Turkey has a highly centralised administration with strong government agencies involved in water resource planning and development. This centralisation was designed to promote economic growth through the financing of infrastructure such as multi-purpose or single-purpose dams for hydropower generation, irrigation and flood control. Water supply,

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<sup>13</sup> A municipal administration can be established in settlements having more than 2,000 inhabitants.

sewerage and waste water treatment are, on the other hand, the municipalities' responsibility.

Depending on the purpose of the infrastructure, the mentioned organisations' activities positively or negatively affect and impact on transboundary water resources. With respect to coordinating transboundary water development actions and mitigating negative impacts, the administrative set-up in Turkey needs further attention to foster transboundary cooperation in which some state agencies could play a greater role (see Table 3).

The **State Planning Organisation** could provide better integration of environmental policies within the planning process of investment projects which are totally or partially financed from public funds. The General Directorate of **State Hydraulic Works** already represents the government in bilateral Joint Technical Committees and takes a leading role in developing joint technical proposals. The DSI is also the main public agency to implement and incorporate the results of EIA studies of water resources development schemes into project design; this needs to be extended to assessing transboundary effects. The role of the **Ministry of Environment, the Ministry of Agriculture and Ministry of Energy** in transboundary water affairs could be strengthened by creating broadened water negotiation agendas possibly composed of issues related to the water-related development sectors such as agriculture, energy and environment which are all in the realm of these ministries. These ministries could offer projects which may be implemented on transboundary water resources for their efficient, equitable and environmentally sound management.

All in all, the **Ministry of Foreign Affairs**, through diplomatic means, continues to lay down the groundwork for transboundary water cooperation by facilitating dialogue and building trust and confidence across borders. One may expect that the role of the Ministry of Foreign Affairs Department of Regional and Transboundary Waters will increase during membership negotiations with the EU simply because of the fact that almost 40% of rivers in Turkey are transboundary. Their management may be affected by regional and international regulations and also surpass domestic legislation.

**Table 3: Activities of public organisations that impact on transboundary water resources**

Activity	Mandated national organisations	Potential transboundary impact
Construction of hydropower schemes <ul style="list-style-type: none"> <li>○ Large dams</li> <li>○ Small dams</li> </ul> Operation of schemes	DSI, EIE GDRS  Public and private operators	Timing of water release (energy generation upstream – water use downstream) Peak floods Reservoir as sediment trap Storage for low water conditions
Construction of surface irrigation schemes <ul style="list-style-type: none"> <li>○ Large-scale</li> <li>○ Small-scale</li> </ul> Operation of schemes	DSI DSI, GDRS  Water user organisations, joint farmer-public Organisations	Water quantity Reservoir as sediment trap Storage for low water conditions
Construction of drainage schemes	DSI, GDRS	Return flows from agriculture into rivers
Groundwater schemes <ul style="list-style-type: none"> <li>○ Construction</li> <li>○ Operation</li> </ul>	GDRS, DSI GW Cooperatives	Dropping of groundwater table
Flood control	DSI	Reducing peak flood flows Water quantity Reservoir as sediment trap
Water supply to <ul style="list-style-type: none"> <li>○ Metropolitan municipalities</li> <li>○ villages</li> </ul>	Bank of Provinces; DSI, public utilities DSI GDRS	Water quantity
Waste water collection Waste water treatment	Bank of Provinces; Public utilities, municipalities	Water quality
Discharge of waste water <ul style="list-style-type: none"> <li>○ industrial</li> <li>○ domestic</li> </ul>	MoE	Water quality
Water pollution control, prevention, environmental standards, permitting and inspection, EIA	MoE	Water quality
River basin development and planning	DSI	Water resources planning and management

Source: Own compilation



## 4 Turkey's position towards international water law

Turkey's position towards transboundary water cooperation is widely perceived as being very reluctant. This view mainly originates from disputes that arose over the Euphrates and Tigris rivers between Turkey, being the upstream country, and the downstream riparians, Syria and Iraq. In addition, Turkey's vote against the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses (1997) (UN Water Convention) as well as Turkey's refusal to discuss transboundary water issues within the context of the 2002 OSCE Economic Forum<sup>14</sup> explains the view of Turkey's critics.

However, as will be seen in the following chapters of this report, Turkey has entered a number of bilateral agreements on water resources management with its neighbours. Turkey is also a signatory to multilateral agreements on the protection of marine environments and freshwater ecosystems, such as the Ramsar Convention on Wetlands, the Convention for the Protection of the Mediterranean Sea against Pollution and the Convention on the Protection of the Black Sea Against Pollution.

### 4.1 General principles of international water law

International water law, just as international law, is based on general legal principles such as the principle of equity of states, good neighbourliness, peaceful settlement of disputes, and so on. Two principles, in particular, are considered to be cornerstones of international watercourse law (compare e.g. Brunnée & Toope 1997):

- the principle of equitable and reasonable utilisation and participation in the development of the watercourse by all riparian states
- the obligation not to cause significant harm to another watercourse state by using the international watercourse

The principles of international water law were first formulated by the International Law Association (ILA) when it published its Helsinki Rules in 1966. Since then, however, little progress has been made in finding international consensus over their application and no binding international treaty has come into force.

The conflicting approaches to allocation and management of transboundary waters can be categorised with the help of three theories:

- The theory of absolute territorial sovereignty states that every nation can utilise the waters of an international river flowing on its territory as it likes, regardless of the consequences in other countries and without the duty to consult.
- The theory of absolute territorial integrity regards an international river as the common property of its co-riparians, which means that no state is allowed to deprive the others of the benefits of the waters in question. Consequently, the lower riparian has the right

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<sup>14</sup> For further details refer to the Summaries of the OSCE 10<sup>th</sup> Economic Forum and of its respective preparatory meetings, available at <http://www.osce.org/eea/documents.html>.

to demand the continued, uninterrupted flow of water from the territory of the upper riparian.

- The theory of limited territorial sovereignty reflects the general legal principle of 'sic utere tuo ut alienum non laedas' (one should use his own property in such a manner as not to injure that of another) and is based on the assertion that every state is free to use the waters of shared rivers flowing through its territory as long as such utilisation does not prejudices the rights and interests of the co-riparians.

Turkey does not acknowledge that downstream countries have the right of co-sovereignty on waters of upstream countries or vice-versa (Kibaroglu 2002). In the past, Turkey has referred to the Helsinki Rules (1966) by highlighting that the ILA considered the principle of equitable and reasonable utilisation to be the guiding rule while the no harm rule was one among a series of elements to be considered in determining whether a given use was 'equitable and reasonable'. Traditionally Turkey has also stressed the principle of "Good Neighbourliness" which considers other riparians' interests in dealing with 'transboundary' and 'international' rivers.

Recently, the Turkish Ministry of Foreign Affairs formulated a set of principles which delineates Turkey's official policy regarding the use of transboundary rivers: (Turkish Ministry of Foreign Affairs 2003):

- "Water is a basic human need.
- Each riparian state in a transboundary river has the sovereign right to make use of the water in its territory.
- Riparian states must make sure that their utilisation of such waters does not give "significant harm" to others.
- Transboundary rivers should be used in an equitable, reasonable and optimum manner.
- Equitable use does not mean the equal distribution of waters of transboundary river among riparian states."

Whereas Turkey explicitly distinguishes between the terms "international rivers" and "transboundary rivers" and considers international rivers only to be those that constitute a border between two or more countries such as the Maritsa river which forms the border between Turkey and Greece and the Arpacay river (Araks basin) where it forms the border between Turkey and Armenia. While such boundary rivers are to be shared equally between the riparian countries, the water of transboundary rivers should be allocated equitably.

However, Turkey has been very reluctant in signing multilateral agreements that lay down the principles of international water law - especially when they include compulsory mechanisms for dispute settlement and the procedures for prior notification. For this reason, Turkey, as one of only 3 countries, has voted against the UN Water Convention and has not signed the UNECE Water Convention. The arguments Turkey put forward during negotiations of the UN Water Convention sheds further light on this position.

## 4.2 Negotiations on the UN Water Convention (1997)

The Convention on the Law of the Non-navigational Uses of International Watercourses (1997) takes the form of a framework agreement that formulates legal and structural ground rules for individual agreements between riparian states of international watercourses. It

contains 37 articles dealing with the obligations of riparian states to share the common water resources, to consult with each other, to protect the environment and to resolve disputes. To date only 15 states have ratified the convention and, as a result, it has not come into force. While Turkey states that the Convention has lost its credibility (Turkish Ministry of Foreign Affairs 2003), other authors argue that the large number (103) of votes for the adoption of the convention<sup>15</sup> in the United Nations General Assembly indicates general acceptance among the other member states (Wouters 1999). Stephen McCaffrey argues that even if the UN Water Convention never comes into force, it is likely to be the starting point for future negotiations for agreements on transboundary waters (McCaffrey 2001).

During the negotiation process Turkey played a leading role among the nations opposing the draft articles of the International Law Commission. When explaining their refusal, Turkey states (among other things) that "the Convention goes beyond the scope of a framework" (Republic of Turkey 2003).

Turkey specifically raised the following points during negotiations.<sup>16</sup>

- The obligation not to cause significant harm should be subsidiary to the principle of equitable and reasonable utilisation. In other words, if a state made use of a watercourse in conformity with the principle of equitable and reasonable utilization, the exercise of that right should not be limited by a second criterion.
- The draft convention was broader than had been intended in the General Assembly resolution 51/206; it should have merely established general principles, the application of which would be determined by means of specific agreements taking account of the particular characteristics of each watercourse. Contrary to what should be the case with a framework convention, the draft convention established a mechanism for prior notification on planned measures which had no basis in general and customary international law, and which created an obvious imbalance among states by setting up an obligation to obtain prior approval on planned measures from other riparians.
- A framework convention was not the appropriate place for setting out obligatory dispute settlement rules; the latter should be left to the discretion of the States concerned.
- Parties to existing agreements should be free to choose whether or not to accept the principles set forth in the draft articles. As for future agreements, there again the parties must be free to conclude both, agreements that took account of the framework convention's provisions and agreements that diverged therefrom, even to a substantial extent.

Little information is available on Turkey's position during the UNECE Water Convention negotiations. According to Demeter, Turkey pledged that the scope of the convention be restricted to questions of water quality and pushed for the phrase "The parties shall take all

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15 The UN Convention on the Non-Navigational Uses of International Watercourses was adopted by 103 votes in favour to 3 against (Turkey, China, Brundi) with 27 abstentions on May 21st, 1997 in New York.

16 Compare UN General Assembly, 51st session: Summary Records of the 12th to 25th and 52nd to 62nd meetings: 6th Committee held at headquarters, New York between 17 September 1996 and 4 April 1997, UN Doc A/C.6/51/SR.12 and following.

appropriate measures to prevent, control and reduce any **transboundary impact**" (art.2, para.1) to be replaced with the narrower term "transboundary pollution". Turkey's efforts were, however, unsuccessful (Demeter 2001). Furthermore, it can be assumed that one of Turkey's major concerns towards the UNECE Water Convention was the dispute resolution mechanism, and not just the focus on environmental regulations.

### **4.3 Participation in other regional agreements**

#### **4.3.1 Black Sea**

Turkey's Black Sea coastline is 1,400 km long, making it the country with the second longest Black Sea coastline and Turkey's most important fishing region. However, catches have been declining due to over-fishing and the Sea's changing ecosystem. Turkey contributes to Black Sea pollution and suffers from the degradation of Black Sea ecosystems. The Black Sea receives large quantities of mostly untreated domestic wastewater from Turkey, mainly from the Kizilirmak, Sakarya, and Yesilirmak rivers. In addition, pollution from the Danube, Dniepr and other streams and sources affect the water quality on Turkey's Black Sea coast.

Regional cooperation in protecting the Black Sea is manifested in the Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), signed in Bucharest in April 1992. It was ratified by all six Black Sea countries (Bulgaria, Georgia, Romania, Russian Federation, Turkey, Ukraine) at the beginning of 1994. The basic objective of the Convention was to substantiate the general obligations of the contracting parties to prevent, reduce and control pollution in the Black Sea in order to protect and preserve the marine environment and to provide a legal framework for co-operation and concerted action to fulfil this obligation.

The Bucharest Convention includes a basic framework of agreement and three specific Protocols, these are:

1. the control of land-based sources of pollution;
2. dumping of waste; and
3. joint action in the case of accidents (such as oil spills).

Implementation of the Convention is managed by the Commission for the Protection of the Black Sea Against Pollution (also sometimes referred to as the Istanbul Commission), and its Permanent Secretariat in Istanbul, Turkey.

The support provided to governments for developing and implementing the Black Sea Strategic Action Plan, took the form of a series of GEF, TACIS and Phare projects, and smaller donor initiatives, coordinated within a loosely defined programmatic framework described as the Black Sea Environmental Programme (BSEP). The BSEP established its headquarters in Istanbul with the support of the Government of Turkey. The most important achievements of BSEP were the Transboundary Diagnostic Analyses and the regional Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (UNDP 2004).

#### **4.3.2 Mediterranean Sea**

Several coastal zones and near shore areas in Turkey are critically affected by pollution of the Mediterranean. These include areas of importance to tourism, such as the coast from Kemer to Alanya, as well as areas of biological importance such as the Goksu Delta

(protected area for waterfowls) and the Bay of Iskenderun. In the north-east Mediterranean, most of the land based pollution loads originate from Turkey. The pollution loads consist of agricultural run-off, domestic and industrial wastewater discharges and organic pollution carried by rivers and streams (Samsunlu et al.2002).

Regional environmental cooperation in the Mediterranean Sea is laid down in the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution.<sup>17</sup> The convention is complemented by six protocols<sup>18</sup>. Today, 21 countries and the EU are party to the convention: Albania, Algeria, Bosnia-Herzegovina, Croatia, Cyprus, EU, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Slovenia, Spain, Syria, Tunisia, Turkey and Yugoslavia.

The United Nations Environment Programme (UNEP) is responsible for the secretariat of the Barcelona Convention and its Action Plan, through the Mediterranean Regional Coordination Unit in Athens, Greece. The Mediterranean Action Plan (MAP) was the first Regional Seas Programme of UNEP established within the framework of the Barcelona Convention.

Within this framework, Turkey declared twelve Specially Protected Areas (SPAs) according to the addendum protocol of the Barcelona Convention. Several Turkish NGOs and the Ministry of Environment have collaborated successfully with MAP's Specially Protected Areas Regional Activity Centre, SPA/RAC (Tunis, Tunisia) in addressing various issues pertinent to the protection of endangered species such as sea turtles and monk seals, and their habitats. Furthermore, Turkey contributed to the MAP Coastal Area Management Programme with the "The Bay of Izmir" project, which was officially launched in June 1990 following an agreement signed between the Turkish Government and MAP. The total of 11 activities was envisaged by the agreement, but only half of them were implemented. However, major positive changes could be observed in the management and the actual development of the Izmir Metropolitan Area, partly attributable to the CAMP initiative (UNEP/MAP/PAP 2005). Achievements of the CAMP project include:

- An EIA of the Izmir Sewage Treatment Project,
- A database on environmental / development issues and environmental zoning of the Izmir area,
- An Integrated Management Study for the Area of Izmir,
- Improved water quality in the bay, and
- Improved institutional capacity for integrated coastal area management (including application of tools and techniques such as GIS and EIA).

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<sup>17</sup> Adopted in Barcelona, Spain, 16 February 1976; entered into force: 12 February 1978; amended: Barcelona, Spain, 9-10 June 1995. New Title: Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (entered into force on 9 July 2004).

<sup>18</sup> The Protocol for the Prevention of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft; the Protocol Concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea; the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources; the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean; (in force) as well as the Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil; and the Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal (pending).

### 4.3.3 Conventions on wetlands and biodiversity

Turkey has shown its commitment to protecting valuable wetland ecosystems by signing, in 1994, the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), adopted in the Iranian city of Ramsar in 1971. With the intention of preventing further loss of wetland areas, the Ramsar Convention established a list of wetland areas of international importance. Designation by a member state of a site in its territory for the Ramsar list awards the wetland site international protection. All parties to the convention are obliged to consider the conservation of listed wetlands in the planning of land and water resource use. Further, they are requested to promote the "wise use" of all non-listed wetlands in their territory (Ramsar Convention, Article 3, no. 1). Until today, 9 Turkish wetlands were included in the List of Ramsar Sites. In January 30, 2002, the Turkish Regulation on Conservation of Wetlands was put into force. The "National Wetlands Committee" which was established through this regulation became an important tool in developing coordination and collaboration between relevant institutions. (Turkish Ministry of Environment 2002)

The Convention on Biological Diversity (CBD) (1992) assigns its contracting parties broad duties aimed at the protection of the long term productivity and diversity of ecosystems and habitats. It covers the conservation of biological diversity, the sustainable use of its components, as well as the fair and equitable sharing of the benefits arising from the utilisation of genetic resources. The Government of Turkey ratified the CBD in 1996 and has participated in several European activities related to the implementation of the convention in forestry and forest biodiversity (Arancli 2002). Awareness is increasing in Turkey about the conservation of its rich and diverse biological resources and the need for their sustainable management. The National Environmental Action Plan and the National Biodiversity Strategy and Action Plan emphasise the importance of integrating biodiversity needs into the development and implementation of relevant sectoral policies, and also envisages the involvement of all stakeholders.

## 5 The river basins

To evaluate the current state of cooperation and the potential for dispute in Turkey's transboundary watercourses as well as to draw conclusions for a strategy to support the formation of water regimes, it is necessary to gain a basic understanding of the context in which cooperation or disputes take place. The basin specific context is characterised by, among others, natural, political and economic circumstances. Therefore, in the next sub-chapters, a description of each basin is given, covering the following aspects:

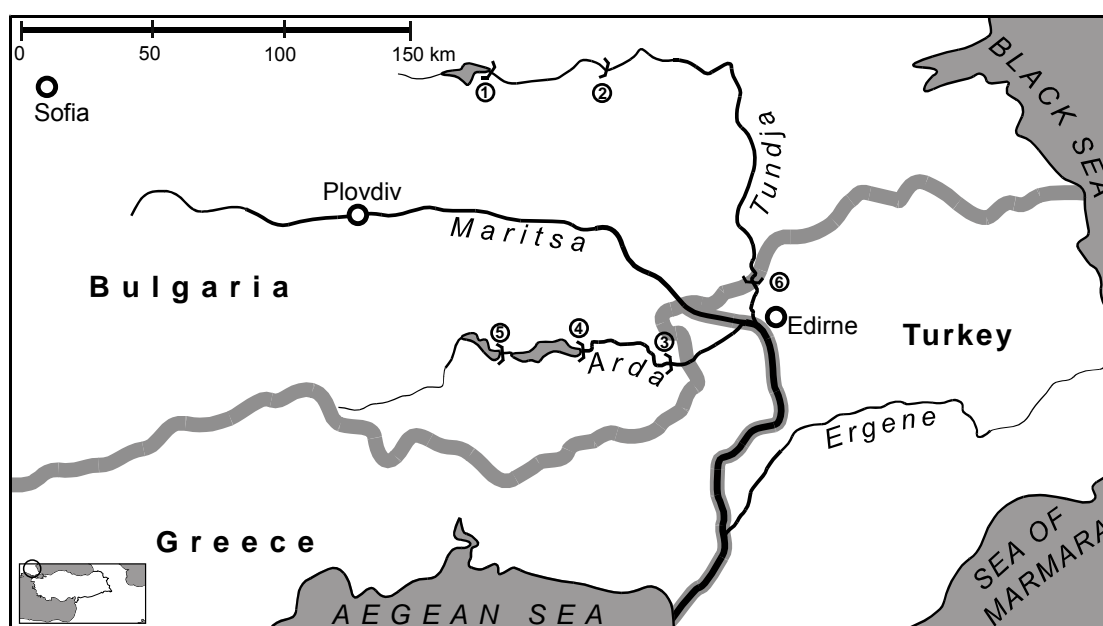
- Geographical, hydrological and ecological setting, including characteristics of precipitation, discharge, actual water quality, morphological aspects, erosion etc.;
- Current and future water uses, including abstractive and in-stream use, state of water resources development, environmental water requirements, and the socio-economic context in which water use takes place;
- Potential impacts on downstream riparians and regional seas, such as water scarcity, flood damages, pollution, changes in flow patterns etc., in order to understand the structure of the problem and to roughly assess the potential for conflicts;
- Status of cooperation, including an inventory of existing water-related and other relevant agreements between riparian countries, a brief overview of water cooperation / conflict history in order to illustrate the regime building path, as well as a sketch of the political relations between the riparians in order to outline the political contextual factors;
- Outstanding issues and options for win-win solutions, including obstacles for cooperation and potential ways to overcome them with the aim of identifying possible starting points for external support.

Some information on these contextual factors is scarce, difficult to obtain, and of unknown reliability. Therefore, not all aspects could be covered for all watercourses. In particular, no comprehensive information on the transboundary groundwater resources between Turkey and Syria was available. In addition, while sufficient information exists for Turkey's water use and development projects, reliable information of the other riparian states' water use and development plans was more difficult to obtain.

## 5.1 The Maritsa basin

The Maritsa basin, one of the major river systems of the eastern Balkans, is shared by Bulgaria, Greece, and Turkey. Conflicting water needs for irrigation as well as flood control are the main disputed issues in the basin, particularly between Turkey and Bulgaria. In the past, political distrust between the three countries hampered co-operation. However, recent rapprochement between Turkey and Greece and the prospect of EU membership for Bulgaria and Turkey are expected to have positive effects on transboundary water management.

**Figure 3: Map of the Maritsa river and its main tributaries**



- (1) Georgi Dimitrov Dam
- (2) Jdrebchevo Dam
- (3) Ivailovgrad Dam
- (4) Studen Kladnetz Dam
- (5) Kardjali Dam
- (6) Suakacagi Dam (planned)

### 5.1.1 Geographical and hydrological setting

The Maritsa river system rises in Bulgaria and flows along the Turkish Greek border into the Aegean Sea. The basin's main river is called Meric in Turkish, Maritsa in Bulgarian, and Evros in Greek.<sup>19</sup> The Maritsa basin, including its main tributaries - the rivers Arda and Tundja<sup>20</sup> that mainly flow in Bulgaria and the river Ergene that entirely flows in Turkish territory - has a drainage area of about 50,000 km<sup>2</sup> of which 66% lie in Bulgaria, 8% in Greece and 26% Turkey (TFDD 2002). Its main river, the Maritsa, is about 500 km long and has its source in the Rila mountains near the summit of Musala. From its spring, it flows

<sup>19</sup> Other spellings include Merich, Maritza, Marica, Hebros.

<sup>20</sup> Other spellings include Ardas, Tunca, Tundzha.



eastwards through tectonic valleys between the Balkan and Rhodope Mountains, passing the city of Plovdiv and the Eastern Rumelia plain. At the point where the Maritsa is close to the three-way border between Bulgaria, Greece, and Turkey, it first forms a natural boundary between Bulgaria and Greece for about 15 km, then, for about 187 km, it forms the border between Turkey and Greece in the Thrace Region before finally entering the Aegean Sea.<sup>21</sup>

**Table 4: Cooperational context in the Maritsa basin in brief**

<b>Maritsa</b> Basin area: 50,000 km <sup>2</sup> ; mean annual discharge 8 BCM		
<b>Riparian position</b>	<b>Basin area (% of total) Contribution to annual discharge</b>	<b>Main water uses</b>
<b>Bulgaria</b> upstream	33,000 km <sup>2</sup> (66%) 5.7 BCM (71%)	irrigation, hydropower,
<b>Greece</b> downstream	3,700 km <sup>2</sup> (8%) 0.5 BCM (6%)	irrigation, conservation area
<b>Turkey</b> downstream	12,800 km <sup>2</sup> (26%) 1.8 BCM (23%)	irrigation
<b>Main agreements and covered issues</b>		
Turkey - Bulgaria	1968 – flood protection, data exchange, joint studies, no harm principle, dispute settlement 1998 – joint infrastructure projects 2002 – exchange of data on water quantity	
Turkey - Greece	1955 – joint construction of flood control 2001 – General MoU on Cooperation on Environmental Protection	
Bulgaria – Greece	1964 – no harm principle, exchange information on floods, joint studies on infrastructure since 1992 – co-operation in EU INTERREG programme, establishment of water quality monitoring network	
<b>Unsettled issues</b>		
Quantity	No agreement on water quantity allocation. Conflicting interests mainly between Turkey and Bulgaria	
Quality	No agreement on water quality standards, exchange of water quality data insufficient, water quality of concern in Turkey and Greece	
Flooding	Early warning and flood protection unsatisfactory for Greece and Turkey	

Source: Own compilation

<sup>21</sup> As the Maritsa river forms the border between Greece and Turkey, Turkish authorities consider it to be an "international river" between Turkey and Greece and a "transboundary river" where it crosses the border between Bulgaria and Turkey (Yanik 1997).

Shortly after the three-way border, close to the Turkish city of Edirne, the Maritsa is joined by the Arda river from the south and the Tundja river from the north. The Arda river springs from the eastern Rhodope Mountains in Southern Bulgaria from where it flows eastwards. After 240 km on Bulgarian territory, it flows for 30 km in Greece before it enters the Maritsa river at the Turkish border. The Tundja river has its source in the Stara Planina Mountains (Balkan Mountains) in the centre of Bulgaria. From there it flows eastwards along the Balkan Mountains towards the Turkish border. For about 15 km the Tundja forms the border between Turkey and Bulgaria. Then, it flows about 30 km through Turkey to enter the Maritsa. The Ergene river springs in the Istranca Mountains in Turkey and joins the Maritsa about 30 km before the mouth of the river.

Where the Maritsa river enters the Aegean Sea near the Gulf of Saroz it forms a delta of about 188 km<sup>2</sup> of which 150 km<sup>2</sup> lie in Greek territory. The river delta is a typical Mediterranean delta formed by the alluvial deposits and shaped by interaction with the sea. The site is one of the most important wintering areas in the Mediterranean. Three-hundred species of birds have been identified in the Delta, including the last 15 surviving pairs of Royal Eagle (Zardava 2004). 100 km<sup>2</sup> of the Greek part of the Delta (Evros Delta) is protected as a 'Wetland of International Importance' under the Ramsar Convention.<sup>22</sup> However, the natural delta ecosystem has been modified by human activity since 1950 (Ramsar Convention 1999).

Continental climate is observed in the basin with cold rainy winters and dry and hot summers. Precipitation ranges between 900 to 1,100 mm in the mountainous regions in Bulgaria and about 600 mm in the lower regions of the basin. Maximum rain is experienced during November, December and January.

Flow patterns of the Maritsa and Tundja have shown great seasonal and annual deviations. During summer, particularly in dry periods, the Tundja flow rate reduces drastically, partly caused by the operation of dams upstream in Bulgaria. Based on the data gathered at flow monitoring stations in west Edirne, the medium discharge rate of the Maritsa is 182 m<sup>3</sup>/s. Discharge rates fluctuate between 1,679 m<sup>3</sup>/s (max) to 10.4 m<sup>3</sup>/s (min). The Ergene river also shows huge variations in flow between summer and winter/spring. Flow rates of the Ergene during summer months fall to nearly 0 m<sup>3</sup>/s whereas intermittent flooding has been seen in the region during the rainy (spring) seasons (Yanik 1997). Total annual water discharge rate of the Maritsa basin is 8 BCM. In the drainage area in Turkey, the Ergene contributes 1.2 BCM, Tundja 0.4 BCM and Maritsa East Bank 0.2 BCM per year. Water potential originating from Bulgaria is contributed to by the Tundja at 0.6 BCM; the Maritsa and the Arda add 5.1 BCM per year. The Maritsa river basin tributaries in Greece contribute about 0.5 BCM/year (Ozis et al. 2002).

Water quality in the basin suffers from agricultural run-off and the discharge of untreated waste-water. Nitrate loads up to 50 mg/l have been measured in the Maritsa and up to 25 mg/l in Arda and Tundja (Regional Environment Accession Project 2002). According to monitoring in Turkey between 1980 and 1990, the Ergene suffers mostly from high organic pollution (Samsunlu et al. 1996). Large amounts of sediment are carried by the Maritsa river. Because soils in the basin are mainly covered by sand and loam layers, one third of the

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<sup>22</sup> In addition, the area enjoys the status of a Special Protection Area (Directive 79/409/EEC for the conservation of birds and their habitats) and as a Site of Community Importance (Directive 92/43/EEC for the conservation of natural habitats as well as the wild fauna and flora - NATURA 2000 Network)

sediment load of the river is made up of sand. Near the Edirne Bridge, 1,200,000 m<sup>3</sup> of sediment per year has been measured.

### **5.1.2 Current and future water uses**

Main water use in the basin is for irrigation. In stream use of hydropower production takes place in Bulgaria. In addition, the Delta region provides good fishing for Turkey and Greece.

#### **Water use in Turkey**

The basin area in Turkey is located in one of the most developed parts of the country. The main urban centres are Edirne, and Kırklareli. Industrial pollution occurs mainly in the vicinity of the cities of Lüleburgaz, Çorlu, and Çerkezköy. Analyses conducted by the DSI and later by the Ministry of Environment have shown that the main sources of pollution in Turkey are domestic waste water discharges, discharges of organised industrial sites (textile, paper, cement factories), waste from slaughterhouses, and salt and sodium contained drainage waste from agriculture (Aktas 1993).

Main water use is for irrigation, as the Ergene basin includes some of the most productive agricultural lands in the country. It, for example, encompasses the most important agricultural sites for paddy production. Other crops include sugar beet, sunflower, corn, vegetables and fruits. About 95% of the drainage area, i.e. 1,239,102 ha of land is arable and 395,194 ha, is irrigable, yet, only 328,039 ha of land is, technically and economically, categorised as irrigable land (DSI XIth Regional Directorate, no year).

Seven dams operate in the Turkish part of the basin, providing irrigation water for about 60,000 ha, flood control and some drinking water supply. As of 2003, the total irrigated area with surface and groundwater resources was 144,639 ha. During the summer irrigation season, about 436 MCM/year of water is required for pumped irrigation (Ozis et al. 2002). Plans are in place to increase irrigation agriculture; irrigation systems are under construction on a further 54,879 ha of land, whereas 328,879 ha are at the project and planning stage. When all the irrigation systems have been completed, 257,493 ha of land will be irrigated with 2.15 BCM/year (Yanik 1997).

#### **Water use in Bulgaria**

In Bulgaria, the water resources of the Maritsa basin are used for agriculture and hydropower production as well as for domestic and industrial water supplies. 21 main dams are in operation with a total storage capacity of more than 3,000 MCM (Arsov 2004). The basin area (about 33,000 km<sup>2</sup>) is home to 2.5 million people (INWEB 2004). The main cities are Plovdiv, Stara Zagora, Haskovo, Sliven, and Yambol. The area suffers from water stress because of drought and deterioration in water quality (Regional Environment Accession Project 2002).

No comprehensive data on water use in the Maritsa basin in Bulgaria is available. However, the Maritsa Plain includes some of Bulgaria's most fertile agricultural land (Regional Environment Accession Project 2002). Areas of relatively intense agricultural production can be found here, particularly in the vicinity of Plovdiv; main crops are fruit, vegetables and rice (Penov et al. 2003). In general, it can be observed that water use for irrigation experienced a

drastic reduction in Bulgaria during the 1990s.<sup>23</sup> Water use efficiency is low with average water losses in irrigation systems of 57%, reaching as much as 75% in some regions (ECSSD 2003).

Pollution sources in the Bulgarian part of the basin include agricultural and stock-breeding run-offs and industrial and urban effluents (Centre for European Constitutional Law 2001). Only about 65% of the population are connected to a sewerage system, and only 20% to a wastewater treatment plant (INWEB 2004). The lead and zinc industry in Bulgaria is based on mining and processing operations near Plovdiv, which might also cause heavy metal pollution in the basin. The river receives industrial waste from various areas, but the quantity of pollutants was markedly reduced due to the economic decline of the country in the 1990s.

### **Water use in Greece**

The Greek part of the basin area only amounts to 3,700 km<sup>2</sup> and is home to about 130,000 people (INWEB 2004). Apart from Alexandroupoli (36,000 inhabitants), there are no major cities. Industrial activity in this part of Greece is also very low. The principal source of pollution is domestic wastewater, especially from towns like Orestiada and Didimoticho (Centre for European Constitutional Law 2001).

No complete data on water uses and irrigation in Greece was available. Freshwater is increasingly used for irrigation, and other land use includes grazing, commercial fishery and some tourism in the delta area (Hellenic Ministry of Environment 1998). A dam was built on the Arda river, close to the Bulgarian border, to regulate discharge from the power plant belonging to the Ivailovgrad Dam in Bulgaria. Water from the reservoir is used to irrigate 30,000 ha of land (Tzovaridis et al. 1996). Close to the river delta, about 15,000 ha of land are used for agriculture (cotton, sugar beet, sunflower, tomatoes, asparagus). In the delta area, agriculture is restricted due to conservation and unfavourable soil conditions (Ramsar Convention 1999).

### **5.1.3 Potential impacts on downstream riparians and regional seas**

Diversion and storage of water for irrigation purposes, mainly in Bulgaria, result in reduced flow downstream. Because of water shortage, Turkey has on some occasions, been deprived of Paddy irrigation (Ozis et al. 2002). In addition, low inflow of freshwater increases salt water intrusion into the river and upstream. Increased salt loads can be observed up to 35 km upstream of the mouth of the river, making the water inappropriate for irrigation. Further, low freshwater inflows cause siltation problems in the Delta (Samsunlu 1996).

The Turkish media has blamed Bulgaria for storing the bulk of the spring and winter flows for summer and early autumn irrigation purposes. This resulted in declining water availability on Turkish side, yet, on other occasions when there were excess winter flows, the articles state, Bulgaria did not hesitate to open the dam and cause severe flooding in the paddy fields downstream in Turkey (Milliyet, 5 Dec. 1996).

In fact, flooding is a major problem in the Maritsa basin in Turkey and Greece. The most recent major flood occurred between February 17 and March 24 2005. It inundated houses

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23 From 1.2 BCM in 1991 to less than 0.1 BCM in 1997 (ECSSD 2003).

and farmland in Greece and produced damage estimated at 50 million US\$ in the area around Edirne (DSI 2005a).<sup>24</sup>

Low water quality in the basin is a concern in Turkey and poses a threat to the protected basin delta. According to the measurements taken at the Kapikule border quality monitoring stations between 1985 and 2001, Turkish authorities claim that Maritsa and Tundja enter Turkey as heavily polluted and modified water bodies (IVth class) (Kole 2004).

High sediment loads of the river cause sand accumulation in the riverbed particularly near Edirne, and forms sand islets on both sides of the river. Several trees rise on these sand islets, and grow into forests. This situation causes severe coastal erosion as a result of increase in roughness coefficient in the riverbed (Yildiz 1999a).

#### **5.1.4 Status of cooperation**

Up to now, only bilateral agreements exist on water-related issues in the basin. Any cooperative initiative in the Maritsa basin needs to be considered within the broader context of political relations between the riparian countries. Relations between Greece and Turkey, in particular, have been far from friendly over the years. After the second Greco-Turkish war (1919-1922)<sup>25</sup> the main issues have been the Cyprus dispute and conflicting territorial claims in the Aegaen Sea, with the 1996 "Kardak Crisis" over a deserted island in the Eastern Aegaen, which brought serious diplomatic confrontation between both countries. In addition, the Maritsa basin is situated in Thrace, an area that is home to diverse communities and Turkish minorities living in both the Greek and the Bulgarian part of Thrace as well as Greek minorities living in Turkey. The minority conflict is the oldest such issue between Turkey and Greece and has been the main problem affecting Bulgarian-Turkish relations since the end of World War II (Petkova 2002).

Since 1999, however, Turkish-Greek relations have entered a new era with a phase of rapprochement, which is largely due to close co-operation between the Foreign Ministers of the two countries. Turkish-Greek joint committees have been established and several agreements on promoting cooperation in fields ranging from environment to combating terrorism have been reached. The only minor drawback was caused by the European Council's decision, in December 2002, to grant EU membership to the Greek part of Cyprus.

#### **Turkey and Greece**

Earlier agreements between Turkey and Greece on the Maritsa river mainly cover the construction of facilities for flood protection, erosion control and water diversion. The two countries, very recently, entered a Memorandum of Understanding on Environmental issues.

The first agreement on the Maritsa between Greece and Turkey was signed in 1934. "The Agreement on the Installation of Hydraulic Systems on both Sides of the Meric River", mainly covered specifications for infrastructure that both parties were allowed to build for flood protection and erosion control. It also included provisions for the exchange of

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<sup>24</sup> 12,000 ha of agricultural land were damaged and two bridges collapsed (source: personal email correspondence with officials from the DSI Edirne Regional Office, 03 June 2005).

<sup>25</sup> Known in Turkey as the Turkish War of Liberation.

topographic data, notification to the other party prior to construction, and for dispute settlement between the two parties.

Another agreement relating to the construction of flood control measures on the Maritsa river was signed between Turkey and Greece in 1955. The text of the agreement was, however, not published. According to Bilen (2000) the agreement provided for the construction of flood control measures in accordance with a master plan. Each government would undertake the construction and financing of the work in its own territory. In order to determine the joint measures that needed to be taken against flooding of the river, Turkey and Greece awarded a contract to the Harza Engineering Company to prepare a master plan for the Maritsa basin. However, only some of the facilities envisaged by the master plan have been realized (Bilen 2000). In order to resolve disputes arising from the master plan and to carry out hydraulic works on both sides of the Maritsa, Turkish-Greek technical teams convened in 1963 and agreed on the "Protocol on the Rehabilitation of the Meric River Basin Forming the Significant Part of Turkish-Greek Border in Thrace." This protocol encompassed articles on the modification of the border between the two parties, as exchange of land was necessary to build infrastructure on the river. Any disputes on this matter would have been assigned to a General Engineer, appointed by the French Ministry of Agriculture. Other articles included stipulations on specific technical issues of water infrastructure construction.

A "Memorandum of Understanding Concerning Cooperation on Environmental Protection" was signed between Greece and Turkey in 2001. It stipulated, that the two parties "shall exchange scientific, technical and legal information among governmental bodies and shall encourage such exchange among academic institutions" (Article 2). "Coordination of co-operation in the different fields of activities shall be managed by a Joint Committee comprising five representatives from each of the two countries" (Article 8). The possible fields of cooperation named do not, however, include river management. Yet, some of the areas mentioned, such as "combating marine pollution", "Environmental Impact Assessment", "Land-based sources of pollution", provide options for co-operation relating to the management of the Maritsa river.<sup>26</sup>

Joint development initiatives also offer opportunities to foster transboundary co-operation in water resource management in the basin. The Community Initiative Programme INTERREG III A / Greece – Turkey is envisaged to support cross-border cooperation projects. The programming period 2003-2006 aims at fostering good neighbourly relationships and promoting the region as a nexus for consolidating peace and growth in the Eastern Balkan Peninsula and the Aegean Sea. Under the environmental component of the programme, priority will be given to the integrated management of the cross-border waters in accordance with the Water Framework Directive and to the management of ecosystems of exceptional ecological significance.<sup>27</sup>

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26 According to the former Greece Minister of Foreign Affairs, George A. Papandreou, the most important achievement attained up to this point concerns the establishment of communication between appropriate carriers.  
<http://www.papandreou.gr/papandreou/content/Document.aspx?d=6&rd=7739474&f=1380&rf=2038276612&m=4565&rm=9378861&l=1>

27 (Priority Axis 3: Quality of Life / Environment / Culture ) For more information on the INTERREG III A / Greece - Turkey Programme see <http://www.interreg.gr/en/>

## Turkey and Bulgaria

In 1968, Turkey and Bulgaria signed the "Agreement between the Republic of Turkey and the People's Republic of Bulgaria on the Cooperation of the Use of the Waters in the rivers Flowing in the Soils of the Two Countries", which refers to the principles of international law and good neighbourly relations. The main objective was to regularise beneficial use of boundary and transboundary rivers and to provide for flood protection. The parties committed themselves to cooperate in research and study of ventures which would be beneficial to both of them, to not inflict serious damages on each other by constructing and operating facilities on the rivers, to exchange information on floods and icing as rapidly as possible, and to exchange hydrological and meteorological data. A Turkish-Bulgarian Joint Commission composed of equal numbers of experts from both countries was authorised with settling disputes which may have arisen during the implementation of the agreement.

The 1975 "Agreement on Long Term Economic, Technical, Industrial and Scientific Cooperation" between the Government of the Republic of Turkey and the Government of the People's Republic of Bulgaria" states that cooperation between the concerned Turkish and Bulgarian enterprises and organisations shall be simplified in all the fields of economy including "energy production and irrigation, including the joint use of the waters whose shores are on both countries, for energy production and irrigation purposes" (Article 5).

Recognising the need for cooperation to alleviate the severe consequences suffered by both parties due to drought, the Agreement on Assistance and Cooperation in the Field of Water for Reducing the Negative Effects of the Drought of 1993 was signed. It states that Bulgaria, on a one-off basis and limited to 1993, should provide additional water to Turkey from the river Tundja. In turn, Turkey should allocate US\$ 0.12 per m<sup>3</sup> of water provided by Bulgaria. Accordingly, Turkey purchased 15,866,000 m<sup>3</sup> of irrigation water from Bulgaria at 1,903,904 US Dollars cost (Turkish Parliament Research Commission 2002).

In 1998, Bulgaria and Turkey signed an agreement on co-operation in the energy and infrastructure sectors, in which Bulgaria agreed to contract Turkish companies for two major infrastructure projects: the Gorna Arda hydropower project and construction of a stretch of the Maritsa highway. In return, Turkey was to purchase a certain amount of electricity at fixed prices from Bulgaria. The Gorna Arda hydropower project was launched in 1999. It included rehabilitation of existing dams as well as construction and operation of three new dams on the Arda river near the Turkish border. In 2000, however, the Turkish Ceylan Holding Company, which was chosen to participate in the two infrastructure projects, experienced financial difficulties. No alternative contractor was commissioned and the projects did not get beyond their planning phases. Turkey stated that this was non-fulfilment of the 1998 agreement and stopped purchasing electricity from Bulgaria in 2003 (Buechsenschuetz 2003).

The Turkish-Bulgarian Joint Committee for Economic and Technical Cooperation signed the "Agreement on the Approval of the 15<sup>th</sup> Term Protocol," in 2002.<sup>28</sup> Under the subheading "Environment", both parties agree to further environmental cooperation for the protection of

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28 Protocol of the Fifteenth Session of the Turkish-Bulgarian Joint Committee for Economic and Technical Cooperation. Done at Sofia, 22-23 January 2002. *Resmi Gazete*, 2002-07-03, No. 24804, pp. 3-36 Contains provisions on trade and economic relations: bilateral trade relations, trade promotion activities, standardisation, industry and transport (inter alia, road transport and maritime transport), telecommunications and postal services, agriculture, and environment.

surface and groundwater resources and water related environments. Under “Energy and Environment”, the Turkish side repeated the request to establish a joint technical working group to investigate the conditions for building the Suakacagi Dam on the Tundja river.<sup>29</sup> The Bulgarian side confirmed that this issue would be addressed promptly. Both sides agreed to continue hydrological data exchange in order to prevent flooding and to exchange data regarding water levels and releases from dams on Maritsa, Arda and Tundja. They further agreed that the Technical Working Group which was created under the 1968 Agreement should continue its regular activities.

A protocol was signed between the DSI and the National Institute of Meteorology & Hydrology (NIMH) of Bulgaria in 2002. This protocol related to the installation, operation, and maintenance of a flow observation telemetry station on the Maritsa river in Svilengrad, Bulgaria for improved monitoring of hydrometeorological data in periods of flood. In addition, joint studies are ongoing to install an early warning system for flood protection on the Turkish-Bulgarian border.<sup>30</sup>

### **Greece and Bulgaria**

Bulgaria and Greece are both signatories to the UNECE Water Convention, which provides a legal framework for co-operation in transboundary water management. Cooperation in scientific and technical fields is also well established.

The main transboundary water agreement between the two countries is the 1964 agreement on common use and management of joint surface water resources. It stipulates that parties must avoid causing damage to the other party by the construction of infrastructure, that parties exchange hydrometeorological data and information on floods, and that they will carry out feasibility studies on joint infrastructure projects (Tzovaridis et al. 1996). In 1971, an agreement was signed between Greece and Bulgaria for the establishment of a Greek-Bulgarian Committee that would deal with electrical energy issues and with the management of common water resources (INWEB 2004).

Within the framework of the INTERREG programme of the European Commission, Bulgaria and Greece have been cooperating on research projects on transboundary waters since the early 1990s. Special emphasis was put on aspects of the management of shared waters. Pollution measuring stations were installed and equipped on the Bulgarian section of the rivers Nestos/Mesta, Strymonas/Struma and Evros/Maritsa and waste water treatment plants were built, using funds from PHARE Cross-Border Co-operation, to reduce pollution in the Maritsa basin from the effluents of the cities of Haskovo, Dimitrovgrad and Stara Zagora. The Greek and Bulgarian Ministries of the Environment are responsible for managing the project (Council of Europe 2002). For INTERREG III, planned actions cover calculating availability and use of water from shared basins as well as the development of joint plans and policy framework for the integrated management of shared waters.<sup>31</sup>

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29 Joint construction of the Suakacagi Dam has been planned with Bulgaria since 1968. The Dam would irrigate 50 000 ha of land, protect 2 000 ha from flooding and operate three turbines, two on Bulgarian side and one in Turkey to generate 100 GWh/year energy.

30 Personal correspondance with the National Hydrological Activities Unit, Planning and Investigation Department, State Hydraulic Works, January 2005, Ankara.

31 For more information on the Operational Programme Interreg III A / PHARE CBC Greece Bulgaria 2000-2006 see <http://www.interreg.gr/en/>.



### **5.1.5 Outstanding issues and options for win-win solutions**

Existing agreements and cooperation in the basin cover issues of flood protection and joint infrastructure projects as well as general environmental cooperation including conservation of protected areas. Issues of water allocation, on the other hand, remain unsettled and no legal provisions exist on water quality standards within the basin. Likewise, arrangements on the exchange of data and information mainly focus on information on floods, while cross-border availability of data on water quality is reputed to be a problem (Mylopoulos et al. 2004). In addition, no agreement exists that would provide for a minimum inflow of freshwater into the Delta, satisfying the water needs of the ecosystems as well as preventing salt intrusion and siltation.

#### **Flood protection, irrigation and energy production**

Conflicting interests in water resource development of the Maritsa basin mainly exist between Bulgaria and Turkey. Turkey's plans to increase irrigated areas in the Maritsa basin would aggravate the situation. In order to make more water available for irrigation in Turkey, it was proposed that Turkey should consider the possibility, despite the additional cost, of building off-stream storage facilities which may collect excess winter outflow from Bulgarian and Greek dams (Ozis et al. 2002). In addition, Turkey has proposed joint dam projects with Bulgaria (see below), which would also serve as flood control measures.

One of the most urgent fields of action in the basin is flood protection. Even though agreements exist for cooperation in flood prevention and control, adherence to them has not been satisfactory in the past. After the severe floods of March 2005, Turkey is reported to have sent Bulgaria a note of protest because of her alleged failure to abide by the bilateral agreement. Likewise, Greece also blamed Bulgaria for flood incidents (Andonova and Velinova 2005, *The Sofia Echo*, 11 Mar 2005).

In the aftermath, Ankara and Sofia agreed to jointly build a dam on the river Tundja in order to mitigate flood problems in Turkey. The two sides agreed on appointing experts to develop the project and to establish a Turkish-Bulgarian joint technical commission for the implementation of the project. The dam is expected to not only serve as flood-protection but will also bring further benefits to the two countries. It could, for example, also provide irrigation water for the area around Edirne and Kirklareli in Turkey (*The Sofia Echo*, 03 June 2005). In April 2005, a technical delegation from Bulgaria paid a visit to the DSI Regional Directorate in Edirne. Consensus was reached regarding the dam site and a protocol was signed. In addition, during the recent visit of the DSI Regional Director to Bulgaria in May 2005, the two sides agreed that project development for the Suakacagi Dam in the Tundja river would be finalised with joint studies in June 2005 (DSI 2005b).

On this occasion, it is expected, that the two countries will also take up discussion on the 1998 electricity-for-infrastructure bilateral deal that included building of dams on the Arda river (see chapter 6.1.4). Bulgaria, as one of the leading electricity exporters in the Balkan region, is interested in resuming electricity exports to Turkey. Turkey, on the other hand, has been reported on insisting on compliance to the agreement by Bulgaria in the way that Turkish companies are contracted to build these infrastructure projects (Nenkova 2005).

## Water quality and environment

A second field of action that could bring mutual benefit to all riparian countries is nature protection and conservation in the basin area; especially the protection of the Ramsar Site. The Evros delta presents a need for action. Projects for the Lower Meric Valley Flood Plain as a biosphere reserve also exist on the Turkish side. Several other initiatives have taken first steps to foster transboundary conservation activities. However, no concrete results have been achieved yet:

- The Turkish Ministry of Environment and Forestry with support from UNESCO Regional Bureau for Science in Europe has organised an international conference on "Biosphere Reserves and Transboundary Cooperation between Bulgaria, Greece and Turkey" which will take place in Edirne in July 2005.
- In 2001, the Mediterranean Wetlands Initiative (MedWet) developed a project to foster transboundary collaboration to manage and protect the Maritsa river and its wetlands. Unfortunately, because of internal reasons, funding for the project was not approved. A new effort might be put forward in late 2005.<sup>32</sup>
- The European Green Belt initiative under the leadership of the German Federal Agency for Nature Conservation (BfN) and IUCN aims to transform the former Iron Curtain area along the east-west divide of Europe into a protected corridor, thus acting as a symbol of unity between East and West. One stretch of the European Green Belt route follows Bulgaria's borders with Turkey and Greece. Within this context, the Maritsa basin has been identified as one of the priority sites for transboundary co-operation (IUCN 2004).

Water quality remains an unsolved issue in the basin. Any solution to this problem, arising, to a significant degree, from insufficient waste water treatment, would need large investment in infrastructure. Ongoing EU-cooperation programmes with accession countries may lead to some alleviation of the problem.

High sediment loads – a consequence of erosion in the basin – causes siltation problems in the river Delta and forming of sand islets. Turkey has started a programme to clean the sand islets in order to maintain a regular flow. However, technical cooperation by the other riparians is deemed necessary to fully address this issue (Yildiz 1999a).

## Data exchange and scientific cooperation

Exchange of hydrological data seems to be insufficient between the riparian countries. It has been reported that no information is available from the Bulgarian side about any waste discharge in the river or any retention of water (Mylopoulos et al. 2004). Establishing scientific exchange between riparian countries can be an invitation for further collaboration.

In the Maritsa basin, exchanges of this nature take place, to some extent, through the International Network of Water-Environment Centres for the Balkans (INWEB) established in 2000.<sup>33</sup> Funded by the UNESCO Regional Bureau for Science in Europe (UNESCO-ROSTE), INWEB organised an international workshop in 2004 with the objective of sharing

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32 Personal email correspondence with Thymio Papayannis, MedWet Senior Advisor, 12 Apr 2005.

33 For more information on this initiative see [www.inweb.gr](http://www.inweb.gr).

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available data on transboundary watercourses in south-eastern Europe and to contribute to the compilation of an inventory according to the UNECE framework document guideline. Participants from all three riparian countries took part in the workshop and presented some data and information on the Maritsa basin. Furthermore, The World Hydrological Cycle Observing System (WHYCOS) offers a network for data exchange. WHYCOS established a global network of national observatories with the objective of creating a relatively transparent data base. The Mediterranean division (MED-HYCOS) has set up five Data Collection Platforms in the Maritsa basin: four in Bulgaria and one in Turkey.

## 5.2 The Kura-Araks basin<sup>34</sup>

The development of water cooperation between the basin countries of the Kura-Araks river basin is attracting increasing political attention. Because of the complicated and partly unstable political relations between the riparian states, and the enormous water quantity and quality problems within the basin, the Kura-Araks basin was recently referred to as a “basin at risk” (Wolf et al, 2003) in some scientific studies. According to these studies, massive conflicts over water resources could occur in the years to come. However, the role of Turkey as an upstream country still appears understudied and barely considered.

**Figure 4: Map of Kura, Araks, and main tributaries**



- (1) Koroglu Dam (planned)
- (2) Besikkaya Dam (planned)
- (3) Arpacay Dam
- (4) Bayburt Dam (under construction)
- (5) Demirdoven Dam

### 5.2.1 Geographical and hydrological setting

The Kura-Araks basin is located in the South Caucasus and is, by far, the most important watershed in the region in terms of surface area, water flow, socioeconomic importance of the water resources, and preservation of the freshwater ecosystems. The basin is an internationally significant river system, which is seriously degraded and continues to be threatened whereby transboundary issues play a major role.

<sup>34</sup> Other names for the river Kura are Mtkvari river, Kuracay river, and Cyrus river. Other names for the Araks frequently used internationally are, inter alia, Aras; and Araz.

**Table 5: Cooperational context in the Kura-Araks basin in brief**

<b>Kura-Araks</b> Basin area: 190,000 km <sup>2</sup> ; mean annual discharge 32 BCM		
<b>Riparian position</b>	<b>Basin area (% of total)</b>	<b>Main water uses</b>
<b>Turkey</b> Upstream / border rivers with Armenia and Iran	27,208 km <sup>2</sup> (14%)	Irrigation, hydro power, household purposes
<b>Georgia</b> Upstream / downstream	33,763 km <sup>2</sup> (18%)	Irrigation, industrial and domestic use
<b>Armenia</b> upstream / downstream / border river with Turkey	34,257 km <sup>2</sup> (18%)	Irrigation, industrial and domestic use
<b>Iran</b> Upstream / downstream / border river with Azerbaijan	39,045 km <sup>2</sup> (21%)	Irrigation, hydropower, household purposes, industry
<b>Azerbaijan</b> Downstream / border river with Iran	55,632 km <sup>2</sup> (29%)	Irrigation, industry, household purposes, hydropower
<b>Main agreements with Turkish involvement and covered issues</b>		
Turkey - Georgia	1927 – border issues, river bank protection, water allocation, compensation requirements, joint commission 2000 – technical cooperation, river bed changes etc.	
Turkey - Armenia	1927 – border issues, river bank protection, water allocation, compensation requirements, joint commission 1964 – joint construction of the Arpacay-Dam, allocation of water and construction costs, joint commission to operate the infrastructure 1973 – bridges and border issues on the Arpacay River, particular regulations relating to tributaries 1990 – technical cooperation, river bed changes, joint hydropower facilities	
Turkey – Iran	1955 – basic principles of the water use in the border region, minimum water flow (1,8 m <sup>3</sup> /s), water allocation (fifty-fifty allocation)	
<b>Unsettled issues</b>		
Quality	No agreement on water quality standards, exchange of data insufficient; rudimentary bilateral agreements (Georgia – Armenia, Azerbaijan – Georgia)	
Quantity	Main critical issue. No comprehensive agreement providing for a fair and economically sound allocation of water.	
Biodiversity	Comprehensive approach to the protection of freshwater ecosystems is lacking	

Source: Own compilation

The watershed extends over 64% of the territory of the South Caucasus states and includes five countries: Turkey, Iran, Armenia, Georgia, and Azerbaijan. The Kura-Araks basin covers the entire territory of Armenia, about 80% of the territory of Azerbaijan and about 52% of the territory of Georgia. Because of their comparatively small share of the watershed area, the river system is less crucial for Iran and Turkey at national levels, nevertheless there are regionally important water uses (cf. CEO 2002).

The watershed consists of two main branches, the Kura and the Araks contribute 55% and 45% respectively to total discharge (see Revenga et al. 1998). The Kura rises in Turkey – the source is a group of springs on Kyzyl-Gudiak Mountain at a height of 2,700 m in the Anatolian highland of Turkey – and enters Georgia after some 210 km. After 390 km through mountainous terrain the river flows into the Azerbaijan steppes and finally discharges into the Caspian Sea. The river is fed by snow and ice melt water, underground sources and rain. The total watershed area of the Kura is about 188,000 km<sup>2</sup> with a total length of about 1,515 km. The other main branch of the river system is the Araks with a length of about 1,700 km and a total watershed area of 102,000 km<sup>2</sup>. The Araks's spring is also in Turkey and after 300 km the river forms several borders: between Armenia and Turkey, for a very short distance between Azerbaijan and Turkey, between Azerbaijan and Iran, between Armenia and Iran, and finally again between Azerbaijan and Iran. Eighty kilometers after crossing the border with Azerbaijan the Araks joins the Kura. Therefore the Kura and its main tributaries cover four full border crossings and four sections as the border river between different countries. Beside that there are over twenty minor tributaries which cross the border or end up at the border in the Araks. From the Turkish perspective, the Arpacay river, which is shared between Turkey and Armenia, is of particular importance to the two countries. It is formed through the merging of the Kars river originating in Turkey, and the river Ahuryan originating in Armenia. There are smaller transboundary waters crossing the Turkish-Iranian border within the Araks river catchment area also; the most important being the Sarisu which has a drainage area of 1500 km<sup>2</sup> in Turkey (Polat 2004). In total, about 40 river segments or tributaries have a transboundary character while crossing a border, being a border or ending at a border in the Kura-Araks basin.

A variety of climates, precipitation conditions and landscapes can be observed in the basin (TACIS 2004).<sup>35</sup> As a general rule, annual rainfall within the basin declines from west to east but the Turkish part can be judged to be rather dry also. In Central Georgia, where the Kura enters from Turkey, average annual precipitation is 500 mm but only 200 mm in Azerbaijan, where the river flows into the Caspian Sea. Similarly, evaporation rates soar from west to east. Drought periods in the Kura basin are common and different regions are affected. While even water-rich Georgia experiences seasonal droughts in several parts of the country and in exceptional years, Azerbaijan suffers from droughts and water shortages the most because more than 70% of the country's drinking water is dependent on the Kura and Araks rivers (Guluzada 2004, TACIS 2004). In addition, there are only limited good quality groundwater resources available making Azerbaijan very vulnerable to scarcity. In contrast, Armenia has generally adapted well to permanent shortages but water scarcity is still a factor in irrigation development and hydropower production (c.f. World Bank 2003). Armenia's advantage is its

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<sup>35</sup> Accordingly, the Kura basin is usually divided into six parts with different climates: South-west (from source to Georgian Borjomi), North (Borjomi-Tbilisi), Middle (Tbilisi-Khrami), Lower (below Mingachevir) and the Araks region.

large stock of high quality groundwater. Georgia's drinking water is mainly drawn from the higher tributaries of the Kura, with groundwater bodies with a satisfactory quality used in parallel also. In the past, Turkey experienced temporary domestic droughts along the Araks river which led to plans to further develop the water infrastructure (see below).

As a general rule, one can state that the further downstream the rivers in the entire basin are, the greater the deterioration in water quality is, and with it the challenges of water management (c.f. World Bank 2003). The most important transboundary water quality issues are organic and heavy metal pollutants and agricultural pesticides that mostly originate from sources in Georgia and Armenia and affect downstream Azerbaijan (cf. TACIS 2004). Water pollution from the Iranian territory is barely documented, and relevant data from Turkey are also not easily accessible. However, Turkey as an upstream state causes only a minor share of the rivers' pollution. The Turkish provinces of Erzurum, Ardahan, Kars and Iğdir lying upstream in the basin show comparatively good environmental conditions, even though watershed degradation, erosion and agricultural pollution (chemicals, pesticides) are issues of concern (Polat 2004).

Equally erosion and sedimentation are important water management issues in the basin which have an impact on downstream water uses. Natural erosion and sediment flow is aggravated by deforestation and flood irrigation in several regions.

Because of the mountainous characteristics of the upper part of the basin and the specific climatic conditions, a huge seasonal variety in river flow and flooding can be seen which also plays an important role. In flood periods, water discharges make up about 60% of annual discharges. The basin states experience floods and droughts with drastic economic consequences, for instance the severe droughts in 2000. Average discharge flow rate of the Kura river in Turkey, however, is 28.75 m<sup>3</sup>/s; total annual water supply of the river in Turkey is about 1 BCM. Yearly average runoff of the Araks river is 4.63 BCM/year.

The basin is rich in terms of biological diversity. There are, for instance, unique alluvial forests along the Kura, and many important wetlands in different parts of the basin. Currently, the basin has four Ramsar sites and 21 wetland dependent Important Bird Areas. Finally, the Kura-Araks basin is vital for the protection of the Caspian Sea's ecosystems because it is the second largest river which drains into the Caspian Sea (CEO 2002).

### **5.2.2 Current and future water uses**

Various activities and water uses, including industrial, domestic, agricultural and hydropower, have always had adverse effects on the quality and quantity of the waters. In total, about 60-70% of the (11-12 BCM) water of the basin is allocated to agriculture, 20-25% to industrial use, and the remainder to drinking water. Water withdrawal for household use is most relevant in Azerbaijan where water consumption already suffers from the poor quality of the Kura with regard to organic pollution, hazardous waste, and sedimentation (CEO 2002).

Industrial water use in the basin is generally influenced by old and outdated technologies which cause unnecessarily high water demands and enormous levels of pollution. However, as many countries in the basin have experienced significant economic decline in the last decade, industrial pollution has decreased; at least temporarily. Today, all countries also have plenty of abandoned contaminated industrial sites which can potentially release pollutants over large periods of time. Major transboundary industrial pollution is caused by the Georgian Rustavili industrialised region just downstream from Tbilisi which impacts on

Azerbaijan, while there are only very few industrial sites (e.g. sugar plants) along the Araks river on Turkish territory (CEO 2002).

Because of climatic conditions, agriculture in all riparian states depends largely on irrigation. For this purpose, a total of 130 reservoirs and dams were built within the basin, mainly located on the tributaries while the main branches of the river (Kura and Araks) are only minimally regulated by only two major reservoirs. Today, Armenia, Georgia and Azerbaijan, in particular, have large but inefficient irrigation systems (based on dams) which suffer huge water loss and salinisation. Negative effects cumulate downstream where poor water quality goes hand-in-hand with quantity problems as the rivers enter the Caspian Sea. In recent years, however, because of some restructuring of the agricultural sector in former USSR republics, several irrigation systems broke down, which lead to a temporary decrease in water use; albeit the decline in industrial water use has been more drastic since the early 1990s in the Caucasus states (CEO 2002).

Energy-related threats to the water resources and fluvial dynamics are mainly caused by the upstream states generating hydropower which affect the flow of water in the basin. There are major plans to significantly increase hydropower production in Iran, and, Turkey and Armenia are also considering some smaller infrastructural developments (Polat 2004).

### **Water development projects in Turkey**

It is necessary to distinguish between the two main branches of the Kura -Araks river system when looking at Turkish plans to build new dams in the region (Polat 2004).

At present, the Kura river has no important water infrastructure in terms of dams, reservoirs or large scale irrigation systems. Some 2,984 ha of land (6% of the irrigable land in the basin) is irrigated by individual farmers with spring waters and by the GDRS (General Directorate of Rural Services) through the waters of the 27 small lakes in the Turkish Ardahan province. However, the Durancam, Besikkaya, Burmadere Dams are due to be built. Thus, 50,670 ha of land is planned to be irrigated in the basin. In addition, there are plans to develop the Koroglu Dam for hydropower generation purposes.

The Araks basin plays a much more important role in agricultural irrigation in Turkey. The Serdarabat Regulator, located where the Araks enters into the Igdir Plain, diverts water both to Turkey and Armenia and with a regulated flow, irrigated agriculture can be practiced in Igdir Plain (see Yildiz 1999a). Generally, Araks river waters are vital for livelihood in the Igdir Plain and in the middle Asian lowlands which often experience dry climates. The Arpacay and Demirdoven Dams were built in Turkey on the headwaters of the Araks river and its tributaries. The Arpacay Dam, located where the river forms the border between Armenia and Turkey, has an active storage capacity of 510 MCM/year. Half of its water is used by Armenia, the other half by Turkey for irrigation of the Igdir Plain. The Demirdoven Dam was built between 1988 and 1995 and serves an irrigation area of about 8,293 ha. At present, the total irrigated area in Igdir, Kars-Akyaka, Kars-Alabalik, Karayazi-Koycegiz is equivalent to 48,094 ha. Additionally, construction of the Bayburt Dam and construction of irrigations systems (such as the East Igdir, Arpacay Plain, the Cildir Lake, the Pasinler Demirdoven Dam) on the Kars river continues and will irrigate 33,221 ha. Furthermore, there are thirteen other dam projects in the pipeline (Polat 2004, Yildiz 1999a).<sup>36</sup> With a total storage capacity

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36 Namely, Soylemez, Karakurt, Kuloglu, Denizgolü, Denizhan, Katranli, Asbuga, Alabalik, Kars, Gecit, Dolayli, Varli, and the Cildir Lake



of these dams at around 4,110 MCM the total irrigated area of all the projects will be 17,903 ha. Other irrigation projects which are planned are the Susuz Project, the Tuzluca Project, the Digor Project, and the Cildir Project. These projects will irrigate 185,458 ha of land.

Most of the projects mentioned above are in rather early planning stages and their realisation not yet assured because of the Turkish government's limited financial resources and restructuring of the Turkish administration and agricultural sectors. The Bayburt Dam is the only large infrastructure project which is already under construction. The reason for this is the dam's important water supply component for domestic and industrial purposes in the dry Kars region, whereas the associated irrigation target is a rather modest (about 5,200 ha). Furthermore, because of rather unfavourable hydrological conditions (at least compared to other Turkish river basins), hydropower generation projects are of minor importance and the majority of dams planned would be predominantly constructed for irrigation. In contrast, Iran's policy of developing hydropower is potentially much more important on the Araks river because the Iranian Government has plans to develop a large number of large and small dams (about 40) on the Araks which would certainly have serious transboundary effects on flow patterns in downstream Azerbaijan.

### **5.2.3 Potential impact on downstream riparians and regional seas**

Even though the transboundary effects of current and planned Turkish activity and development within the river basin has yet to be seriously assessed, one can expect negative effects on water quality and quantity (Polat 2004, CEO 2002). Construction of dams and the development of irrigation on the scale described, even if not all the projects would see the light of day, would certainly affect flow patterns, water availability and freshwater ecosystems such as wetlands and alluvial plains in the downstream states, mainly in Armenia, Iran, and Azerbaijan. In addition, intensive agriculture on irrigated land usually has an impact on water quality because of salinisation and the use of chemicals and pesticides. At present, agriculture is still considered to be the most significant water pollution source in the basin. Today, water availability is not just a matter of concern between Turkey and Armenia but also between Turkey and Iran. In this context, the Sarisu river is one river that has attracted a certain amount of political attention because Turkey could not always provide for the promised water flow (see below).

Consequently, there is no doubt that water quality problems within the basin have an important transboundary dimension; however precise assessment of the contribution of the different countries or sectors is barely possible. For instance, because of a lack of reliable data and limited monitoring, little is known about the precise impact of Turkey's water use on downstream water quality. In principle, the impact of Turkish activity on both water quality and quantity is more relevant in the Araks basin while the hitherto planned activities on the Kura river are of less importance. At the Kura river, the most important transboundary pollution stems from Georgian industrial sites and urban agglomerations.

There also are several engineering aspects of river development along borders that would demand improved bilateral cooperation. For instance, Turkey intends to facilitate and improve use of the Araks river's water from the joint regulator of Serdarabat which was constructed for irrigation purposes. Since the envisaged technical measures on the Turkish side would imply removal of the river bed on a short stretch of river, approval by the

Armenian government and technical cooperation with the Armenian authorities would be necessary (Yildiz 1999a).<sup>37</sup>

Generally speaking, it is obvious that long-term sustainable development within river basins and the preservation of freshwater ecosystems demands international and multilateral cooperation of the basin states. Long term efforts and initiatives to manage the Kura-Araks basin and to coordinate the riparian states would certainly also require the involvement of Turkey. The same is true for the protection of the Caspian Sea, which significantly suffers from river pollution. In addition, flood and drought management are issues with high transboundary relevance.

#### 5.2.4 Status of cooperation

In face of the challenges described, there is only rudimentary coordination and cooperation between the five basin countries. At present, there are few bilateral agreements: With regard to coordination between Georgia, Azerbaijan, and Armenia, the previous intra-Soviet-Union mechanism of cooperation, information sharing etc. ceased to function after the break-up of the Soviet Union. Following a Georgian initiative carried out within the context of an EU TACIS programme in 1997, rather rudimentary bilateral cooperation agreements have now been established between Azerbaijan and Georgia, and Armenia and Georgia (TACIS 2004). Furthermore, the Environment and Security Initiative in the Southern Caucasus – financed and supported by UNEP, UNDP, OSCE and NATO – was aimed at assessing water-related security risks in the basin and supporting the riparians (Georgia, Armenia, Azerbaijan) in identifying starting points for cooperation (see UNDP 2003, OSCE 2002b). Furthermore, there are several initiatives and ongoing projects predominantly on a technical and a bilateral level, while a comprehensive and multilateral cooperation framework is still lacking.<sup>38</sup> These recent bilateral initiatives are conspicuous by the absence of Turkey and Iran, although a UNDP/GEF-project<sup>39</sup> explicitly aims to integrate Turkey into the project.

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37 Turkey and Armenia utilise the regulated waters of the Araks river from the joint regulator of Serdarabat for irrigation purposes. Just prior to the Serdarabat regulator at the left bank of the river in Armenian territory, Armenia withdraws water, whereas from the right bank of the river Turkey withdraws water. However, to be able to use that water, Turkey first needs to collect the water in the sediment ponds as the Araks brings large amounts of deposits to the right bank where the inner bend of the river is situated. The DSI has tried to make the necessary arrangements to provide good quality and equal amount of water to Turkey; yet, the DSI underlines the fact that, in order to find a complete solution to water withdrawals at the Turkish side, the river bends will have to be removed. This would in fact result in the rearrangement of the riverbed of the Araks. Yet, as the Araks (Arpacay) forms the boundary between Turkey and Armenia, such adjustments in the riverbed should be approved by both sides. Existing regulations within the bilateral agreements do not address this matter. Hence, technical collaboration is needed to respond to the challenge (Yildiz 1999).

38 The hitherto completed or ongoing projects were funded, inter alia, by:

- USAID: South Caucasus Sustainable Water Management Project (Armenia, Azerbaijan, and Georgia - Turkey has also officially observed some of the activities of this project); see <http://www.usaid.gov/am/activitypages/sustainablewatermanagement2004%20.htm>
- UN Economic Commission for Europe: the South Caucasus Environmental Protection Programme (Armenia, Azerbaijan, and Georgia);
- NATO South Caucasus River Monitoring Projekt, see <http://www.kura-araks-natosfp.org/>
- The European Union: EU TACIS Trans-boundary Water Management Project; see <http://www.jointrivers.org/eng/>
- The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety: "Development of the trans-boundary cooperation for hazard prevention in the Kura-river basin", see [http://www.kura.iabg.de/inventarisierung\\_engl.htm](http://www.kura.iabg.de/inventarisierung_engl.htm)

39 For further information refer to <http://www.undp.org/ge/Projects/kura.html>

There are also only rudimentary agreements between Turkey and its neighbours (Polat 2004). The history of Turkish cooperation within the basin goes back to the 1920s and the early days of the Soviet Union. The most important boundary rivers shared between Turkey and the Soviet Union were the Posof (which now forms the border with Georgia), the Arpacay and the Araks (now shared with Armenia). All these rivers used to form boundaries between Turkey and the USSR. In 1927, Turkey and the Soviet Union signed the 'Protocol on the Beneficial Uses of Boundary Waters' (so-called Kars-Protocol) which concern, inter alia, the use of the Arpacay and the Araks rivers. This protocol is still in force. The basic provisions of the arrangement are a fifty-fifty allocation of water (article 1) and several regulations on infrastructure and dam building. A Joint Boundary Water Commission was established later and in 1928, some articles of the protocol were amended. A further, predominantly technical agreement - a protocol for the construction of a common bridge on the river Arpacay - was signed on 23 April 1963.

An important agreement between Turkey and the USSR is the Protocol on the joint construction of the Arpacay Dam dating from 1964. This protocol provides a set of rules concerning the joint construction of the dam whose water would be shared on a fifty-fifty basis. Both states are free to use their water for irrigation purposes and may build a hydropower plant on their respective territories. In addition, article 18 of the protocol regulates quantitative water use downstream of the dam up to the Iranian border. Equally, issues such as the allocation of construction costs and the compensation for land losses are addressed in the Protocol; the same is true for the founding of a joint dam commission to operate the infrastructure. This protocol was later followed by the 1975 officially ratified "Cooperation Agreement on the construction of a dam on the bordering Arpacay (Ahuryan) river and the constitution of a Dam Lake" which assures the basic principles that were already outlined in the 1964 Protocol.

On 26 October 1973, "The Agreement for the Cooperation between the Republic of Turkey and the Union of Soviet Socialist Republics for the Construction of the Bridge and the Bridge Lake Formation on The Arpacay River Border" was signed. The provisions of that agreement play a key role in the regulation of boundary waters, because it explicitly provides for regulations concerning the tributaries and makes several clarifications omitted in the 1927 agreement. As the last agreement between Turkey and the USSR, a protocol was signed on 7 March 1990. According to this agreement, "...any shift in the riverbeds of the Arpacay, Coruh, Posof and Caksu rivers would be prevented jointly or the necessary facility to adjust the watercourses would be built in collaboration" (Esenyel 2001). In addition, the protocol addresses technical issues relating to the construction of joint hydro-technical facilities however, the respective installations have not yet materialised.

Under "The Protocol on the Joint Utilization of the Waters of the Sarisu and the Karasu River" which was signed on 18 November 1955 by Iran and Turkey water use rules were defined and basic principles such as a "fair use of the waters in the border region" were laid down. Article 10 of the protocol states that, "the parties may develop irrigation facilities on their portion of the river after agreeing on the need of using water for irrigation". Moreover, Turkey promised that she would release 1,8 m<sup>3</sup>/s water from Sarisu to Iran under all circumstances. In addition, both states agreed on a fifty-fifty allocation of the water of the Karasu river by reaching an agreement on the needs and requirements of their irrigation projects and by adhering to the existing border regime.

Against the background of existing agreements that predominantly address border issues, water infrastructure development, and respective water withdrawals at border rivers, comprehensive agreements on transboundary water issues are clearly lacking. For instance, water quality questions and freshwater ecosystem preservation are not addressed. In addition, the existing agreements lack implementation and monitoring structures, the same is true for procedural rules, such as transboundary impacts assessments, information sharing, notification etc.

### 5.2.5 Outstanding issues and options for win-win solutions

Generally speaking, and as far as Turkey is concerned, the transboundary management of the Kura and Araks rivers does not receive much political attention and the interest in water conflict matters is rather low. Georgia, as the main polluter of the Kura river, appears little concerned about Turkey's influence on the river. Georgia lacks the basic monitoring capabilities required to both assess the water quality of the Kura river and to quantify the pollutants stemming from the Turkish stretch of the river.<sup>40</sup> As far as the Araks river is concerned, the planned development of dams might have a serious impact on Armenia's water usage and to a lesser extent on Iran and Azerbaijan also, but these issues have not yet been comprehensively addressed in the political arena. However, it is assumed by some observers that the impact of Turkish dams on the Araks was possibly discussed during negotiations for Baku-Tiflis-Ceyhan Oil Pipeline Project where, inter alia Turkey, Azerbaijan and Georgia were party to the agreement (Yildiz 1999a).

The water flow of the Sarisu river is a matter of concern for Iran and Turkey at present. Iranian authorities expressed their concern on this matter when Turkey could not provide the water quantity they had assured for the dry periods; they could only in fact provide 1 m<sup>3</sup>/s or 1.5 m<sup>3</sup>/s during the dry seasons.

In this context, it is worth mentioning the very complicated political situation in the basin, which turns cooperation into a political and diplomatic challenge. For instance, the border between Turkey and Armenia is closed and Turkey has no official diplomatic relations with Armenia; although recently there was some easing of the tension and some unofficial political activity. In contrast, historically, Turkey has always had close relations with Azerbaijan and good and cooperative relations with Georgia. However, Turkish-Iranian relations are characterised by a low degree of affinity as the two countries - far from being traditional allies - have serious differences over terrorism issues.

However, different forms of cooperation on natural resource management do exist in the basin, and it is hoped that cooperation on such technical issues as water resources will become increasingly possible. For instance, a GEF project is in the pipeline that will explicitly address the involvement of Turkey and Iran in multilateral cooperation projects on the river.

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40 Personal Communication with the head of the water department of the Georgian Ministry for the Environment, November 2004.

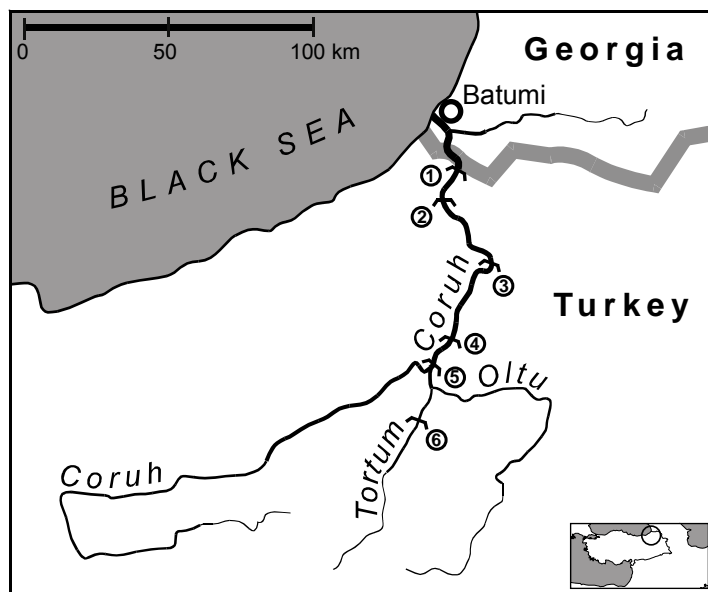
### 5.3 The Coruh basin<sup>41</sup>

The Coruh river is the longest river of the East Black Sea region and is of high economic importance to Turkey because of it is largely undeveloped but has economically exploitable hydropower potential. However, the planned dams could also cause serious environmental damage in downstream Georgia, in particular on the Black Sea coast in the Adjara province.

#### 5.3.1 Geographical and hydrological setting

The Coruh river is located in north-east Turkey and is shared by just two countries: Turkey and Georgia. Approximately 91% of the basin's drainage area (21,100 km<sup>2</sup>) is, however, in Turkey while Georgia's share amounts to 9% only. The principal tributaries of the Coruh river are the Tortum and Oltu rivers in Turkey, and Adzharis and Tsakali rivers in Georgia. In total, the Coruh river is 426 km long, ca. 400 km of which lies within Turkey's borders. It also forms a short border (3 km) between Turkey and Georgia. Finally, the river flows for 24 km through Georgia.

**Figure 5: Map of the Coruh river and its main tributaries**



- (1) Muratli Dam (under construction)
- (2) Borcka Dam (under construction)
- (3) Deriner Dam (under construction)
- (4) Artvin Dam (planned)
- (5) Yusufeli Dam (planned)
- (6) Tortum Regulator and HEPP

The river originates in the western part of the Mescit mountains at a height of over 3,000 m and lies to the north-west of the Erzurum-Kars Plateau. From these mountains the Coruh first flows west, then turns east with a sharp bend at the Bayburt Plain and afterwards follows a tectonic hollow which separates the East Black Sea coastal mountain series from the inner mountain range. The Coruh valley located in the eastern part of Ispir, is one of the deepest

<sup>41</sup> Internationally, „Coruh“ is the most frequently used name for the river. Other given names are Chorokin, Coroch and Chorokhi.

valleys in Turkey. Having passed the city of Yusufeli and the confluence with the Oltu river, the Coruh flows north and shapes a mountain landscape with deep canyons. Passing through the cities of Artvin and Borcka, it leaves Turkish territory near the city of Muratli. Near Batumi, the capital city of the Georgian semi-autonomous province Ajaria, the river empties into the Black Sea through a delta which is largely composed of the alluvium that it has accumulated.

Because of climatic conditions, the river carries plenty of water in all seasons albeit with remarkable seasonal variations (Yildiz 1999b). The river experiences a transitional climate between Black Sea's mild and wet weather and East Anatolia's cold climate. Turkey's average annual rainfall is 642 mm, whereas the Coruh basin receives 475 mm rain in an average year. According to the long-term observations measured at the flow monitoring station in Muratli, the average flow rate is 202 m<sup>3</sup>/s. The highest run-off measured at this station was 2,431 m<sup>3</sup>/s and the lowest 37.6 m<sup>3</sup>/s. Rainfall and especially snowmelt from the high mountains suggest that there is high water availability. In spring, total water flow reaches 221.38 MCM/year constituting 40.9% of the mean annual flow. The flow rate of the Coruh in May alone approximately equals twice the amount it carries during the whole winter season.

**Table 6: Cooperational context in the Coruh basin in brief**

<b>Coruh</b> Basin area: 21,100 km <sup>2</sup> ; mean annual discharge 6.3 BCM		
<b>Riparian position</b>	<b>Basin area (% of total)</b>	<b>Main water uses</b>
<b>Turkey</b> upstream	19,200 km <sup>2</sup> (90%)	irrigation, hydropower, recreation / tourism
<b>Georgia</b> downstream	900 km <sup>2</sup> (10%)	Small-scale agriculture, recreation, fishery
<b>Main agreements and covered issues</b>		
Turkey - Georgia	1927 – border issues, river bank protection, water allocation, compensation requirements, joint commission 2000 – technical cooperation, river bed changes etc.	
<b>Unsettled issues</b>		
Quality	No agreement on water quality standards and exchange of data insufficient.	
Sediment	Main disputed issue. Negative impacts of Turkish dams on the sediment regime and on coastal zones in the environs of Batumi (coastal erosion).	
Biodiversity	Comprehensive approach to the protection of freshwater ecosystems is lacking	
Water quantity	At present not relevant transboundary issue. Current allocation rule (50:50) was not contested.	

*Source: Own compilation*

In total, according to Turkish long-term observations, annual flow rates of the Coruh ranges from 3.3 BCM/year (1955) to 11.2 BCM/year (1968). The medium annual flow rate

determined through long year measurements is 6.3 BCM/year, which corresponds to the 3.4% of the total water potential in Turkey (Kurucim 2002).<sup>42</sup> Apart from the comparatively high and variable flow rates, the river carries high levels of sediment and deposits (estimated at 5 MCM/year) which stem from erosion in the Turkish mountain regions. Despite the rather small drainage basin area, the river has high hydropower production potential due to the topographic conditions and, in particular, the sharp fall of the river from high mountains to sea level.

In contrast to reliable monitoring of the river's flow, accurate and dependable water quality data are lacking and/or are not easily accessible. Pollution of the river is relatively small, at least compared with other transboundary rivers in the region (e.g., Kura-Araks rivers). At present, urban waste water is a source of pollution because of insufficient waste water treatment and solid waste disposal facilities. In addition – and limited to specific sites – industrial pollution plays a certain role, for example, discharge from the mining industry. In contrast, pollution from agriculture is of minor importance because the little farming that takes place, is on a small scale. Far from being pristine, the Coruh river however shows high value in terms of biological diversity and hosts plenty of important species and habitats. The river's valley is known for its rich flora with high endemism. According to available sources, some 2.500 species of vascular plants can be found in this area, including 160 endemic ones. Large mammals are well represented in the region, as are important amphibians and reptiles.

### 5.3.2 Current and future water uses

Currently, only a minor share of the river's water is used for economic or social purposes. The most relevant water uses are water supply withdrawals (groundwater is, however, an easy accessible substitute in several regions) and instream activities such as kayaking and boating. The latter has enjoyed an increase in recent years and provides significant added value to the regional tourist sector. Because of the topography of the basin, agriculture is only of minor importance and the development of additional irrigation areas (although mentioned in the relevant planning documents) is estimated to play rather a minor role in future planning.

Today, the most important pressures on freshwater ecosystems come from the development of hydropower generation installations. Because of favourable topographical conditions, the Coruh has (according to DSI estimates) the potential to provide some 13% of the usable hydroelectric power in the country, which, to date, remains largely untapped. The first hydropower plant in the basin that was completed and begun commercial operation was Tortum I (installed capacity of around 26 MW) on the homonymous tributary. The other hydropower station already in operation is the Murgul HEPP.

Initial studies concerning the hydropower production potential in the river valley and associated costs had already been carried out by Turkish authorities in the late 1960s. The Coruh Master Plan was eventually finished in 1982 and was followed by the Coruh Basin Development Plan. Construction of the first large dam started in 1998 after various bureaucratic procedures had been fulfilled (Deriner Dam, see below). According to the Coruh Basin Development Plan, five large dams are to be built on the main branch of the river.

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<sup>42</sup> With an estimated yearly runoff of around 8.7 BCM/year, the World Bank recently published a somewhat higher estimation of the river's flow (see Worldbank 2003).

These dams include the Deriner Dam and hydroelectric power plant (HEPP) with 670 MW installed capacity, the Yusufeli Dam and HEPP with 540 MW installed capacity, the Artvin Dam and HEPP with 332 MW installed capacity, the Borcka Dam and HEPP with 300 MW installed capacity, and finally the Muratli Dam with 115 MW installed capacity. The Deriner and the Yusufeli dams rank among the most important dams in Turkey in terms of size and hydropower potential.

The Muratli and Borcka dams are still in construction (personal correspondence with officials at the DSI Planning and Investigation Department, March 2005). The construction of the Deriner Dam is also still on-going and fill-up is expected in 2007.<sup>43</sup>

The Turkish authorities consider the Coruh Basin Development Plan and associated dam constructions as vehicles to support economic development in north-eastern Turkey. Although the programme predominantly focuses on hydropower generation and the supply of electricity, an irrigation (agriculture development) component also runs in parallel. With the construction of the dam cascade, 30,000 ha of land are planned for irrigation, mainly along the upper and middle streams of the river. This rather modest objective for agricultural development is due to the basin's topographical limits. A full realisation of the planned development of irrigation agriculture could, however, significantly increase agricultural water use and change settlement patterns in the area.

Georgia does not use water from the Coruh river for its domestic water supply or its industrial demands, and, as agricultural irrigation does not play any significant role either, fishing has assumed more importance.

### **5.3.3 Potential impact on downstream riparians and regional seas;**

Since the planned dams will predominantly be used for hydropower generation, the impact of the infrastructure on annual water flows from Turkey to Georgia is rather limited and, unsurprisingly, transboundary water quantity questions are therefore not at the centre of political debate. Furthermore, Georgia is not dependent on the Coruh river for energy and water; this clearly reduces the potential for conflicts. The most serious transboundary impact of the dams will be the expected radical change of sediment regime of the river.

In this context, it is worth mentioning the erosion problem along the Georgian Black Sea coast. Georgian authorities and ecologists claim that the dams planned in Turkey, in particular the almost complete Deriner Dam, will stem the drift of the solid element of the river flow, in particular sand and other alluvial materials that constitute the characteristics of the river and shape the coastal region.<sup>44</sup> The coastline around Batumi is strongly characterised by these alluvial materials whereby the river flow deposits sand, stone, and debris at the river mouth and the nearby coastal stretches, which then counteract the erosive action of the sea. Consequently, the most serious of the anticipated effects of the dams upstream in Turkey could possibly be increased coastal erosion that might not only threaten ecosystems and beaches in the vicinity of the river's delta but also fisheries, and urban areas

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43 With 247m height and 72 m length and with a 67 MW installed capacity the Deriner is number one among the concrete dams in Turkey and the 5th in the world.

44 See RFE/RL 1998; Another interesting source is the NGO publication by Jaoshvili (2003),:



in the agglomeration of Batumi.<sup>45</sup> Clearly, it is not only the river Coruh that is posing problems for the coastal protection in the region of Batumi: dams built on the Georgian rivers Enguri and Rioni have had the same effect in allowing erosion by the Black Sea to outpace the natural replenishment provided by the rivers.

The fact that the dams will change the sediment flow of the Coruh river in one or another way is largely acknowledged by both Turkey and Georgia; however the expected and precise impact on the Georgian coast line and the possible acceleration of erosion in the Batumi region are not. In general, it is not easy to foresee the direct effects of the planned Turkish infrastructure because coastal erosion is a multi-faceted problem with a variety of causes and effects generated by a variety of human interventions. Thus, even within Georgia there is enormous variation in expense estimates required for additional coastal protection. While representatives of the Georgian National Ministry for Environmental Affairs are expecting costs for mitigation and prevention measures (e.g., artificial enhancement of sediment flow from other rivers, coastal protection measures) to be around US\$ 150 million, others estimate a much lower financial burden.<sup>46</sup> For instance, rough calculations for more modest coastal protection measures amount to US\$ 5 million.<sup>47</sup>

#### 5.3.4 Status of cooperation

There is no comprehensive bilateral agreement on the management of the Coruh river between Turkey and Georgia. Nevertheless, and somewhat contrary to international NGO perceptions of Turkish-Georgian water relations, there is a protocol, several declarations and other cooperative elements relating to the management of the river. Both countries entered friendly and positive political relations after the demise of the Soviet Union and the declaration of Georgian independence in April 1991. Turkey and Georgia signed "The Friendship, Cooperation and Good Neighbourliness Agreement" in 1992. With this agreement, previous agreements and treaties between two countries with respect to Turkey and the Soviet Union were also recognised. Today, Turkey is not only a principal political and a strategically important partner for Georgia in the region, but also a very important trading partner. Economic exchange between both countries has experienced an impressive increase in the last decade with the consequence that Turkish-Georgian trade constitute 17% of the total international trade volume of the Georgian economy.

The first, most relevant and most enduring water-related international agreement between the Soviet Union and Turkey goes back to the 1920s and covers, in general, water allocation and securing the borders of the boundary rivers. In 1927, Turkey and the Soviet Union signed the *Protocol on the Beneficial Uses of Boundary Waters* (the so-called Kars Protocol) which addresses, inter alia, the use of the Coruh river because it forms the boundary between the two states for 3 km (cf. Kurucim 2002). The basic provisions of the arrangement are a fifty-fifty allocation of water (article 1) and several regulations on infrastructure and dam

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<sup>45</sup> Besides reinforced coastal erosion, the dams will certainly have a serious impact on freshwater ecosystems and, inter alia, fish species in the river basin. However, the current debate on the transboundary consequences largely only focuses on the erosion problem.

<sup>46</sup> Personal Communication with the head of the water department of the Georgian Ministry for the Environment, November 2004.

<sup>47</sup> The leader of the Georgian Green Party, Giorgi Gachechiladze, has been cited with a suchlike assessment in the public media. Source: The Messenger. April 20, 2005. <http://www.messenger.com.ge>

building. A **Joint Boundary Water Commission** was established later. Since this agreement only applies directly to those stretches of the river forming a border, it does not cover the handling of all transboundary effects that might occur because of changes of the river flow elsewhere in the basin.<sup>48</sup> For instance, article 5 of the protocol demands compensation if a party suffers from dam building over a river that constitutes a border. However, it is rather unlikely that this (and other provisions of the protocol) apply to the dam projects under consideration too, because this is not an agreement concerning transboundary resources flowing across the boundaries. More recently, the Soviet Union and Turkey signed another protocol in 1990 that regulates necessary technical cooperation to avoid changes of the river bed in several border rivers, inter alia the Coruh river.

In addition, the cooperation of Georgia and Turkey in the Black Sea Convention and other international activities to improve the environmental conditions of the Black Sea could serve as a context to facilitate cooperation at the Coruh river basin.

Aside from these arrangements on boundary issues, no treaty or protocol is in place to govern the use and protection of the transboundary Coruh river. Specific consultation and cooperation "records" have however been made for the Coruh dam development.

### 5.3.5 Outstanding issues and options for win-win solutions

As early as the 1980s, the Soviet government expressed concerns, via diplomatic channels, about the possible environmental impact of the planned dams and requested a joint investigation. The Soviet Union repeated this request in 1990 but due to the demise of the union the diplomatic channels were no longer active. When Georgia expressed concerns about the Coruh river Development Programme in 1994, both countries entered a phase of bilateral technical cooperation in the form of a series of technical meetings in 1994 and 1995 (see Yildiz 1999b). Even at this stage of consultation and negotiation, divergent problems emerged with different priorities. Turkey proposed to plan future dams in a bilateral manner and invited Georgia to enter into a broader Turkish-Georgian cooperation relating to joint energy projects over Coruh and Kura rivers. These joint developments were designed in such a manner that Georgia could receive compensation for potential damages from the already planned Coruh river development. In fact, the Turkish government was apparently not willing to consider a renunciation of the disputed dams on the Coruh river but proposed to broaden the negotiations. Georgia's government, in contrast, put the main emphasis on the negative environmental impacts of the already planned Turkish dams, and was neither prepared nor willing to negotiate bilateral cooperation on future joint dams, inter alia because of different priorities in energy policy.

The Coruh issue then entered a higher bilateral political agenda and was discussed during several political consultations on a ministerial level between 1997 and 1998. During an official visit by a Georgian delegation to Ankara in 1998, Turkey officially recognised Georgia's concerns. On that occasion, the Turkish delegation also stated that conditions were not suitable to sign an agreement concerning the environmental impact of the dams, because of incomplete and insufficient information. Moreover, the Turkish side renewed the

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<sup>48</sup> For instance, Article 5 of this arrangement regulates the right of the parties to build a dam on the waters constituting the border. Furthermore Article 5 states that those parties that experience damage because of a dam on the boundary waters, should be compensated.

idea of broadening water cooperation and embracing projects that would potentially have mutual benefits.

During the negotiations in 1997 and 1998, Georgia referred to the aforementioned coastal erosion at Batumi and region, and, as a solution, proposed a cost assessment of measures needed to alleviate the problem which would then be met by Turkey. However, Turkey's position on the impact of the dam maintained that dependable data was still lacking and future action to alleviate the possible effects should be determined in the light of reliable scientific evidence that could only be collated once the dam was installed. Turkey took over the financing of two monitoring stations in Georgia to supervise the development of the river flow and its currents.<sup>49</sup> According to Georgian media reports, Georgia failed to meet its commitment to ensure the maintenance of the monitoring stations that had become damaged and that now lie derelict. This example illustrates that bilateral water cooperation on the Coruh is not only characterised by diverging priorities and objectives but also by very weak Georgian administration. However, the Turkish authorities pursued the monitoring of the river with the help of working groups that were dispatched to the site twice a year. Finally, the ceremony for the start of construction of the Deriner Dam took place in 1998 and Georgia's then president Eduard Shevardnadze was one of the international participants.

Following the ceremony, Georgia and Turkey agreed upon the installation of a bilateral group of expert to monitor the effects of the dam on the coastal zone. However to date, these efforts have failed to provide any consensual scientific assessment. While representatives from the Georgian Environmental Ministry, National Environmental NGOs and the Georgian Green Party stress the significance of the environmental impact, the Turkish ambassador in Georgia cited a significantly less convinced statement to the media: "To date, expert analysis has not revealed any indication of the dam's environmental impact as claimed by certain circles." (cited in Kupatadze 2005).

However, in the aftermath of the Georgian "revolution" and the election of president Sakashvili in 2004, the Coruh issue has re-entered the bilateral political arena. Furthermore, the imminent completion and filling of the dam brings the ecological question to the fore and readdresses the counter-measures needed (Yerman 2004).<sup>50</sup> Recently, the Tbilisi authorities stated that they are taking the potential impact of the dams very seriously and that they are still seeking an adequate and satisfying agreement with Turkey. According to Georgian representatives, a possible solution might involve a neutral third party who would facilitate and mediate the joint environmental impact studies. Prevention and/or mitigation measures could then be accordingly designed and the costs allocated. Another aspect recently addressed by the Georgian authorities was the still controversial procedural questions, where the most relevant issue relates to whether Turkey is obliged to carry out a comprehensive assessment of the transboundary environmental impact of specific dam projects planned, and if so, which procedural rules should be applied.<sup>51</sup>

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49 In this context it is worth remembering that Georgia does not dispose of a working river monitoring infrastructure.

50 Lately a daily paper in Georgia, namely Akhali Veria published articles on that issue by criticizing Turkish planned projects. See also Nazi 2001.

51 For instance, international NGOs and national Georgian environmental associations stated that, in spite of an already existing agreement between the two countries in the context of environmental protection, Turkey did not adequately consult Georgia on the environmental impacts of the Yusufeli Dam (see Kupatadze 2005).

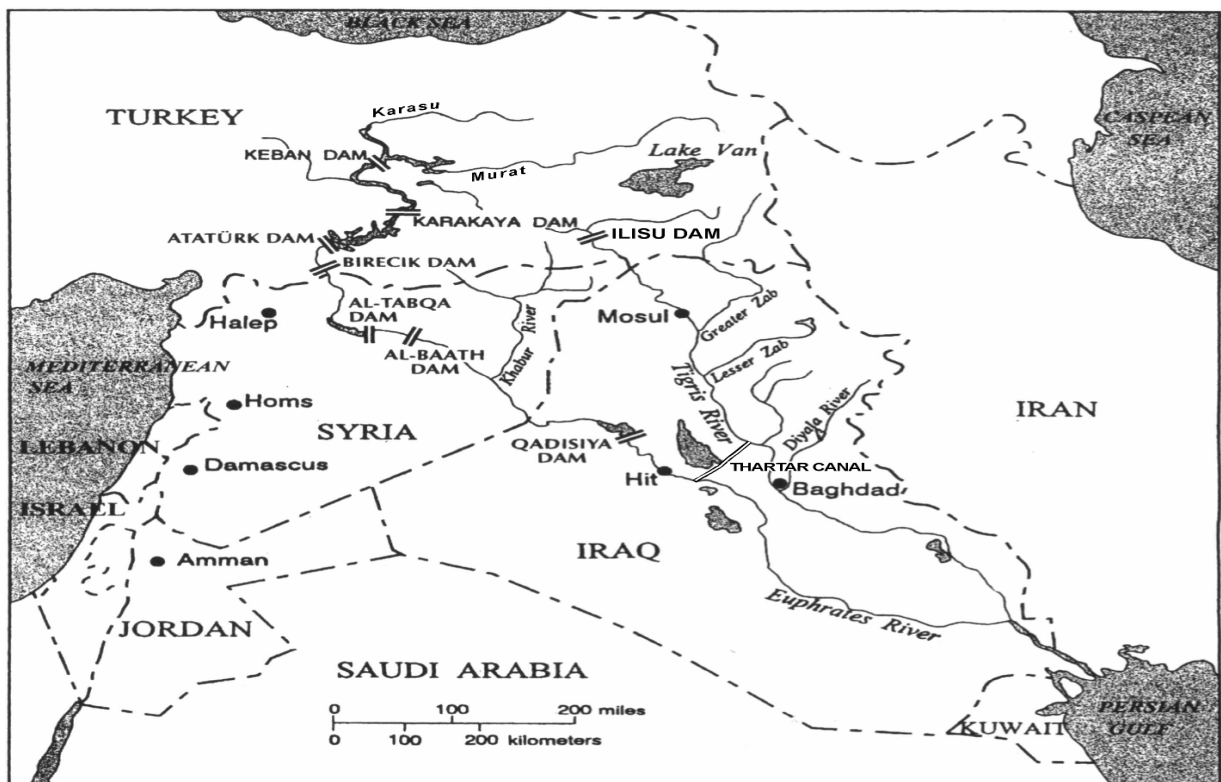
The renewed political attention to the Coruh river must also be seen in the context of the recently changed political status in the semi-autonomous republic of Abkhazia. For a couple of years Abkhazia was out of Georgia's sphere of influence, however, in 2004 Georgia's new president brought Abkhazia back under Georgian sovereign political influence.

Despite the unsatisfactory situation from a Georgian perspective, it is not envisaged that Georgia would risk damaging political relations with her strategically important neighbour Turkey. In addition, an escalation of ill will is unlikely because Turkey is also interested in a stable political and economic climate. In spite of the absence of an effective bilateral agreement, Turkey has already taken on the obligation of financing the monitoring of, and compensating for, the effects of a dam on the other side of its border; a fact that points to particular caution being exercised in her relations with Georgia.

## 5.4 The Euphrates and Tigris rivers<sup>52</sup>

Water-related development projects on the Euphrates and Tigris rivers have been highly contested over the last three decades and have caused relations between the riparian states, i.e. Turkey, Syria and Iraq, to become highly strained, and serious crises occurred. All riparian states are unilaterally strengthening their efforts to develop water resources to increase their hydropower potential, and to extend their irrigated agricultural areas. These activities pose the main threat to their mutual relations, and to date, the riparians have failed to achieve a common agreement. Since major non-water issues are now solved, or are at least approached, in a more pragmatic manner, the prospects for joint initiatives have improved.

**Figure 6: Map of Euphrates, Tigris, and main tributaries**



### 5.4.1 Geographical and hydrological setting<sup>53</sup>

The Euphrates and its tributaries drain an enormous basin of 444,000 km<sup>2</sup> of which 33% lies in Turkey, 19% in Syria, and 46% in Iraq. On the other hand, the Tigris and its tributaries drain an area of 387,600 km<sup>2</sup> of which 15% lies in Turkey, 0.3% in Syria, 75% in Iraq, and 9.5% in Iran. Both rivers originate in Turkey, scarcely 30 km from each other, flow through Syria and Iraq, and form the Shatt-al-Arab watercourse north of Basra in Iraq before

<sup>52</sup> Internationally, 'Euphrates' and 'Tigris' are the names used. In Turkish, the Euphrates is called Firat, and Al-Furat in Arabic. Tigris is named Dicle in Turkish, and Dijla in Arabic.

<sup>53</sup> This section draws from Kibaroglu (2002a).

discharging into the Persian Gulf. These twin rivers have extremely high seasonal and multi-annual variances in their flow, and severe drought and destructive flooding have been common phenomena for millennia.

The **Euphrates** has two main sources, the Murat and Karasu rivers, which drain the high plateau to the north-west of Lake Van. The Keban Dam was built in the early 1970s where the streams meet in Kharput. Downstream of the Keban Dam, the main river stem joins numerous springs of various discharges; it then joins the Tohma tributary upstream of the Karakaya Dam and receives incremental contributions from the Kahta river (upstream of the Ataturk Dam) and from the Nizip tributary (downstream from the Birecik Dam). The Euphrates then first flows south-east wards, then south-west and breaks through the mountains in a gorge near Hilvan, and crosses the Syrian border at Karkamis.

**Table 7: Cooperational context on the Euphrates river in brief**

<b>Euphrates</b> Basin area: 444,000 km <sup>2</sup> ; mean annual discharge 32 BCM		
<b>Riparian position</b>	<b>Basin area (% of total) Contribution to annual discharge</b>	<b>Main water uses</b>
<b>Turkey</b> upstream	146,520 km <sup>2</sup> (33 %) 28.922 BCM (90 %)	irrigation, hydropower, flood control
<b>Syria</b> downstream	84,360 km <sup>2</sup> (19%) 3.213 BCM (10.0%)	irrigation, hydropower
<b>Iraq</b> downstream	204,240 km <sup>2</sup> (46%) 0.0 BCM (-)	Irrigation, inhabitants of marshes
<b>Main agreements and covered issues</b>		
Turkey - Syria	1987 - interim protocol, water quantity to be released at Turkish-Syrian border. 2001 - Joint Communique plus 2003 Implementation Protocol: exchange of expertise, training, joint projects; Joint Technical Committee.	
Syria – Iraq	1990 - water sharing between Syria and Iraq	
<b>Unsettled issues</b>		
Quantity	No final agreement. No common approach.	
Groundwater	Overuse on both sides.	
Quality	At present, subordinate.	
Protection/ restoration	Mesopotamian marshlands.	

*Source: Own compilation*

In Syria, the Euphrates has two tributaries, the Balikh and the Khabour rivers. The Khabour sub-basin together with its transboundary tributaries and its springs is the most complicated element of the system; various branches of the Khabour originate either from Turkey or from Syria and are estimated to have a significant potential of 200 MCM/year. From there, over

the remaining 1,000 km of its course in Iraq, it gains no further increments of water. In Iraq, at a point 360 km from the border, the Euphrates reaches its 100,000 km<sup>2</sup> giant plain at Ramadi. Further downstream, near Nasiriye, the river becomes a tangle of channels some of which drain into the shallow Lake of Hammar and the remainder joins the Tigris at Qurna.

The **Tigris** originates from a small mountain lake, south of the city of Elazig in eastern Turkey, and flows through the basaltic district of Diyarbakir. It forms the border between Turkey and Syria, and Iraq and Syria. Its two major tributaries are the Great Zab and Lesser Zab, which join the river downstream of Mosul. The contribution of the Tigris tributaries to the river's potential is very significant and amounts to roughly 50% of the Tigris flow at Baghdad.

Downstream from Baghdad the river's slope is flat and it becomes exceedingly tortuous with the Tigris joining the Euphrates to form the Shatt al-Arab watercourse north of Basra. Most of the water in the lower part of both the Euphrates and Tigris is lost in a wide area of salinated swamps and marshlands (see below). The combined area of lakes and swamps at the head of the Persian Gulf varies from 8,288 km<sup>2</sup> at the end of the dry season to 28,490 km<sup>2</sup> during spring floods.

**Table 8: Cooperational context on the Tigris river in brief**

<b>Tigris</b> Basin area: 387,000 km <sup>2</sup> ; mean annual discharge 52 BCM		
<b>Riparian position</b>	<b>Basin area (% of total) Contribution to annual discharge</b>	<b>Main water uses</b>
<b>Turkey</b> upstream	57,600 km <sup>2</sup> (14.9%) 20.840 BCM (40%)	irrigation, hydropower
<b>Syria</b> - border with Turkey / Iraq	1,000 km <sup>2</sup> (0.3%) --	
<b>Iraq</b> downstream	292,000 km <sup>2</sup> (75.3%) 26.571 BCM (51%)	irrigation (diverts water through Thartar Canal to Euphrates), hydropower
<b>Iran</b> - upstream on one tributary	-- 4.689 BCM (9%)	
<b>Main agreements and covered issues</b>		
None		
<b>Disputed issues</b>		
	No consensus on procedure. No consensus on whether Euphrates-Tigris form one single watercourse system. Dispute over Ilisu Dam construction .	

Source: Own compilation

In summer, the **mean annual flow** of the Euphrates is 32 BCM/year of which about 90% is drained from Turkey, whereas the remaining 10% originates in Syria. As for the Tigris, the

average total discharge is determined as 52 BCM/year, of which approximately 40% comes from Turkey, whereas Iraq and Iran contribute 51% and 9%, respectively. Estimates for the total flow of the Tigris-Euphrates and their tributaries vary between 68 BCM and 84.5 BCM.

The catchment areas of both rivers experience a sub-tropical Mediterranean **climate** with wet winters and dry summers. As the snow melts in spring, the rivers are in spate, augmented by seasonal rainfall, which reaches its maximum between March and May. This climate prevails in south-eastern Turkey, as well as in northern Syria and Iraq. Winter precipitation ranges between 400 and 600 mm and allows rain-fed cultivation of winter grain, though supplementary irrigation raises yields and allows multiple cropping. In the Mesopotamian Plain annual rainfall is rarely above 200 mm. The summer season is hot and dry, with midday temperatures approaching 50°C resulting in high evaporation and daytime relative humidity as low as 15%. Evaporation also reinforces water salinisation and water loss in major reservoirs in Turkey and Syria, and in Lake Habbaniya and the Thartar Canal in Iraq.

#### **5.4.2 Water resource development**

At present, irrigated agriculture - the greatest user of water - is unequally developed in the three riparian states. Iraq has used the Euphrates to irrigate 1 to 1.3 million ha for a long time now. Syria started in the 1960s, and intensified irrigation in the Upper Euphrates after the completion of the Tabqa Dam in the mid 1970s. Prior to the completion of the Ataturk Dam (1990), irrigation in south-east Turkey was limited to groundwater and extended to about 114,000 ha. A major threat to water resources, and to the riparians relations, is the envisaged enlargement of areas to be irrigated with water withdrawn from the Euphrates and the Tigris in all three countries: about 1.7 million ha in Turkey as part of the Southeastern Anatolia Project (see chapter 3), 640,000 ha in Syria and 500,000 ha in Iraq.

Variation in the flow of both rivers ranged from conditions of severe drought to destructive flooding before upstream reservoirs were built in Turkey that are capable of smoothing out such variances and providing a dependable year-round flow downstream. However, since the 1960s Turkey, Syria and Iraq have invested in large-scale water development projects, the largest of which is Turkey's Southeastern Anatolia Project. A series of dams were built, first in Iraq, then in Syria and Turkey to provide irrigation water and to generate hydropower. The major dams on the Euphrates are, Keban, Karakaya, Ataturk, Birecik and Karkamis in Turkey; Tabqa, Al-Baath and Tishreen in Syria, three more dams can be found on the Khabour river (Khabour Dam, Eastern Khabour Dam, Western Khabour Dam) in Syria. Because a large portion of Iraqi territory rarely exceeds 300 m in altitude, the topography limits the possibility of impounding the Euphrates behind large dams. However, since 1988 the Thartar Canal has linked the Tigris with the Euphrates in Iraq, in this way using the Tigris' water for irrigation. As is the case with Syria, most of Iraq's land is low-lying and afflicted by deposits of gypsum and salt; both of these are not compatible with irrigation.

#### **5.4.3 Incidents of crises over the Euphrates**

As a result of supply-led developments, the water demands of the riparians exceed the actual amount of water that can be supplied by the Euphrates and Tigris rivers. If all irrigation projects envisaged are realised, by 2040 (the completion date for all projects), total demand



would far exceed supply.<sup>54</sup> Although consumption targets are very subjective, they nevertheless form the basis of the riparians' claims to the rivers' water. Rapidly increasing populations in these countries and the importance of food production have given further impetus for the utilisation of the rivers.

During the 1970s, 1980s and 1990s a number of crises occurred in the region, following the unilateral development of several water resource projects.

Turkey started impounding the Keban reservoir in February 1974 at the same time as Syria had almost finalised construction of the Tabqa Dam. The impounding of both reservoirs in the following two years escalated into a crisis in 1975<sup>55</sup> with Iraq accusing Syria of reducing the river's flow to intolerably low levels, while Syria blamed Turkey. The Iraqi government was not satisfied with the Syrian response, and mounting frustration resulted in mutual threats. This was averted when Saudi Arabia mediated and ensured that extra water was released from Syria to Iraq.

Another major crisis occurred in the early 1990s when the Ataturk dam in Turkey was filled. On 13 January 1990, Turkey temporarily reduced the flow of the Euphrates river in order to fill the Ataturk reservoir. (January was chosen because it was the month with no demand for irrigation water). Turkey notified its downstream neighbours before November 1989 of its intention and in a communication it explained the technical reasons behind the action and also provided a detailed programme for the replenishment of the losses. Turkey also released twice the usual amount of water for two months prior to terminating the flow and sent delegations to the region to explain the need for the action, and the measures taken. It finished the work in three weeks as opposed to the one month initially planned. However, the Syrian and the Iraqi governments still registered official complaints, and consequently called for an agreement to share the waters of the Euphrates, as well as for a reduction of the impounding period.

Finally in 1996, after Turkey started construction of the Birecik Dam, an after-bay dam on the Euphrates, both Syria and Iraq sent official note to the Turkish government in 1995 and 1996 indicating their objections to construction on the grounds that it would affect the quantity and quality of waters flowing into Syria and Iraq. The issue became an international affair when Syria and Iraq requested that Arab League countries cease financial aid to Turkish projects and boycott European companies that had financed the dam (Scheumann 2003: 750f). The dam was not designed for consumptive purposes, but to regulate the water levels of the Euphrates when power generation at the Ataturk Dam was at its peak.

#### **5.4.4 The negotiation process and status of cooperation**

Negotiations between Turkey and Iraq on the development of the Euphrates' water originally started in the 1940s, however, since the early 1960s a new series of technical negotiations has attempted to foster new dialogue and information sharing for the region. The following sections highlight these negotiations. It appears that from this time until negotiations came to a close in the early 1990s, the riparians hardly changed their positions (Kibaroglu 2002b).

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<sup>54</sup> Iran's demand is not included; its supply amounts to 9%, i.e. 4.7 BCM/year. For details, see Belül 1996.

<sup>55</sup> The situation was exacerbated because impounding took place during a period of continuously dry weather.

In the 1960s, the three riparians entered a new phase of their relationship over water, upon Turkey's decision to construct the Keban Dam on the Euphrates. The downstream riparians, particularly Iraq, insisted on guaranteed flows (350 m<sup>3</sup>/s at minimum) to be released by Turkey during the impounding period. Hence, a first meeting was held in June 1964 with Turkish and Iraqi experts attending. At the end of negotiations, Turkey guaranteed to undertake all necessary measures to maintain a discharge of 350 m<sup>3</sup>/s immediately downstream from the dam, provided that the natural flow of the river was adequate to supply this discharge. This was communicated to Syria and Iraq the same year. Moreover, during this meeting, Turkey proposed the establishment of a Joint Technical Committee (JTC), which would inspect each river to determine its average yearly discharge. The JTC would determine the irrigation needs of the three countries through joint field studies and would be authorised - by calculating the needs of the riparians for present and future projects - to prepare a statement of the main principles and procedures in order to facilitate an agreement on water rights.

Following this first technical meeting between Turkey and Iraq, a few more ad hoc meetings were held. Among these the most notable one - the first tri-partite negotiation - was held in Baghdad in 1965 where the three delegations exchanged technical data on the Haditha (Iraqi), Tabqa (Syrian) and Keban (Turkish) dams. In line with a Turkish proposal, Syria suggested that it would be beneficial to commission a JTC study of the water requirements of the irrigable lands, and subsequently to examine the possibility of covering possible shortages of water supplied by the Euphrates by diverting a part of the Tigris river's water to the Euphrates. Iraq strongly opposed this proposal and insisted on negotiating only on the waters of the Euphrates.

During the 1970s, delegations from the three countries gathered on several occasions to exchange information about technical issues relating to the reservoirs. No agreement was reached, and Turkey and Syria unilaterally determined the impounding programmes for their reservoirs (see 6.4.3).

In the early 1980s, the Turkish development plans created a new demand for cooperation. This time Iraq proposed the formation of a permanent Joint Technical Committee. At the end of the first meeting of the Joint Economic Commission between Turkey and Iraq in 1980, a JTC was established which Syria joined in 1983, whereupon Turkey, Syria, and Iraq held sixteen meetings up to 1993 (Kibaroglu 2003).

The **mandate** given to the JTC was defined as determining the methods and procedures, which would lead to a definition of a reasonable and appropriate amount of water that each country would need from both rivers. The main items on the JTC's agenda were the exchange of hydrological and meteorological data, the sharing of information on progress achieved in the construction of dams and irrigation schemes in the three riparian countries, and the discussion of initial plans for the filling of the Karakaya and Ataturk reservoirs (both Turkish).

However, after sixteen meetings, the JTC could not fulfil its mandate, and the talks became deadlocked. The major issues that led to the deadlock related to both the subject and the object of negotiations: whether the Euphrates and the Tigris could be considered a single

water system, or whether the discussions should be limited to the Euphrates.<sup>56</sup> The wording of the JTC's final objective, i.e. reaching common terminology, was also problematic: whether to formulate a proposal for the 'sharing' of 'international rivers', or to achieve a trilateral regime to determine the 'utilisation of transboundary watercourses'. Iraq and Syria consider the Euphrates an *international* river and insist on an immediate sharing agreement under which its waters would be shared on the basis of each country's stated water needs. On the other hand, Turkey regards the Euphrates and Tigris as forming a *single transboundary river basin* where the waters should be *allocated* according to the identified needs.

During negotiations it emerged that the water potential was unable to meet the declared demands of the three riparians. And, more importantly, there were also uncertainties and inadequacies relating to the data on water and land resources. In response to Syrian and Iraqi demands to formulate urgent 'sharing arrangements' dependent on criteria put forward by them (see below), Turkey proposed the *Three Stage Plan for Optimum, Equitable and Reasonable Utilization of the Transboundary Watercourses of the Tigris-Euphrates Basin* in 1984. The Plan was drafted with a *needs-based* approach<sup>57</sup> where, *needs*, can be defined by one or a combination of the following: irrigable land, population, or requirements for a specific project, or a sector. The Three Stage Plan encompasses joint inventory studies of land and water resources of the region and the estimation of water needs for the competing sectors, agriculture in particular. It is expected that this will provide the basis for optimum allocation of the available water resources related to the determined needs (Kibaroglu and Ünver 2000). With the Three Stage Plan, Turkey also called for the establishment of a joint body to collect, handle and exchange data regarding water and land resources so that annual and seasonal variations could be incorporated in the estimates made, in order to determine allocations. Along with reaching a set of agreed upon criteria in data-sharing, it was hoped that negotiations could move on to coordinating development projects and create joint projects. However, the Turkish Three Stage Plan was coolly received by Iraq and Syria, and they continued to demand fixed water quotas (Kibaroglu 2004).

## Box 2: Bilateral accords concerning the Euphrates river

### The Turkish-Syrian Protocol of 1987

The Turkish-Syrian Joint Economic Commission meeting on 17 July 1987 had an important effect on water issue negotiations. *The Protocol on Matters Pertaining to Economic Cooperation*,<sup>58</sup> signed by Turkey and Syria at the conclusion of the meeting, incorporated provisions for water, the temporary nature of which was recognised. Article 6 of the Protocol reads as follows:

<sup>56</sup> The Turkish side regards the Euphrates and Tigris as one river system because both rivers form the Shatt al-Arab watercourse. This opinion is reinforced by the existence of the Thartar canal, which was built by Iraq: it connects the Tigris with the Euphrates and diverts water from the Tigris to the Euphrates. This view is, so far, not shared by Iraq and Syria. With respect to these contradicting views, Article 2, a) of the UN Water Convention reads as follows: "Watercourse' means a system of surface and groundwaters constituting by virtue of the physical relationship a unitary whole and normally flowing into a common terminus."

<sup>57</sup> According to Wolf (1999), a *needs-based* approach provides for a greater potential for disputes resolution than *rights-based* approaches.

<sup>58</sup> United Nations Treaty Series 87/12171, 17/7/1987.

*During the filling up period of the Ataturk Dam reservoir and until the final allocation of the waters of the Euphrates among the three riparian countries the Turkish side undertakes to release a yearly average of more than 500 m<sup>3</sup>/s at the Turkish-Syrian border and in cases where monthly flow falls below the level of 500 m<sup>3</sup>/s, the Turkish side agrees to make up the difference during the following month.*

As a basis for comparison, the long-term average flow of the Euphrates is about 1,000 m<sup>3</sup>/s at the Turkish-Syrian border.

#### **The Syrian-Iraqi water accord of 1990**

Syria and Iraq perceived the interruption to the flow of the Euphrates (from impounding actions at the Ataturk Dam) as the first of many similar disruptions resulting from The Southeastern Anatolia Project (GAP) activities, and consequently signed a bilateral accord in 1990. The Joint Minutes (1) read as follows:

*The Iraq water share on the border region between Iraq and Syria is 58% as a fixed annual total percentage (water year) of the water Euphrates river allowed to pass in Syria through the border with Turkey, and the Syrian share of water is the remainder quantity 42% of the water of Euphrates river allowed to pass through the border between Turkey and Syria.*

Syria and Iraq use **mathematic formulae** to define their water quotas. Syria proposed that the co-riparians should declare their demands for each river separately, i.e. the Tigris and the Euphrates rivers. If the claims exceed a river's discharge, the deficit will be proportionally deduced from each share. The Iraqi mathematic formula is somehow different and admits that each riparian should declare its claims for the realised projects, then for those under construction and, finally, for any that are planned. Each country's water quota would be defined subsequently, i.e. first for the projects in operation, then for those under construction, etc., with the realised projects having priority over planned projects.

Although agreement was not reached over procedures or over water quotas, in 1987 and 1990 two bilateral accords were concluded (see Box 2) which were largely products of the then prevailing political atmosphere among the riparians.<sup>59</sup> They were, however, not the results of JTC negotiations, but were initiated at the highest political levels. Both are acknowledged as **interim** agreements by all riparians.

However, the role of the JTC should not be underestimated; even if its meetings were infrequent and if it appeared that little substantive progress was made on the question of water allocation, it served as a useful channel of communication. Even though the JTC originated from the Joint Economic Commission, it focused on water allocation only. Its ultimate aim of ensuring cooperation and coordinated management of water resources could not be fulfilled because the riparians were persistently claiming their water rights.

#### **5.4.5 International concerns on GAP**

After the inundation of the Ataturk Dam reservoir, the Ilisu Dam (which is a GAP project) became a controversial issue, not just among the riparians, but between Turkey and export credit agencies and international non-governmental organisations. The dam, sited on the Tigris river, is expected to create a reservoir with a volume of 10.4 BCM and a surface area

<sup>59</sup> See Scheumann (2003) for the relevance of non-water issues as disturbing factors.

of 313 km<sup>2</sup>. The Turkish authorities consider it to be a key project as it is their largest remaining power installation. The Ilisu and Cizre dams combined will produce circa 5 billion kWh per year, and generate more than 400 million US\$ for the Turkish economy. Hydropower generation is planned with an installed capacity of 1,200 MW with expected yearly electricity production of 3,800 GWh (Altinbilek 2000).

An international consortium of export credit agencies (ECA) from Switzerland, United Kingdom, Germany, Italy, Austria, Japan, Portugal, Sweden and the US, coordinated by the Swiss Export Risk Guarantee, considered funding the project. The project itself and the policies of the ECAs were strongly criticised by environmental and human rights groups<sup>60</sup> on social, environmental and cultural grounds. In response, in December 1999 the ECAs announced that four conditions would have to be met by the Turkish Government before the project would receive export credit support. These conditions were as follows (quoted from European Rivers Network 2000):

1. Draw up a resettlement programme which reflects internationally accepted practice and includes independent monitoring;
2. Make provision for upstream water treatment plants capable of ensuring that water quality is maintained;
3. Give an assurance that adequate downstream flows will be maintained at all times;
4. Produce a detailed plan to preserve as much of the archaeological heritage of Hasankeyf as possible.

In October 2000, less than one year later, an international Fact Finding Commission visited the area to assess the progress made. The Commission concluded that "the conditions have yet to be met, and that the prospect that they will be met in the near future is remote." Shortly before the report was released, a Swedish company which had a 24% stake in the consortium withdraw from the project, followed by Balfour Beatty and all the other foreign companies in the consortium in late 2001.

From a Turkish perspective, the Commission was criticised for not having paid enough attention to on-going archaeological rescue activities,<sup>61</sup> and to the Ilisu Dam Lake Area Subregional Development Plan project which were initiated by GAP RDA back in the early 1990s. Both projects had to be deferred due to the state of emergency in the region for almost a decade. Thereafter, the salvage project for the documentation and protection of the archaeological heritage of the area started in 1998 with funds provided by GAP RDA. Educational institutes from within Turkey collaborated with international teams from the US, Germany, Italy and France to devise a comprehensive schedule for the work. Since then archaeological sites in the area have been extensively surveyed and recorded, and excavations and relief works have commenced (GAP 2005). However, the Ilisu Dam Lake Area Subregional Development Plan could only start in 2002, which caused a delay by changing resettlement projects through the development of preferable spatial alternatives (Southeastern Anatolia Project Regional Development Administration 2001).

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60 Friends of the Earth, the International Rivers Network, the Center for International Environmental Law, and the Washington Kurdish Institute (see <http://www.ilisu.org.uk>); see also WCD 2000, Regulation, Compliance and Implementation, pp. 20-21.

61 I.e. the project in Hasankeyf which is the major ancient town on the Ilisu Dam site.

The Turkish government reacted critically to the campaign which, it claimed, was led by UK-based activist groups. The Ministry of Foreign Affairs stated that the dam would neither reduce the flow of the river nor cause pollution (Ministry of Foreign Affairs 2004a). The *Turkey Country Report* to the Third World Water Forum also claimed that the actual facts were somewhat different than those asserted by the Fact Finding Commission. With reference to the transboundary (downstream) issues involved, the report reads:

*The Ilisu Dam is not designed for irrigation, only for power generation: The water passing through the turbines has to flow back into the river bed. River water flowing into Iraq and Syria will not be polluted because the use of water for hydropower is non-polluting. As a result of Ilisu, new sewage treatment facilities will be built in the towns upstream, thus improving water quality. Ilisu will act as regulator holding back water during the winter floods and releasing it during the summer droughts.* (Republic of Turkey 2003: 76)

Once again, the Ilisu Dam and other GAP dams had come under attack because of their anticipated negative impacts on the Mesopotamian marshlands in Iraq. The Euphrates-Tigris river system used to divide into many channels at Basra, forming an extensive marshland area. The marshes were, however, largely drained by Saddam Hussein's government in the 1990s as a means of driving out the rebellious Marsh Arabs. The study "The Mesopotamian Marshlands: Demise of an Ecosystem" of the United Nations Environment Programme claims:

*The Mesopotamian marshlands, which until recently extended over an original area of 15,000 to 20,000 km<sup>2</sup>, have been devastated by the combined impact of massive drainage works implemented in southern Iraq in the late 1980s/ early 1990s and upstream damming.* (UNEP 2001: ix)<sup>62</sup>

Since the 2003 invasion of Iraq, drainage policy has been reversed and the Ministry of Water Resources in Iraq has embarked on a large programme of engineering to reorganise the whole drainage area, by removing many engineering installations and irrigation schemes and restructuring agricultural practices in the region in order to replenish the marshes. These efforts were supported by the Japanese Ministry of Foreign Affairs. It has provided funds through UNEP's Post Conflict Assessment Unit and is engaged through funding for GRID-Europe to develop an Iraq Marshlands Observation System. This is a decision-making support tool, to develop and implement a monitoring system to systematically acquire, analyse, and exchange information in the Marshlands ecosystem; to develop information products and services based on the data gathered to support management of the restoration process; and to evaluate the success of wetland restoration and its impacts on the regional environment, including that of the northern Persian Gulf.<sup>63</sup> The Iraqi programme has so far managed to reclaim about 30% of the lost marshland.<sup>64</sup>

Despite these recent developments, the European Parliament, in line with general international opinion, has requested that Turkey "be sensitive to the water requirements of

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<sup>62</sup> See also UNEP 2003.

<sup>63</sup> [www.grid.unep.ch/activities/sustainable/tigris/mmps.php](http://www.grid.unep.ch/activities/sustainable/tigris/mmps.php) [29 September 2005].

<sup>64</sup> Personal correspondence with Prof. Mukdad Ali, Baghdad University, College of Science, March 2005; see also [www.grid.unep.ch/activities/sustainable/tigris/index.php](http://www.grid.unep.ch/activities/sustainable/tigris/index.php) [29 September 2005] and [www.un.org/Pubs/chronicle/2002/issue2/0202p44\\_mesopot...](http://www.un.org/Pubs/chronicle/2002/issue2/0202p44_mesopot...) [29 September 2005].

these countries, with particular reference to the lower Mesopotamian Marshes in Iraq and Iran, where water flows have been significantly reduced by the construction of the Ataturk Dam” (European Parliament 2004: No. 42).

While the rate of marshland diminution, and its causes, has yet to be assessed and reviewed more accurately,<sup>65</sup> the case once more establishes the need to harmonise and coordinate basin-wide development efforts, not just by considering in-stream flows and sectoral water demands (agriculture, energy, industry) but also by looking at all uses and users. The Ilisu Dam should be taken by Turkey as an opportunity to re-consider the fact that environmental and social issues are more adequately dealt with at the planning and implementation phases of dam planning. There is a need for improved participation as early as the planning stage, and possibly in designing resettlement programmes. In any case, it seems likely that a similar future event will lead European firms and Export Credit Agencies to apply the non-objection rule which makes approval of projects by riparian states conditional.

#### **5.4.6 Recent developments and prospects for cooperation**

Relations between Turkey and Syria have considerably improved since the signing of the Adana Security Agreement in 1998, and new and promising initiatives have been undertaken. In 2001, the GAP RDA initiated contact with Syria by sending a delegation on the invitation of the General Organisation for Land Development (GOLD), Ministry of Irrigation, Syria. This was followed by a Syrian delegation headed by the Minister of Irrigation paying a visit to Turkey. As a result, a *Joint Communiqué* was signed between the GOLD and GAP administrations on 23 August 2001 which fostered cooperation in areas such as training, technology exchange and conduct of joint projects. The document included provisions for training programmes; joint projects such as a twin village project; joint irrigated agricultural research projects with twin research stations; exchange programmes (management, operation and maintenance of irrigation systems, participatory rural development projects and soil improvement). It also intends to establish joint executive bodies, i.e. a Joint Technical Committee and a Steering Committee.

The Joint Communiqué comprises of a selected range of activities which may lead to the creation of a coordination mechanism between the two government agencies. It is hoped that building ‘intergovernmental networks’ will serve to open up new opportunities for realising *win-win* solutions. Its overall goal as perceived by their initiators is to provide sustainable utilisation of the region’s land and water resources, and to deal with water management within the larger context of overall socio-economic development and the integration of under developed regions within Turkey and Syria.

However, even though the two administrations have remained in contact since 2001 through mutual formal visits, the envisaged programmes and joint projects have not materialized.

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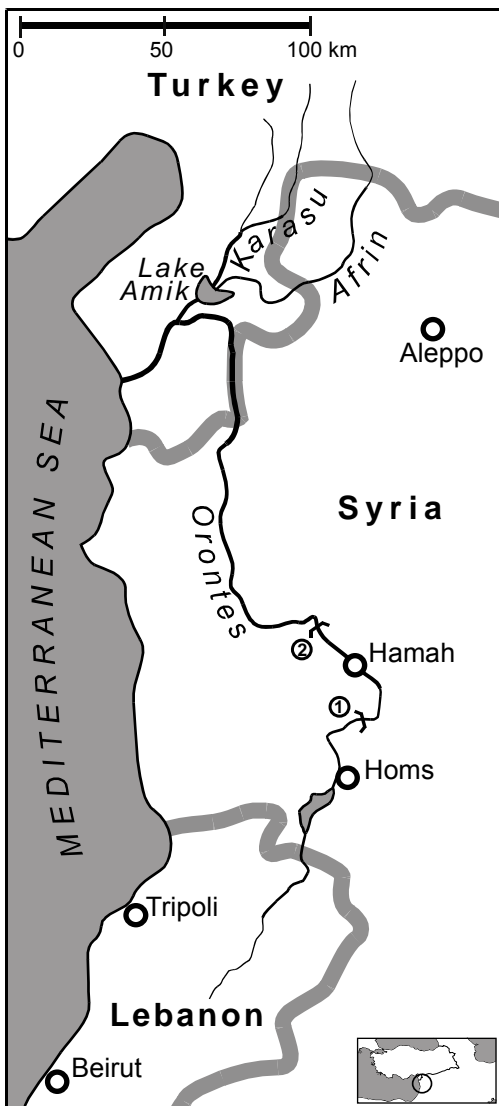
65 The UNEP/DEWA/GRID website considers that “positive signs of environmental recovery have been emerging [...] visible in new satellite images taken in May 2003.” (UNEP/DEWA/GRID 2004).

## 5.5 The Orontes basin<sup>66</sup>

Lebanon (upstream), Syria (mid-stream) and Turkey (downstream) are riparian states to the Orontes river, and Turkey and Syria to its major tributary, the Afrin river. Lebanon and Syria have agreed on water allocations from the Orontes, while water-related issues relevant to Turkey and Syria are yet to be negotiated. Up until 1998, non-water issues, i.e. security and territorial disputes, were critical and contentious between Turkey and Syria, but since then bilateral relations have improved considerably.

### 5.5.1 Geographical and hydrological setting

**Figure 7: Map of the Orontes river and its main tributaries**



- (1) Rastan Dam  
(2) Mahardeh Dam

The Orontes river originates in Lebanon near the city of Baalbek in the northern part of the Bekaa Valley. It flows in a northerly direction between the Lebanon and the Anti-Lebanon Mountains towards Syria, enters Syria near the town of Hermel, then drains into the Qattaneh reservoir and flows in a northern direction through Syria. In Syria, it passes the cities of Homs and Hama in the western part of the country, and crosses the fertile Al-Ghab depression. Then, it forms the border between Syria and Turkey for about 31 km, until it bends west in Turkey and finally discharges in the Mediterranean Sea. Its total length is about 448 km of which 35 km lies in Lebanon (upstream riparian), 325 km in Syria (mid-stream riparian) and 88 km in Turkey (downstream riparian) (Arisoy and Türkoglu 1998: 29). The catchment area covers 37,900 km<sup>2</sup> of which 49.94% is in Turkey, 44.32% in Syria and 5.74% in Lebanon (TFDD 2002).

The **Afrin river** which is the major tributary of the Orontes, and the **Karasu river** rise in the northern part of the basin, namely in the Akcadag, Karadag and Sof mountains in Turkey. While the Karasu flows on Turkish territory and forms the border between Turkey and Syria for a short distance, the Afrin passes Syrian territory before it re-enters Turkey and flows into Lake Amik.

The three rivers – Orontes, Afrin, Karasu – have a combined mean annual discharge potential of 2.8 BCM of which 0.3 BCM/year is generated in Lebanon, 1.2 BCM/year in Syria and 1.3 BCM/year in Turkey.

66 In Arabic and Turkish, the Orontes is named Asi.



Minimum and maximum discharge rates range between 10 and 400 m<sup>3</sup>/s. When the Orontes river enters Turkey it has a yearly potential of 1.5 BCM. The water potential of Karasu is 0.39 BCM/year; the annual discharge rate of the Afrin river when it re-enters Turkish territory is 0.31 BCM<sup>67</sup> (Baran et al. 1997).

### 5.5.2 Water resource development

The Orontes river and its tributaries are intensively used by all riparian countries for irrigation purposes, domestic water supply and to service industry. However, the main strain on water resources comes from Syria's and Turkey's unilateral development plans to increase irrigation, and from Syria's discharge of untreated waste water into the river making downstream use problematic.

**Table 9: Cooperational context in the Orontes basin in brief**

<b>Orontes</b> Basin area: 37,900 km <sup>2</sup> ; mean annual discharge 2.8 BCM		
<b>Riparian position</b>	<b>Basin area (% of total) Contribution to annual discharge</b>	<b>Main water uses</b>
<b>Lebanon</b> Upstream	2,175 km <sup>2</sup> (6%) 0.3 BCM (11%)	Domestic water supply, irrigation, hydropower
<b>Syria</b> mid-stream	16,797 km <sup>2</sup> (44%) 1.2 BCM (43%)	Domestic water supply, irrigation, hydropower
<b>Turkey</b> downstream	18,972 km <sup>2</sup> (50%) 1.3 BCM (46%)	Domestic water supply, irrigation, hydropower, flood control
<b>Main agreements and covered issues</b>		
Turkey - Syria	1939 - demarcation of the Thalweg of the respective rivers as the border Recently - Free Trade Agreement 2004 - joint dam project	
Syria - Lebanon	1994 - allocation of water (80 MCM/year for Lebanon, rest for Syria)	
<b>Unsettled issues</b>		
Quantity	No agreement between Syria and Turkey on water allocation.	
Quality	No agreement.	

Source: Own compilation

67 Figures differ according to literature used.

## Lebanon

Lebanon, which has a typically Mediterranean climate with heavy winter rains and dry and arid conditions during the rest of the year, is in a relatively favourable position as far as rainfall and water resources are concerned. However, development is limited during the dry summer months. Lebanon's main sources of irrigation waters are the Litani river and the Litani-Awali water resource system, and not the Orontes. Lebanon uses relatively little for irrigation from the Orontes. Country-wide, 87,500 ha are irrigated with surface water (1993), of which about 11,500 ha are located in Northern Lebanon.<sup>68</sup> According to the bilateral agreement signed in 1994 between Lebanon and Syria concerning the sharing of the waters of the Orontes river, Lebanon's annual share amounts to 80 MCM out of 420 (or 510)<sup>69</sup> MCM.

Lebanon plans to build a multi-purpose dam on the Orontes river, the project's components being as follows: (1) to provide water to the cities of Hermel and Baalbek; (2) to provide irrigation water for 6,100 ha of land; (3) to construct the Asi Dam to irrigate land in the Bekaa Valley, and (4) to construct a hydropower plant. Syria objected to the project at the beginning, but later conceded. However, it has still not yet been implemented due to a lack of finance (Canatan 2003).

## Syria

Syria has heavily developed surface (and ground) water resources in the Orontes basin where annual rainfall ranges between 300 and 800 mm, and annual evaporation between 1200 and 2000 mm. According to a World Bank study (2001), the Orontes river provides 20% of Syria's total estimated water use volume, and ranks second to the Euphrates. The same study states that water use from the Orontes is as follows: agriculture consumption 82%, domestic water supply 8% and industry 10%. Syria has built about 40 dams on the Orontes with a total capacity of 736 MCM; the main ones, are Rastan, Qattaneh and Mahardeh. The large Homs-Hama canal which starts from the Qattaneh reservoir, provides water for 23,000 ha of land; the Mahardeh reservoir supplies water to the Asharneh plain, and the Rastan reservoir irrigates areas in the Asharneh and Al-Ghab plains. On-going water infrastructure development includes the construction of three more dams (Afamia, Zeizoun, and Qastoun), and an increase to the irrigated area by 72,000 ha. However, the reservoirs do not provide enough water, thus groundwater is pumped for irrigating 20,000 ha.

In the 1950s, Syria started to systemically drain the Al-Ghab marshes in order to open land up for irrigation. The Orontes river bed was enlarged and deepened, and dams were built to regulate the flow of the river and to provide water for irrigation. The Al-Ghab Project was carried out between 1958 and 1967 and covered 46,000 ha. The project was considered to be very important since it would contribute greatly to Syria's economy and because plans were made to settle farmers in the region.

## Turkey

In the early 1940s, the Amik Lake only had a few natural drainage canals and consequently fields and nearby villages were frequently flooded. Hence, in the early 1970s - through the drainage and land reclamation works of the DSI - the Amik Lake was drained and the Amik

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68 Detailed data on water use are not available.

69 The FAO Aquastat Database estimates surface water flow to Syria at 510 MCM/year through the Orontes river and the bordering El Kebir river (FAO Aquastat 1997).

Plain created; this later developed into a significant agriculture asset for the region. However, shortcomings of the drainage works undertaken in the 1970s are evident and have resulted in negative environmental impacts and continuous flooding and droughts.

There are 12 projects for water resource development in the Turkish part of the Orontes basin and on its tributaries, four of which are in operation; two under construction and six in the investigation phase. The projects are designed to regulate the flow of the river and its tributaries in order to provide water for irrigation, domestic needs, to generate hydropower and to protect land and settlements from floods.

The projects which are in operation irrigate 14,067 ha of land and produce 17.0 GWh/year of energy with a capacity of 3.30 MW. The projects currently under construction will irrigate 8,019 ha and provide 0.95 MCM/year of drinking water. The planned projects will irrigate 77,489 ha, protect 20,000 ha of land from floods, provide 36.43 MCM/year drinking water, and, with an installed capacity of 1.60 MW, produce about 62.77 GWh/year. If the projects under construction and in planning are implemented, the total irrigated area will cover 99,575 ha, 180 GWh/year of energy will be produced, 37 MCM/year drinking water will be provided, and 20,000 ha will be protected from floods. However, these plans cannot be realised with the amount of water currently received from Syria.

### 5.5.3 Status of cooperation

So far, major conflicts over the use of the Orontes' waters have occurred between Turkey (downstream) and Syria (upstream). From the Turkish point of view, the present challenges to cooperation stem from (1) agricultural water demand and planned irrigation projects in both countries, and (2) the quality of the water which arrives in Turkey.

A chronological **record of bilateral cooperation** between the riparian countries is as follows:

On 19 May 1939, Turkey and Syria signed an agreement entitled *Final Protocol to Determine Syria-Hatay Border Limitation*. The agreement stipulated that the waters of the rivers Orontes, Karasu and Afrin, where they constitute the boundary between Syria and Turkey, will be utilised in an equal manner. The Thalweg lines<sup>70</sup> of these rivers demarcate the Turkish-Syrian border (Inan 1994); there were, however, no specifications on how to use the rivers' waters.

In 1950, Syria approached the World Bank to obtain funding for the Al-Ghab Project. An agreement was signed between the two parties the same year. The World Bank concluded that water usage in the Orontes river basin would not be jeopardised as a result of the project, that it would control the winter floods and benefit all riparians and the summer flow would provide enough water to irrigate all areas in the region. However, the World Bank also considered the concerns of the Turkish side and organised a meeting among Turkish and Syrian experts in Syria. There, the Turkish representatives claimed that Turkey would face frequent floods during construction, and that the project would leave no water for Turkey during irrigation seasons. In 1962, Syria assigned the development of the Orontes river project to the Dutch company NEDECO. According to Caponera (1993), the plan was drafted without taking Turkish needs into consideration. During a meeting between the engineers of the two riparian states, the Turkish delegation offered a draft protocol which stated that a

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70 Thalweg is the line following the lowest part of a valley, whether under water or not.

river basin development plan for the whole basin should be developed to include measures to mitigate flood hazards; to study the feasibility of a dam on the border to irrigate the Amik Plateau, and to install flood warning systems in the basin. However, the meeting ended without agreement.

On 22 July 1972, Syria and Lebanon signed a bilateral agreement concerning the use of water in the Orontes river basin. However, this agreement did not come into force. On 20 September 1994, the two countries then concluded the "Bilateral Agreement Concerning the Usage and Sharing of the Waters of the Al-Asi River (Orontes) between the Syrian Arab Republic and the Lebanese Republic". According to this treaty, the parties considered the waters of the Orontes river as common waters. The total annual discharge rate of the river was considered to be 420 MCM/year of which the Lebanese share was estimated at 80 MCM, and the Syrian at 340 MCM. The quantity of waters extracted from the river near Harmel Bridge and other sources including rainfall, torrents and ground water resources in Lebanon were considered to be part of the established Lebanese share. The measurement and control of the water quantity in Lebanon was entrusted to a joint technical committee. The works concerning the maintenance and reparation of canals was considered to be the responsibility of both countries, but financial resources were to be provided by the Syrian side (Canatan 2003).

Negotiations between Turkey and Syria are more complicated for the following reasons:

Since the start of negotiations between Turkey, Syria and Iraq under the mandate of the Joint Technical Committee in the early 1980s, Turkey and Syria adopted conflicting strategies with regard to the subjects of negotiation. While Turkey insisted that the talks would encompass the regional transboundary waters including the Orontes, the Euphrates and the Tigris, Syria refused to formally discuss the Orontes river with Turkey. Syria claimed the Turkish province of Hatay – through which the Orontes river flows and discharges into the Mediterranean – as Syrian territory.<sup>71</sup> Hence, Syria regards the Orontes river as a 'national river' which flows in Syrian territory and drains into the Mediterranean Sea without crossing Turkey. Any negotiation would have been tantamount to acknowledging Turkey's sovereignty over the Hatay region.

This meant that negotiations on sharing the Orontes' water did not take place although negative downstream impacts from Syrian water development schemes are evident. Turkey argues: "Syria has been making use of 90% of the total flow which reaches an annual average of 1.2 BCM at the border. Out of this total capacity, only a meagre amount of 120 MCM enters Turkey, after it has been heavily used by Syria. This amount will further decrease to the range of 25 MCM if the planned reservoirs of Ziezoun and Kastoun in Syria are built" and start operating (Ministry of Foreign Affairs 2004b). The Syrian irrigation scheme referred to are the Hama-Humus (20,000 ha) and the Al-Ghab (70,000 ha). Furthermore, Syria might be able to satisfy its drinking water and hydropower demands with the Jisr el Shugur Embankment, the Rastan, Mehardan, Zeizoun and Kastoun dams on the Orontes. This would mean that the annual capacity of the river (2.8 BCM/year) would be consumed just by Syrian projects. As a result of over-consumption in Syria, the river's flow inside Turkey

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<sup>71</sup> Until recently, Syria claimed the former Ottoman sub-province of Alexandretta (presently the Turkish province of Hatay) as Syrian territory. Hatay appeared as part of Syria on all official Syrian maps, and consequently the Orontes river was regarded as an internal affair of Syria.

is decreased to 3 m<sup>3</sup>/s (94.6 MCM/year), and makes irrigation in the Amik Plateau impossible. In addition, the remaining waters reaching the Orontes Delta are heavily polluted.

However, since the signing of the Adana Accord (Security Protocol) between Turkey and Syria in October 1998 (Scheumann 2003: 751), there have been a number of promising mutual official visits which point towards improved bilateral dialogue and a new trust in the region. As a product of this recent rapprochement, the two riparians have further improved their economic relations and have signed the first Free Trade Agreement on 22 December 2004 which actually defines and recognises state boundaries. Turkish authorities interpret the signing of the Free Trade Agreement as Syria's acknowledgment and recognition of Turkey's borders and the province of Hatay within them. A Turkish diplomatic source said that Damascus lifted its reservations to signing the trade deal after an "accord" was reached on affirming Turkey's sovereignty in the southern province of Hatay, formerly Alexandretta, to which Syria had claims.<sup>72</sup>

At present, there are ongoing attempts by The Mediterranean Association to Save the Sea Turtles (MEDASSET) to protect a coastal strip, which includes the Orontes Delta (Turkish territory), as a breeding grounds for the Green Turtle (*Chelonia mydas*). The MEDASSET report to the Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats proposed the protection (in particular) of the beaches to the north and south of the mouth of the Orontes river where the highest nesting density can be found (MEDASSET 2003). This will have repercussions for in-stream water flows and on water quality, and it remains to be seen whether Turkish authorities will support this initiative.

Bilateral relations have improved since 1998 and joint efforts are on the way. During the most recent visit by the Turkish Prime Minister Erdogan to Syria on 22 December 2004, the press recorded that the Turkish Prime Minister indicated his cooperation on the issue and promised technical assistance to the Syrian Prime Minister Otri that includes a joint project to build a dam on the Orontes River in Syria.<sup>73</sup> The purpose of this dam would be to provide water to irrigate 20,000 ha in Turkey and 10,000 ha in Syria as well as to produce hydropower for Turkish and Syrian needs (Şen and Çelik 2004, Radikal 2004). It was agreed that a joint technical delegation would be formed to study the technical issues pertaining to the construction of the joint dam. A Turkish-Syrian delegation visited the Orontes basin in Syria to examine the topographical and geological characteristics of the region as well as the places likely to be affected by the dam's construction (DSI 2005c).

#### 5.5.4 Outstanding issues and prospects for cooperation

While Syria and Lebanon agreed on water allocations in 1994, Turkey and Syria had settled the demarcation of their mutual borders in 1939. The present challenges for cooperation between Syria and Turkey on the Orontes' waters stem from conflicting agricultural water demands, planned irrigation projects in both countries and the quality of the water which arrives in Turkey.

At present, basic data relating to water resource potential and actual water use in both riparian countries is still contested. Agreement is also yet to be reached on how to arrive at

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<sup>72</sup> AP-Turkish Daily News-Anatolia News Agency-NTVMSNBC/, 29 September 2005.

<sup>73</sup> [www.turkishdailynews.com.tr/article.php?enewsid02647](http://www.turkishdailynews.com.tr/article.php?enewsid02647), [29 September 2005].

water sharing and harmonisation of national development plans. The issue of water quality requires heavy investment in water treatment facilities since, until recently, Syria was virtually without domestic waste water treatment facilities and waste water was disposed of into rivers untreated (World Bank 2001: 33).<sup>74</sup> Organic pollution concentrations and levels of ammonia were dangerously high, and the ecosystem of rivers showed serious deterioration and even irreversible damage.

Whether negotiations for the construction of the recently proposed joint dam will materialise or not, remains to be seen. The recent technical dialogue focuses solely on water quantity issues; urgent water quality matters are yet to become part of the negotiation agenda. However, the seeds of cooperation observed in the Orontes river basin may pave the way for further confidence-building measures between Turkey and Syria.

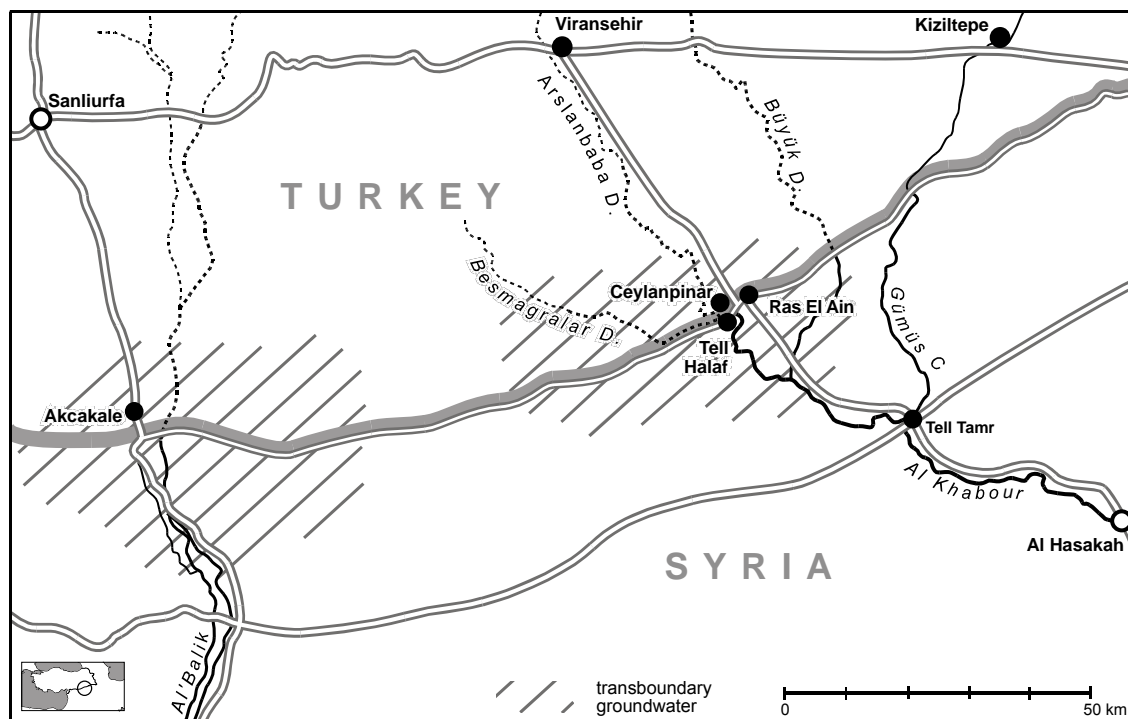
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<sup>74</sup> Canatan (2003, Annex 6) lists industrial plants which discharge untreated waste water into the Orontes. These include the sugar processing industry, plastic, textile, ceramics, concrete, and steel.

## 5.6 Turkish-Syrian transboundary groundwater resources

Turkey and Syria share a transboundary groundwater resource system, namely the Ceylanpinar aquifer and Ras El Ain<sup>75</sup> karstic springs which are found in the Urfa-Harran and the Ceylanpinar plains in south-eastern Turkey and in the Lower Balikh and Lower Khabour basins in Northern Syria. The Ceylanpinar aquifer is a karstic carbonate aquifer (TUMAS 1991). The Khabour river,<sup>76</sup> a tributary of the Euphrates, is fed by the Ras El Ain springs which receive their main discharge from groundwater resources in the Ceylanpinar-Harran-Sanlıurfa plains in Turkey. The Ras El Ain karstic springs have an average discharge of 38.66 m<sup>3</sup>/s. In other words, precipitation that falls in Turkey is a major source of the aquifer's recharge (Zaitchik et al. 2002).

**Figure 8: Location of Turkish-Syrian transboundary groundwater resources**



According to a World Bank study, “rapid groundwater extraction both in Turkey and in Syria from the transboundary aquifer system (i.e. Ras El Ain) has reduced the spring flow discharges to the (Khabour) river [...] Overuse has caused a decline of the flow rate from a long-term average of 50 m<sup>3</sup>/s to a few m<sup>3</sup>/s at present and down to zero during drought years, as in 2000.” (World Bank 2001: 16;17) In both countries, groundwater is used for irrigation, and is supplied from wells which far exceed the officially approved number.

<sup>75</sup> Other names are Ras al’Ain, or Ra’s Al Ayn.

<sup>76</sup> In Syria, the Euphrates is joined by two tributaries, the Balikh and Khabour rivers. The Khabour sub-basin together with its transboundary tributaries and springs is the most complicated element of the system. Various branches of Khabour originate either in Turkey or Syria. Clearly, Sacir, Balikh and Khabour together with springs and other unrecorded streams, which are estimated to have a potential of 200 MCM/year, contribute a significant volume to the discharge of the Euphrates. Both rivers discharge into Syria and join the Euphrates downstream of the Syrian Tabqa Dam.

### 5.6.1 Groundwater use in Turkey

According to DSI statistics (1972), groundwater resources are abundant in the southern part of the Harran-Sanlıurfa Plain which extends south of the town of Harran up to the city of Akcakale at the Syrian border. The total amount of groundwater in this plain is estimated to be 190 MCM/year, with water quality suitable for agriculture.

At present, about 15,000 ha of land near Akcakale are irrigated by publicly drilled wells for cotton, vegetables, soya bean, and clover cultivation. In the Ceylanpinar plain, 27,000 ha are irrigated with groundwater resources along with 7,000 ha in Suruc; both are located in the lower reaches of the Harran Plain (DSI 1995). The GAP irrigation component, inter alia, comprises of the Mardin-Ceylanpinar-Harran Plains Irrigation Project (part of the Euphrates basin) which plans to increase the area irrigated for groundwater. The project is designed to irrigate 228,569 ha of land with surface water and 131,589 ha with groundwater, which corresponds to nearly 21% of the entire irrigation projects in the region.

Irrigation water in the Harran Plain is provided by a total of 1,700 wells of which 1,300 were licensed by the DSI, the remaining 400 were drilled illegally. Some 335 wells near Akcakale are operated by the DSI, some by the GDRS, and about 1,300 by private farmer-operators. Due to the high number of illegal non-licensed wells, the amount of groundwater extraction is not known, but it is estimated that, between 1982 and 1990, groundwater levels near Akcakale dropped by 15 to 20 metres. Groundwater quality has also been affected by the use of fertilisers and pesticides which percolate into the groundwater storeys. The effects of irrigating with surface water in parts of the Sanliurfa-Harran plain on groundwater levels are not known.

### 5.6.2 Groundwater use in Syria

In Syria, the Khabour river has experienced a serious decline in river flow and groundwater table depth (World Bank 2001) because irrigation is practiced on some 30,000 ha of land. In the Upper Euphrates area, groundwater is supplied by 1,550 wells. Between 1985 and 1998, Syria's irrigated areas increased rapidly, which is attributable to the rapid increase in groundwater use (country-wide, 60% is irrigated with groundwater). Almost all wells were privately developed and operate privately, with 50% of the total operating without license.

Until recently, the Syrian government's credit policies promoted unrestricted groundwater irrigation: farmers received tax-free low interest rates loans, and diesel was subsidised. Yet, as a result of a recent policy change, the Syrian Ministry of Irrigation is in the process of regulating all illegal wells. Farmers and other citizens must register any illegal well on their property with the appropriate authority, and apply for a license to operate. A committee has been set-up in each basin to study each application, and to decide whether to grant a license or to close a well. In cases where a license is granted, a discharge meter is installed and a maximum extraction figure, based on well location, irrigated land area and other factors is specified.

In some areas, the government has proposed well consolidations as an alternative to well closures. This involves the closure of private wells and the provision of water to farmers through a limited number of collective wells. This reduces well interference problems and allows wells to be carefully located where resources are sufficient. In addition, clear directives can be established and control can be exerted over extraction levels and efficient water use encouraged.



In the Aljezira region in north-eastern Syria, several irrigation projects and dams were constructed that rely on the flow of Khabour river. This river receives its main discharge from the Ras-Al-Ayn aquifer and a group of springs surrounding it. The vast number of wells drilled in the Ras-Al-Ayn area and the overexploitation of groundwater by farmers has led to a severe decline in the depth of the groundwater table. The decline of discharges from the Ras-Al-Ayn aquifer and the surrounding springs threaten the continual flow of the Khabour river and, of course, the projects that rely on its water. The Syrian government took decisive action to recover the situation by drilling 68 wells with an average discharge of 200 l/sec each and by extracting water from these wells to supplement the flow of the Kabour river. It also took the opportunity to make long term consolidation plans for the existing illegal wells in the Ras-Al-Ayn area by establishing an irrigation project based on the concept of "cooperative farming" where illegal wells will be replaced by drilling a number of wells with high levels of discharge. This project is set to irrigate an area of 20,000 ha. The feasibility study has been completed and will shortly be implemented (Mualla and Salman 2003).

### 5.6.3 Improving control over joint groundwater resource use

Since detailed information on the extraction of water from transboundary groundwater resources, including data on the water quality, are not accessible or are very much limited, the nature of the problem is not completely clear. However, it seems that Turkey and Syria share a common problem: **the inadequate control of groundwater extraction through the licensing of wells** causes a drop in the water table depth.

In both countries, the right to use groundwater is officially only acquired through the issue of a license by the State Hydraulic Works in Turkey, and by the Ministry of Irrigation in Syria. The illegal drilling of wells and operating of pumps are subject to fines, and licenses can be withdrawn if the users do not comply with laid-down specifications (e.g. discharge, depth). The Syrian Ministry of Irrigation has recently banned the drilling of wells for three years, and reforms are underway which will strictly define the spacing of wells as a strategy for reducing groundwater extraction (World Bank 2001: 39; 41).

The areas using groundwater resources in Turkey as well as in Syria belong to the irrigation development schemes which are to be provided by water from either the Euphrates or its tributaries. This will pose a particular challenge for both countries to reasonably and equitably develop and manage the ground water in the region with consideration to hydrological interdependence with surface water, and the potential for conjunctive use.

However, joint effort by both countries should first consider the creation and consolidation of scientific knowledge on the hydro-geological features of groundwater resources through a joint research project carried out, for instance, by universities and the respective public authorities concerned. This could be supported by the International Hydrological Programme (IHP) of UNESCO which runs an "Internationally Shared (Transboundary) Aquifer Resources Management (ISARM)" programme in partnership with other agencies such as FAO, ESCWA and UNECE<sup>77</sup>.

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77 For more information on this programme see [http://igrac.nitg.tno.nl/isarm/isarm\\_home.html](http://igrac.nitg.tno.nl/isarm/isarm_home.html).

## 5.7 Cooperation and outstanding issues: similarities and differences

The state of cooperation and the outstanding disputed issues on the many Turkish transboundary rivers are characterised by both similarities between the river basins, in particular in terms of external and internal political forces, and context specific factors and developments.

Current disputed issues on Turkish transboundary waters have similar underlying root causes. All rivers basins under scrutiny can be found in regions that have always been traditionally characterised by some political tension between Turkey and its neighbours. These political circumstances aggravated past water conflicts which otherwise could have been solved much more easily if the political climate had been more favourable. "Water disputes" or "water conflicts" were overlaid, or at least influenced, by multifaceted interstate conflicts involving other core political issues, such as terrorism, recognition of borders or territorial issues.

In addition, in situations where Turkey was the upstream country, classical upstream-downstream conflicts occurred characterised by the divergent interests of the riparian states. The respective Maritsa and Orontes river cases are important exceptions, with Turkey as a downstream riparian. The knowledge that Turkey is upstream at several important transboundary rivers (Euphrates-Tigris, Coruh etc.) goes hand-in-hand with the widespread international perception of (strong) upstream states aggravating conflicts, or being reluctant to cooperation, and has also clearly contributed to Turkey's rather dubious 'international water cooperation reputation'. However, there are rudimentary forms of cooperation in both constellations which illustrate that cooperation can principally be developed in upstream-downstream constellations too, and that location is not the only decisive factor in explaining whether and when cooperation takes place.

Furthermore, water cooperation in many of the transboundary basins has to take place in the context of limited water availability in several (or even all) riparian countries, making the allocation of water quantity, i.e. agreements on guaranteed river flow, an important and potentially discordant issue. Because of natural conditions and basic political decisions on national development, Turkey, as well as her neighbours, heavily relies on water for irrigation and power production with water being an important and, in some respects, strategic resource for the national economy. Consequently, regional water negotiations are frequently exacerbated and governed by states insisting on their sovereign right to water because of their economic needs. Equally, comprehensive regional agreements or treaties that could help regulate potentially inharmonious claims by riparian states are not in place. There are a limited number of bilateral (and sometimes outdated) protocols and other arrangements. Finally, river basin organisations or committees that might serve as fora for the accommodation of water conflicts are not available either, or they are unable to fulfil their mandate.

Despite these similarities, the picture of water disputes and cooperation at the individual Turkish transboundary river basins is far more complex and multi-faceted because of huge differences in terms of the hydropolitical constellations, the causes of individual water conflicts, the dynamics of the respective bilateral political relations and, finally, the range of agreements available and the organisational approaches to the disputed issues. In this context, analyses of transboundary waters in this chapter provide the following results:

### **The Maritsa-Ergene river basin**

Bilateral relations in the Maritsa basin have improved over the last decade, providing a political context for negotiations and for settling major water-related conflicts. Still, collaboration in flood protection needs to be improved, and conflicting claims by Turkey and Bulgaria to water for the purpose of irrigation can be an impediment to the implementation of irrigation projects in Turkey. It remains to be seen whether the planned joint dam projects will be realised and whether they offer an appropriate solution for conflicting water needs. No agreements exist yet on water quality in the basin, and upstream water pollution is increasingly perceived as an issue for Turkey and Greece. EU-membership for all three riparian countries offers a good incentive to increase transboundary cooperation. The prospect of joint nature conservation activities and a legal framework for the protection of wetlands provide further incentives for collaboration in water resource management. Such collaboration could also contribute to good neighbourly relations between the riparian countries, and among the communities living along the border regions.

### **The Kura-Araks river basin**

The Kura-Araks river basin is influenced by a much more complicated political constellation than, for instance, the Coruh river, because, the large number of riparians goes hand-in-hand with weak and, in some cases, much more tense political relations. At present, Turkey is barely involved in ongoing international efforts to bring the riparian states together and to improve coordination within the basin. While this appears somewhat justified because of minimal transboundary impact caused by current Turkish water use (e.g. on the Kura river) and expected political impediments caused by the Turkey-Armenia conflict, increasingly diverging interests between Turkey and other basin countries cannot be completely ruled out in the long term. Several riparian states, in particular Turkey and Iran, have plans to develop water infrastructure for hydropower generation and / or irrigation development. However, Turkey is interested in long-term cooperation in the basin, and political relations with the other riparian states (e.g. Armenia) are expected to improve through small-scale confidence building measures.

### **The Coruh river basin**

Water cooperation over the Coruh river benefits from generally good political relations between the sole riparians Georgia and Turkey. However, apart from some outdated and obsolete agreements between the Soviet Union and Turkey, there is still no adequate legal or organisational (institutional) approach to water management in place. The expected negative impact of Turkish dams on the Georgian Black Sea coastline is at present a matter of concern. The conflict surrounding the Coruh river is not about water sharing per se, but about sediment; the Turkish dams are expected to seriously affect the sediment regime of the river and, as a result, increase erosion in the Batumi vicinity. This 'sediment' conflict was bilaterally addressed in the late 1990s by the establishment of several technical committees and some cooperative moves were made, however, at least from the new Georgian government's point of view, an agreement acceptable to both sides is yet to be reached.

### **The Euphrates-Tigris rivers**

Water dispute in the region clearly stems from uncoordinated water development projects. So far, the agreements on the Euphrates are all bilateral (Turkey-Syria, Syria-Iraq), as is the Joint Communiqué (Turkey-Syria). Since bilateral relations between Turkey and Syria have improved for various reasons, cooperation over water issues has a greater chance of success, as can be evidenced by the GAP-GOLD Protocol (2001) and the subsequent Implementation Document (2003). The Protocol comprises of limited but essential activities to create a coordination mechanism to implement activities related to sustainable utilisation of the region's land and water resources, and to deal with water management within the larger picture of overall socioeconomic development and the integration of under-developed regions in Turkey and Syria. If implemented, it will provide a good platform to launch more intense cooperation. However, the Joint Communiqué does not address crucial issues and does not include Iraq as a partner. It is agreed that a new cooperative framework will only develop if all riparian states reconsider their negotiation strategy in the light of each other. The Turkish Three-Stage-Plan may, if extended, be a starting point which would enable the parties to design solutions on a sound, data reliant basis.

### **The Orontes river basin**

While Syria and Lebanon agreed on water allocations in 1994, Turkey and Syria only settled the demarcation of the border in 1939. However, in December 2004, Syria and Turkey agreed to build a joint dam on the Orontes at the border. The purpose of this dam would be to provide irrigation water and hydropower for Turkish and Syrian needs. Both countries focused on developing water resources for irrigation, hydropower, drinking water and infrastructure for flood control. However, as perceived by the Turkish side, the present challenge to agree on the Orontes' waters stems from agricultural water demand, the planned irrigation projects in both countries, and the quality of the water which arrives in Turkey. There is a need for reliable data on the water resource potential and the actual use in both riparian countries, and on an agreed-upon procedure of how to share the water. The proposal to protect a coastal strip including the Orontes Delta on Turkish territory as breeding ground for the Green turtle, will have repercussions on in-stream water flows and on water quality. To solve the latter, joint investment in water treatment facilities is essential.

### **Turkish-Syrian transboundary groundwater resources**

Since detailed information on groundwater extraction and groundwater quality is very much limited, the nature of the problem is not completely clear. However, the depth of the groundwater table has receded, clearly indicating the overuse of groundwater resources in both countries. The areas using groundwater in Turkey and Syria belong to the irrigation development schemes which receive water from either the Euphrates or the Khabour rivers. This will pose a particular challenge to both countries to reasonably and equitably develop and manage the groundwater in the region, with consideration to hydrological interdependence with surface water and the potential for conjunctive use. Based on sound knowledge, Turkey and Syria will have to develop strategies to control groundwater extraction in order to halt overuse.

## 6 Turkey: Trading water in regional markets

Water trading across national borders is not a new custom. Trans-national water trading is practiced, with economic advantage to buyer and seller, and with ecological impact on lakes and river basins wherever water is harvested. It is not trivial to state, that regional water markets only materialise if traders and buyers exist. Presenting the actual facts on the two Turkish water trading projects and the perspectives of potential water importing countries, it can clearly be seen that potential buyers are very much reluctant to pay for water. When Jordan's King Abdallah, a potential customer, visited a water trading project, (the Manavgat Water Supply Project), he openly stated that he expected Turkey to deliver water to Jordan free of charge or only at a symbolic price (Neue Züricher Zeitung, 24 June 2000). Major obstacles to the development of water markets are political, rather than technical or financial.

### 6.1 The Peace Pipeline Project

The Peace Pipeline Project was first announced and initiated in 1986 by the then Prime Minister Turgut Özal. The project would transport water from the Ceyhan and Seyhan rivers - both of which originate in the Taurus Mountains and discharge into the Mediterranean Sea in the Province of Antalya (see Figure 2, p. 8, river basins no. 18 and 20) - via two pipelines to the water-short countries of the Gulf, the Hashemite Kingdom of Jordan and the Kingdom of Saudi Arabia. One pipeline would be 4,000 km in length, the second 2,800 km and combined would be able to deliver 6 million cubic meters daily; investment costs were expected to range between US\$ 5 and 30 billion depending on the length of the pipelines.

The Peace Pipeline Project was included in the bilateral *Protocol on Matters Pertaining to Economic Cooperation* between the Republic of Turkey and the Syrian Arab Republic,<sup>78</sup> which was signed in Damascus on July 1987. Article 10 of the Protocol states:

*"The Turkish Side explained the details of the "Peace Pipe Line" planned to carry a portion of the waters of the Seyhan and Ceyhan rivers in Turkey through Syria by two pipe lines, one going to countries of the Gulf and the other to the Hashemite Kingdom of Jordan and Kingdom of Saudi Arabia to supply water for household purposes and limited irrigation in the region. The Syrian Side agreed in principle to the project and showed interest provided that the Turkish Side carries out its technical and economic feasibility study by an international consultancy firm. The Syrian Side undertakes to facilitate the feasibility studies pertaining to the Syrian portion of the project. In case of its positive conclusion, the Syrian Side will enter into negotiations for the final realization of the project."*

When Turkey subsequently announced that the Peace Pipeline Project would also benefit Israel, the project never left the ground and did not have a chance of being implemented thereafter. One reason was financial, but the real problem was political: not because Syria feared losing its stake in the Euphrates, but because all the Arab countries, including Syria, expressed reluctance to provide Israel with water; Israel, on the other hand, was not very enthusiastic about the prospect of its water supply running through Syrian territory. Whether the Peace Pipeline Project will be reconsidered and be realised depends, above all, on overall developments in the Israeli-Palestinian conflict and relationships between Syria and Turkey, and Syria and Israel.

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78 United Nations Treaty Series 87/12171, 17/7/1987.

## 6.2 The Manavgat Water Supply Project

The Manavgat Water Supply Project is designed to provide water from the Manavgat river<sup>79</sup> to water-short countries in the region, water-short settlements and resort areas along the Mediterranean shore and cities in Turkey (e.g. Istanbul). The Manavgat river originates in the Province of Antalya (see Figure 2, p. 8, river basin 09), and has a mean annual discharge of 4.7 BCM which equals to an average flow of 140 m<sup>3</sup>/s of which 60 m<sup>3</sup>/s are judged to be available for export. According to the media, potentially interested regional buyers are Israel, The Turkish Republic of Northern Cyprus, Cyprus, Jordan, Malta, Crete, and Libya (Süddeutsche Zeitung, 9 January 2005).

Right from its inception, the Manavgat Water Supply Project has been criticised by the Arab media because Turkey would deliver water to Israel, even though it had not been designed for Israel's water needs alone. Water is already being supplied to Northern Cyprus, and Jordan and Libya has also shown an interest in buying water from the Manavgat river. However, at present, in the short-term, Israel is expected to be Turkey's major trading partner (with a supply of 10% available from the Manavgat station) although negotiations are still ongoing and technical and financial matters still to be settled.

Construction of the project was started in 1992 by the Turkish firm ALARKO Holding Company and was completed in 1999; the cost came to US\$ 150 million. Water would be lifted from an intake structure downstream of the Manavgat hydropower plant to a treatment plant and storage tank at a height of 70 metres.<sup>80</sup> According to the former Director General of Turkey's State Hydraulic Works (DSI), Dogan Altinbilek, the plant is capable of providing up to 250,000 cubic meters of purified and 250,000 cubic meters of un-purified water daily, or 500,000 cubic meters of raw water daily (Jordan Times, 18 January 2000; DSI XIIIth, no year). The two terminals, which operate like petrol filling stations, are designed to facilitate loading of 250,000 ton (dead weight) capacity tankers. Most of the Manavgat's water would meet the demand for potable water for household consumption, but press reports suggest that part of it will also be considered for irrigation purposes. This is, of course, a decision for the buyer. The Manavgat's water would need to be transported to the customer either in huge floating polythene bags, called "Medusa" in Canada, or Spragg (USA) plastic bags, with a fleet of water tankers (converted oil tankers) or a pipeline.

Water transport to North Cyprus started in July 1999 (Bicak and Jenkins 1999). In January 2000, the *Jordan Times* reported on a meeting between the Turkish Deputy Prime Minister and Minister for Energy and Jordan's Water and Irrigation Minister (Jordan Times, 18 January 2000). The matter discussed was the quantity required by Jordan, the transport route - running either through Syrian territories or Israeli ports, and the price ("We even informed Jordanian officials that we are ready to extend a special price to Jordan ...", a Turkish diplomat was quoted as saying (Jordan Times, 17 May 2000).

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79 The Manavgat river is 82 km long and has a catchment area of 1,350 km<sup>2</sup>; it is fed by precipitation from inside and outside its catchment area due to the geological formation of the region. It flows through a 4 km long gorge before reaching the city of Manavgat and discharges, after 7 km, into the Sea. (Yavuz 1997)

80 There are two dams: Oyampinar Dam (1984) which produces 1,620 GWh/yr with a 540 MW installed capacity; Manavgat Dam (1987) which is an afterbay dam, to produce 220 GWh/yr of energy with 48 MW installed capacity and to provide irrigation water for 14,000 ha land of which 10,600 ha are under irrigation. (Yavuz 1997)

In October 2002, Israel's Prime Minister, Ariel Sharon and Turkey's former Minister of Energy, Zeki Cakan agreed in principle that, for the next 20 years, Turkey would sell 50 MCM of water to Israel annually. According to estimates, the price of water at the unloading port in Ashkelon, Israel, would be 80 cents to US\$ 1 per cubic meter. The use of super tankers is currently being considered as an alternative to the Medusa Bags. The tankers would unload on an existing floating Single Buoy Mooring, located 3.25 km from the port of Ashkelon.

Many reservations were raised in Israel on the idea of importing water. On January 5, 2004, *Haaretz* reported:

*“Government yesterday approved the purchase of one billion cubic meters of water from Turkey. Finance Minister Benjamin Netanyahu and minister in the Finance Ministry Meir Sheerit voted against the proposal, while 13 cabinet members voted in favor of the transaction.”*

Netanyahu opposed the transaction because the cost of the imported water would be higher than that of desalinated water, which according to desalination records, would be 50 to 54 cents per cubic meter (half the price of the Turkish water). It is further unclear whether the imported water would be fed into the National Water Carrier (the Israeli water company Mekorot would have to build a link) and be used on a day to days basis or whether the water would be used to recharge the coastal aquifer and only be used during times of drought and in emergencies. To further reduce Israel's dependency on Turkey's fluctuating water markets, it was proposed that only a certain percentage of Israel's water supply be composed of Turkish water (water cap).

Importantly, Israeli scientists proposed that the marketing and management of the Manavgat river's water would need to be operated by a private agency with Turkish and foreign shareholders, in this way insulating the Turkish Government from Arab criticism of its sale of water to Israel, and to assure that the Turkish Government could not easily be pressured into cutting off supply (Just 1999). Yavuz considers that the operation could be undertaken by a Turkish enterprise or by an agency with shareholders (Yavuz 1997: 564).

When compared with the Peace Pipeline Project, the Manavgat Water Supply Project has several perceived advantages: the transportation system could be implemented quickly; it requires less investment than a pipeline; deals to buy water from Turkey could be made bilaterally (particularly important for Israel who fear objections from its Arab neighbours); the use of tankers or plastic bags would pose fewer environmental risks than a pipeline. On the negative side, draining bulk water may disrupt natural habitats and reduce biodiversity on site (Barlow and Clarke 2002).

Whether Israeli politicians and decision-makers are considering a water swap idea is not known. The idea is essentially that for every drop of water from Turkey, water could be released from Israel's National Carrier to Gaza, or from the Sea of Galilee to Jordan. It is believed that the water swap idea would neutralise any pressure Arab countries might apply to Turkey, and that such a move would also promote regional cooperation and offer the Palestinians and Jordanians their required water.

### 6.3 National concerns in Turkey over water trade

When the Peace Pipeline Project was first conceived it was fiercely contested over regional concerns. In the meantime, national and local circumstances have changed and they might now hamper the development of the project if it is reconsidered. Recently the Ceyhan Delta was proposed as a Biosphere Reserve in which in-stream water use was accepted as a *beneficial* use, thus implying that the amount of water that could be traded would be reduced.

In addition, there has never been a finite policy on how to deal with established user-rights to the waters of the Seyhan and Ceyhan rivers, which would be offended if water is extracted from either river for trading purposes. The waters of both rivers are intensively used for irrigation in the Cukurova Region which is one of the most fertile agricultural areas of Turkey. Agriculture is highly commercialised, and private farmers and holdings produce high-value crops for international and national markets. Since 1994, water management has been decentralised in irrigated agriculture: water user associations have been established as representative organisations of commercial farmers who will have a stake in deciding who may use the Seyhan and Ceyhan rivers' water.

It is not known whether the Manavgat Project has raised concerns in Turkey or not. Since the area of the Manavgat river is mountainous and forested, local water demand is limited (irrigable land within economic reach is limited and is mainly found at the estuaries), and Turkish officials have made clear that irrigation projects are small scale and do not affect water deliveries. However, the Province of Antalya suffers from water shortages, especially in summer where water demand is high due to tourism and seasonal drought (Kaya 2005), and water prices in the region are kept high in order to control demand.

### 6.4 International bearing

The Turkish water trade projects have an international bearing for a number of reasons: water-short Middle East countries can increase water availability through imports from Turkey. It is believed that this would contribute to stability in the region while tensions over the Middle East's contested waters would be reduced. **Water swap plans** have the potential of circumventing the difficult issue of riparian rights, and trading water by Turkey can open the door of inter-basin cooperation to the riparian countries in the Euphrates-Tigris and the Jordan river basins, if the respective countries agree. For instance, Israel could agree to release an equivalent amount of water from the Sea of Galilee to Jordan for each cubic meter of water received from Turkey. However, the water importing (Middle East) countries would become dependent on the Turkish water market, or as it is sometimes articulated: the water importing countries would be at the mercy of Turkey.

It is often speculated that water trading by Turkey would strengthen its position as a **water hegemon** in the region. It is feared that Turkey would deny the other riparian states of the Euphrates and Tigris (Syria and Iraq) their fair share of water from the two rivers. Instead of working towards a tripartite agreement, Turkey would offer to sell water at market prices to her neighbouring states. However, there is no evidence that the Turkish Government would follow this strategy, and it can be taken as certain that the riparian states would never agree to it.<sup>81</sup> Importantly, the Turkish water trading projects are not designed to withdraw water

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81 Gottschlich 2004 states that "Instead of buying water from Turkey, the Syrians want more water out of the Euphrates".



from transboundary rivers but from **national rivers**, i.e. the Ceyhan and Seyhan rivers located in the Province of Adana (see Figure 2, , p. 8, river basin no. 18 and 20), and the Manavgat river flowing through the Province of Antalya (see Figure 2, catchment 09). Both rivers originate in Turkish territory and discharge into the Mediterranean Sea along the Turkish coast.

While mega projects for bulk water transfers are already operating, and more are being planned and implemented (compare Barlow and Clarke 2002), trading water between Israel and Turkey has been perceived as a shift from the common understanding of “drinking water as public good” to “**drinking water as commodity**”. This would eventually pave the way for the establishment of regional water markets, a concept that has provoked international criticism.

## Conclusions

Since Turkish water trading projects are not designed to withdraw water from transboundary rivers but from **national rivers**, the projects do not pose any threat to other riparians claims. As can be seen, water trading by Turkey to potential buyers cannot yet be considered a success: negotiations on technical and financial matters are ongoing. More importantly, it has been proposed that the marketing and management of the Manavgat river's water would need to be operated by a private agency with Turkish and foreign shareholders. This would insulate the Turkish Government from Arab criticism of its sale of water to Israel and assure that the Turkish Government could not easily be pressured into cutting off the supply.

Local interests in Turkey may restrict the amount available for trading and make it necessary to assess the environmental impact of water trading projects.

## 7 Conclusion and Recommendations

The main objective of this study is to analyse and assess the status of cooperation on Turkish transboundary rivers. The study should, in particular, provide an informative source with which to identify potential for enhanced cooperation between the riparian states, and to provide indications for the potential role of the European Union and its member states. The background to the project is the European Union's decision to start official accession negotiation with Turkey in October 2005. The goal of EU accession implies that Turkey is obliged to adopt and implement the entire body of European Environmental Law, covering many, far reaching legal requirements (for example, the Water Framework Directive with significant implications for the member states' international water cooperation), and a couple of international environmental agreements where the EU is the contracting party. Against this backdrop it is expectable that cooperation on Turkish transboundary rivers will become an important issue in accession negotiations and, consequently, demands careful analysis of hitherto achievements and shortcomings. In the EU-Turkey accession partnership, the transboundary water issue has already been identified as a priority issue, which demands short-term considerations and progress.

Consequently, this study provides an initial assessment of crucial water management challenges on major Turkish transboundary rivers, the current state of cooperation and unresolved disputes. However, this desk study was disadvantaged by a lack of available data and a limited amount of existing literature. While the conflicts on the Euphrates and Tigris rivers have already been extensively discussed in international literature, other transboundary rivers, such as the Orontes, Kura-Araks, Coruh or Maritsa have, in general, received far less political and scientific attention. Equally, many documents relating to these waters (e.g. international protocols, agreements etc.) and other necessary data (water flow, use data, impact on infrastructure etc.) were also not easily accessible, making the consolidation of adequate data a challenge.

Clearly, not all gaps in information could be filled, and, as a result, some of our assessments are of a rather preliminary nature and would need further analysis. However, our results illustrate the variety of issues that are (or were) disputed on Turkish transboundary waters and allow for some general conclusions to be drawn concerning cooperation prospects and the potential role for the EU and its member states, such as Germany.

### 7.1 Controversial issues, hitherto agreements and conflict intensity

Our analysis reveals significant and challenging disputes over all rivers under scrutiny that need new approaches and strategies to overcome cooperation obstacles. However, the rather alarming description of Turkish transboundary water disputes having the potential for serious water conflicts appears exaggerated and does not realistically mirror the current situation, even in the most marked water quantity disputes over the Euphrates-Tigris rivers system.

In terms of hydro-political constellations, we have the classic constellation of Turkey being the upstream riparian of several rivers (Euphrates-Tigris, Coruh, Kura), a mixed situation,

because of either many transboundary tributaries (Araks) or shared groundwater bodies (Turkish-Syrian aquifers), and Turkey as the downstream riparian on the Orontes and Maritsa rivers. In addition, there is variation concerning the objects of dispute. While, for instance, the Euphrates-Tigris, the Sarisu (Araks basin) and the Orontes river questions mainly concern guaranteed river flow, the issue of conflict on the Coruh river is sediment flow. Between the Maritsa riparians, flood protection is a matter of concern in addition to water quantity and quality issues. However, water quality generally plays a minor role while quantity / water flow issues still dominate, mirroring respective weak national water quality provisions or their weak implementation.

At present, most disagreements relate to the building of dams which influence river usability downstream. The Turkish water development policy, with its emphasis on hydropower production and irrigation projects by means of infrastructure (e.g. dams) was outlined in chapter 3. In principle, we can assess disputes at transboundary waters as the external consequences of the internal economic development strategy putting strong emphasis on the production of agricultural commodities and on achieving independency from energy imports. Apparently, the Turkish GAP project on upstream Euphrates-Tigris is the most important single Turkish development programme on its transboundary waters which caused the most downstream objections and, in several phases, serious tensions between the riparians. At present, the downstream riparians are demanding augmented, guaranteed river flow and have expressed concerns about the planned Ilisu Dam project. Massive river development programmes are under construction or are planned on other transboundary rivers (e.g., Coruh, Araks, Orontes) but the probability that all the planned works will materialise is not easy to assess.

Even though it is generally not easy to anticipate future water dispute constellations, it can be expected that water quantity issues will gain in importance because of population and economic growth in Turkey and her neighbour states. Importantly, the riparian countries to, for example, the Euphrates, Tigris, and Orontes rivers are pursuing the same development path, where water resource development is perceived to be crucial for economic growth in particular in the agricultural and energy sectors. Consequently, an accentuation of water quantity rivalry at the Turkish transboundary basins cannot be excluded per se. This assessment relates not only to the Euphrates-Tigris rivers but also to other rivers such as Coruh or Kura-Araks. For instance, realisation of all currently planned dams along the Araks river could not only seriously affect downstream water users and freshwater ecosystems, particularly in Azerbaijan, but also cause disputes with neighbouring Iran. The situation on all the transboundary rivers studied, strongly suggests the need for joint efforts to assess and coordinate transboundary water management in order to harmonise basin-wide development, where, apart from water sector demands (energy, agriculture), instream flows and ecosystem protection should also be taken into account.

Transboundary water quality disputes are looming in several basins too, inter alia in the Orontes. Since water quality has seriously deteriorated in several transboundary waters, joint initiatives to improve the situation are clearly required. Another important ecological issue is the protection of freshwater ecosystems. However joint activities by riparians are either lacking or are in an early stage and need additional support. For example, wetland protection issues actually play a role in the Maritsa basin, and the biodiversity value and the protection status of the river's delta could make this issue even more important in the future. Equally, freshwater ecosystems are of pivotal importance in the Kura-Araks basin too as there are

lake areas and wetlands downstream of high biodiversity value. Clearly, the already initiated effort to restore the Mesopotamian marshlands in Iraq could potentially ignite a new demand for coordinated transboundary water management in the Euphrates-Tigris rivers system.

With regard to regional cooperation, there are, at least, rudimentary forms of cooperation and agreements for all rivers. As outlined in the analysis, all these agreements are bilateral and predominantly concern water quantity or border issues. Turkey and its neighbours have not yet agreed on more comprehensive forms of cooperation that would tackle the different aspects of water use and needs (quality, quantity, flood protection, preservation of ecosystems, and prevention of accidents) in an integrated manner and could potentially facilitate negotiations by linking different water management issues. Most of these agreements lack an effective organisational back-up in the form of monitoring or joint dispute resolution mechanisms. On the Euphrates-Tigris rivers, for instance, a number of crises have arisen due to the lack of a regulated consultation mechanisms among the riparians. Between Turkey and the South-Caucasian riparians, there are merely some outdated agreements that do not provide for adequate regulations on the issues of the day. In all cases, questionable data – or simply lacking data – regarding stream flow, water removals, return flow, present water use etc. play an important role in the negotiation processes. In general, available data and information are incomplete and not regularly exchanged between the riparians, making the improvement of the quality and quantity of information on water and land resources in the basins a challenge.

In all aspects, the tense political relations between Turkey and the riparian states have seen a shift towards a more favourable political environment recently. For instance, bilateral relations between Turkey and Syria improved considerably after 1998 and have already proved to be favourable for dealing with water-related disputes over the Orontes and the Euphrates-Tigris rivers. However regulation and development of joint strategies for transboundary groundwater resources is not yet part of the agenda. With the regime change in Iraq, there is an evolving international context too which brings, on the one hand, new downstream claims for water, but, on the other hand, offers new prospects for cooperation. Even though, the political conflict between Armenia and Turkey has not yet been solved, the two countries have managed to sustain working boundary water relations (inherited from the Turkey-Soviet Union period) since the construction of the Arpacay (Ahuryan) Dam in 1986. Furthermore, political relations between Greece and Turkey are, in the meantime, much more pragmatic allowing for a deepening of water cooperation also. Similarly, the already intensifying Turkish-Bulgarian water cooperation could benefit from a shared accession perspective.

Although we assessed and highlighted the risk of disputes escalating in several rivers because of increasing demand for domestic, irrigation and energy production purposes, there are also a number of water development projects and changing water demands, which can potentially contribute to an easing of conflict. For instance, the drastic decline in irrigation agriculture and industrial water use has eased the intensity of water conflict in the Kura-Araks basins. An ease in water rivalry can also be expected from the decline of irrigation agriculture in Bulgaria. A lack of financial resources has caused Syrian irrigation programmes to fall well behind schedule, and initial Iraqi plans are not likely to be implemented soon also. Finally, the future of the various ambitious Turkish development plans is not easy to predict because of increasing financial difficulty and the simple fact that the most favourable locations for dam building have already been developed over the last few decades.

The position of Turkey is strongly characterised by her national economic background of water use. As mentioned previously, the current problems at transboundary waters must be interpreted in the context of the Turkish national development plan. Turkey attempts, *inter alia*, to increase the production of agricultural commodities, to increase the economic well-being in structurally under-developed parts of the country, and to satisfy growing energy demands via water development. This national water development approach, apparently characterised by a classic engineering approach, is complemented by a clear articulation of interest in transboundary water development. Clearly, other riparians, e.g. Syria at the Orontes, Bulgaria at the Maritsa, follow a similar economic development plan and follow comparable water use patterns which may then lead to conflicts over water consumption.

Generally speaking: The Turkish Government follows a combined strategy of cooperation (e.g., building joint dams with Bulgaria, Georgia or Syria, joint training measures with Syria) with, on the one hand, a rather reserved position concerning the conclusion of regional water accords, and, on the other, a *faits accomplis* strategy as downstream riparians' objections usually can not prevent Turkey realising a disputed dam. Clearly, this *faits accomplis* strategy must be interpreted in the context of the often very tense relations with the other riparians (e.g. with Syria and Iraq) who, for their part, have for long followed a veto-strategy by trying to prevent Turkey from achieving its water resource plans.

The main aspects for building cooperation at the transboundary level can be summarised as following:

(1) In the past, Turkey's position regarding international water law was widely perceived as being reluctant, and the fact that Turkey voted against the UN Convention on the Law of the Non-navigational Uses of International Watercourses (1997) supports this view. However, Turkey acknowledges several basic principles of international water law. According to the Turkish position, the principle of equitable and reasonable utilisation should serve as a guiding rule for the allocation of transboundary waters and the settlement of conflicts. Consequently, Turkey pleads for the *limited territorial sovereignty* doctrine but objects to the doctrine of *co-sovereignty of the riparians*, which would strengthen downstream interests (according to the Turkish position) in an asymmetrical manner. However, it seems that Turkey's reservations mainly stem from a reluctance to agree on far-reaching procedural rules (e.g., compulsory mechanisms for dispute settlement; detailed procedures for prior notification). As our analyses of cooperation over the rivers show, this does not mean that Turkey rejects any transboundary cooperation. Interestingly, the historical bilateral agreements which concerned riparians include mechanisms for conflict resolution.

(2) Against this background, the EU accession partnership is one of the rare documents entailing a Turkish commitment to pursue international water cooperation not only in line with the EU's water framework directive but also with international conventions to which the European Union is a party. This commitment concerns, for instance, the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992) which implies a broad range of procedural rules. Herewith, the accession perspective clearly allows for a changed situation regarding Turkey's willingness to accept the basic provisions of regional water law. In addition, an implementation of international and EU regulation on transboundary Environmental Impact Assessments (Espoo-Convention, EU EIA Directive) would certainly show significant progress.

(3) At present, Turkish cooperation is largely of a bilateral nature and mainly based on bilateral protocols that predominantly tackle technical issues and the allocation of water rights. While such an approach might show the advantage of potential negotiations, because of an apparently limited number of riparians and topics, an enlargement of the states cooperating and the issues might offer the countries new mutually beneficial issues and could make the negotiation of linkage issues easier. For instance, an increase in topics for negotiation at the Euphrates and Tigris rivers on the basis of water-related development sectors could probably make the necessary improvements easier to achieve.

(4) Transboundary water allocation is a complicated and politicised issue making the development of a conflict resolution strategy a challenge. Turkey – like most of the other riparians – traditionally did not want third-party involvement in water negotiations. From today's perspective it seems rather unlikely that this attitude will drastically change in the near future even if EU accession will demand new approaches to transboundary water management of Turkey. Thus, transboundary water issues were already identified as problematic issues during the preparation of the EU-Turkey accession negotiations.

(5) In most cases, an adequate data base is still not yet in place; this is strongly demanded by Turkey. However, this fact can be interpreted from different perspectives: On the one hand, a reliable data base is virtually a *conditio sine qua non* for successful water cooperation, where the Turkish insistence on an improved information base is more than understandable. For instance, cooperation on the Euphrates-Tigris rivers clearly suffers from the lack of complete data presently available and the very limited data exchange and joint investigations. On the other hand, the demand for data could be used as a pretext to protract negotiations and new commitments. In this case, this position would rather be part of the *faits accomplis* strategy mentioned above. Irrespective of whether the latter assessment is correct or not, a deepening of water cooperation demands a new culture of information exchange and joint studies at all basins. However, a weak administrative set-up in the riparian states might prevent progress.

(6) Turkey's position on transboundary water issues is also characterised by initiatives and / or proposals to jointly investigate water use and water needs in respective countries, instead of merely negotiating water rights. This paradigm shift is probably best illustrated by the Turkish offer to build joint dams with Georgia that could serve the energy needs of both countries, and the proposed Three-Stage-Plan for the Euphrates-Tigris rivers system. The latter would contribute to water allocations that take into account water needs for agriculture, population, industrial water use etc., and the basin-wide costs and benefits of the different management options. Taking this Turkish proposal seriously, the offer could contribute to a sustainable water management strategy. However basin-wide and needs-based coordination is highly challenging in political terms, including open questions of distribution and institutionalisation. But in the long-term, the shift from water-rights negotiation to a needs-based approach is highly relevant in the context of water scarcity in international basins.

(7) Turkey has already come up with more concrete joint dam development project proposals in the river basins as initiatives for enhancing mutual benefits related to hydropower and irrigation. Joint water storage projects such as the Serdarabad regulator (already in operation) on the Araks river (Arpacay), the Suakacagi Dam (in planning and negotiation stage) on the Maritsa river (Tundja), and the recently proposed dam on the Orontes river (being dealt in current Turkish-Syrian technical talks) are all examples of Turkish initiatives

for joint water development driven by a pragmatic and workable approach to transboundary water cooperation in these river basins.

(8) Although there are only preliminary examples available, Turkey appears to be much more open to international cooperation concerning environmental issues, such as nature protection. This is illustrated by recent initiatives relating to cooperation on nature protection between Turkey and its Caucasian neighbours. Potentially, such initiatives could serve as starting points for broader cooperation in the basins and the development of a more integrated management perspective.

(9) Finally, a trend has developed in Turkish water management strategies suggesting that health issues, water quality aspects, and integration of stakeholders into the decision-making processes have gained in importance. In general, one can observe a somewhat divided national discourse on water management with one 'development centric' branch emphasising water infrastructure development for national economic and energy development reasons, and in contrast, the other rather environment-orientated green branch focusing on environmental and social issues, and calling for improved environmental regulations, the consideration of freshwater ecosystems etc. Consequently, the predominant emphasis on dam building and water infrastructure development as a major instrument of Turkish water policy is increasingly debated with stakeholders. In the long term, this might slow the pace of infrastructure development in the country because political positions which challenge schemes designed solely for infrastructure development, are gaining in importance. In this sense, future infrastructure developments to meet the increasing demand for water-produced services could be counterbalanced by equally important issues such as environmental protection and social harmonisation.

## **7.2 Recommendations**

Based on our empirical findings, we can draw up some key recommendations which consist of both, general strategic elements to support Turkey in transboundary water management, and basin-specific recommendations.

### **7.2.1 General recommendations**

As discussed above, there are still important water management challenges and interstate disputes at the Turkish transboundary rivers, which demand new approaches to international water coordination. In the context of the EU accession negotiations, Turkey should be encouraged to enhance and improve water coordination at her transboundary waters. Clearly, a valuable support strategy should be tied in with general Turkish water sector reforms towards sustainable water management, and the specific instruments and programmes that deal with transboundary water issues. Against this backdrop, the potential components of the supporting activities are the following:

(1) Encourage Turkey to continue developing the already instigated Turkish water sector reforms towards more comprehensive, environment-oriented and socially sound management approaches, including increasing its consideration of the transboundary effects of national water management decisions and national water infrastructure developments;



- (2) Current EU member states and Turkey should share their respective experiences in transboundary water management in terms of information, water allocation, pollution control, financing of measures and organisational approaches to cross-border co-operation;
- (3) Support the riparian states at the Turkish transboundary rivers in technical and data issues, i.e. monitoring infrastructure, data gathering and analysis, hydrological and integrated hydrological economic modelling. In particular, riparian states at all transboundary rivers should be supported in building-up inventories of polluters and pollution sources respectively;
- (4) Support the riparians in identifying joint programmes and projects with a win-win character, including innovative benefit- or cost-sharing mechanism elements. Here, the transferability of positive international experiences and state-of-the-art knowledge should be jointly discussed with the Turkish Government;
- (5) The German government should invite Turkey to join the above mentioned Petersberg Process, which could provide an adequate framework for the beginning of the suggested reinforced exchange of experiences;
- (6) The European Commission and the German government should encourage international research activities, whereby interdisciplinary research projects comprising the different water-related disciplines should develop possible solutions for transboundary water management problems and assess the expected consequences, including environmental, social, and economic effects;
- (7) Assist in Turkey's preparation for the implementation of the WFD's provisions relevant for the management of transboundary rivers, including the required coordination of the riparians and the implementation of the WFD's public participation requirements. Possible elements and means are joint diagnosis and assessments of the current state of the waters, a dialogue with the riparians via support workshops, technical meetings etc. Here, the EU and the member states should demonstrate the different possible administrative, technical, and organisational approaches to the implementation of the WFD. Potentially, a transboundary pilot basin scheme for the implementation of the WFD could be chosen in order to facilitate the implementation of the WFD, and to demonstrate the transboundary implementation needs (preferably for the Maritsa river basin);
- (8) Develop an EU-Turkey Twinning Project on the implementation of the WFD at transboundary river basins, which should be realised in cooperation with the Turkish Ministry of Foreign Affairs and established in the water department of the Ministry;
- (9) Support Turkey to improve the national capacity relevant for the implementation of the procedural rules of EU environmental law, including the Environmental Impact Assessment Directive and, in particular, its provisions relating to national projects with significant transboundary environmental effects;
- (10) Encourage Turkey to comply with the demands of multilateral environmental and water-related agreements, which are to be implemented by all EU member states. In this context, the most relevant pieces of regional water law with direct implications for transboundary water management are, inter alia, the UN-ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, the Aarhus Convention, and the Espoo Convention;

(11) Initiate a dialogue between the EU and Turkey relating to the recommendations of the World Commission on Dams and its potential implications for the development of water infrastructure within the EU member states;

(12) Expand cooperation with Turkey in implementing international environmental agreements with positive side-effects on the management of transboundary rivers, for instance, intensified cooperation and exchange of experience relating to wetland protection (Ramsar Convention) and erosion control (UN Convention to Combat Desertification).

## 7.2.2 Basin-specific recommendations

In addition, the following aspects might serve as preliminary points for the development of regional and basin-specific supporting strategies:

### The Euphrates-Tigris and Orontes rivers, and Turkish-Syrian groundwater resources

In general, there is a need to work towards a joint platform which includes all riparian countries, and to establish consultation mechanisms to harmonise basin-wide development efforts. This would also mean taking an integrative perspective on water development, use and protection, including in-stream flows.

At present, it seems very unlikely that Turkey would welcome direct involvement by third parties in negotiations on transboundary water issues. However, there are some areas of action which might positively impact on transboundary water management.

The German Bank for Reconstruction and Development (Kreditanstalt für Wiederaufbau)<sup>82</sup> has already provided funds for constructing wastewater treatment facilities in some of the larger cities in Southeast Turkey (e.g. Diyarbakir on the Tigris) thus improving water quality. Others sites relevant to transboundary water quality control, not only in Turkey, should be considered.

As mentioned earlier, there is a serious lack of **reliable data**. If wished, joint initiatives to create reliable data related to surface and groundwater resources could be promoted.

At present, Turkey and Syria struggle on how best to design groundwater inspection policies. This could be promoted by a research project comprising of a team of Turkish-Syrian researchers, from both academic and public institutions.

Using the programme of the Joint Communiqué (2001) as a template, support could be provided, for example in developing and implementing **participatory irrigation management approaches in agriculture**, designing strategies for efficient water use and to control salinisation in agriculture etc. Moreover, a broadened agenda of cooperation could be facilitated for the sustainable use of the region's land and water resources.

Joint projects could be encouraged in **water-related development fields** such as energy, agriculture, environment and health. This strategy may be able to gather the riparians around a basic objective to deal with water management within the larger picture of overall socioeconomic development and integration of the underdeveloped regions in Turkey, Syria and Iraq.

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<sup>82</sup> [www.kfw-entwicklungsbank.de/DE/Laender%20und%20Projekte/Europa32/Turkey79/Inhalt.jsp](http://www.kfw-entwicklungsbank.de/DE/Laender%20und%20Projekte/Europa32/Turkey79/Inhalt.jsp), [29 September 2005].

Since all countries are pursuing water resource development by means of infrastructure (dams), support can be provided on how to adequately deal with **environmental and social issues** in the **planning and implementation phases of dams**.

### **The Kura-Araks basin**

Current cooperation suffers, inter alia, from a lack of **reliable data**. Activity could be targeted on the exchange of water flow and water use data, water quality etc. Although there are already several projects ongoing, the set-up and / or the improvement of a working and well-adapted monitoring infrastructure is urgently needed.

Support can be provided in shaping the **agricultural development strategy** in the Kura-Araks catchment area in a sustainable and participatory manner. In addition, diffuse pollution from agricultural sources is a matter of concern that provides room for cooperation.

Current programmes and initiatives largely focus on the three south Caucasian states of Georgia, Armenia, and Azerbaijan, with Turkey as a marginally (if at all) involved partner. Clearly, **water quality** is a prime transboundary issue between Georgia and Azerbaijan, but there are relevant water quality issues along the Turkish-Armenian and the Turkish-Iranian border too. Here, bilateral measures to control emissions from point sources and diffuse sources could serve as starting points in the region. In addition, Turkey and Iran should be invited to join the existing transboundary efforts for hazard prevention. Equally, Turkey should be encouraged to join the UNDP/GEF Kura-Araks project.

Because of the outstanding value of **biodiversity** in the basin, there are a couple of internationally relevant nature protection issues that have not been adequately addressed yet; for instance basin-wide approaches to wetland protection, integration of ecological instream uses and transboundary protection areas. The German Bank for Reconstruction and Development (KfW), the German Agency for Technical Cooperation (GTZ), and the German Federal Nature Protection Agency (BfN) already support nature protection within the Kura-Araks river basin.

In the long-term, uncoordinated realisation of all existing **water infrastructure development** plans in the riparian states, in particular in Turkey and Iran, would negatively affect water availability downstream and harm water-dependent ecosystems. Therefore, enduring dialogue between the riparians on infrastructure development should be facilitated. In this context, the long-term inclusion of all riparians is crucial.

### **The Coruh basin**

Bilateral cooperation between Turkey and Georgia benefits from good political relations and extends to water-related fields such as nature protection. However, in order to tackle the 'sediment conflict' and to ensure sustainable management of the river, international support can be helpful to accelerate water cooperation.

According to EU law, Turkey should be assisted in carrying out a state-of-the-art **environmental impact assessments** for the planned dam cascade on the Coruh river. In this context, the sediment question has to be addressed and carefully studied.

Despite good relations, water cooperation between the two countries still suffers from a weak legal foundation and a largely absent organisational back-up. Support may be provided in

order to establish a **permanent bilateral cooperative structure** and to strengthen bilateral monitoring of the planned infrastructure.

Since both countries already cooperate in ongoing activities to improve the **ecological state of the Black Sea**, the Coruh river dispute and the assumed effects of the infrastructure on the coastal zones could be addressed within this framework. In addition to bilateral cooperation at the Coruh river, the erosion issue at the Georgian Black Sea coast demands a comprehensive and long-term approach for which the multilateral Black Sea Cooperation might be an adequate platform.

The ecological state of the Coruh river and the related coastal ecosystems should be subject to supplementary **scientific studies and analyses**. International support may be helpful in developing sufficient capacity and in supplying adequate resources.

Based on careful assessment of the sediment management issues, various **technical cooperation measures** could be designed and implemented in order to reduce negative downstream effects. The transfer of international experience coupled with a technical approach to sediment management in the context of dam building should be analysed.

### **The Maritsa basin**

Even though agreements exist between Bulgaria and Turkey and between Bulgaria and Greece, the exchange of information and the operation of dams during floods have not been satisfactorily. Support could be provided to the three riparian countries to establish a **joint programme for flood warning and control**.

The same refers to the **prevention of hazards**. A joint programme for transboundary cooperation on hazard prevention could, for example, be the scope of an EU Twinning project. The German funded programme in the Kura Aras basin serves as a good example.

Several initiatives touch on the issue of transboundary co-operation in the basin. Building on these initiatives or providing technical or financial support to them could improve the **status of ecosystems and biodiversity** in the basin area and foster co-operation between the riparian countries in water management.

**Water quality** in the basin suffers from the discharge of insufficiently treated domestic wastewater, mainly in Bulgaria and Turkey. Solving this problem requires major investment. Financial support as provided by EC programmes and development banks could be flanked by initiatives promoting co-operative approaches and the exchange of knowledge and know-how between riparian countries.

The major user of water in the basin is irrigated agriculture in both Bulgaria and Turkey. Promoting joint riparian efforts to increase **water use efficiency in irrigation** could not only help to reduce pressure on available water resources, but also foster co-operation in water resource management. The same applies to efforts on reducing pollution by agricultural run-off.

Aspirations for EU accession require all riparians in the Maritsa river basin to adopt the **WFD and UNECE Water Convention**. Using the Maritsa river basin as a **pilot area**, Bulgaria and Turkey could be assisted in implementing the relevant legislation thus providing an agenda for transboundary cooperation. Such an initiative could finally aim at the establishment of a trilateral river basin commission, in the same way as they exist in other European transboundary basins.

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## **ANNEX 1**

### **Analytical background – the current debate on transboundary water issues**

The management of transboundary waters has received much political and scientific attention in the last few years. This widespread interest in this issue can be traced back to the fact that international cooperation on transboundary waters is a crucial condition for sustainable management of rivers and groundwater bodies, because of various resource interdependencies. Clearly, the often cited new international consensus on water reforms that are necessary in the form of an 'Integrated Water-Resources Management', demands effective interstate coordination if the complex task of management should adequately be addressed. Since water management in one country regularly has an impact on the water resource conditions and the waters' usability in another, riparian states have to agree on water use and protection measures in one way or another. One particular challenge is the fact that rivers are regularly characterised by upstream-downstream constellations where water use in the upstream state inflicts water availability, or water quality changes, on the downstream region. Since such constellations are constituted by unidirectional externalities, downstream states do not dispose of the means to directly and physically influence the upstream resource use in the same manner (cf. Rogers 1997). Consequently, upstream-downstream situations at international waters are considered to render interstate cooperation of riparians particularly complicated because, usually, incentives to cooperate are not uniform between riparians (see Klaphake 2005). Clearly, the distribution of political, military, or economic power also plays an important role as powerful downstream states – for instance Egypt in the Nile basin – can usually influence water uses in 'weaker' upstream states.

Transboundary water management, however, has also attracted growing attention in recent years because of the socio-economic and security dimensions of water scarcity in many regions of the world. Potentially associated with increasing resource scarcity are, on the one hand, reduced prospects for socioeconomic development in affected countries, and, on the other, unstable security and political destabilisation between riparians. Today, water scarcity is already being perceived as an important threat to national economic and social development in many countries that face limited availability. Surely, water scarcity can be overcome by institutional, economic, social, and technical innovations (Ohlsson 1999). However necessary water reforms are often highly demanding in institutional and political terms because long established resource use patterns must be changed and important water uses surrendered, causing political obstacles and potentially undesired social or economic side effects. Within or between states, water scarcity can assume a contentious role when important water-dependent economic sectors such as agriculture, can no longer be supplied.

While most of the negative consequences of water shortage and conflicts over resource use occur on a local or regional level, water scarcity and the associated risk of increasing conflict certainly take on an interstate dimension too. In particular, riparian states of transboundary waters that heavily rely on water availability for food production and energy are likely to enter into rivalry in cases of uncoordinated increase of water use resulting from water shortages (see Ohlsson 1999).

But is the aggravation of conflict and destabilisation of relations between the riparians in water-stressed basins inevitable? The emerging consensus in water scarcity-conflict literature says “apparently not” and points to the fact that water scarcity is not only a source of conflict but also a highly important trigger for cooperation (cf. Wolf 1998). Clearly, conflicts around shared water resources can intensify, but so can the conflict resolution-processes. In the event of water scarcity, states are principally able to adopt coping strategies and, in particular, to start initiatives in order to reach consensus with neighbouring states, prior to risking comprehensive destabilisation of relations (cf. Sadoff and Grey 2002). In fact, a couple of studies have shown that the simple equalisation Water Scarcity = Water Wars lacks empirical relevance and conceptual justification (Wolf 1998, Beach et al. 2000, Elhance 1999).

Thus, pessimistic predictions on inevitably escalating water conflicts does not appear to be justified, but effective international water cooperation is, however, not a trivial task in political and institutional terms, either. Available information on transboundary water management has convincingly demonstrated that cooperation of riparian states is regularly characterised by long-lasting and difficult political processes. Interstate water disputes frequently concern not only the different ‘rational’ interest of the states concerned but possibly diverging attitudes, values, and cultural perceptions relating to the resources in parallel. Clearly, water cooperation is significantly supported and facilitated in those cases where a favourable institutional framework for interstate cooperation – e.g. in the form of international law, treaties, river committees, shared management norms, dispute-resolution mechanism etc. – is in place. In general, the existence of regimes<sup>1</sup> can encourage cooperation via the institutionalisation of cooperation, increased accountability, and transparency. Accordingly, regimes lower the cost, risk and uncertainty of cooperation and of achieving security. According to Haftendorn (2000), regimes in the context of transboundary water disputes exist “when the affected states [...] observe a set of rules designed to reduce conflict caused by use, pollution or division of a water resource” More simply put: within the context of a dynamic water regime forming at contested transboundary rivers and increasing economic integration, interstate differences on water resource uses may converge towards cooperation and riparians may ‘learn’ to cooperate.

The regime theory perspective offers a conceptual framework for water cooperation and allows for prerequisites for regime building and effective transboundary water cooperation. In general, the regime theory points to the fact that cooperation between states needs an institutional framework to become effective. Clearly, jointly accepted norms of international water law could significantly ease conflict. In addition, basic institutional provisions such as rules of notification, exchange of data etc. may be important elements; the same is true for joint investigations, common research activities etc. In the long run, riparian states should attempt to identify ways of sharing the benefits of transboundary river management to stabilise cooperation via the mobilisation of the riparian states’ economic and political interests.

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<sup>1</sup> As defined by Krasner (1983), a regime is a “complex of principles, norms, rules and decisions-making procedures around which actors’ expectations converge in a given area of international relations”.



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In addition, basin-wide activities with the objective of enhancing water use efficiency and to minimise water loss can reduce the pressures on resources and help to cope with interstate disputes too. In this context, third parties (international organisations, individual states) might assume the role of a facilitator and/or mediator and, thereby, provide an important contribution in the early stages of cooperation.



## ANNEX 2

### Translations of bilateral water agreements

Annex	Basin	Parties	Year	Title
2.1	Maritsa	Greece - Turkey	1934	The agreement pertaining to the construction of hydraulic facilities on both banks of the Meric-Ebros River
2.2	Maritsa	Greece Turkey	1963	Protocol on the improvements of the River Meric watercourse that constitutes a significant portion of the Turkish-Greek Thracian Border
2.3	Maritsa	Bulgaria Turkey	1968	Agreement between the Republic of Turkey and the People's Republic of Bulgaria on the Cooperation of the Utilization of the Waters of the Rivers Flowing in the Territories of the Two Countries
2.4	Maritsa	Bulgaria Turkey	1975	Agreement on Long Term Economic, Technical, Industrial and Scientific Cooperation between the Government of the Republic of Turkey and the Government of the People's Republic of Bulgaria
2.5	Maritsa	Bulgaria Turkey	1993	Agreement on Assistance and Cooperation in the Field of Water for Reducing the Negative Effects of the Drought of 1993
2.6	Kura-Araks	USSR Turkey	1964	Protocol and its attachments on the meeting of the Turkish-Soviet Joint Commission pertaining to the construction of a joint dam on Arpacay (Ahuryan)
2.7	Kura-Araks Coruh	USSR Turkey	1975	Cooperation Agreement between the Government of the Republic of Turkey and the Government of the Union of the Soviet Socialist Republics on the construction of a dam on the Arpacay (Ahuryan) boundary river and the Constitution of a Dam Lake
2.8	Kura-Araks Coruh	USSR Turkey	1990	Agreement on the Cooperation for the Construction of Hidrotechnical Facilities for the Prevention or Correction of the Riverbeds of Arpacay (Ahuryan) Coruh River, Posof and Caksu Streams extending between the border stone number 41 through border stone number 450 on the Turkish Soviet Union border
2.9	Euphrates	Turkey Iraq	1946	Treaty of Friendship and Good Neighbourly Relations signed between Turkey and Iraq

## Annex 2.1

No. 184- Law on the ratification of the agreement pertaining to the construction of hydraulic facilities on both banks/shores of Meric-Ebros river concluded in Ankara on 20 June 1934 between the Republic of Turkey and the Republic of Greece.

18 May 1935

Law Nr. 2719

Article 1- The agreement pertaining to the construction of hydraulic facilities on both banks of the Meric-Ebros River, signed on 20 June 1934, between Turkey and Greece, was ratified and certified.

Article 2- This law shall enter into effect on the date of its publication.

Article 3- The Ministry of Foreign Affairs shall be responsible for the execution of this law.

### **Turkish-Greek Agreement on the construction of water facilities on both banks of Meric River.**

The Republic of Turkey on one hand and  
The Republic of Greece on the other

Desirous of regulating the hydraulic facilities on both banks of the river Meric within the friendly spirit that exists between the two nations and have decided to conclude this agreement to this effect:

The President of the Republic of Turkey has appointed:  
His Excellency Menemenli Numan Bey, Secretary General of the Ministry of Foreign Affairs,

The President of the Republic of Greece has appointed:

His Excellency Sakellaropulos, Extraordinary Envoy and Minister Plenipotentiary to Ankara.

After presenting their credentials of authority have agreed on the following issues:

### PART ONE

Provisions and conditions pertaining to the facilities currently in existence.

#### 1- Facility to be removed

Is currently existing on the river and the facility mentioned below shall be removed as soon as possible.

- 1) The foundation piles of the ancient Decauville bridge located immediately at the downstream of the Marassia-Maras village;
- 2) Two dams at the mouth of the river and in the vicinity Gemicikoyu-Gematu towards Turkey and the spurs under construction (section to of the Kuckuncukadasi-border limitation protocol)
- 3) The mill dam carried away by water and located at the upstream of Edekoyu-Pactii and the spur just a little above the said dam towards Greece,;
- 4) The brick wall at the point where the Cayade delta forks out and in the vicinity of the Turkish checkpoint.

#### 2- Facilities to remain in place:

All the other facilities that actually exist on the river such as the protective wall, dikes, spurs, small spurs, etc., shall be retained as they are until preparation of the project (B) which will set out the

rules in respect to these facilities. It should be well understood that this preservation of the facilities should not imply in any way, the development that will carry the facilities beyond their lines of operation, or modification thereof. It is also well understood that the term retention shall not imply the repair of the devastated spur. The measures taken on these facilities in order to continue to deride their intended use shall not mean improvement or extension of the existing facility. Such maintenance works may only be performed after notifying the other party ten days in advance of the actual date of work. As the Turkish delegation had requested the removal of the closing dike in the direction of the mouth where the river meets at the Kuleburga (Pythion) downstream and which obstructs the natural flow of the river at the border marking number 23, marked by the border limitation commission during 1925-1926 on one hand, the Greek delegation had requested the removal of the spurs at the Nazimbey Ciftligi shores, which gave the appearance of encroachment, it was decided to incorporate this matter in the review to be conducted in accordance with section 11 of project (b) of this agreement, and the 20 kilometer portion of this project shall be included in the review.

Leaving or removing of the dikes on the shores of Turkey facing Kurtbucagi (south of Poros-Kaldirkos) in project B shall be stipulated after the review stated in part II.

## PART TWO

Hydraulic facility to be constructed.

- 1) Provided that prior notification of one month is given, determination of the type of facility each party is to build at its liberty.

These facilities shall be in three types:

- a) Frontal protection walls of the river shores,
  - b) Dikes,
  - c) Spurs
- a) Provided that the base is not broader than 4 meters in the river bed as of the revetment, and does not exceed the water level of 50 centimeters at most the frontal protection walls may be made in any shape or form and out of any material. The thickness of the revetment may not exceed one meter. However, the situation is different for sustaining walls. In this event the thickness of the wall shall be calculated according to the material to be used and the pressure it will be exposed to.

If wooden piles are to be used for frontal protection, the width of the facility may not exceed 3 meters from the shores when the level of water is at its lowest.

Generally frontal protection may be erected at the places where the river is eroded or where there is the possibility of erosion. They shall in no way be erected at the convex or the tips of the shores.

- b) The dikes shall be submersible, and proportionately short in length, shall be parallel to the river or inclined to the river. The purpose of the dikes is to protect the inhabitants thereat from floods. These shall be erected at steep shores at points that are threatened with being destroyed by floods. Likewise, permission shall be given for the construction of these dikes around the villages and at desired heights to protect the villages from flood waters. It is well understood that Turkey is authorized to construct any type of hydraulic facilities in the area between the Arda Bridge and border marking number 23, granted that, such works shall be restricted in accordance with the international laws and other laws that Turkey is a part of, if the work performed adversely affects the Greek territory.
- c) Permission shall only be granted to build small spurs at the concave places caused by erosion. The maximum length of these spurs shall be 7.50 meters at the place of erosion and this length shall

gradually be shortened as the erosion decreases and shall be drawn to it at the place where the erosion begins or ends. These spurs shall be perpendicular to the low flow and their heights shall not exceed the natural floor on the shore and its tip shall be equal to the level of the low water. It shall be sloped above the low flow and shall be 45 degrees at the base. Spurs shall not be built at places where the river separates and where islets are constituted.

- 2) Hydraulic facilities to be built after the joint review of the gradual stages for the reinforcement of the main bed of the river.

Both States shall begin the reinforcement of the main bed coasts in the joint section by taking into consideration the effects caused by the main and the secondary tributaries flowing into the river. If a correction needs to be made in the bed of the river in the study conducted as a result of this process, such correction shall be made with an agreement concluded between the parties in this regard.

The said process shall be conducted in sequences at the places where the river separates the common watercourse from the source to the downstream of the river. Each section must be 20 km long. The said process shall be conducted by both parties together and shall be completed within the period specified in the study prepared in this regard.

The drawing of topographic maps shall begin from the direction of the source and obtaining of the first maps starting from the Bulgarian border shall begin in the summer of 1934. The competent authorities of both parties shall mutually determine the details that will go into making the topographic maps through the use of precision triangulation and measuring equipment. The repers and the points of triangulation determined by the border limitation commission shall be included in this triangulation study. As the topographic maps are completed piece by piece, the advance drawing for each section or the whole part and the advance drawing shall be submitted to a third party expert. The advance drawings to be prepared by the said party shall include the execution schedule.

After the approval of the advance project by both Governments, each government shall prepare the final project based on the advance drawing for the place(s) where the advance drawing pertains. These final projects shall be submitted to the approval of both governments and shall only be executed after such approval. The disputes that may arise in this regard shall be solved by means of an arbitrator.

- 3) Urgent actions that could be taken, through agreement, during the time to elapse until the implementation of project B.

Without prejudice to the procedures stipulated in part III of this agreement, urgent individual works may be executed by each of the contracting parties provided it is submitted to the approval of the other party beforehand.

- 4) A preparatory hydraulic facility contained in (Plan A) for the improvement of the Meric –Ebros valley and which in any case is beneficial.

The study and construction of a large hydraulic facility for the general improvement of the Meric-Ebros River, that is the works to be performed by both parties for the protection of the land from large floods. The construction of such a facility shall be postponed because it does not seem possible to build one for a period of ten years.

Along with this, as it is necessary to conduct observation for all types of studies, and not only the studies for the above, both parties have decided to establish observation stations (rainwater measuring stations and water measuring stations) as of now.

The competent authorities of both parties shall conclude an agreement on the quantity of such stations, their types and locations and the preparation of the observations to be made there, their operation, and the manner in which the parties shall inform each other of the observations made at these facilities.

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### PART THREE

Procedures to be followed in the determination of the studies and the execution of the works stipulated in paragraph 3 of Part 2.

The party that wants to conduct such work at its own shore shall prepare a technical study related with the work, in duplicate copies, and submit it to the other party. The party receiving such a request must reply within 3 months approving such a request without any conditions, or accept it with certain changes, or that it is totally against such a request. If the party receiving such requests unconditionally approves the request within 3 months or remains silent during that period, the party which has submitted this request shall become entitled to perform the works provided that the works are in accordance with the study submitted. All modifications that need to be made prior to the start of such work or found necessary during the performance of the work shall be notified to the other party in the same manner. If the party receiving the request denies concurrence or sets forth conditions, which cannot be accepted by the requesting party, the dispute to arise in this regard shall be solved amicably and if this is not possible it shall be referred to arbitration.

If the party that wants to initiate any work finds it beneficial, it may submit an advance drawing that the other party may use for its approval. Nevertheless, this shall not bind the other party receiving the request on its discretion to approve or decline. That is, the party receiving the request may abstain, temporarily from giving the approval even after receipt of the final drawing.

Obtaining of the topographic maps and the performance of the hydraulic observations for the performance of the studies mentioned above shall be subject to the rules stipulated in the following paragraphs.

#### 1) Topographic maps:

If it becomes necessary to obtain topographic data of the other party to conduct the above studies or for the information of the other party on the measuring and observation to be made thereat, or to obtain intersections in length and width throughout the length of the river, the concerned party shall submit a letter to request such a map indicating the extent and the scale of the topographic map. The party receiving the request shall reply to the other party within one month as of the receipt of such a request that it concurs with this request, and to determine a date as close to the date of request, or if the expenses involved with such a study is to be borne the requestor or the party receiving the request, or if the requesting party shall use its own personnel and equipment in preparing such a map. If the disputes to arise from the performance of such work cannot be resolved amicably they shall be referred to arbitration.

#### 2) Observation of Springs:

Each of the parties, on their own territories and at the bridges whose sections end on the territories of that party, may construct observations stations without seeking the approval of the other party and conduct observations thereat giving the time of the observation and the place where the observation is to be made ten days prior to the date of the observation.

If one of the contracting parties wants to establish an automatic reading water station, it must first of all submit the drawing of such a station and obtain the approval of the other party. The party receiving the request is obliged to reply within three months as of the date of the request. The contracting party may request that modifications be made in the project or may abstain from giving its approval. In this event, the dispute shall be resolved through arbitration. If the party receiving the request fails to reply within the prescribed period, the other party may construe this as approval and may begin construction at the end of the specified period.

### 3) Measuring the speed of water:

Either of the parties shall only be able to measure the flow of the Meric-Ebros river with measuring equipment provided that the party wanting to make the measuring gives, a ten days prior notice, informing the other party about the nature of the measuring involved, the duration of the measuring, and the equipment and materials to be used.

If it is desired to conduct the measuring with fixed equipment and tools, the procedure to be followed shall be the same as the one prescribed for automatic water measuring stations in paragraph 2 of part 3.

If it becomes necessary to obtain the length and width of the intersections, the procedures prescribed in paragraph 2 of this section for topography shall be followed. That is, the prior notification that needs to be given is limited to only ten days.

### 4) Miscellaneous provisions and conditions:

- a) The competent authorities of both, by working hand in hand with each other, may prepare and implement regulation that will allow the production of fish in the main waters of the river. This regulation shall contain provisions, which will prohibit the damming of the river waters, and change the course of the river and direct the removal of such items.
  - b) Because the border marking number 24 was washed away by the current it shall be reconstructed in the summer of 1934.
  - c) Because there are numerous trees and brushes piled up in the bed of Meric –Ebros, which hinder the flow of the water and cause damages in the course of the river, there will be tree cutting in accordance with plan B and this work shall constitute one of the elements of the said plan. Because there is a greater urgency for the trees to be cut near Kuleliburgaz-Python where the railroad crosses the river on the Turkish side, the tree cutting should be performed without waiting for the implementation of plan (B).
  - d) The competent authorities of both parties shall reach an agreement to remove the trees and their stubs, which hinder the flow of the river at some sections, as soon as possible.
  - e) New plantation either directly or through planting shall only be permitted in the concave and eroded sections of the shores.
- 3) As set forth in the various paragraphs of this agreement, letters which convey the purpose of the work to be performed and which do not require the approval of the party shall be submitted to the governor of Edirne or to the Meric-Ebros commission.

## PART FOUR

### Performance of the work and controls on the maintenance of the facility

In accordance with the provisions in the preceding sections, the party concerned shall notify the other party of the starting date of the construction and maintenance works for which permission has been obtained and for the other party to control the works during the performance of the work and until the completion of it. This control shall be performed by an expert and when necessary a military officer shall accompany him in his checks. Such experts shall check, on-site, the facility to see if it has been constructed in accordance with the conditions stipulated in the agreement and the procedures set forth above and if they comply with the approved drawings.



The concerned party shall render all the necessary assistance to the party performing the work from the beginning until its completion.

In the event, the above mentioned commission, after the on-site inspection, determines that the work performed does not comply with this agreement or the approved drawings or the modifications decided to be made later, the concerned party after the receipt of the notification to this effect, is obliged to suspend the works it is performing or to demolish the facility or to modify it in the manner recommended.

All disputes that may arise from the interpretation or the implementation of this agreement by the Supreme Contracting Parties shall be referred to arbitration if the efforts for a mutual solution fails, and if an agreement cannot be reached the matter shall be referred to the International Court of Justice in accordance with article 22 of the Agreement between Turkey and Greece on friendship, neutrality and reconciliation, dated 30 October 1930.

If the concerned party is found to be right with the decision of the court, the work that was suspended on grounds that it did not comply with the provisions of this agreement or the drawing or the modification thereto may be resumed.

The expenses incurred because of the suspension or the demolition of the works, and reconstruction of the facility shall be borne by the party that caused the delay or demanded the demolition. The amount of compensation shall be determined by the court.

This agreement shall remain valid for a period of ten years as of the date of exchange of the ratification. Provided that notification is served six months prior to the expiration of this period, this agreement may be terminated by one of the contracting parties. If neither of the parties exercises this right it shall be automatically extended for another ten years.

This agreement was concluded in Ankara on 20 June 1934.

Sakellarpoulos

Numan

## Annex 2.2

REPUBLIC OF TURKEY  
OFFICIAL GAZETTE  
9 JANUARY 1967  
MONDAY  
NR: 12499

LAW

The Law pertaining to the approval **Protocol dated 19 January 1963 on the improvements of the River Meric watercourse that constitutes a significant portion of the Turkish-Greek Thracian Border.**

Law Number 813                      Date of Acceptance: 27/12/1966

Article 1- It was found appropriate to ratify the enclosed protocol signed in Ankara on 19 January 1963 between the representatives of the two governments on the adjustment involving the change in bed occurring in five different places due to the improvement works being performed on River Meric which constitutes a significant portion of the Turkish-Greek Thracian border.

Article 2- The Council of Ministers is authorized to conclude the agreements arising from this Protocol.

Article 3- This law shall enter into force on the date it is published.

Article 4- The Council of Ministers shall execute the provisions of this law.  
3/1/1967

PROTOCOL

In order to resolve the dispute arising from the execution of the hydraulic works on both banks of the Meric-Evros riverbeds, the Turkish-Greek technical teams comprised of the individuals listed below shall:

The Turkish side:

1. Arif Onat: Vice Director General, General Directorate of State Water Works.
2. Sadettin Acar: Deputy Chief, Projects and Construction Department
3. Mufit Kulen: Deputy Chief, Projects and Construction Department
4. Ihsan Baltaoglu: Deputy Regional Director, XIth Regional Directorate of the General Directorate of State Water Works.

The Greek side:

1. Nicolas Chorafas: Professor at the University of Thessalonica and Inspector at Construction Affairs
2. Stavros Triantaphyllidis: Director of Hydraulic Construction Works of the Greek Ministry of Construction.
3. Kimon Kyriacos: Technical Advisor
4. Constantin Kougoulos: Western Thrace Construction Works Chief.

This team, duly authorized, convened at the General Directorate of State Water Works and held negotiations during 8 January 1963 through 16 January 1963.

Through continued discussions and review in depth of the works performed and to be performed the parties have come to an agreement in the following manner on the land to be exchanged resulting from this.

## SECTION I Exchange of Land

### ARTICLE -1

Because of the construction works to be performed in order to prevent floods from the rise in the water level of Meric-Evros River, some sectors of the borderline shall be modified. Therefore, it has become necessary to exchange some land in the said sectors. In order to accomplish this exchange, the borderline determined by the Joint Border Commission, established during 1925-1926 in accordance with the Lausanne Treaty, shall be taken as the basis. The land to be exchanged between the two countries shall be equal in area and in case of an ultimate exchange the values of the lands exchanged shall be taken into consideration.

### ARTICLE-2

It was found appropriate to perform the land exchange in two stages. In the first stage, a portion of the land in the Enez sector and the portion of the land in the Ferre sector shall be mutually exchanged. In this manner, the borderline existing in the form of a river in this sector shall be significantly converted to a land border. The area of the land to be exchanged in the first stage shall be equal.

The final determination of the borderline shall be in the second stage and shall be in the following manner.

The starting point of the land border line in the Enez region shall at a maximum of 50 meters to the west from the Ipsala barrier and the Meric-Evros river bed intersection point, and shall terminate at 100 meters to the west of 0+000 of the HARZA Project barrier. There will be no change in the said border between the source and the Ferre intersection. The existing borderline between Ferre upstream intersection and the Peplous downstream intersection shall not be changed. The existing borderline up to the Saricaali (Tyhion) intersection that is not shown in the HARZA project but found appropriate by the parties during the negotiations shall remain unchanged. And finally, the Saricaali (Thyion) intersection, which will be dealt with in the near future, shall remain as a river border.

Both parties have agreed to have the borders drawn in the manner specified above and have agreed to exert all their efforts to accomplish this.

Without prejudice to the provisions in article 23, the exchange made in the first stage shall be final. Only the lands to be exchanged in the second stage, in order to insure equality in their areas, may be altered in the Enez sector. In any case, the borderline shall remain to the west of the barrier to be constructed in this sector.

### ARTICLE -3

The area of the land to be exchanged between the parties in the Enez and Ferre sector shall be approximately 1,750 decares. This figure may increase or decrease by 10% in case a new route other than the one specified in HARZA project is used. A significant portion of the land that will be transferred by the Greek side in Enez for the land in Ferre shall be to the east of the barrier proposed in the HARZA study. The borderline to be determined according to the new route of the barrier may

exceed the barrier route specified in the HARZA Project at most 50 meters to the west, in certain sectors. 9/10<sup>th</sup> of the land to be exchanged by Turkey at Ferre shall be to the west of the barrier route to be constructed according to the HARZA Project and the remainder shall be to the east. This final unprotected section parallel to the barrier shall be equal in thickness throughout its length.

#### ARTICLE -4

Both governments shall exert their best efforts to complete all the necessary formalities for the realization of the land exchange following the entry into effect of this protocol. To the extent of enacting a law, to the constitution of a joint commission to draw the border line, if necessary and to erect barbwire throughout the border line, with the expenses split in half between the parties. Both governments agree to use all their means to accomplish the practical and legal aspects of the first stage by 15 July 1963.

#### ARTICLE-5

Along with the works to determine the borderline, a joint team, comprised of experts, shall begin to work on the assessment of the value of the lands to be exchanged. If there is a difference in value, the party owing the money shall deposit the amount in question in foreign currency to the account number of the recipient with a Swiss bank and this amount shall be blocked until the exchange in the second stage is completed. The said account shall be independent from the economic, trade or other relations between the two countries. If a dispute arises between the members of this team, upon the request of one of the parties, the matter shall be referred to a General Engineer to be appointed by the French Ministry of Agriculture.

#### ARTICLE-6

The Greek government undertakes to re-construct the Peplos barrier according to the HARZA project in the year 1963.

#### ARTICLE -7

The Turkish Government, at its discretion, shall be entitled to fortify the Peplos enclosing barrier in the dimensions specified in the HARZA project, with its own measures of protection.

#### ARTICLE-8

The Greek Government shall fully retain the right to establish a drainage network and a pumping station in the Peplos covered area to be created in this manner.

#### ARTICLE -9

The Greek Government, at its discretion, shall be fully entitled to construct a barrier according to the dimensions specified in the HARZA project or smaller, in the sector to be left to it in the Ferre sector.

The Turkish Government, at its discretion, may erect a barrier at Ferre and may establish a pumping station, within its own boundaries, to drain the water from the covered area to be created in this manner.

#### ARTICLE -10

The Greek Government fully retains the right to establish a protective barrier within the Greek soil and along the borderline in the Karaagac sector without having to pay any compensation to Turkey for any reason whatsoever.

## ARTICLE-11

As of the entry into effect of this protocol, either of the parties, by submitting their applications in writing within 15 days in advance, may begin construction at Enez and Peplos for the Government of Turkey, and Ferre for the Government of Greece, at the site and in the size specified in the HARZA project. In such an event, it shall be assumed that permission has been automatically granted for one party to enter the land of the other and to begin the construction works at the expiration of the said period. If one of the parties does not comply with the provisions of this article the other party shall become entitled to wreck the construction made by the other.

## ARTICLE -12

In the second stage, the exchange of land shall be accomplished within a reasonable period of time. The remaining portion of Ferre sector and the Saricaali (Tyhion) sector shall be exchanged against the land in Peplos. That is, the land in Ferre not exchanged up to the Ferre intersection and the Saricaali intersection in the west of Saricaali region shall be exchanged for the portion in the Peplos sector.

The route of the Saricaali (Tyhion) intersection to be dealt by Turkey shall be determined with an agreement to be concluded between the authorized administrations of both countries.

For the determination of the said route:

- a. The area of land Turkey accepted to abandon to Greece in Saricaali may not be less than 1500 decares and may not exceed 2,500 decares.
- b. The intersection shall be suitable for hydraulic conditions.
- c. The intersection shall comply with the principles determined in the Harza study.

In keeping with article 1 of the protocol on hand; in order to ensure the equality of the lands to be exchanged, it shall be possible to move the land border established at Enez to the east and to the west in order to reach the final decision on the border. The technical problem of the Tatarkoy (Vissa) intersection, one of the points discussed in the negotiations, shall be incorporated into the lands that will be exchanged during the second stage in the event it is settled by abandoning a portion of the Turkish soil to Greece or vice versa.

## ARTICLE-13

The final marking of the land border and the assessment of the value of the land subject to exchange and compensation for same shall be subject to the procedures stipulated for the first stage. Along with the compensation to be determined, the values of the pumping stations and drainage network, and the difference from the costs stipulated in the (Harza project) for the barriers constructed in Peoplos and Ferre sectors up to date, shall be taken into consideration. Likewise, the blocked account mentioned in article 5 shall be taken into account in the calculation of the said amount.

## ARTICLE -14

The finalization of the exchange of land in the second stage shall be made with the deposit in the Swiss bank mentioned in article 5, of the differences in value of the lands subject to exchange.

SECTION II  
Technical Issues

## ARTICLE-15

Tatarkoy (Vissa) intersection:

For now, construction of the Tatarkoy (Vissa) intersection shown on the Harza Project is not necessary. Because the riverbed has changed in such a way it will not require the construction of this intersection shown on the Harza project.

In spite of this, there is the possibility that the riverbed may damage the Greek costs and therefore, this matter needs to be solved. Therefore, a group of technicians from both sides need to conduct in-situ examination of the situation and need to find an appropriate solution and if need be prepare a project, and render a decision on how the construction should be done, and come up with results and these results need to be finalized after the exchange of Notes between the Ministers of Foreign Affairs of both parties. While a solution is being searched for this matter, action must be taken in accordance with the decision of the Joint Border Commission, which met during 28 June – 7 July 1959. If the decision reached requires the exchange of land, this matter shall be taken into consideration in the second stage of the land exchange because of the implementation of the Harza Project specified in article 12.

The Joint Commission should have completed its work by September 1963.

#### ARTICLE -16

In order for Enez, Ferre and Peplos intersections to function as envisioned in the project, it has been agreed that the covering of Enez and Peplos shall be performed by the Turkish side and the Greek side shall do the covering of Ferre, at a time convenient for them after the entry into effect of this protocol. Provided that the locations and drawings of these coverings are in conformity with the Harza studies, there is no need to exchange the drawings or have them approved prior to the construction. Both sides may begin the construction works without requesting additional permission, but by notifying the local organization 15 days prior to the actual start of works. Both parties are at the liberty to construct the covering 50 meters from the tip of the counter-party and to work exclusively on the construction.

If repairs are required in the said covering they may exercise this right by notifying the local administration of the other party within 15 days prior to the start of work or perform the work at a later date.

#### ARTICLE-17

Control of Fuse-plugs

Since the construction works are coming to an end, it has been decided to mutually check the plans and altitudes of the barriers and the fuse plugs and to determine if they are in conformity with the guidelines contained in the Harza project. This mutual control shall be performed by a team of mixed technicians to be constituted within three months starting on 1 July 1963.

The details on the implementation of this article are found in enclosure 1.

#### ARTICLE-18

Summer barriers:

The parties have jointly decided to conduct studies on the protection of the lands in between the barriers, and places not protected by barriers and to improve the conditions of these arable lands. Likewise, it has been decided that the measures to be taken for these soils were to protect these soils from the possible floods that occur between the months of May and September and not against major floods. In that case, it is necessary to jointly decide on the extent of the floods for which measures

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need to be taken. The technical teams shall conduct the hydrological study of the river to this end and shall notify each other of their findings. Construction shall be made at the place found appropriate and work shall be performed on the advance drawing of the barriers.

A meeting at higher levels shall be conducted between the parties within a reasonable period of time for the control of the advance drawings and a protocol to this effect shall be signed. This protocol shall specify the priorities of the summer barriers and the start and end of the works on the barriers.

The details pertaining to the hydrological studies and the advance drawings are given in enclosure 2.

## ARTICLE-19

Works performed without the consent of both parties:

Works performed by both parties without obtaining the prior consent of each other are listed below.

a) By Turkey:

1. Spurs constructed in three groups near Soufulu (Soufli) without notifying the other party and without obtaining their consent.
2. The existence of a poplar wood forest in the Ipsala bridge sector, on Greek soil that reduces the flow the river creates an undesired situation for the Turkish coast.
3. Allegations were made that barriers not specified in the HARZA project were built.

b) Greek side:

1. A drainage canal was built by the Turks from the Nazimbey islet to let the waters flow into the Meric river which is in violation of the border drawn by the Joint Team according to the Lausanne Treaty,
2. Constant loading of the excavation soil from the drainage canal specified in the HARZA project in the direction of Uzunkopru into the waters of the river, which prevent the free flow of the water.
3. Preservation of the cofferdams constructed at the start of the Enez intersection,

After the review of the issues enumerate above, it was observed,

- a) Both parties should adhere more closely to the provisions on the water construction of the 1934 Turkish-Greek Agreement,
- b) That any construction which obstructs the flow of water on the river bed should be avoided without exchanging of drawings,
- c) It was found appropriate to review all the subjects and solve them so that they will not cause damages to both parties by a local team of experts from both parties,

## ARTICLE -20

Organizing the riverbed:

Both parties have agreed that there is a need to regulate the bed of Meric remaining between the downstream of Ferre intersection and the upstream of Enez intersection.

This regulation shall be conducted according to the drawings prepared by a mixed team to be constituted for this work, based on the flow rate of the river to be observed. The parties may perform these projects either jointly, or separately, or have one of the parties perform the work and the other contributes half of the expenses, after the ratification of the projects by the parties. During the works on the axis of the river, the condition that the area of the land which will pass to the other party shall be equal and that the area of these lands, for both parties, in any case may not exceed 1000 decares, because of the change in the axis of the river and the border. Because the said lands are equal in value, only their areas shall be taken into consideration in the exchange.

## ARTICLE-21

Provision of irrigation water and its quantity and control:

It was observed that the irrigation problem of the plains on both sides of Meric-Evros River was not sufficiently studied by the HARZA project.



Therefore, the following issues have been found appropriate for the beneficial use of the waters from the river by both sides.

- 1- Measuring of the flow rate shall be continued by both parties both in the existing hydrometric stations and those that are to be installed.
- 2- Both sides shall continue the studies and preparation of projects on the irrigation facilities.
- 3- A senior level technical meeting shall be held in the month of September 1963 to render decisions on the said studies and the projects.
- 4- The water drawing facilities for irrigation purposes shall either be through a regulator to be built together by the parties, or in the form of water socket erected by the concerned party on the coast. However, this unilateral construction of the socket shall be subject to an agreement concluded between the parties and shall not cause damages on the coast of the other party.
- 5- Until the completion of the issues mentioned above, both parties shall continue with the irrigation practices they have been applying up to now.

### SECTION III Recommendations

#### ARTICLE -22

Both parties have made the following recommendations on the matters that were not thoroughly discussed:

- 1- Both parties recommend that the technical delegates come together on certain days, regardless of the fact that there are agenda items or not, and to hold extraordinary meeting in case of emergency situations.
- 2- The Greek delegation has recommended that poles be erected to prevent the disputes to arise because of the change in the riverbed and to prevent border issues to the extent possible throughout the borderline determined by the Lausanne Treaty Mixed Commission and the corrections that may become necessary from the implementation of this protocol. The poles shall be erected in a manner to prevent danger from floods.
- 3- The Turkish delegation has recommended that land border in the Enez region be extended up to the river to prevent possible border issues. Because, when the HARZA project is implemented in full in this sector, the mouth of the river shall move to the Enez intersection.

Both parties decided to refer the above-mentioned recommendations to their governments to be reviewed in the future.

### Final Provisions

#### ARTICLE- 23

This protocol shall enter into effect upon the ratification by the concerned governments and through the exchange of notes between them.

However, the provisions pertaining to the exchange of land or abandonment thereof, shall enter into effect after their ratification in accordance with their respective constitutions and the pertinent laws.

The following individuals, whose signatures appear below, have prepared and signed the protocol in this regard.

This protocol was prepared in Ankara in duplicate copies on 19 January 1963.

Turkish Delegation

1. Arif Onat
2. Sadettin Acar
3. Mufit Kulen
4. Ihsan Baltaoglu

Greek Delegation

1. Nicolas Chorafas
2. Stavros Triantaphyllidis
3. Kimon Kyriacos
4. Constantin Koungoulos

ENCLOSURE-1

The manner of checking the plans and heights of all the fuse plugs and barriers by both parties:

- 1-. Taking into consideration the existing trigonometric symbols, one or several mixed technical teams shall perform the following measurements:
  - a) The planning of the barriers according to the Harza study,
  - b) The planning of the length of fuse-lugs, their locations and number as specified in the Harza study,
  - c) Check the altitude of the barriers and fuse-plug sections,
2. The mixed technical teams mentioned above should be constituted by 1 June 1963 and should begin their studies. By this date, the parties will have mutually granted permission to work in the region of the other party and to roam there freely.
3. It has been determined beforehand that the in-situ studies shall last for three months.
4. The results of the measuring to be conducted by this mixed team shall be presented to the authorized administrations of both parties within two months as of the start of fieldwork.
5. In case of any disputes, the matter shall be referred to another mixed commission. The members of this commission shall be determined by the ministries of the two countries. The commission shall evaluate the dispute from both sides and shall determine its effect for proper functioning as stipulated in the Harza Project.
6. The said mixed commission shall present its findings and remarks in the form of a joint protocol and shall present this to the authorized administrations of both parties. In case of serious disputes, the concerned ministries of both parties shall exchange letters to make the necessary changes.
7. The party that caused the dispute must make its calculations according to the changed indicated in the letter of the other part's ministry and the remarks of the Joint Technical Commission.

ENCLOSURE-2

**ABOUT THE DETERMINATION OF THE LOCATIONS WHERE SUMMER BARRIERS COULD BE ERECTED (THEIR HEIGHTS AND THEIR DISTANCE FROM THE SHORES OF MERICEVROS RIVER), THE PURPOSE, AND THE METHOD OF PREPARING THE HYDROLOGICAL STUDIES.**

A) Hydrology:

Purpose:

1- Every year, during the period of April through November the hydrometric measuring data of the size and frequency of the floods observed from the Edirne and Pythion intersection and Ipsala and other shores shall be compiled: As a result of this compilation, the largest flood observed during this period and its possible occurrence shall be determined. Obviously attention shall be paid in the compilation of data on the level of water at the above-mentioned sites. These figures should be available with the graphic and theoretic curves of water consumption.

2. Compilation of all the rain observations by Turkey and Greece in the Meric-Evros river basins, and if possible, efforts should be exerted to obtain the observations belonging to the Bulgarian side of the river basin.
3. Determination of the of the maximum flow rate of the river, through the application of one of the known methods (Analytic or American), based on the data compiled on rain and the correlation of the hydrometric measuring during the period mentioned. This method is applicable for the flow rates at the three points mentioned below:
  - a) Karaagac borderline
  - b) Pythion bridge
  - c) Ipsala Bridge.

If sufficient results cannot be obtained with these methods because of the lack of the necessary observations, it shall suffice to make an estimate of the possible consumption during the said period with the existing data.

4. After all of these, assessment shall be made of the economic expenditures for the protection of the summer barriers.
5. The estimated capacity of the current low riverbed shall be calculated based on the topographic sections obtained at intervals of 20 m starting from Ipsala bridge to the Karaagac border.
6. A five-month period, as of the entering into effect of this agreement, has been determined, for the compilation of the existing data and to reach the results mentioned above.
7. Both parties must pass the information available to them to the other party. Pursuant to this, the concerned administrations of both countries shall prepare appropriate studies at the points mentioned above. This study shall be prepared and submitted in English for the other party to review it.
8. A technical team shall be constituted two months later to meet at Edirne and Dedeagac to discuss the results obtained by both parties. The purpose of these meetings is to present the following issues to the authorized administration of both parties.
  - a) The consumption involved with the summer barrier project,
  - b) Their distance from the shores of the river
  - c) Their altitudes
  - d) The sections of the barriers and manner of construction, (Makta, fuse-plug).

Places where summer barriers shall be constructed:

- 1) Both parties are obliged to show the sites where they want protected throughout the summer season, as a result of the 5 month period hydrological study, on map of 1:50,000 scale.
- 2) The team which will review the hydrological studies shall indicate these points on the map and the protocol to be prepared in this regard shall be submitted to the respective authorized administrations.
- 3) It is desired that the respective administrations notify each other of their final decision within 3 months following the date of their decision.
- 4) Based on this concurrence, both parties shall prepare a joint program for the implementation of the project for the protection of the summer barriers. This program shall be ratified by the both governments.

## Annex 2.3

Decision Number: 7/248

Ratification of the “Agreement between the Republic of Turkey and the People’s Republic of Bulgaria on the Cooperation of the Utilization of the Waters of the Rivers Flowing in the Territories of the Two Countries” found appropriate to be ratified with the law number 194, dated 25 November 1969, was decided by the Council of Ministers on 13/2/1970 in accordance with article 3 of the law number 244 dated 31/5/1963, based on the letter number IDEI-321.502-5/70/12, dated 31/1/1970 of the Ministry of Foreign Affairs.

C. SUNAY  
Head of the State

S. DEMIREL  
Prime Minister

R. SEZGIN  
State Minister

H. ATABEYLI  
State Minister

T.BILGIN  
State Minister

S. OZTURK  
Min. of Justice

A. TOPALOGLU  
Min. of Defense

H. MENTESEOGLU  
Min. of Interior

I. S.CAGLAYANGIL  
Min. of Foreign Affairs

M. EREZ  
Min. of Finance

O. OGUZ  
Min. of Education

T. GULEZ  
Min. of Public Works

G.TITREK  
Min. of Trade

V. A. OZKAN  
Min. of Health & Social Asst

A. I. BIRINCIOGLU  
Min. of Customs & Monopoly

I. ERTEM  
Min. of Agriculture

N. MENTESE  
Min. of Transportation

S. OZTURK  
Min. of Labor

S. KILIC  
Min. of Industry

S.O.AVCI  
Min of Energy & Natural Res.

N. CEVHERI  
Min. of Tourism

H. NAKIBOGLU  
Min. of Construction

T. KAPANLI  
Min. of Rural Affairs

H.OZALP  
Min. of Forestry

I. SEZGIN  
Min. of Sport & Youth

### **Agreement between the Republic of Turkey and the People’s Republic of Bulgaria on the Cooperation of the Utilization of the Waters of the Rivers Flowing in the Territories of the Two Countries**

The contracting parties have agreed on the following issues: by informing each other, in general terms, on the facilities built or envisioned to be built on the rivers crossing both countries or on Meric, Tunca, Degirmendere (Veleka) and Rezve rivers which constitute the border and the quality of water in these rivers;

By acknowledging the necessity for close cooperation in the use of these waters flowing in their respective countries for irrigation and other needs which are of vital importance for the economic development of the respective countries and which require necessary measures for protection against adverse consequences from floods and icing;

By indicating that development of the water resources through the application of science and technology are important elements for the welfare of their people;

Based on the principles of international law and good neighborly relations.

#### ARTICLE -1

The Republic of Turkey and the People's Republic of Bulgaria shall cooperate in examination and studying the facilities to be built and operated on the rivers flowing through territories of two countries which will be beneficial to both parties.

#### ARTICLE-2

The contracting parties have agreed not to inflict serious damages to each other by constructing and operating facilities on the rivers flowing through their territories.

#### ARTICLE-3

The contracting parties have agreed to exchange information on floods and icing instantly.

Additionally, the contracting parties agree to exchange hydrological and meteorological data on the rivers flowing through their respective countries.

The procedure of communication and exchange of data in this regard shall be determined with a technical protocol to be signed between the two contracting parties.

#### ARTICLE -4

If one of the parties requests the compilation, preparation and delivery of the data and information mentioned in article 3, and required only by the party making the request, the party making the request shall pay for the expenses made by the other party complying with the request.

The balances of these expenses shall be cleared every year. Formula in this regard shall be prepared in the protocol mentioned in article 3.

#### ARTICLE-5

The agencies mentioned in article 6 shall act in accordance with the principles of this Agreement by signing separate implementation agreements for each individual undertaking that will provide new mutual benefits and conditions to the contracting parties.

#### ARTICLE-6

Following the entering into effect of this agreement, the contracting parties, within three months, shall notify each other of the addresses of the agencies authorized to implement this agreement.

The meetings of the agencies mentioned in this article shall be determined and arranged through diplomatic channels.

## ARTICLE-7

Turkish and Bulgarian languages shall be used in the meetings. The documents to be prepared jointly (technical data, protocols, decisions, etc.) shall be prepared in both languages.

The information, data, documents, letters etc. to be exchanged between the contracting parties shall be prepared in the language of the party submitting such documents.

## ARTICLE -8

The disputes that may arise from the implementation of this agreement shall be referred to the Joint Turkish-Bulgarian Commission, comprised of experts of both parties in equal numbers.

Through diplomatic channels, the contracting parties shall inform each other about the appointment of the experts to the Joint Commission as well as the place, date of the meetings and related issues on the works of the Joint Commission.

If the Joint Commission cannot reach an agreement on the matters they are reviewing, these matters shall be resolved through diplomatic channels through negotiations between the contracting parties.

## ARTICLE- 9

This agreement shall be subject to ratification and shall enter into effect thirty days after the date of exchange of the ratification documents in Sofia.

This agreement has been prepared and signed in duplicate original copies in Turkish and Bulgarian in Istanbul on twenty-three October of the year one thousand nine hundred and sixty-eight, and both texts are equally valid.

R. Kutan  
Republic of Turkey

People's Republic of  
Bulgaria (Signature)

**Annex 2.4**

REPUBLIC OF TURKEY  
OFFICIAL GAZETTE  
28 JANUARY 1976  
WEDNESDAY

Nr: 15482

DECREES

Decision Number: 7/10887

Ratification of the "Agreement on Long Term Economic, Technical, Industrial and Scientific Cooperation between the Government of the Republic of Turkey and the Government of the People's Republic of Bulgaria signed in Sofia on 13 September 1975; was decided by the Council of Ministers on 13/11/1975, in accordance with articles 3 and 5 of the law number 244, dated 31/5/1963, based on the letter number ESID: 320.796-1/75-1102, dated 28/10/1975 of the Ministry of Foreign Affairs.

FAHRI S. KORUTURK  
Head of the State

S. DEMIREL  
Prime Minister

Prof. Dr. N. ERBAKAN  
Min. of State and Vice Prime Minister

Prof. Dr. T. FEYZIOGLU  
Min. of State and Vice Prime Minister

A. TURKES  
Min. of State and Vice Prime Minister

I. MUFTUOGLU Minister of Justice	F. MELEN Min. of Defense	A. N. ERDEM Min. of Education
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O. ASILTURK Min. of Interior	I. S. CAGLAYANGIL Min. of Foreign Affairs
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Y. ERGENEKON Min. of Finance	F. ADAK Min. of Public Works
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H. BASOL Min. of Trade	Dr. K. DEMIR Min. of Health and Social Assistance
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O. OZTRAK Min. of Customs & Monopoly	A. T. PAKSU Min. of Nourishment and Animals
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N. MENTESE Min. of Transportation	A. T. PAKSU Min. of Labor
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S. KILIC Min. of Energy & Natural Res.	A. DOGRU Min. of Industry and Trade
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L. TOKOGLU  
Min. of Tourism

N. OK  
Min. of Construction and Housing

R. DANISMAN  
Min. of Culture

V. POYRAZ  
Min. of Rural Affairs

T. KAPANLI  
Min. of Forestry

A. S. EREK  
Min. of Sport and Youth

A. M. ABLUM  
Min. of Social Security

**Agreement on Long Term Economic, Technical, Industrial and Scientific Cooperation between the Government of the Republic of Turkey and the Government of the People's Republic of Bulgaria.**

With the desire to expand and deepen the benefits of mutual cooperation in economic, technical, industrial and scientific fields;

With the belief that the development of this cooperation will accelerate the economic and technical progress of both countries;

The Government of the Republic of Turkey and the Government of the People's Republic of Bulgaria have reached an agreement on the following issues:

ARTICLE 1

In order to intensify and diversify their economic relations, the contracting Parties have agreed to develop and strengthen the economic, technical, industrial and scientific cooperation to a maximum extent.

ARTICLE 2

The Parties shall facilitate the initiatives of the Turkish and Bulgarian agencies and enterprises to sign contracts and shall assist such organizations in ensuring that the said contracts are in accordance with this Agreement and the laws in effect.

ARTICLE 3

Both parties have observed that the cooperation covered under article 2 may notably be conducted in the following manner.

- Establishment of new industrial facilities and the extension and modernization of the facilities existing in the two countries.
- Joint production and marketing of the items to be consumed in the markets of the two countries or in third country markets.
- Establishment of mixed production, commercial and transportation companies.
- Improvement of economic relations through the facilitation of transit of goods, materials and passengers traveling through the respective countries and cooperation in the fields of transportation and communication.

ARTICLE 4



The economic, technical, industrial and scientific cooperation covered under this agreement shall be accomplished through individual contracts to be signed between the concerned agencies and companies of the two countries and these contracts shall specify the conditions and methods of cooperation. When necessary, the said contracts shall be approved by the competent authorities of the two countries.

#### ARTICLE 5

The cooperation between the concerned Turkish and Bulgarian enterprises and organizations shall be facilitated in all the fields of economy and particularly in the following fields:

- Machinery production and metallurgy industry,
- Production, preparation and marketing of the agricultural and agricultural industry products produced in the two countries and cooperation in agricultural economy and food industry including the related methods and procedures,
- Energy production and irrigation, including the joint use of the waters flowing through both countries for energy production and irrigation purposes,
- Electronics, chemicals, petrochemical and medical industries,
- Transportation and communication,
- Tourism
- Commercial exchanges and other fields, which are of common interest to both countries.

#### ARTICLE 6

The Contracting Parties have decided to assign the Turkey-Bulgaria Joint Economic Commission, established with the letters exchanged on February 1972, to monitor the implementation of this Agreement.

This commission, henceforth to be referred to as the Turkish-Bulgarian Joint Committee for Economic and Technical Cooperation, is assigned with finding solutions for the problems that may arise during the implementation of this agreement, to make appropriate recommendations to their respective countries and to identify new possibilities of cooperation.

#### ARTICLE 7

The Contracting Parties shall realize the economic, technical, industrial and scientific cooperation, which constitute the subject of this agreement, within the framework of their respective laws in effect.

#### ARTICLE 8

This Agreement shall enter into effect on the date the Contracting Parties exchange Notes stating that the agreement has been ratified in accordance with the national laws of the respective countries, and shall remain valid for a period of 5 years.

Unless one of the parties notifies the other in writing three months prior to the expiration of this period that it wants to terminate the agreement, it shall be automatically extended on annual basis.

#### ARTICLE 9

If the contracts signed within the framework of this agreement have not been completed by the time this agreement expires, the provisions of this agreement shall remain valid for these contracts until they are completed.

This agreement has been prepared in two original copies in French in Sofia on 13 September 1975.

Government of the  
Republic of Turkey

Government of the People's  
Republic of Bulgaria

**Annex 2.5**REPUBLIC OF TURKEY  
OFFICIAL GAZETTE21 SEPTEMBER 1994  
WEDNESDAY

Nr: 22058

## EXECUTIVE AND ADMINISTRATIVE SECTION

## International Agreement

Decision Number: 94/5830

Ratification of “the Agreement between the Government of the Republic of Turkey and the Government of the Republic of Bulgaria on Assistance and Cooperation in the Field of Water for Reducing the Negative Effects of the Drought of 1993”, the enclosed notes between the two countries; was decided by the Council of Ministers on 30/6/1994 in accordance with articles 3 and 5 of the law number 244, dated 31/5/1963 based on the letter number BKYB/1927-5731, dated 20/6/1994 of the Ministry of Foreign Affairs.

Suleyman DEMIREL  
Head of the State  
Prof. Dr. TANSU CILLER  
Prime Minister

M. KARAYALCIN  
Min. of State and Vice Prime Minister

N. CEVHERI  
Min. of State

Y. AKTUNA	A. S. EREK	I. TEZ	B. S. DACE
Min. of State	Min. of State	Min. of State	Min. of State

T. AKYOL	M. A. YILMAZ	N. KURT	A. A. DOGAN
Min. of State	Min. of State	Min. of State	Min. of State

A. ATAC	E. SAHIN	N. TEKINEL	S. ERDEM
Min. of State	Min. of State	Min. of State	Min. of State

M. S. OKTAY	M. GOLHAN
Min. of Justice	Min. of Defense

N. MENTESE	M. MOGULTAY
Min of Interior	Min. of Foreign Affairs

I. ATILLA	N. AYAZ	O. KUMBARACIBASI
Min. of Finance	Min. of Education	Min. of Construction and Housing

A. ATES	M. K. DINC
Min. of Trade	Min. of Health

M. KOSTEPEN	M. MOGULTAY
Min. of Transportation	Min. of Labor and Social Security

V. ATASOY  
Min. of Energy & Natural Res.

M. T. KOSE  
Min. of Industry and Trade

A. ATES  
Min. of Tourism

A. ATES  
Min. of Culture

R. SAHIN  
Min. of Agriculture&Rural Affairs

H. EKINCI  
Min. of Forestry

R. AKÇALI  
Min. of Environment

**The Agreement between the Government of the Republic of Turkey and the Government of the Republic of Bulgaria on Assistance and Cooperation in the Field of Water for Reducing the Negative Effects of the Drought of 1993.**

The Government of the Republic of Bulgaria and the Government of Turkey mentioned as 'the parties' below have agreed on the following issues,

Based on Friendship, Good Neighborly Relations, Cooperation and Security Agreement between Bulgaria and Turkey,

On the acknowledgement of the need for a close cooperation in the use of the waters of the rivers crossing their countries as envisioned in the Agreement signed in 1968,

By taking into consideration the need for cooperation to alleviate the severe consequences of drought suffered by both parties due to the significant decline in the water level in the said rivers crossing their countries,

In response to the application by the Government of the Republic of Turkey due to the bad situation in the Meric valley on the Turkish side.

ARTICLE -1

The Republic of Bulgaria, on a one time basis and limited to the year 1993, shall provide additional water to the Republic of Turkey from river Tunca in accordance with the Volume and Graphic specified in the enclosure.

ARTICLE-2

- 1- The Republic of Turkey shall allocate US\$ 0.12 per m3 of water provided in compensation for the measures taken by the Republic of Bulgaria to provide the water.
- 2- The manner and type of compensation and the graphic of allocation shall be determined between the parties by 5 September 1993 latest after the entry into effect of the Agreement.
- 3- If the parties cannot reach an agreement in accordance with paragraph 2 of this article, the amount determined in accordance with the conditions specified in paragraph 1 of article 2 shall be deposited by the Republic of Turkey in the bank account number designated by the Republic of Bulgaria.

This Agreement shall enter into effect on the date of the exchange of Diplomatic Notes containing the text of the Agreement.

## ENCLOSURE-1

## ADDITIONAL VOLUME AND GRAPHIC OF WATER TO BE PROVIDED FROM RIVER TUNCA IN ACCORDANCE WITH ARTICLE 1 OF THE AGREEMENT.

1- The Republic of Bulgaria shall allocate additional water from River Tunca in the manner specified below.

The allocation of water shall 25 M<sup>3</sup>/sec for five days or total 10.8 x 10(6)M<sup>3</sup>, for 21 days 12.3M<sup>3</sup>/sec or total 21.8x 10(6) for a total of 32.6 x 10(6) M<sup>3</sup> additional water.

With the proposal of the Republic of Turkey the said flow regime may be changed without exceeding the total volume.

With the change in situation or meteorological conditions Turkey may request the suspension of the provision of additional water.

In this event, the water flowing in within 48 hours shall be accepted as additional water provided by Bulgaria and shall be taken into consideration in the calculation of the compensation.

Changes may not exceed 20% and new changes may not be proposed before an interval of 5 days.

2- In the determination of flow in river Meric and its tributaries the basic flow under natural conditions shall be "de facto" accepted in principle, and this amount shall be accepted outside of the calculation. This flow rate is accepted as 5 m<sup>3</sup>/sec for River Tunca during the month of August.

3- 20% of the water coming from JREBCEVO Dam shall be lost. This loss shall be shared as 10% each between the parties.

After the calculation of the water provided at the border of the Republic of Turkey the water, exceeding 5 m<sup>3</sup>/sec, shall be increased by 10% and this shall be compensated in accordance with article 2 of this agreement.

4- The amount of water that passes shall be determined by means of the Flow Observation stations located in both countries and at the vicinity of common border. The results obtained shall be audited at certain intervals or upon the request of one of the parties.

**Annex 2.6**REPUBLIC OF TURKEY  
OFFICIAL GAZETTEMONDAY  
31 AUGUST 1964

Number: 11794

## DECREE

Decision Number: 6/3363

Ratification of the enclosed Protocol and its attachments on the meeting of the Turkish-Soviet Joint Commission pertaining to the construction of a joint dam on Arpacay (Ahuryan) (to enter into effect on the date the ratification documents are exchanged); has been decided by the Council of Ministers in accordance with article 3 of the law number 244, dated 31/5/1963 based on the letter number 167/91, dated 10/7/1964 of the Ministry of Energy and Natural Resources.

/s/ C. GURSEL  
Head of the State

I. INONU Prime Minister	K. SATIR State Minister Vice Prime Minister	I. S. OMAV State Minister
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M. YOLAC State Minister	N. YETKIN State Minister	I. SANCAR Minister of Defense	S. CUMRALI Min. of Justice
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O. OZTRAK Min. of Interior	F. C. ERKIN Min. of Foreign Affairs	F. MELEN Min. of Finance
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I. OKTEN Min. of Education	A. H. ONAT Min. of Construction
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F. ISLIMYELI Min. of Trade	K. DEMIR Min. of Health & Social Assistance
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M. YUCELER Min. of Customs & Monopoly	T. SAHIN Min. of Agriculture	F. ALPISKENDER Min. of Transportation
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B. ECEVIT Min. of Labor	M. ERTEN Min. of Industry	H. ORAL Min. of Energy & Natural Res.
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A. I. GOGUS Min. of Tourism & Promotion	C. UZER Min. of Housing	I. YURDOGLU Min. of Rural Affairs
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PROTOCOL

**The Protocol on the meeting of the Turkish-Soviet Joint Commission pertaining to the joint construction of a dam on Arpacay (Ahuryan).**

Participants in this Turkish-Soviet Joint Commission:

Republic of Turkey

U.S.S.R.

Chairman: Neset Akmandor

Chairman: Bagramian G.A

Asst.Chairman: Arif Onat

Asst.Chairman: Melnikov V.M.

Member: Nazmi Karatekin

Member: Voronine A.L.

Member: Ayten Aydin

Member: Abramian A.A.

Member: Refik Akarun

Member: Avakian K.A.

Member: Turgut Dincer

Member: Grigorian S.O.

Member: Hidayet Turanli

Member: Youri Savostianov

Member: Mehmet Palamutoglu

Member: Saip Anadol

Member: Ismail Hakki Demirel

Member: Ibrahim Metiner

Member: Ekrem Arikan

Translator: Mehmet Kurbanoglu

The Joint Commission comprised of the members whose signatures appear below has reached the following conclusions:

A- The height and type of the Arpacay (Ahuryan) Dam:

Article-1 The Soviet delegation, in consideration of the economic feasibility and the project prepared by them, has proposed to jointly construct a reservoir with a storage capacity of 440 million m<sup>3</sup> volume on ARPACAY (AHURYAN).

The Turkish side, based on the estimate that 350 million m<sup>3</sup> of water may be released to Arpacay (Ahuryan) from the Kars stream after the development of Kars and Cildir plateaus proposed that a reservoir with a capacity of (280-300) million m<sup>3</sup> be constructed.

The Soviet delegation accepted the Turkish delegation's proposal in this regard.

The parties have agreed not to demand any claims from each other in the event they were wrong in their estimates and the water released from both countries to Arpacay (Ahuryan) was less in quantity.

The calculations of the dam was made based on the estimates that on an average 350 million m<sup>3</sup> of water shall be released annually from the Turkish territory and on an average 150 million m<sup>3</sup> of water shall be released annually from the Soviet territory and that an average of 50 million m<sup>3</sup> of water shall be released from the mid-basin annually to Arpacay (Ahuryan).

The Turkish side shall provide the graphics of the water flowing from their territory to Arpacay to the Soviet side who will be preparing the project.

Article-2 The height, location and the volume of the reservoir shall be determined and decided in final form after the preliminary studies by taking into consideration the maximum amount of water that may flow into the dam from the Kars stream and the water contribution from the Soviet side with the

capacity to regulate an amount of 500 million m<sup>3</sup> of water, with the related studies, research and other data and the water inflow and outflow graphics.

Article-3 The Soviet side proposed that that the dam to be built on Arpacay (Ahuryan) should primarily be made of concrete based on the studies conducted by the Soviets in this regard in 1945 and the available data. At the end of the discussions the Joint Commission agreed to make a final decision on the type of the dam after obtaining additional data and conducting further research and during the preparation of the advance planning if the dam should be made of earth, rock fill, concrete or arch type by way of comparison.

B- Preparation of the Project:

Article 4 - The drawings on the Arpacay (Ahuryan) dam shall be prepared in three stages first for the advance planning, second for the preparation of the final drawing and third for the implementation drawings.

Article 5- The advance drawing shall be completed within four months as of the entering into effect of this Protocol, in keeping with the schedule enclosed to the protocol and furthermore shall contain the instructions for the use of water at the upstream and downstream of the reservoir and shall be submitted for the governments' approval.

Article 6- Within two months as of the delivery of these advance drawings the official agencies of both parties shall notify each other on whether they accept the drawings as they are or they want to make changes in them.

In order to make the changes the Turkish –Soviet Joint Commission shall convene at an appropriate place to discuss the changes and make the decisions on the necessary changes.

Article 7- If any government refuses the advance drawings (plans), the expenses related with the preparation of this drawing shall be shared equally between the parties. In this event this protocol shall become null and void. The parties shall not be entitled to make claims from each other as a result of this. (Except for the costs that went into the preparation of the advance drawing). \*

Article 8- The instructions for the joint operation of the Arpacay (Ahuryan) dam that will be approved with the advance drawing shall constitute the basis for the operation of this dam.

Article 9- The final drawing shall be prepared based on the advance drawing (planning) and in accordance with the schedule enclosed to this Protocol within four months as of the date of approval of the advance drawing (planning) and shall be approved by the authorized agencies of both parties within two months.

Article 10- The implementation drawings shall be prepared by the party performing the construction and the relevant costs shall be incorporated into the construction costs.

Article 11- The parties have agreed that the Soviet Union project representatives shall prepare the projects of the reservoir (Dam) on the Arpacay (Ahuryan) River.

The Turkish side retains the right to have six representatives at most, throughout the duration of the preparation of the project, by including the relevant expenses in the project costs.

During the preparation of the drawings, the Soviet side shall provide the necessary information and data to the Turkish representatives and provide them the necessary assistance.

Within one month following the ratification of this protocol, the Turkish side will also provide to the Soviet side all the information and data it has and the preparatory calculations on the reservoir.

The Soviet side shall perform all the explorations and research and likewise prepare all the data for the project. The Turkish side shall assist the Soviet side in connection with these works.

Article 12- The parties have agree that the preparation of advance drawing shall cost TL 470,000 (47,000 Ruble) the breakdown of which is TL 125,000 (12,500 Ruble) for the preparation of the drawing, and the cost of drilling TL 380,000 or (Ruble 38,000) . It was agreed during the preparation of the advance and final drawings that the initial estimates for the drilling would TL 250 or (Ruble 25) per meter and that there would be 1000m of drilling involved. If the amount of drilling to be performed changes, this would be deducted from or added to the preparation costs of the drawing and the cost of the project will become more realistic.

The expenses of having Turkish experts in the Soviet Union for the preparation of the drawings shall be shared equally between the parties.

Article 13- The following principles shall apply in the preparation of the advance and final drawings:

- a) The parties retain the right to build and operate a hydroelectricity plant on the side of the reservoir that belongs to them and to make use of the water thereat. In order to facilitate the operation the hydroelectricity plant it should be constructed on the territory of the respective party. Each party shall determine the capacity of the power to be obtained from the plant.

The output graphic of the water to be released from the reservoir for the plant shall be provided to the project agency of the Soviet Union

- b) There shall be weirs at each side of the dam in order to obtain water for irrigation purposes. The controls for this weir shall be found in the respective sides of the dam and shall be operated individually.
- c) The full weir shall not have a lid and therefore shall operate automatically.
- d) Attention should be paid for the simple and safe operation of the dam during the preparation of the project.

Article 14- The following guidelines should be observed in the preparation of the instructions for the joint operation of the dam to be prepared together with the advance drawing and to be submitted for approval.

- a) A permanent commission shall be established for the preparation of the annual operation schedule related with the operation of the dam and authorized to check the implementation of this schedule. This commission shall be constituted with equal participation of experts from both sides.
- b) The maintenance, repair and renovation on the common parts of the dam and related facilities shall be performed with the decision of the above-mentioned commission and the related expenses shall be borne equally by the parties.
- c) Each party shall operate the dam with its own materials, vehicles, equipment and personnel. Work on the additional facilities shall be performed individually. Water withdrawals from the reservoir for irrigation and energy production purposes shall be made in accordance with the annual operation schedule of the reservoir.
- d) After the construction of the dam, the parties may draw water from the dam and from the Aras stream according to their shares either directly from the reservoir or from any border points of Arpacay (Ahuryan) and Aras Rivers. Both parties may withdraw water flowing in their territory from wherever they want, at any time and in any quantities they need extending up to the Iranian border and use it as they wish. Each party shall withdraw its own water according to the graphic approved by the commission. Changes in the graphic shall be made with the approval of the commission.



Measuring devices shall be placed at the necessary places in order to determine that the total amount of water drawn from the reservoir by the parties is equal to each other at the end of the period of usage.

- e) At the end of irrigation season every year, the operating commission working permanently, shall check whether the amount of water used by the parties to be in conformity with the water usage schedule.
- f) By taking into consideration the hydrological data, the water usage schedule shall be reviewed each year by the permanent commission and revised according to the requirements declared by the parties. This revised schedule shall contain the amount of water to be released from the reservoir, the places where water is to be taken from and the amount of water to be taken. The revision of water usage schedule may be performed monthly.
- g) Water measuring weirs or facilities shall be established to measure the water taken from the dam lake either with pumps or through gravity and measuring shall be conducted at these points every month :
- h) Either of the parties shall have the right to measure and control the amount of water taken by the other party when found necessary;
- i) The location of the existing Guven (Talin) and Serdarabat (Oktonberian) regulators shall be modified to take water according to the drafted operating plan and water measuring facilities shall be established and new stations in additions to the existing flow observation stations shall be established.
- j) Each party reserves the right to take the necessary measures to draw water at a time suitable for that party and to use half the water in the reservoir allotted to it without being subject to the other party,  
The water drawing facilities of one side should not damage the water drawing facilities of the other party.

Article 15- During the preparation of the drawing both parties shall grant multiple entry rights to the personnel of the other party to cross the border and shall render the necessary assistance for the successful completion of the works. Therefore, the parties, through the border commissioners, shall provide information on the personnel who need to cross the border, the type and the place of work to be performed by them, the duration of the work each time and in timely manner.

Article 16- The disagreement mentioned in the Turkish-Soviet Joint Commission Protocol number 3 prepared in Erivan in 1962 (under the title of the sharing of the Arpacay (Ahuryan) and Aras waters) is now changed with the construction of the Arpacay (Ahuryan) dam and the waters to be shared is focused on the very small amount of water coming from the downstream of the dam and the Aras drainage basin.

However, the Turkish side's proposal to consider the natural flow within the instructions of the operation of the dam was not accepted by the Soviet side on ground that there was a dispute on this matter and that it should be left to the decision of the two governments to resolving the dispute. Hence, accordingly the parties agreed that the matter should be presented to the respective governments for their decision.

#### C- Usage of the reservoir by the parties;

Article 17- The parties have agreed to use the water to be regulated in the future reservoir on equal basis.

Likewise the parties agree that by the regulated water they mean the water drawn from the reservoir and all kind of water that flows through the dam.

Article 18- After the dam has been constructed the parties retain the right to use their share of the water from the reservoir and from the dam to the downstream through the boundary rivers of Arpacay

(Ahuryan) and Aras up to the Iranian border, without violating the rights of the other party, at any point, at any time, in any quantities they desire.

D- Participation in the construction costs;

Article 19- The expenses mentioned in article 22 for the joint dikes, weirs, construction tunnels and other necessary auxiliary and secondary facilities and the losses mentioned in article 23 shall be all equally borne by the parties.

Article 20- The expenses for the hydroelectricity plant and the operation buildings, service ways, energy transport lines, telephone cables, and other facilities which are built with its own initiative and which are not stated in the approved project shall be borne by the party undertaking these constructions.

E- Compensation for inundated areas;

Article 21- The parties have agreed that the following values shall be considered in the determination of the damages for the compensation of areas which go underwater.

These shall be; farmlands, settlements, highways, and railroads, and other facilities which will remain underwater in the regions.

The parties have taken into consideration that the damages to be incurred because the land will be inundated by the reservoir will be TL 60,000,000 million based on the declaration of the Turkish party and that the damages of the Soviet party will be 540,0000 Ruble based on the declaration of the Soviet party.

Because the losses of the Turkish party will be even greater owing to the expropriation of land, Turkey will contribute TL 3 million less to the construction of the dam and to the half the expenses of the joint facilities.

Both parties will conduct the evacuation of the land that will be inundated through their own construction organizations.

If the actual damages incurred because of the land inundated are found to be more, the parties shall not make claims to each other because of this.

F. Definition and evaluation of expenses and damages:

Article 22- With the word 'expense,' the values calculated according to the ratified projects and the unit prices used for the joint facilities mentioned in article 19 and the auxiliary facilities to be built during the construction of the joint facilities.

Article 23- The word 'damage' shall mean the following:

Remedying the damages incurred from floods, avalanches and wreckages, operation of material depots, preparation of the worksite area, building of storage areas for construction materials, service and operational roads.

Article 24- The unit prices will be used in the calculation of the advance and final projects as well as in the calculation of the construction works completed and the construction cost and damages.

The unit price used for final estimates shall be used in calculating the works performed by the parties.

Article 25- The parties have agreed that the financials issues such as the rate of exchange to be used in the calculation and how and over what period of time the payment will be made should be prepared by

the authorized organs of the parties, and also added that the agreed version of the text upon the ratification by the respective governments shall be attached to this protocol.

G- Principles of performing the joint construction works:

Article 26- It has been agreed in principle that one of the parties shall construct the dam and the other shall check the construction.

Article 27- The parties have agreed that the governments will later decide as to which party will construct the dam according to the ratified final projects.

Article 28- The party that takes upon the construction work shall fulfill all the technical responsibilities. Any kind of changes to be made in the approved project may only be made with the concurrence of both parties.

Article 29- A joint permanent commission comprised of representatives of both parties in equal numbers shall be established to obtain concurrence on matters to arise during the construction works, and this commission shall convene upon the request of one of the parties. The decisions of the commission shall be ultimate.

Article 30- The construction site shall be fenced off with barbwire during the construction. People working on the construction and the control of the construction, together with the personnel, vehicles, construction machinery and equipment serving these people may move freely within the construction site. Entry into and exit from the fenced off area shall be made at certain points.

The personnel of both parties shall be able to conduct their business without any hindrance inside the fenced off area.

Article 31- The borders of the construction area shall be shown in the final project. Places of entry into and exit from the area, the procedures, protection, lighting and other issues shall be prepared and determined by the border commissioners. Entry into and exit from the construction site by certain personnel in connection with the construction works shall likewise be determined by the border commissioners.

The parties shall render all assistance to those who will be coming to inspect and check the construction site and the representatives of the other party.

Article 32- If an act in violation of the laws, regulations and general rules is committed in the temporarily fenced off area during the performance of the construction, the investigation and indictment shall be conducted by the laws of the party on whose territory the violation was committed.

Article 33- The parties undertake to fulfill all expropriation and evacuation works in the area which will be inundated before the dam begins to hold water and in this manner prepare the lake area ready to store water.

H- Preparing a topographic map:

Article 34- When the Turkish Government notified its approval in principle for the negotiation of the construction of a joint dam on Arpacay (Ahuryan), the Turkish Delegation had considered this joint dam project together with the development of the Cildir, Kars and Igdir plateaus including the smaller plateaus up to the border as a whole. The Turkish delegation believes that the projects to be prepared for the development of the land and water resources in these areas must be based on photogrammetric maps in the scale of 1/25,000.

Therefore, Turkish delegation declares and proposes that there is a with the initiation of the Arpacay (Ahuryan) Dam construction, the need for the preparation of a photogrammetric map in the

scale of 1/25000 for the region covering from Lake Cildir up to the Iranian border of the Turkish-Soviet border and constituting a belt in the width of 30 km from the Turkish side.

The Turkish Delegation declares and accepts that it will take all the necessary measures to eliminate all the concerns of the other side in the process of obtaining this map that is entirely of technical nature.

In order for this protocol to take effect, The Turkish delegation, based on the main reasons deliberated above, finds it necessary for appropriate circumstance to be created for the making of such a map, otherwise it does not see any urgency for the construction of Arpacay(Ahuryan) dam to begin immediately.

Article 35- The Soviet delegation is of the opinion that making of such a map covering the Turkish territory all along the Soviet-Turkish border is not relevant to the construction of the Arpacay (Ahuryan) reservoir. The Soviet delegation does not find it appropriate for the Turkish delegation to tie the effectiveness of this protocol with the taking of photograph of the border region from the air because this matter could only be resolved by the officials who will be ratifying this protocol.

#### I- Other Issues

Article 36- The existing State border line shall remain as it is, without any changes, after the construction of the dam and the making of the reservoir. The borderline shall be identified on the surface of the lake by means of buoys or the like items.

The parties have agreed to establish poles on each side before filling the reservoir and to tie buoys to the border poles.

Article 37-The parties reserve the right to fish or to hold benefits through other activities only at their side of the border of the dam lake. As regards to this matter, the parties have agreed that the authorized agencies of the parties shall prepare regulations in accordance with the Agreement on the Utilization of the Boundary Waters, signed on 8 January 1927.

Article 38- The parties have agreed to leave the issues discussed in the articles 16, 34 and 35 of this protocol to be resolved with the decisions decision of the governments in accordance with article 10 of the Turkish –Soviet Agreement on the Utilization of the Boundary Waters, dated 8 January 1927.

This protocol and its enclosures shall enter into effect after its ratification by the authorized agencies of the parties.

This protocol has been prepared in duplicate copies in Turkish and Russian in Ankara on 25 April 1963. Both texts are same, and shall be equally valid.

#### Turkish Delegation

Chairman: Neset Akmandor  
Asst.Chairman: Arif Onat  
Member: Hidayet Turanli  
Member: Saip Anadol  
Member: Ismail Hakki Demirel  
Member: Ekrem Arikan

#### USSR Delegation

Chairman: Bagramian G.A  
Asst.Chairman: Melnikov V.M.  
Member: Voronine A.L.  
Member: Abramian A.A.  
Member: Avakian K.A.  
Member: Grigorian S.O.  
Member: Youri Savostianov

Supplement to the Protocol dated 25/4/1963 of the Turkish-Soviet Joint Commission

Program for research, study and project works of the Arpacay(Ahuryan) Dam and reservoir.

## A- PLANNING (Advance Project)

### I. Review of the Existing Data:

- 1- Review of the meteorological, hydrological, topographic, geological and other existing documents.

### II. Topographical studies:

- 1- Preparation of 1/5000 scale topographic and survey maps of the Arpacay (Ahuryan) Dam area (2-3 km more to the downstream of the river and 1460 level as proposed by the Soviets).
- 2- Preparation of topographic maps in the scales of 1/5000 or 1/1000 of the dam sites.
- 3- Sufficient number of length and width sections in the river bed, weir and construction tunnel up to the downstream of the river at the dam site as proposed by the Soviets.

### III- Hydrological and water requirement calculations:

- 1- Evaluation of the flow rates obtained from the Arpacay (Ahuryan) Kosavenk and Aras – Karakale flow observation stations.
2. Obtaining the repetition of flood over the last 5, 10, 25 and 50 years of the Arpacay (Ahuryan) River at the dam site and determination of a survey of flood hydrographies.
3. Calculation of the sedimentation amount for over a 50 years period (approximately) in the Arpacay (Ahuryan) river dam site.
4. Determination of the water level and drawing of a key curve corresponding to various consumption levels at a certain distance from the dam site downstream of the river for a number of sections.
5. Determination of the water requirements of both sides and preparation of graphics. (One party shall give its water requirement curve to the other party who is preparing the advance drawing. These curves shall be allocated to the parties according to the amount of water that could be regulated through the dam, by reserving half its rights.
6. Determining whether water quality is suitable for irrigation or not.

### IV- Geological Engineering Works:

- 1-. Preparation of geological maps of the reservoir area with a scale of 1/25000 and preparation of detailed geological maps of places found necessary and other geological engineering works with a scale of 1/5000.
- 2-. Conducting of geological engineering studies at the sites of the dam and miscellaneous facilities.
- 3- Research of stone, sand-pebbles and territory for various types of dams, determination of sites, and determination of their quantities and physical characteristics, etc.

### V- Designing of projects and preparation of reports:

- 1- Preparation of volume graphics with a scale of 1/5000 of the surface maps.

- 2- Calculation of the reservoir volume by taking into consideration the amount of water entering the dam on the one hand, and considering water leakage, evaporation losses and dead volume on the other.
- 3- Determination of the height of the dam by taking into consideration the load of the weir, waves and air factor.
- 4- By comparing various types of dams selection of the most suitable dam in technical and economic terms.
- 5- Selection of the appropriate type and sizes by comparing various types of weirs.
- 6- Preparation of projects for the water conversion facilities necessary for the construction.
- 7- Preparation of work flow and organization charts.
- 8- Preparation of instructions for the joint operation of the dam.
- 9- Survey costs for the joint facilities to be built on both sides of the reservoir.
- 10- Preparation of the project drawings and report in five copies, in Turkish and Russian.

The following issues should be contained in the report:

- a) Introduction
- b) Meteorological and hydrological data related to the dam site,
- c) Geological engineering studies of the dam site and the lake area,
- d) Facilities and their features,
- e) Preparation of work flow and organizational drawings
- f) Explanation of the alternatives related with the dam and miscellaneous facilities,
- g) Preparation of the final project and results and recommendations on the construction

- 11- Preparation of the calculation and study files in 5 copies in Turkish and English.

## B- FINAL PROJECT

### I -Topographic Studies:

- 1- Preparation of map of the construction site with a scale of 1/500.
- 2- Preparation of the width sector at the site selected for the construction of the dam.
- 3- Application works of the service ways, electricity and telephone cable routes necessary for the construction of the dam.

### II- Geological Engineering studies:

- 1- Additional geological engineering works at the dam site and at various facilities.
- 2- Supplementary research on construction materials available for the type of dam selected.

### III- Project Works:

- 1- Preparation of the projects for the selected type of dam and auxiliary facilities (To enable both sides to build a hydroelectricity plant individually).
- 2- Drawing of the construction sites, service roads and worksite facilities.
- 3- Preparation of the work flows and work organization charts.
- 4- Construction cost of all the facilities and annual expenses.
- 5- Preparation of the report on the final project.
- 6- Preparation in Turkish and Russian of the final project in five copies each (One copy of each picture shall be prepared an original copy).

REPUBLIC OF TURKEY  
MINISTRY OF FOREIGN AFFAIRS  
108.081-DI/3-36

#### MEMORANDUM

The Memoranda, dated 21 August, 14 December 1963 and 16 April 1964, submitted by the Embassy of the Union of Soviet Socialist Republics in Ankara to the Republic of Turkey, Ministry of Foreign Affairs, in connection with the Arpacay Dam have been carefully reviewed by the authorized Turkish authorities. The views and proposals of the concerned Turkish authorities in respect to the Soviet proposals addressed in the said memoranda are explained below:

1-The Turkish officials were very pleased to learn that the concerned Soviet officials have granted permission to take photographs in connection with the construction of Arpacay dam in Turkish territory from Lake Cildir up to the Iranian border along the Turkish –Soviet border within a belt of 30 km through photogrammetry at an altitude of 600 meters, via Turkish aircraft with Turkish and Soviet experts on board.

As stated in the memorandum of the Embassy of the Union of the Soviet Socialist Republics, dated 16 April 1964, the Turkish and Soviet experts shall examine the aircraft and the cameras prior to each flight, will board the aircraft, they shall examine the films after they have been taken and shall immediately destroy any films that contain views of the Soviet territory.

2-The Turkish delegation which has expressed its opinion in article 4 of the Protocol number 3 prepared by the Turkish-Soviet Joint Commission in Erivan on 4 July 1962, on the provisions of article 1 of the “Agreement between the Republic of Turkey and the Union of Soviet Socialist Republics on the Utilization of the Rivers, Streams Constituting the Border” dated 8 January 1927 have concluded that since these two rivers, namely Aras and Arpacay should be considered as one river along the Turkish-Soviet border, the party which did not get its share of water from Arpacay should be able to get from any point on River Aras. The Turkish officials were very pleased to learn from the Soviet memorandum dated 21 August 1963 that the Soviet side could, in principle, accept the equal distribution of the water extending along the Turkish-Soviet border up to the Iranian border after the construction of the reservoir on Arpacay river. However, in order to prevent the arising of any disputes in the future, the Turkish officials request that the Soviet side officially accept and confirm the views expressed by the Turkish delegation in article 4 of the protocol number 3, dated 4 July 1962 on the sharing of the waters constituting the Turkish-Soviet border.

3-Article 32 of the Turkish-Soviet protocol, dated 25 April 1963 stipulates that the two sides reached a consensus on the matter concerning the punishment of persons who commit crime, during the construction of the dam, jurisdiction of the country in whose side the crime is committed will be valid. Thus, the Turkish side does not see any need for a change to be made in connection with this matter.

The concerned Turkish officials have also stated that they are desirous to have the Turkish-Soviet Protocol, dated 25 April 1963 be ratified, as soon as possible, and have stated that the ratification by Turkey of the said Protocol will take place after the final concurrence between Turkey and the Soviet Union on the issues mentioned in articles 2 and 3 of the above protocol.

1 July 1964

Ankara, 6 May 1964

THE EMBASSY OF  
THE UNION OF SOVIET SOCIALIST REPUBLICS  
NO. 221/64

The Embassy of the Union of Soviet Socialist Republics expresses due respects to the Republic of Turkey, Ministry of Foreign Affairs and has the honor to explain the following points in response to the confirmation requested by the Ministry on the issues contained in the memoranda dated 16 April 1964 and 9 June 1964 in connection with the proposed construction of a reservoir on Ahuryan (Arpacay) river:

The Soviet side has carefully reviewed the proposals made by the Turkish side in the preparation of the protocol, dated 25 April 1963 and on which agreement was reached by the Soviet-Turkish Joint Commission which met in order to simplify the construction of a joint reservoir on River Ahuryan.

Based on the request made by the Turkish side, the Soviet authorities have agreed to have photographs taken from an altitude higher than 600 m of the Turkish border line extending from Lake Cildir up to the Iranian border covering a belt in the width of 30 km from the border, via a Turkish aircraft jointly with Soviet and Turkish experts. However, the Soviet and Turkish experts shall examine the aircraft and the cameras prior to every flight, participate in the flights, and check the films after they are taken and shall immediately destroy any film that contains views from the Russian territory.

The Soviet authorities re-confirm their agreement on article 32 of the Protocol, dated 25 April 1963 which states that "If any violation of any law, regulation or rule should occur in the area fenced off during the construction period of the dam, the investigation and the prosecution of the perpetrator shall be done according to the laws of the party on whose side the violation was committed."

The Soviet side also concurs with the Turkish proposal to decrease the volume of the Ahuryan reservoir from 440 million m<sup>3</sup> to 280-300 million m<sup>3</sup> as determined in the said protocol.

The Soviet side, which has taken into consideration Turkey's desire to prevent any disputes on the equal distribution of the water, hereby officially gives its concurrence on the principle of using the water equally all along the Soviet-Turkish border up to the Iranian border after the construction of the reservoir on the River Ahuryan.

Concurrence is given on all the other articles of the protocol on which agreement has been reached by the Soviet-Turkish Joint Commission in connection with the joint construction of a dam on River Ahuryan (Arpacay).

Thus, the Soviet authorities having taken into consideration the benefits of developing good neighborly relations and the cooperation between USSR and the Republic of Turkey have concurred with the Turkish side's requests. This action shall be ratified with the final approved version of the said Protocol and has lifted the obstacles for the initiation of the works on the joint construction of a reservoir on river Ahuryan.

On this occasion, the Embassy of the USSR confirms its deepest respect to the Ministry of Foreign Affairs of the Republic of Turkey.

Translated from the original in Russian. Ankara, 22 June 1964



22 June 1964  
Mehmet Kurbanoglu  
Translator  
Signature

The Ministry of Foreign Affairs of the Republic of Turkey presents its respects to the Embassy of the Union of Soviet Socialist Republics and has the honor to inform the Embassy that it has received the Note number 221/64, dated 22 June 1964:

The Soviet side has carefully reviewed the proposals made by the Turkish side in the preparation of the protocol, dated 25 April 1963 and on which agreement was reached by the Soviet-Turkish Joint Commission which met to negotiate and facilitate the construction of a joint reservoir on River Ahuryan.

Based on the request made by the Turkish side, the Soviet officials have agreed to have photographs taken from an altitude higher than 600 m of the Turkish border line extending from Lake Cildir up to the Iranian border covering a belt in the width of 30 km from the border, via a Turkish aircraft jointly with Soviet and Turkish experts. However, the Soviet and Turkish experts shall examine the aircraft and the cameras prior to every flight, participate in the flights, and check the films after they are taken and shall immediately destroy any film that contains views from the Russian territory.

The Soviet authorities re-confirm their agreement on article 32 of the Protocol, dated 25 April 1963 which states that "If any violation of any law, regulation or rule should occur in the area fenced off during the construction period of the dam, the investigation and the prosecution of the perpetrator shall be done according to the laws of the party on whose side the violation was committed.

The Soviet side also concurs with the Turkish proposal to decrease the volume of the Ahuryan reservoir from 440 million m<sup>3</sup> to 280-300 million m<sup>3</sup> as determined in the said protocol.

The Embassy of the Union of Soviet Socialist Republics  
Ankara

"The Soviet side, which has taken into consideration Turkey's desire to prevent any disputes on the equal sharing of the water, hereby officially gives its concurrence on the principle of using the water equally all along the Soviet-Turkish border up to the Iranian border after the construction of the reservoir on the River Ahuryan."

"Concurrence is given on all the other articles of the protocol on which agreement has been reached by the Soviet-Turkish Joint Commission in connection with the joint construction of a dam on River Ahuryan (Arpacay)."

"Thus, the Soviet authorities having taken into consideration the benefits of developing good neighborly relations and the cooperation between USSR and the Republic of Turkey have concurred with the Turkish side's requests. This action shall be ratified with the final approved version of the said Protocol and has lifted the obstacles for the initiation of the works on the joint construction of a reservoir on river Ahuryan."

On this occasion the Embassy of the USSR confirms its deepest respects to the Ministry of Foreign Affairs of the Republic of Turkey.

This said Note conveys the concurrence of the Soviet officials on the issues of contention which were contained in articles 16,17, 18, 32, 34 and 35 of the Turkish-Soviet Protocol, dated 25 April 1963 in connection with the dam contemplated to be built on Arpacay river and which are listed below:

- a) Equal sharing of all the waters of the rivers along the Turkish-Soviet border between the two countries,
- b) The laws that shall be enforced in case of a violation of laws at the dam construction site,
- c) Preparation of photogrametric maps of the Turkish territory from Lake Cildir up to the Iranian border within a 30 km belt from the border,

And the Ministry of Foreign Affairs, with the memorandum, dated 6 May 1984, submitted to the Embassy of the USSR confirms that these are the view of the Turkish authorities.

The Turkish officials who have expressed their pleasure for the acceptance of all their proposals and views by the Soviet officials have initiated immediate action for the ratification of the said protocol instantly.

The Ministry of Foreign Affairs shall immediately inform the Embassy upon the completion of the approval of the said protocol.

On this occasion, the Ministry of Foreign Affairs of the Republic Turkey expresses its deepest respects to the Embassy of the USSR.

Ankara, 8 July 1964

**Annex 2.7**REPUBLIC OF TURKEY  
OFFICIAL GAZETTE10 DECEMBER 1975  
WEDNESDAY

NR: 15438

## DECREEES

Decision Number: 7/10394

Ratification of the "Cooperation Agreement between the Government of the Republic of Turkey and the Government of the Union of Soviet Socialist Republics on the construction of a dam on the Arpacay (Ahuryan) boundary river and the constitution of a dam lake, found appropriate to be ratified with the law number 1961, dated 26 June 1975, and to enter into effect on the date of exchange of the Ratification Document; was decided to be ratified by the Council of Ministers on 8/8/1975, in accordance with article 3 of the law number 244, dated 31/5/1963, upon the letter number ESID: 108.081-1/75-766, dated 18/7/1975 of the Ministry of Foreign Affairs.

FAHRI S. KORUTURK  
Head of the StateS.DEMIREL            Prof.Dr. N. ERBAKAN  
Prime Minister        Vice Prime MinisterProf.Dr. T. FEYZIOGLU    A. TURKES            S.OZTURK  
Vice, Prime Minister    Vice Prime Minister    State Minister  
& State Minister        & State MinisterH.AKSAY  
State MinisterM.K ERKOVAN    G.KARACA    F.MELEN            I.MUFTUOGLU  
State Minister    State Minister    Minister of Defense    Min. of JusticeO.ASILTURK            S.OZTURK  
Min. of Interior        Min. of Foreign AffairsDr. Y. ERGENEKON    A.N.ERDEM            F.ADAK  
Min. of Finance    Min. of Education        Min. of Construction  
H.BASOL            Dr. K. DEMIR  
Min. of Trade        Min. of Health & Social AssistanceO. OZTRAK            N. MENTESE  
Min. of Customs        Min. of Transport  
& MonopolyA. T. PAKSU            S. KILIC  
Min of Labor            Min of Energy & Natural Res.  
L. TOKOGLU            N. OK            V. POYRAZ  
Min of Tourism &        Min of Housing        Min of Rural Affairs  
Promotion

T. KAPANLI    A. S. EREK                                    R. DANISMAN  
Min of Forest    Min of Youth & Sport    Min of Culture

A. M. ALBUM  
Min of Social Security

### **Cooperation Agreement between the Government of the Republic of Turkey and the Government of the Union of the Soviet Socialist Republics on the construction of a dam on the Arpacay (Ahuryan) boundary river and the Constitution of a Dam Lake**

The government of the Republic of Turkey and the government of the Union of Soviet Socialist Republics have agreed on the following issues by taking into consideration the good neighborly relations existing between the countries and the provisions of the Agreement "On The Use of the Border Waters" signed at Kars on 8 January 1927, and based on the desire to further develop their economic and technical cooperation which will benefit the government of the Republic of Turkey and the government of the Union of Soviet Socialist Republics:

ARTICLE 1- The Government of the Republic of Turkey and the Government of the Union of Soviet Socialist Republics have decided to construct a dam on the Arpacay (Ahuryan) river which is at the common border of the two countries, and to constitute a dam lake with a volume of 525 million m<sup>3</sup>.

ARTICLE 2- For the realization of the cooperation envisioned in article 1 of this agreement, the Soviet organizations, shall prepare the drawings of the work in keeping with the technical drawing approved by the official agencies of both parties, to include the delivery of equipment and materials necessary for the construction, and shall construct a dam on the bordering Arpacay (Ahuryan) river and constitute a dam lake with a volume of 525 million m<sup>3</sup>.

ARTICLE 3- For the realization of the cooperation envisioned in article 1 of this agreement, the Turkish organizations, as half partners, shall fully participate in the technical control of the dam construction.

ARTICLE 4- The lump sum expenses of the dam according to the technical project prepared by the Soviet organization was found to be 16,6 million Ruble and this amount shall be equally financed by the parties, that is each party shall bear 50% of the expenses.

ARTICLE 5- Because the irrigation facilities on the Turkish side will not be completed on time, therefore, in order to preclude Turkey from incurring losses in the usage of half of the dam water in the initial stages, the Soviet side shall bear 4.4 million ruble of Turkey's share of the construction costs.

However, this implementation shall not prejudice the principles of meeting half the expenses by Turkey and the Soviets of the dam construction and benefiting equally from the dam waters.

ARTICLE 6- With the balance remaining after the deduction of the 4.4 million Ruble from Turkey's 50% participation share in the construction of the dam, as stated in article 5 above, Turkey shall perform construction works on lump sum basis, preferably on the Turkish side, at the point to be mutually agreed.

The enumeration of this construction to be performed by the Turkey, preferably on the Turkish side, has been specified in Enclosure I which is an integral part of this agreement.

ARTICLE 7- All the necessary assistance, within the framework of the laws in effect, shall be rendered to the members of the Soviet agencies involved with the construction for their entry into and

exit from the area determined and fenced off by Turkey and for them to lodge during the performance of the works.

Members of the Turkish agencies tasked with the construction and control of the dam shall be accorded the same kind of assistance from the Soviet side and shall be allowed to enter and exit.

Following the completion of the construction of the dam, the Turkish and Soviet personnel tasked with the operation of the facility shall be entitled to enter freely into the identified Soviet and the Turkish facilities.

All these issues shall be fulfilled in accordance with the guidelines outlined in Enclosure-II and Enclosure-III.

ARTICLE 8- The equipment and material to be shipped to the construction site in accordance with this agreement shall be mutually kept exempt from taxes, and customs duties.

The leftover equipment and material that will be taken into the Soviet and Turkish sides exempt from taxes and without any limitations because of the joint construction of the dam shall be removed in the same manner upon the completion of the construction as these material and equipment will no longer be required.

ARTICLE 9- The parties in an effort to provide services on the basis of equal shares, may jointly perform major and minor repair works on the dam and the dam lake through mutual consent.

ARTICLE 10- The joint operation of the dam on Arpacay (Ahuryan) river and the dam lake shall be performed in accordance with the Instructions given in Enclosure-III.

ARTICLE 11- For the cooperation related with the construction of a dam on the Arpacay (Ahuryan) boundary river and the constitution of the dam lake shall be prepared by the Turkish and Soviet agencies within 3 months pursuant to the signing of this Agreement and shall be signed after the Agreement enters into effect.

ARTICLE 12- No matter what the extent and the capacity of the dam lake which is created with the construction of the dam on Arpacay (Ahuryan) river will be, there shall be no change in the border existing between the two countries today.

When the dam lake is constituted, the existing border today shall be reflected on the surface of the water by means of buoys.

ARTICLE 13- This Agreement shall enter into effect on the date of exchange of the ratification document(s) after the completion of the approval process in accordance with the current laws in effect in both countries.

ARTICLE 14- This Agreement has been prepared in duplicate copies in Turkish, Russian and French. In case of inconsistencies between the Turkish and Russian versions the French version shall prevail.

In witness hereof, the following fully authorized officials, whose names are written below, have signed this Agreement.

Signed in Ankara on 26 October 1973.

/S/ Oguz GOKMEN  
Government of the  
Republic of Turkey

/S/ V.A.SERGEYEV  
Government of the  
Union of Soviet Socialist Republics

## ENCLOSURE-I

The enumeration of the construction works to be performed by the Turkish side in accordance with article 6 of this Agreement signed between the government of the Republic of Turkey and the government of the Union of Soviet Socialist Republics on 26 October 1973, for the joint construction of a dam on Arpacay (Ahuryan) River:

- 1- Make the dam foundation leak-proof
- 2- Upstream and downstream Cofferdams
- 3- Operation buildings
- 4- Conference buildings
- 5- Service road leading to the irrigation water output (left shore)
- 6- Right bank operating road,
- 7- Development of the dam site

**GUIDELINES PERTAINING TO THE PROVISION OF TEMPORARY ASSISTANCE IN CROSSING THE TURKISH-SOVIET BORDER AND FOR THE TURKISH AND SOVIET CITIZENS WORKING ON THE CONSTRUCTION AND CONTROL OF THE DAM ON ARPACAY (AHURYAN) DAM AND TEMPORARILY REMAINING AT THIS SITE.**

The guidelines to which the pedestrians (or vehicles) will be subject to in temporarily crossing the Turkish-Soviet border at the Arpacay (Ahuryan) river:

- 1- In order to facilitate the crossing of the border for the Turkish and Soviet experts, laborers, vehicles, equipment, technical equipment, materials, foodstuff, medicine and other cargos to be delivered to the construction site of water facilities in connection with the dam to be constructed on Arpacay dam and the related parts of this dam, a simplified process (for pedestrians or vehicles) for crossing the border is introduced with this agreement.

## ENCLOSURE-II

PASSAGE NR: -----

For crossing the Turkish-Soviet Border by vehicle:

Driver: (Name, Surname) (Father's name)

Identification Card Nr:

Shall cross the border with the vehicle (Plate nr) -----

(Make) model (machine, engine number) and

follow -----road.

The crossing shall be valid until .../.... /197...

Individual in charge

Signature (Name, Surname)

Seal ----- 197...

(Turkish text) (Russian Text)

Encl-3

LIST NR:.....and the identification card nr belonging to the service letters sent from the Turkish Border to the Soviet border with the surnames, names and the names of fathers.

Sender:.....  
(Name of the organization)

Line Nr. Nr of the place where the package is sent to

Names of (Receivers)

-Individual in charge  
(Signature) ----- (Name, Surname)

Seal..... 197...

(Turkish text)            (Russian (text))

### ENCLSOURE III

#### INSTRUCTIONS ON THE JOINT OPERATION OF THE DAM AND RESERVOIR ON ARPACAY (AHURYAN) RIVER

After the construction of the dam on Arpacay (Ahuryan) river, the parties reserve the right to use the amount of water that is allotted to them, from the dam lake and the downstream of the dam up to the Iranian border via the border rivers of Arpacay (Ahuryan) and Aras, without violating the rights of the other party, from any point they want, at any time they want and in any quantities they want.

These instructions outline the rules of technical operation of all the hydrometric equipment used for observation and measuring and facilities of the dam and the reservoir.

A Permanent Working Commission, comprised of three representatives from each side, these being a head engineer, operation expert, and a hydraulic engineer, for the solution of matters related with the joint use of the water and the technical operation of the dam's facilities is established.

Both parties shall notify each other of the names, surnames and duties of their own representatives in the Permanent Working Commission through the border commissar.

The Permanent Commission shall operate within the framework of these regulations and act according to the principles of obtaining water not only from the regulated waters in the reservoir, but from the water flowing in Aras river, and from Arpacay (Ahuryan) corresponding to the half of the share of the party, and from any point from the Aras river on the border.

A sub-commission, with the participation of three representatives from the operation services of both parties, shall be established in order to execute the decisions of the Permanent Working Commission.

If a change needs to be made in composition of both commissions, the border commissars of the parties shall notify each other.

During the joint operation of the dam, all matters related with the maintenance of the state border regime and the place, time, and the manner of the meeting of Turkish and Soviet experts shall be arranged by the border commissars.

Both parties undertake to let the experts and members of the Permanent Working Commission and the sub-commission who carry the access documents showing the border crossing point, and the date (time), enter their soils in order to perform the works outlined in these regulations.

#### Duties of the Permanent Working Commission:

1. The primary duty of the commission is to prepare the annual operating schedule of the dam and to check the implementation of this schedule.
2. The commission shall decide on the following issues at the meetings held once a month:
  - a) Matters related with the operation of the dam and the facilities,
  - b) Use of the water by the parties according to the water usage schedule,
  - c) Sanitation of the reservoir,
  - d) Fish production in the dam lake.
  - e) Disputes between the operating personnel of the two sides,
3. Upon the request of one of the parties, the Permanent Working commission shall make corrections on the water usage graphics and the maintenance and repair schedules of the facilities.
4. The Permanent Working Commission shall check once a month the conformity of the amount of water actually drawn by the parties with the water usage schedule in effect. A balancing shall be made in the waters from the Arpacay (Ahuryan) River and the reservoir waters according to Form 2 enclosed in the instructions.

In order to do balancing between the water released from the dam and the water coming from the downstream of the reservoir and from other sources, new measuring devices equipped with automatic indicators shall be installed on the existing hydrometric equipment on the Arpacay and Aras rivers. The observation data evaluated by the operating services of both parties shall be submitted to the Commission in the form given in enclosure 3 of the Instructions.

5. Throughout the operation period, the dam and other facilities shall be systematically reviewed and any cracks, loose and deformed parts, and damages shall be entered in a report by the Permanent Working Commission.

The Commission shall render decisions to correct the results of these deformations and take measures for them not to occur more frequently or in greater amounts, and shall check to see if these measures are being implemented.

6. The Permanent Commission retains the right to apply to the authorized agencies of the parties for the modification of any element of the facilities.
7. Commission's work will be performed on the basis of equality. Disputes that may arise during the operation of the Commission shall be referred to the authorized officials of the parties for solution.
8. The Commission shall hold meetings on rotational basis in Turkey and the Soviet Union.
9. Upon the request of either one of the parties, the meetings of the commission shall be held every month. The place and date of the meeting shall be determined through mutual agreement beforehand.

One of the rooms shall be allocated for the meeting.

#### Maintenance and Repair:

11. The parties shall perform the maintenance of the reservoir and repair of the facilities on their part.



12. The dam shall systematically kept under surveillance by the operation services of both parties.

13. With the inspections conducted from time to time all the deformations and damages shall be noted.

In order to determine the vertical and horizontal movements of the dam and other facilities shall be tied to the permanent ropers. The levels of the facilities and elements shall be checked by the operating personnel form time to time.

14. The expansion joints of the dam and the facilities shall constantly be checked and when necessary the joints shall be repaired to prevent any leaks.

15. Deformations and damages that occur for various reasons shall be eliminated as soon as possible.

16. The metal sections of the facilities (according to the rules of maintenance) shall be oiled, painted and shall be kept operational at all times.

17. Leaks from the dam and the reservoir shall be subject to special control.

18. During winter the mobility of lifting devices and other equipment shall be systematically checked and shall be protected from freezing.

19. The dam and its facilities shall be thoroughly inspected by a commission comprised of the responsible experts of both parties once every 3 to 5 years. The decisions taken by the said commission shall be implemented by the Permanent Working Commission.

20. The parties use their own personnel, materials and equipment during the operation of the facility.

The parties shall mutually agree if additional operational facilities are to be built and each party shall build its own facility.

#### Water Distribution Arrangement:

21. The parties shall withdraw water from the reservoir according to the water usage schedule.

22. The parties may obtain their half share of water either from the regulated waters made in the reservoir or from the water flowing in the river Aras, at any point on the Arpacay (Ahuryan) river and Aras River that constitute the border.

23. Every year, at the end of the irrigation season, the Permanent Working Commission shall check to see if the amount of water used by the parties is in accordance with the water usage schedule.

24. In accordance with the water withdrawals graphic, the parties shall use their share of the water from the reservoir at any place and at any time they want. In order to determine the amount of water taken by both parties from the reservoir and from the rivers both parties shall install the necessary automatic recording apparatus.

25. The water usage programs prepared in advance shall be adjusted according to the actual weather conditions of the year and the changes in the hydrological regime of the rivers.

The water distribution guidelines envisioned in the Protocol dated 25 April 1963 shall be observed in the adjustment of the water usage programs.

26. In the annual water usage program, the total volume of the water obtained by both parties should be equal. In the monthly meetings of the Permanent Working Commission, the amount of water they will take and the places where they will withdraw water are determined for the duration of the following month. Extraordinary meetings shall be held upon the request of one of the parties to solve the matters related with the water usage and to make changes in the monthly water usage graphics.

27. The parties shall be entitled to use their share (half each) of the water from the weirs at any place and at any time they want.

28. In case the parties construct a hydropower plant, water withdrawals for that purpose should not make any changes in the height of the dam and in the volume of the reservoir that are determined in the advance drawings. Additionally, this matter should not prejudice the other party's right to use its share of the water according to the water usage graphic as determined in the advance drawing.

29. The operation services of the parties have the mutual right to check each other's actual water drawing.

Upon mutual consent, the parties shall conduct measuring to control the water and make corrections on the consumption curves, and the authority to control shall rest with all the water measuring facilities.

30. The party that has not used its share of water according to the water usage graphic by the end of the year shall not be entitled to claim the amount of water it has not used in the following year(s).

#### Operation Services:

31. Both parties shall perform operation services of the dam throughout the year.

32. Both parties shall have technicians and workers in sufficient numbers for the operation of the dam and the facilities.

33. Office buildings shall be constructed on both sides for the operation personnel to work and shall be maintained.

34. The operation service shall perform the following works:

- a) Maintenance, repair and renovation works of the dam and the facilities,
- b) The works envisioned in the water usage program
- c) Works related with establishment and maintenance of water measuring facilities,
- d) Calculation of the water inflowing and out flowing from the reservoir,
- e) Raising and lowering the lids to release water from the dam,
- f) Manipulation of the lifting device to eliminate to possibility of its freezing,
- g) To let the flood waters pass without causing any damage,
- h) Execute decisions of the Permanent Working Commission.

35. The chief engineer of the dam and the reservoir is a member of the Permanent Working Commission.

36. The operating service of each party shall have telephone connections to its own administrative center and the dam facilities.

Miscellaneous Issues:

37. The parties shall withdraw water from the reservoir at the dam weirs envisioned by Turkey and the Soviet Union in accordance with the water usage program. In order to alleviate the load of the weirs in the transfer of large amounts of water, excess water shall be released from the weirs at the same time.

The amount of released water shall not be considered in the water usage account.

38. In order to monitor the dynamics of the groundwater flows that may occur during the filtration of the reservoir, dam body and the nearby facilities, observation wells shall be opened during the construction. The cost of opening these wells shall be incorporated into the cost of the dam construction. The level of the groundwater shall be constantly monitored from these wells. This observation data should be exchanged between the parties every month.

39. The machinery and equipment shall be operated in accordance with the instructions given by the factory or specially written instruction.

40. In accordance with paragraph "I" of article 14 of the Protocol dated 25 April 1963, the regulators of Guven (Talin) and Serdarabat (Oktemberyan) may be modified according to the operating plan prepared in order to allow the intake of necessary water. These shall be equipped with water measuring devices.

The modification shall be accomplished according to the project to be mutually agreed.

The party that cannot use its share of water for any reason whatsoever, may not object to the other party's utilization of its share of water.

41. The dam and its facilities and their environs shall be lit up at night.

42. Each side will keep construction materials, equipment, etc. for possible emergency failures that may occur unexpectedly.

The list of materials and equipment and their quantities shall be maintained by the Permanent Working Commission.

43. The Arpacay (Ahuryan) reservoir may be used for fishery. The conditions for fish production shall be determined between the parties with a special agreement.

44. Forms 1, 2 and 3 have been attached to these instructions to be used as guides during the operation of the dam. The Permanent Working Commission has the right to make additions and changes on these forms.

**Annex 2.8**REPUBLIC OF TURKEY  
OFFICIAL GAZETTE

2 MAY 1990

NR: 20506

## EXECUTIVE AND ADMINISTRATIVE SECTION

## International Agreement

Decision Number: 90/312

Based on the letter of the Ministry of Foreign Affairs Nr. KGEH/KOHD-1421, dated 16/3/1990, and in accordance with articles 3 and 5 of the Law number 244, the Council of Ministers has decided to ratify the enclosed "Agreement on the Cooperation for the Construction of Hidrotechnical Facilities for the Prevention or Correction of the Riverbeds of Arpacay (Ahuryan) Coruh River, Posof and Caksu Streams extending between the border stones number 41 through border stone number 450 on the Turkey- Soviet Union border" signed between the Government of the Republic of Turkey and the Government of the Union of the Soviet Socialist Republics in Ankara on 7 March 1990.

Turgut Ozal  
Head of the State

Y. Akbulut  
Prime Minister

M. KECECILER	K. INAN	H. DOGAN	G. TANER
Minister of State	Minister of State	Minister of State	Min. of State

C. CICEK	I. CELEBI	V. DINCERLER
Min. of State	Min. of State	Min. of State

M. YAZAR	I. OZARSLAN	E. KONUKMAN
Min. of State	Min. of State	Min. of State

I. OZDEMIR	M. TASAR	K. AKKAYA	H. ORUC
Min. of State	Min. of State	Min. of State	Min. of State

M. O. SUNGURLU	I. S. GIRAY	A. AKSU
Min. of Justice	Min. of Defense	Min. of Interior

A. BOZER	A. KAHVECI	A. AKYOL
Min. of Foreign Affairs	Min. of Finance & Customs	Min. of Education

C. ALTINKAYA	H. SIVGIN	C. TUNCER
Min. of Housing & Construction	Min. of Health	Min. of Transportation

L. KAYALAR  
Min. of Forestry  
& Rural Affairs

I. AYKUT  
Min. of Labor & Social  
Security

S. YURUR  
Min. of Industry & Trade

F. KURT  
Min. of Energy & Natural Resources

N. K.ZEYBEK  
Min. of Culture

I. AKUZUM  
Min. of Tourism

**Agreement on the Cooperation for the Construction of Hidrotechnical Facilities for the Prevention or Correction of the Riverbeds of Arpacay (Ahuryan) Coruh River, Posof and Caksu Streams extending between the border stone number 41 through border stone number 450 on the Turkish Soviet Union border signed between the Government of the Republic of Turkey and the Government of the Union of Soviet Socialist Republics.**

Acting on the good neighborly relations existing between the Government of the Republic of Turkey and the Government of the Union of Soviet Socialist Republics,

In accordance with the "Protocol On the Control, Maintenance, Repair and Improvement of the Border Markings between the Republic of Turkey and the Union of Soviet Socialist Republics and the Maintenance of the Border Forest Cutting Belts" dated 29 December 1973 and "the Final Protocol of the Joint Control Commission on the Results of the Joint Control conducted during 1984-1988 on the Passing of the rivers, and streams between the border of the Republic of Turkey and the Union of Soviet Socialist Republics, dated 6 December 1989,

The parties have agreed on the following issues for the prevention or correction in the changes in the beds of Arpacay (Ahuryan) river, Posof stream, Coruh river and Caksu stream extending between the border stone number 41 and border stone number 451 of the border region.

#### ARTICLE 1

The contracting parties shall enter into cooperation in the fulfillment of the measures envisioned in the Final Protocol for the correction of the existing changes and for the prevention of possible changes in the beds of the:

- a) Arpacay (Ahuryan) river around the border stone number 50/2
- b) Caksu stream between the border stone number 229 and 230,
- c) Posof stream between the border stone number 230 and 232,
- d) Coruh river between the border stone number 418 and 423.

#### ARTICLE 2

The cooperation envisioned in article 1 of this agreement shall be executed in the following stages:

- i) Preparation of maps (plans)
- ii) Research should be conducted based on the preliminary and final projects should be prepared thereafter,
- iii) Construction of Hydrotechnical Facilities

Each party shall conduct necessary activities individually. The details of the works shall be specified by a Work Protocol to be jointly prepared by the concerned agencies of the parties within the framework of this Agreement.

## ARTICLE 3

The cooperation envisioned in article 1 of this Agreement shall be executed by the General Directorate of the State Hydraulic Works of the Government of the Republic of Turkey and the Ministry of Water Construction Works of the Government of the Union of Soviet Socialist Republics.

## ARTICLE 4

In order for the persons, vehicles, cargo, equipment and other materials to cross the border for the performance of the activities envisioned in article 2 of this agreement, the crossing of the border shall be at the crossing points determined in accordance with "the Guidelines for the Simplified Crossing Arrangements and Temporary Stay in the Territories of the Other Party, between the Turkish- Soviet State Border of the Persons, Vehicles, Cargo, Equipment and Other Materials for the Works related with the Hydrotechnical Facilities related with prevention or correction of the changes in the beds of Arpacay (Ahuryan) River, Posof Stream, Coruh River, and Caksu Stream extending between the border stone number 41 through the border stone number 450 on the Turkish-Soviet border" and which is an integral part of this agreement and given in the enclosure.

## ARTICLE 5

Each party shall construct the units of the facilities on their territories, including the provision of the necessary equipment, materials and labor, following the approval of the Final Project, through its own means. The necessary construction works shall be performed in accordance with the joint work schedule to be specified in the Work Protocol and in parallel with both sides and in a manner not to harm the river banks of the other party. The parties shall reserve the right to supervise the performance of these works.

## ARTICLE 6

The equipment and materials to be sent by each party for the works to be performed on their respective soils in accordance with this Agreement and which need to cross the border in order to be transported according to the local requirements shall be exempt from all taxes and duties. The leftovers of the said equipment and materials shall be taken back in the same manner after the completion of the construction works.

## ARTICLE 7

The parties shall operate and maintain the facilities to be constructed on their soils through their own means.

## ARTICLE 8

The parties shall jointly check that the beds of the rivers and streams to be recreated during the performance of the hydrotechnical facilities are in conformity with the conditions stipulated in the border marking documents of 1973.

After the completion of the construction the parties shall prepare and approve the joint operation guidelines of the hydrotechnical facilities.

## ARTICLE 9

This Agreement shall be subject to ratification in accordance with the laws of both parties and shall enter into effect as of the date of the Note notifying that the internal formalities have been completed.

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This Agreement has been signed in Ankara on 7 March 1990 in duplicate copies in Turkish and Russian and both texts are equally valid.

YURI A.SOLMOV  
Government of the Union of Soviet  
Socialist Republics

ERKAN GEZER  
Government of  
the Republic of Turkey

## Annex 2.9

REPUBLIC OF TURKEY  
OFFICIAL GAZETTE  
FRIDAY, 12 SEPTEMBER 1947  
NUMBER: 6705

### LAW

Law on the ratification of the Treaty of Friendship and Good Neighbourly Relations signed between Turkey and Iraq and the Supplementary Protocol and Agreements to this Treaty.

Law number 5130      Date of Acceptance: 5/9/1947

Article 1- The Treaty of Friendship and Good Neighbourly Relations signed between the authorized representatives of Turkish and Iraqi governments and the six supplements to this treaty on Protocol, Extradition of Criminals, Law, Punishment and Trade Affairs, and Agreement on Legal Assistance and their enclosures have been accepted and ratified.

Article 2- The Agreement mentioned in article 1 and the protocol enclosures shall enter into effect upon the exchange of the ratification documents;

The Extradition of Criminals, and the Contract on Legal Assistance pertaining to Law, Punishment and Trade Affairs shall enter into effect in fifteen days after the exchange of the ratification documents.

Article 3- This law shall enter into effect on the date of its publication.

Article 4- The Ministries of Justice, Interior, Foreign Affairs; National Education, Trade, Economy, Transportation, Customs and Monopoly shall execute this law. 6/9/1947

### **The Treaty on Friendship and Good Neighbourly Relations between Turkey and Iraq**

His Excellency Ismet Inonu, the President of Turkey, and His Excellency the Prince Regent Abdullah of the Kingdom of Iraq have acted together in order to improve the friendship and the very good neighbor relations existing between Turkey and Iraq and to fortify the coalescence and the brotherly relations between the two nations over centuries.

Both countries have accepted the ideals of peace and security as the unchanging foundation of their foreign policy in the search of peace and security in the world and especially in the Middle Eastern countries, and are pleased to see that the provisions of the United Nations Charter, signed in San Francisco, with the intent developing international solidarity, solidifies their own purpose and will accelerate them in pursuing their goals,

With the consideration that mutual understanding and assistance in the area of economy will facilitate closer relations in its true sense,

With the rightful bliss of taking the first step in the implementation of the principles upheld in the United Nations Charter and with the intent of remaining loyal to the commitments arising from the Charter,

Have come to the conclusion that an agreement has to be reached in order to accomplish all of the thoughts above and have, therefore, appointed the individuals whose names are written below for this purpose:

His Excellency Ismet Inonu, the President of Turkey:



His Excellency Hasan Saka,  
Deputy of Trabzon, Minister of Foreign Affairs

His Excellency Feridun Cemal Erkin  
Ambassador, Under Secretary, Ministry of Foreign Affairs

His Excellency Regent Prince Abdullah of the Kingdom of Iraq:

His Excellency Al Farik Nuri Essaid  
Speaker of the Senate, holder of the 1<sup>st</sup> Degree Rafidain Order

His Excellency Abdullah Hafidh  
Member of the Saylavlar Assembly

After these representatives have presented their certificates of authority in the prescribed manner, they have decided on the following provisions:

#### Article -1

The parties to the Treaty undertake to comply with the territorial integrity of each other's countries and with the border delimited and demarcated between the two countries with the Treaty dated 1926.

#### Article -2

The parties to the Treaty undertake to definitely avoid intervening with each other's internal affairs.

#### Article -3

The parties to the Treaty undertake to cooperate on international matters of mutual interest in general, and to consult each other on regional matters and to provide full support and collaboration to each other in pursuing policies related to these matters within the framework of the United Nations Charter.

#### Article -4

The parties to the Agreement undertake to immediately notify the authorized organs of the United Nations Organization in case of a threat of attack on the territorial integrity of the respective countries or to the inviolability of borders or in case of an attack to either one of the parties.

#### Article-5

The parties to the Agreement undertake to resolve all disputes that may arise between the parties in peaceful manner in accordance with the provisions of article 33 of the United Nations Charter and if they cannot resolve the dispute in this manner they agree to take the matter to the Security Council in accordance with article 37 of the said Charter.

Likewise, the parties to the Treaty undertake to do best of their efforts to resolve the disputes that may arise between one of the parties to the Treaty and a third neighboring country or between two neighboring countries in accordance with the same provisions.

#### Article-6

The parties to the Treaty, in keeping with the spirit of the Treaty, have accepted the protocols listed below as integral parts of this agreement in order to promote their cooperation, and develop their relations in every field:

- 1- Supplementary Protocol Nr. 1: Protocol to regulate the waters of the Tigris and the Euphrates and their tributaries.
- 2- Supplementary Protocol Nr. 2: Protocol on Bilateral Cooperation on Security Matters
- 3- Supplementary Protocol Nr. 3: Protocol on Cooperation in Education, Training and Culture.
- 4- Supplementary Protocol Nr. 4: Protocol on Post, Telegraph and Telephone.
- 5- Supplementary Protocol Nr. 5: Protocol on Economic Affairs.
- 6- Supplementary Protocol Nr. 6: Protocol on the Border Affairs.

Parties to the Treaty have also signed the below agreements:

Agreement on the extradition of criminals.

Agreement on Legal Assistance Pertaining to Law, Punishment and Trade.

#### Article-7

This Treaty has been concluded for an indefinite period of time however; this Agreement may be reviewed upon the request of either of the parties at the end of every five years.

This Treaty shall be ratified by the parties and the certificates of ratification shall be exchanged at Baghdad as soon as possible.

In case of disputes on this Treaty concluded in Ankara in Arabic, Turkish and French, on twenty-nine March of the year one thousand and forty-six, the French version of the Agreement shall prevail.

Hasan Saka

Nuri Essaid

Feridun Cemal Erkin

Abdulilah

#### SUPPLEMENTARY PROTOCOL NUMBER 1

#### PROTOCOL ON FLOW REGULATION OF THE TIGRIS AND EUPHRATES RIVERS AND OF THEIR TRIBUTARIES

In order to ensure the maintenance of a regular water supply, to regulate the water flow and to avoid the danger of floods during the annual periods of high water, it had been found necessary to construct dams and permanent observation stations in Turkish territory,

They believe that after studies the most appropriate places for the dikes and other constructions all the expenses of which will be met by Iraq, will be found on the Turkish territory,

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They have agreed to establish permanent observation stations on Turkish territory to record the flow of the said rivers and also agreed that the records to be obtained in this manner need to be delivered to Iraq regularly,

Since they have agreed, that the water control facilities to be built on these rivers should in principle also be used for irrigation and hydropower production serving the interest of both countries,

They have agreed on the following issues:

#### Article -1

Iraq may send to Turkey groups of technical experts to make investigations and surveys, collect hydraulic and geological information needed for the selection sites for the construction of the dams and observation stations to be constructed on the Tigris, Euphrates and their tributaries.

The maps to be drawn from the result of the land measurements, shall be prepared by the authorized Turkish agencies.

All the expenses for the works mentioned in this article shall be met by Iraq.

#### Article-2

The technical experts from Iraq shall collaborate with Turkish technical experts; Turkey shall authorise them to proceed to the places to be visited and shall provide them with the information, assistance and facilities necessary for the accomplishment of their task

#### Article-3

Turkey shall install and operate permanent flow measurement facilities, and transmit periodically the readings and the recorded data to Iraq. Iraq and Turkey shall meet the operating expenses of these stations, on equal basis, as of the date of entry into effect of this protocol.

Turkish and Iraqi technicians shall inspect the permanent observation stations at specific intervals.

During times of overflow, the river level observations made every day at 8 o'clock in the morning shall be wired to the officials to be designated by Iraq via the communication stations in Diyarbakir, Cizre for the Tigris, and via the communication stations in Keban, etc. for the Euphrates.

The results of the level observations during normal times when there is no overflow shall be sent to the same agencies as bi-monthly bulletins.

Iraq shall pay for the notification expenses mentioned above.

#### Article -4

Turkey in principle accepts to construct flow regulation works needed in the interest of Iraq in Turkish territory.

Each of the facilities except the permanent observation stations shall be a subject of separate agreements with respect to their location, expense, operation and maintenance and in meeting Turkey's irrigation and electricity requirements.

#### Article-5

Turkey shall inform Iraq of projects for waterworks on any of the Protocol watercourses, and shall consult with Iraq with a view to accommodating the interests of both countries.

#### Article-6

Pursuant to the signing of this Protocol, the parties to the treaty shall appoint a representative respectively, as soon as possible. The representatives shall discuss all the matters related with the fulfillment of the provisions of this protocol and shall act as go-between for keeping communication between parties.

Hasan Saka

Nuri Essaid

Feridun Cemal Erkin

Abdulilah

## SUPPLEMENTARY PROTOCOL NUMBER 5

### PROTOCOL ON ECONOMIC AFFAIRS

The parties to the agreement have agreed to the following issues for the two countries to realize the conditions to work more closely and in cooperation in the field of economy.

#### SECTION I

##### Joint Economic Commission

##### Article –1

A Joint Economic Commission shall be established and this commission shall hold meetings at specific intervals to discuss how the provisions contained in sections 1,2,3,4 and 5 of this protocol and the provisions contained in the Supplementary Protocol numbers 1 and 4 shall be implemented and shall jointly prepare drafts as to what will be necessary to clearly define these provisions, and submit these drafts for the review and approval of both Governments.

##### Article-2

The committees in the Joint Economic Commission shall be the following:

1. Trade, Customs and Finance Committee
2. Tourism Committee
3. Transportation and Ports Committee
4. Committee for regulating the waters of the Tigris and Euphrates rivers.