IMPACT OF TIGRIS AND EUPHRATES WATER CRISIS ON THE ENVIRONMENTAL CATASTROPHE OF IRAQI MARSHLANDS

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Abstract

The water crisis of the Tigris and Euphrates has reached a very dangerous level, especially for Syria and Iraq. Turkey's stated political objectives to build large dams under its Great Anatolian Project (GAP) have been the source of this crisis. This project consists of a total of 22 dams, (capacity of around 120 billion cubic meters) and contains nineteen hydroelectric electricity generating stations which are expected to be completed by 2010.

Over the past ten years, Turkey had consistently refused to discuss the ramifications of the GAP developmental plans. It had also refused to consider any regional ramifications, human rights, breaches of international justice or historical and political relations with the rest of the Arab world Turkey further refused to supply sufficient water shares of internationally owned rivers, according to international water sharing policies and legal agreements.

This shortage of supply has effected all local water systems, as far south as the Southern Iraqi Marshlands, which themselves cover an area of 15,000 - 20,000 square kilometres. These marshlands are situated north of Basrah City occupying a triangular area between three cities of Basrah, Misan and Nasiriya, discharging their water to the Arab Gulf via a delta system, through the Shutt Al-Arab estuary.

This water situation has also affected the entire region's macro environment and weather patterns, as well as the creation of more than half a million Marsh Arab refugee. Over the past ten years. The UN in Geneva has established an agency to care for the marshland's displaced refugees.

The Southern Iraqi Marshlands are major wetlands of the region and the world. They are considered as a world heritage site according to their historical and archaeological importance to the region.

The marshlands people form an important historical link to the ancient Sumerian and Babylonian civilisations in the former Mesopotamia, who have given to the world significantly important scientific gifts, such as the modern numeric system of math, and the basis of interpersonal communication through the alphabet.

International agencies must be rallied, to prevent any further deterioration, and provide for total restoration of the riparian countries. Failure to immediately enact such actions can only result in the continually expanding conflicts and human miseries, which now blight the effected regions.

1 BACKGROUND

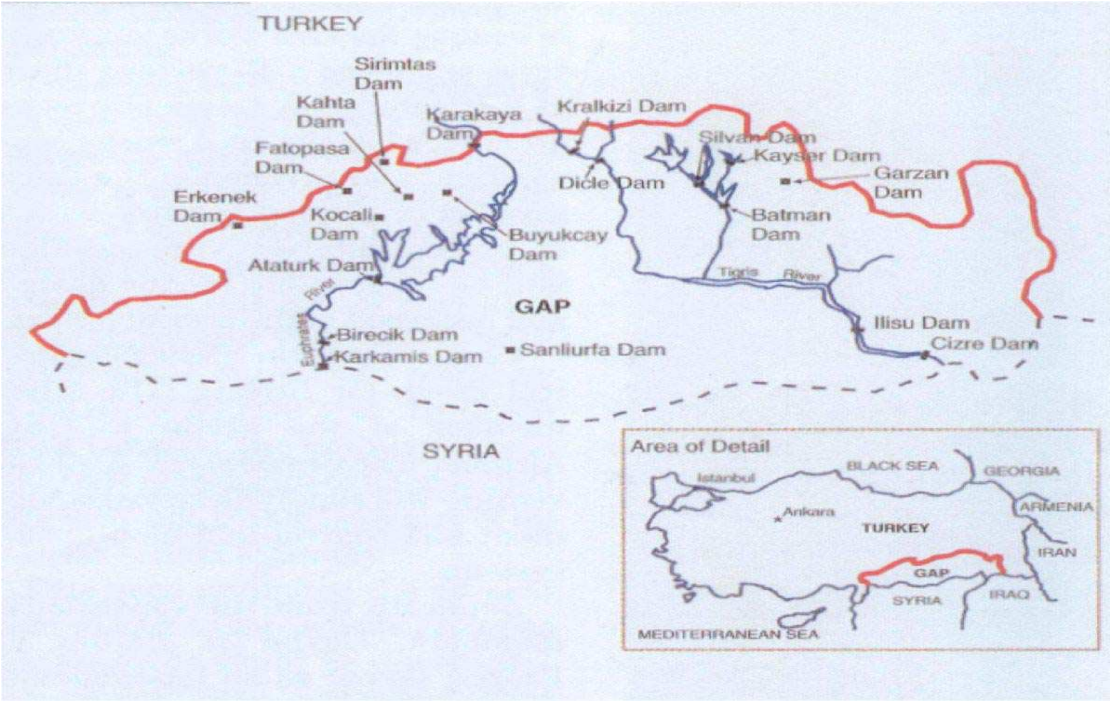
Problems of Tigris and Euphrates water resources originating in Turkey have increasingly escalated into a series of political and economical crises due to limits that have continuously been placed on the cross border discharge of these two rivers by Turkey. The problem has so far

involved only the Euphrates, but it will eventually affect Tigris River as well [Roger P. and Lydon P. 1994].

Following Turkey's refusal to follow both the League of Nations and the United Nations treaties stemming as far back as 1923. A "*Joint Committee for Technical and Economical Affairs"* was formed in 1966, that met sixteen times without success and was finally dissolved in 1992.

Turkey is planning to block most of the water that has historically flowed into Syria and Iraq, through building of mega dams and reservoirs, such as Kiban Dam and others under the *Great Anatolia Project* "GAP" [Al-Moueid, 1990 and Hannosh A. 1995]. Turkey has also announced a "Water Peace Project", using water from some Euphrates tributaries to supply neighbouring countries, and the Gulf, with water through two pipelines costing over $5.0 billion US [Ozden Bilen, 1997]. No date has yet been set for this project.

The 22 GAP water reservation projects (Map 1) are expected to be completed in 2010, 14 of these are on Euphrates River, with the remainder on the Tigris River. At the end of 2000, nine dams and several irrigation networks had already been fully completed, containing a maximum capacity of about 93 billion cubic meters. Long-term supply will be decreased to 15 and sometimes to 13 billion cubic meters [AL-Rubaie, 1996].



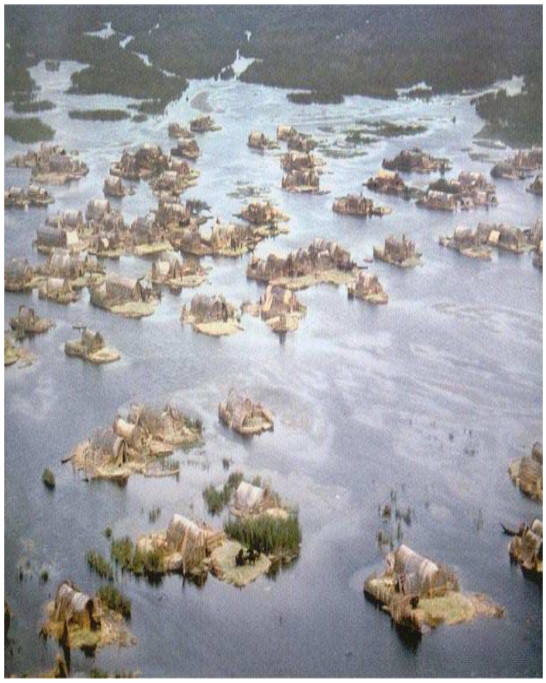
Map 1 – Shows the GAP Project's dams and reservoirs.

The Tigris water flow will decrease from 21.2 to 10.5 billion cubic meters measured at the exit border between Turkey and Iraq seriously affecting the existing irrigated lands in both of Syria & Iraq as well as all of the marshlands at the South.

Severe climate, due to high temperatures together with their short winter and low average annual precipitation, makes both Syria and Iraq very much dependent on the Euphrates water flow [Mounro etal 1996, AL-Ansary 1996]. Iraq has less than 154mm per year and Syria 252mm per year of which 75% is lost by evaporation [FAO, 1997], while Turkey averages 643mm rainfall per year [Ozden Bilen 1997].

Mesopotamia's Tigris and Euphrates Basins created most of the world's oldest civilisations, due to the efficient use of the area's natural resources [Hannosh A. 2000]. Research evidence shows that these areas were extremely productive [AL-Najim M. 1998, Mahmoud 1998]. Mesopotamia was called the "Black Land", due to its very fertile soils and its plentiful water resulting in high yields of cereals and other agricultural products for both the population of Mesopotamia and its neighbouring countries. [Allan etal. 1996, Biswas, 1994, Hacan etal. 1997].

Water shortages in the region have also changed the nature of the marshlands in southern Iraq. The marshlands receive their water supply from the two rivers of Tigris and Euphrates, as well as from the drainage systems and irrigation channels which together form lakes of different depths of approximately (1 - 1.5 meters). These lakes are joined together through a network of channels which are used by the people of the marshlands to travel to different settlements, as well as the surrounding country-sides and the small towns where they can get easy access for food, clothes and other household needs. The water of the marshland is mobile, not stagnant, such as the Hammar marshland which is known to be the largest fresh water marshland in Iraq as it intersects the Euphrates River. Many small islands which are called "shans" (Fig. 1) are spread within the marshlands and this is where the region's people live. "Shan" is a Sumerian word and it translates to hill. Marshland houses are made of reed and papyrus plants (Fig. 2).



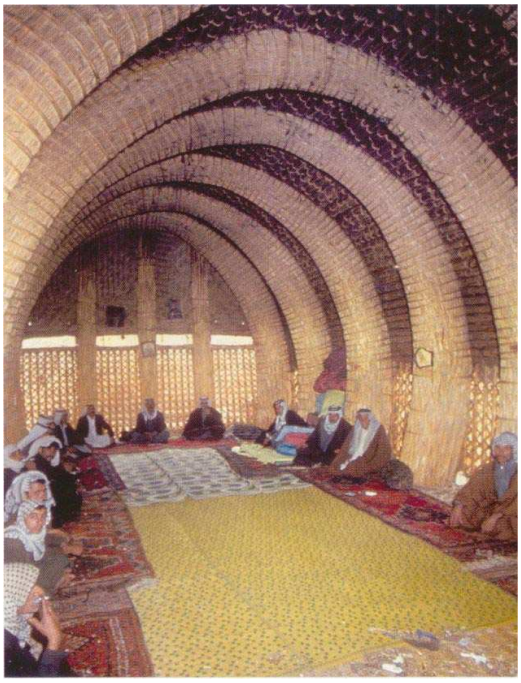


Fig. 1 - The marshlands villages are built on artificial floating islands by enclosing a piece of swamp, and filling it in with reeds and mud.

Fig. 2 - A cathedral-like arches of the *mudhif*, guesthouse made completely of reeds which is a cultural legacy of ancient Sumer.

2 THE NEED TO REHABILITATE THE MARSHLANDS

Studies of satellite maps of the geographical areas taken in 2001 show that only 10% of the marshland exists of the original 20,000 sq. Km, represented by the Huwaiza Marsh which depends on the excess water that reaches it from the Kurkha River flowing from Iran, while Qurna and Hammar Marshes that used to cover 20,000 square km have disappeared. As a result, the marshlands lost many of their plant and animal species, and in consequence have also lost many of their people.

This was a great loss. The British scientists and scholars in a book called, "The Return of the Marshes" described the marshes to be the Iraqi *heaven*. The destruction of the southern Iraqi marshlands is a social and environmental disaster. It has been ongoing for several years starting from the early eighties, and reaching its peak destruction at the beginning of the nineties as the operations of drying the marsh areas became the Iraqi State policy. The construction of the "Third River" in 1992, which is 172 kilometres long, with a discharge capacity of 220-250 cubic meters per second, lasted only 6 months, since it was prioritized by the Iraqi government. It starts from the point where the channel crosses the Euphrates River and ends at the intersection with Shutt AL-Basrah

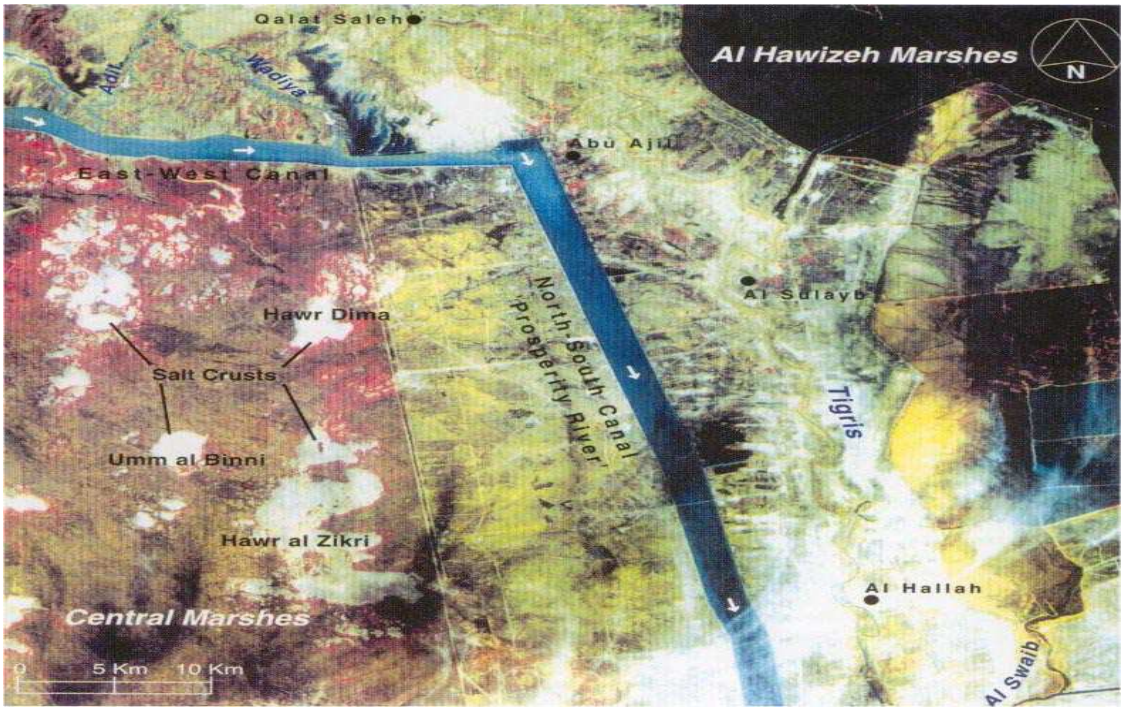
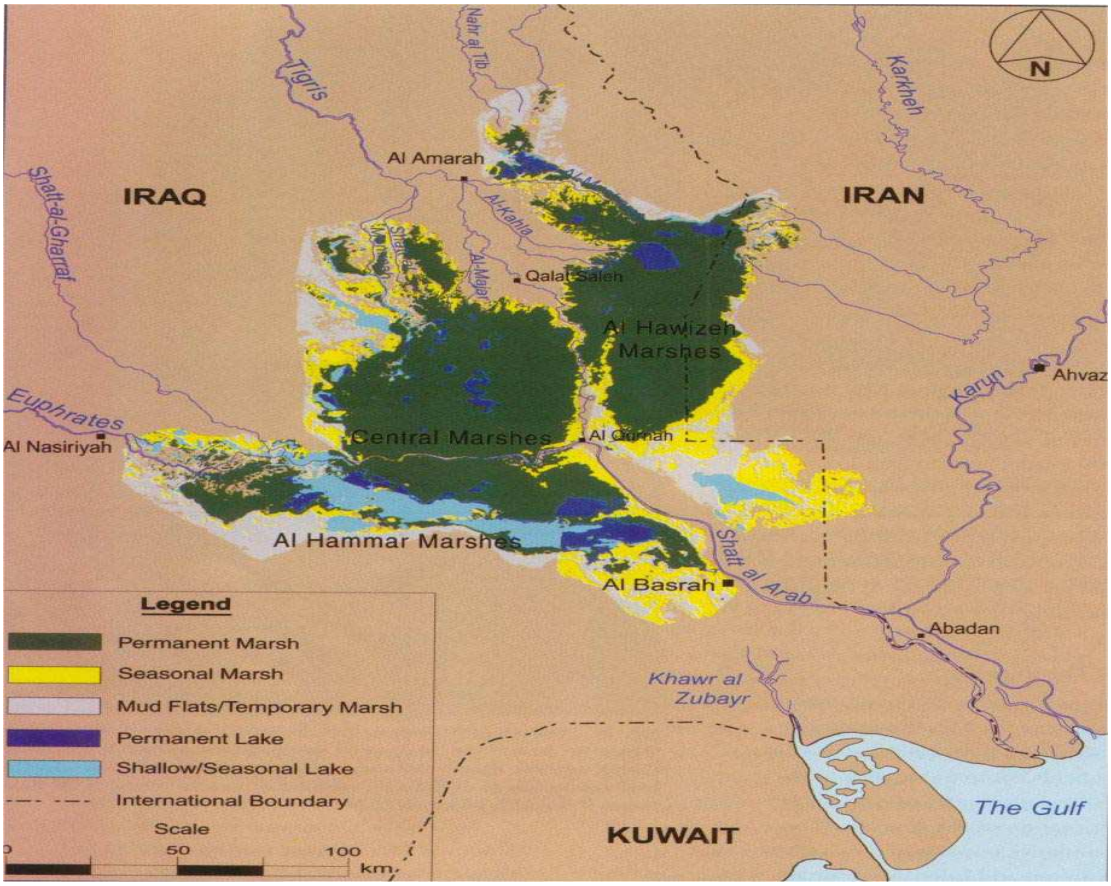


Fig. 3 - December 1993 image shows the 2-km wide and 50km long 'Prosperity River' which captures the waters of Tigris distributaries and channels them across the marshes to the Euphrates near its junction with the Tigris at Al-Qurna.

After the completion of the project, many villages were burned, including their contents of plants and animals. Even the water was poisoned to kill all the fish and other water animals. The rice fields, being the main source of food and income of the people were also destroyed. As a result of this operation half a million of the marshland people migrated to other Iraqi cities or took refuge in the neighbouring countries. Currently, there are 95,000 refugees in Iran where humanitarian organizations are providing assistance.

The marshland therefore has become saline, with frequent sandstorms unfit for cultivation keeping in mind that before, it was one of the largest wetlands in the Middle East, and one of the ten most important environmental areas on earth according to UNISCO (Map 2). The region also has a great religious importance for Muslims, as well as for Christians and Jews.



Map 2 - Mesopotamian Marshlands: Land Cover 1973-76.

The inhabitants of the marshlands are such an important and unique society that is worthy of anthropology studies, as well as studies of their souvenirs, remaining written documents or art works carved on rocks during the early civilisations that go back to 4000 B.C. Even the migratory birds have also lost an important site that they used to frequent it in the past during their annual migration ritual. The destruction of the marshlands is one of the most horrible and atrocious environmental crimes that have taken place in this century which cannot be justified by any measure, aside from its high cost involved (Map 3). The international environmental organisations, as well as the human rights organisations, must find ways to tackle and correct this environmental catastrophe. The international health, social, economical and educational authorities are also invited to join in this monumental effort. Although, in February 1993, the United Nations expressed their concerns over the destruction of the wetlands, more efforts are needed to draw concrete actions to address this humanitarian and environmental disaster.

The first action that is required along this road would be the respect of the riparian rights. The fact that the water sources of the Tigris and Euphrates Rivers have been immensely cut has exasperated the situation. Blocking these two international rivers is the main reason for this environmental tragedy in the south of Iraq, including the climatic effects associated with it.

Map 3 - Mesopotamian Marshlands: Land Cover 2000

3 EFFECTS OF THE GAP PROJECT ON THE DOWNSTREAM COUNTRIES

Tigris River discharges an average annual volume of 21.2 billion cubic meters across the Iraqi-Turkish border. Turkey plans to establish a total of eight dams as part of the "GAP" project on the Tigris River, having completed four by the end of 2000, causing the annual average river system volumes to decrease by 50% to about 10.5 billion cubic meters.

The GAP project currently transfers a third of the total discharge of Euphrates water (330 cubic meters per second), to irrigate an extensive area in Turkey not originally located in the Euphrates basin, via two large tunnels, 27 kilometres long and 6.5 meters in diameter. This water is desperately needed to irrigate the million hectares in Syria and Iraq [Ozden Bilen 1997].

Turkey has already reserved about 100 billion cubic meters, of which only one fifth (20 billion cubic meters) is required for its legitimate use.

Green Peace and *Friends of the Earth* [Nigel Sloan, April 2000] have confirmed that the decrease in the supply of the international water has caused local settlers to migrate. This has made thousands of Kurds homeless. The plan for Ilisu Dam (One of the GAP project dams) will also destroy an ancient and important archaeological site in Hassankef Town dating back to the 7th century B.C. The rise of the water table in the Turkish agricultural areas due to the increased water storage may also cause irreversible environmental damage to Turkey itself.

At the beginning of 1989 [AL-Najim M. 1989, Jamalo 1996], the water salinity of Euphrates began to increase rapidly, reaching 1000 PPM at Al-Qaim Town on the Syrian-Iraqi border. Previously it had never exceeded 500 PPM. Water salinity in Syria & Iraq is now forecasted to dramatically increase following the proposed "GAP" project completion in 2010.

This constantly decreasing water quality in the downstream basins will continuously prevent Iraq from effectively reclaiming its former rich agricultural soils. It would also prevent the natural drainage of salts and other pollutants from the whole Euphrates/Tigris system, most of which soils are heavy and already face drainage difficulties, making them useless for agricultural purposes [AL-Najim M. 1989].

When the total planned area of the "GAP" project (1.7 Million hectares) is cultivated, the resulting saline drainage water returning to the Euphrates [Kolar S. 1992, Tolba etal 1990], will carry thousand tonnes of salt and un-dissolved complex materials resulting from the use of pesticides, herbicides and fertilisers. Consequently this will add further complication on the human and animal health in the downstream countries.

4 THE LEGAL CASE

Although water distribution rights were continuously negotiated since the 1960's, disputes between Turkey, Syria and Iraq remain unresolved. Turkey believes it should determine the ratios of water sharing from the Tigris & Euphrates river system, whenever and however Turkey decides, without adherence to earlier agreed-upon rules and regulations.

The real fear started in 1974 in Iraq, when the construction of Kiban Dam in Turkey, with a capacity of 30.6 billion cubic meters, was finally completed. Later that same year, Iraq suffered further setback of shortages of Euphrates water when Syria completed its own 14.2 billion cubic meters capacity Al-Thawra Dam**,** and started to fill its reservoir. Saudi Arabia had to intervene to arbitrate this serious conflict.

In 1987, when Turkey started to store huge amounts of water in the reservoir of its Ataturk Dam, a serious conflict arose between Turkey and both Syria and Iraq, continuing until the summer of that year, when former Turkish president, Mr. T. Ozal visited Syria and signed an official protocol agreement between the two countries [Roger and Lydon, 1994]. Turkey subsequently agreed to firstly but temporarily discharge 500 cubic meters per second across the Syrian-Turkish border, and then to progressively increase the water discharge to 700 cubic meters per second, until a final solution to share the Euphrates water could be found.

Fig 4. Ataturk Dam with a reservoir capacity larger than Euphrates total annual flow.

In a further agreement between Syria and Iraq signed in 1989, Syria agreed to discharge 58% of the Euphrates water received from Turkey, across the Iraqi-Syrian border meaning that Syria would keep the remaining 42% of the water. However, Turkey continued to discharge only 500 cubic meters per second, and therefore both Syria and Iraq, who formerly received 31.8 billion cubic meters per annum, actually received only 15.8 billion cubic meters per annum, and sometimes even less (only 13 billion cubic meters per year).

Iraq has no objection that Turkey stores sufficient amount of water as needed, as long as the riparian rights are taken into consideration.

Finally, between 13 January to 12 February in the spring of 1990, Turkey stopped all the Euphrates water flow to both Syria and Iraq claiming that they needed this water to fill the 48.6 billion cubic meters Ataturk Reservoir (Fig. 4). Syria and Iraq's winter crops were seriously affected. As a result, the Iraqi Government had to subsidise more than 7 million people, including the farmers in the 2 million hectares of Euphrates Basin, who completely depend on the Euphrates water for all drinking and agriculture requirements. Finally, the Arab League was forced to step in for an attempt to find a solution to this crisis.

At the beginning of 1993, the Turkish president Mr. S. Demeril and the former Syrian president Mr. H. Al-Assed signed yet another agreement, which stated that by the end of 1993, they would specify the Euphrates sharing formula. On the 1st of June 1993, this agreement was confirmed as an international document, by the General Secretary of the United Nations. However, no final solution has yet been reached to solve the water crisis in the region.

5 THE LEGAL TECHNICALITIES

The Lausanne Act, of 14th of July 1923 under the auspices of the League of Nations, required the establishment of a special committee made up of Turkey, Syria and Iraq, called *"The Joint Committee for Technical and Economical Affairs"*. The Act declared that every country that shares an international river basin, has the right to obtain a reasonable and equitable water share, according to certain conditions.

The main role of the "Joint Committee for Technical and Economical Affairs" was the resolving of the distribution formulae, especially when a country wishes to build hydraulic construction

that would negatively affect water discharge to the downstream countries. The United Nations laid down the conditions for the water distribution of international rivers at a water conference held in 1977 that reaffirmed the 1966 Helsinki resolutions, as follows:

1) The extent area of the basin, which feeds the river in each country.

2) The total area of the river's basin of that country.

3) The types of water usage and the water needs in each country.

4) The population that depends on basin's water of the international river.

5) The financial compensation to the damaged country, caused by any of the Hydraulic constructions.

Turkey being the upstream country, claimed to have the absolute sovereignty right with the water of both Tigris and Euphrates Rivers as they consider that international rivers are those which draw a boundary between the countries. Because this definition was not satisfied in the case of Tigris & Euphrates Rivers, they considered that neither of them could be classified international.

The United Nations International Committee of Law (ILC) re-defined an international water course in September 1991, to be a river that has some parts in different neighbouring countries, and confirmed that there is no difference between the terminology of international and trans-boundary water courses [Ohlsoon, 1995].

Previously, the International Law Organisation, at its session in Salzburg in 1991, determined that each country had the right to use all the water it needed from any international river that flows within its territory but that there was no right for any riparian country to establish any hydraulic construction to exploit the watercourse, unless previous legal acceptance had been signed between the riparian countries.

Iraq for its part, firmly believes that both the Tigris and Euphrates Rivers are considered as international rivers and have always been so. Iraq also considers that each river has its own separate basin, and that each of the riparian countries has the right to share the water fairly, according to international law. These previous agreements stated that for projects prior to 1987,all hydraulic constructions had to get the guaranteed amount of water that has been already agreed to, whilst projects developed after 1987 would be subject to individual negotiations between the countries concerned to confirm the share ratio for each project.

Iraq reiterated that the 1987 agreement between Turkey and Syria to discharge 500 cubic meters per second across the Syrian-Turkish border was only conceived as a temporary agreement, to allow Turkey to fill the Ataturk Reservoir. When the reservoir was full, this agreement would cease and the water discharge to the Syrian border would increase to at least 800 cubic meters per second.

6 THE TURKISH SECURITY PROBLEMS

Turkey believes that the Great Anatolian Project (GAP) will be the main basis for a political settlement of the Kurdish people in the region of the south-east, for whom the standard of living is very low. GAP irrigation networks would increase their per capita income through the use of new and advanced agricultural technology. However, Ilisu Dam will not accommodate resettlement of close to 30 villages of about 36,000 people who will be displaced by the project. Although the government subsidises them, at the moment they have nowhere to go and the trouble continues.

7 CONCLUSION:

The flow of Tigris and Euphrates Rivers has increasingly become important in the last few years. The increasing demands of water for the three riparian countries (Turkey, Syria and Iraq) are leading to serious conflicts in the near future, requiring global attention to avoid existing tensions in the Middle East.

Mesopotamia, or the Land between the Two Rivers, was always known as a productive farming area from time immemorial. Tigris and Euphrates have played important roles in the creation and development of the Sumerian, Babylonian and Assyrian Civilizations. The GAP project in Turkey will monopolize the water of Tigris and Euphrates Rivers which will adversely affect agricultural production in the area and the livelihood of millions of people who depend on it, not only for agriculture, but also for every day use for drinking and household needs. Half-finished GAP project has already made living miserable in the downstream countries. If the current trend continues, the region will extremely suffer.

During the construction of the GAP project, Turkey has continually and aggressively broken agreed upon international water settlements. It is the responsibility of the International Community and the United Nations organisation to ensure that Turkey ceases its violations of international treaties and human rights. Further constructions of dams under the GAP plan must immediately cease. Peace-loving countries must put an end to Turkish monopoly and unilateral action, which if continued will bring political unrest and misery to millions of people in Syria and Iraq.

The Iraqi marshlands are major wetlands of the region and the world and are our only remaining link to the past Mesopotamian civilisations of Sumer, Babylon and Assyrians. The continued systematic destruction of such major world assets must be challenged and somehow halted. It is necessary to plan and map out an overall strategy to achieve restoration of the marshlands. The overall strategy would involve tackling different aspects of the problem simultaneously through the following lines:

1. A greater and more sustained campaign is needed to publicise nationally and internationally the extent of the destruction of the marshlands and the devastating consequences on the population, ecology and economy of the region.

2. In particular, to lobby and urge UNESCO to “declare the marshlands as a World Heritage Site and plan accordingly”, in view of the historical and archaeological importance of the region.

3. Carry out scientific studies related to preventing further deterioration in the Huwaiza Marsh and to provide possible solutions for the restoration of at least a part of the affected marshlands. These would include dismantling some of and modifications to the existing engineering works and building a barrage system sufficient to enable the controlled re-flooding of the marshland area. Estimates of the amount of water needed from upstream are available.

4. Carry out designs for model villages with appropriate infrastructure and services, e.g. housing, schools, health clinics and agro-industrial schemes for the returning refugees in post Saddam Iraq. Such an environment will help restore agricultural activities, including fishing, raising domestic animals etc.

5. A comprehensive study is needed for developing the economy of the region as a whole and the extent to which the previous sustainable economy of the marshes could be restored. Some work is already in progress in this area.

6. It is vitally important that the issue of a fair and equitable division of water resources of the rivers Tigris and Euphrates among the riparian countries: Turkey, Syria and Iraq be urgently addressed and an internationally binding agreement instituted**.** Turkey should not be allowed to continue constructing large dams and free use of water of the two rivers in complete disregard to earlier international agreements.

8 REFERENCES

Allan, J.A. and court, J.H. 1996, Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin. Tauris Academic Studies, London, New York.

Agnew, C. and Anderson, E.1992, Water Resources in the Arid Realm, Routeldge, London, New York.

Anderson E. W. 1986, Water Geopolitics in the Middle East. Key countries conference on U.S. foreign policy on water resources in the Middle East. Instrument for peace and development, CSIS, Washington DC, 24-11-1986, p 18-19.

Biswas, A.K. 1994, International waters of the Middle East, From Euphrates-Tigris to Nile, Oxford University press.

Bulloch, J. and Darwish, A. 1996, Water War; Coming Conflicts in the Middle East, St. Edmundsburg press Ltd, London.

FAO of the United Nation, Rome, 1997, Irrigation in the Near East Region in Figures, Water Report.

Hacan, R.M. Haise, H.R. and Administer, T.W. 1967, Irrigation of Agricultural Lands, American Society of Agronomy-Madison, Winsconsin, USA.

Kolars J. 1992, Fine-tuning the future Euphrates-Tigris System, presented to the council on foreign relations, 17 June 1992.

Mahmoud S. 1989, Review and Assessment of Water Resources in the Arab World. Water Inter. No. 14.

Martin Hvidt 1997, Water in the Middle East, a source of conflict or co-operation. Conference held, August 26th 1996, at Odence University, Danish Middle East Network and Centre for Middle East Studies.

Medizini 1998, A. The Euphrates River: an analysis of a shared river system in the Middle East. Thesis for Ph.D. degree, SOAS, London University.

Munro, D.C. and Touron H. 1996, Estimation of Marshland degradation in southern Iraq, using multi temporal land sat images. Eleventh Thematic conference and Workshops on Applied Geologic Remote Sensing, Las Vegas, Nevada, 27-29 February 1996.

Naff. T. and R. C. Maston, 1984, Water in the Middle East Conflict and Cooperation? A West View Replica Edition, London, p 85-97.

Nigel Sloan, April 2000, A Response to Ilisu Critics, Balfour Beaty, International Water Power and Damn Construction.

Ohlsoon, L, 1995, Hydropolitics: Conflicts over water as a development constraint, University press Ltd, Dhaka.

Ozden Bilen, 1997, Turkey and Water Issues in the Middle East. Turkish print, Social and Economical, Political R-Foundation (TESAV).

Roger, P. and Lydon, P.1994, Water in the Arab World; Perspectives and Progress, Harvard University Press, USA.

Shapland, G. 1997, Rivers of Discord. International water disputes in the Middle East, Hurt & Company, London.

Tolba, M. K. and Biswas, A.K. 1990, Earth and Us: Population-Resources-Environment-Development-United Nation, Environment Programme, Butterworth Heinemann.

9 ARABIC REFERENCES

Al-Ansary, N. 1996, The Strategy of Water Resources in the Arab World, Univ. of Al-Albait / Jordan.

Allan, J. A, Water Issue in the Middle East, Al-Hayat Newspaper No. 13525, 15 June 1997, London.

Al-Khafagi, A. 1990, Iraqi Economic After the War with Iran, Journal of Arabic Strategy No. 32, Institute for Arabic Develop.

Al-Moueid, H.S. 1990, Water War in the Middle East, Dar Kenan Express, Damascus.

Al-Najim M. 1998, Tigris, Euphrates Water: Political, Economical and Regional Relations. National Scientific Conference, Water Resources, Use and Protection, 23-25 September 1998, Sofia.

Al-Najim M. 1989, Quality of Shat Al-Arab river's Water. Journal of Marine Research Centre, Univ. of Basrah. Basrah/Iraq.

Al-Najim M. and Hammady K.B. 1986, Drainage, Dar Al-Kutoob press, University of Mussal, Mussal / Iraq.

Al-Rubaie, S. 1996, The conflict between the riparian countries on Euphrates water distribution. The Iraqi report, Dec-96, Paris.

Al-Rubaie, S. 1997, The conflict between Turkey, Syria and Iraq on Euphrates Water. The Iraqi Report, Feb. 1997, Paris.

Hannosh A. 2000, Iraq, Population of, Analytical Study, Natural and Social Environment, Dar Al-Kunooz, Beirut.

Hannosh A. 1995, Date's Palm Trees, its past and future, Al-Wifaq Newspaper No. 181, 13 Sept. 1995 London.

Jamalo, A. 1996, Euphrates: The struggle for water in the Middle East, Riad Al-Rayers Book Ltd, London, Beirut.

Salman, M. 1992, Shared water resources between Syria and the other countries. Thesis for M.Sc. Univ. of Damascus.