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WATER AS AN ELEMENT OF COOPERATION AND DEVELOPMENT IN THE MIDDLE EAST

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Managing the Impact of Development: The Euphrates and Tigris Rivers and the Ecology of the Arabian Gulf - A Link in Forging Tri-Riparian Cooperation

Introduction

The story is told about Robert Benchley, an American writer, that when he was an undergraduate at Harvard he was once asked in a political science examination to "Discuss Fishing rights on the Grand Banks off Newfoundland from the point of view of either the Canadians or the Americans." Benchley, being unprepared for that particular question, wrote on his paper, "Since this subject has been thoroughly examined many times from both points of view, I choose to discuss it from the point of view of the fish."

The hydrologic development of the Euphrates and Tigris Rivers is of enormous importance, and is the subject of a large and growing bibliography. This bibliography represents numerous points of view, and even those analyses, like my own, which have attempted to remain dispassionate and neutral have viewed the management of the Euphrates -- and by extension, the Tigris -- as a series of unilateral or bilateral events. The Turks have been notable in their search for paths to shared management of those riverine resources (Bilen, 1992; Turan; Tekeli), but to my knowledge no work has been produced as yet showing the results of using the rivers in a supra-national context. The present discussion attempts to do so by viewing the three nation's combined riverine development as it impacts upon the Arabian/Persion Gulf (hereafter referred to as The Gulf) and its biological resources. This approach is at an ecological rather than a national scale (Pringle, et al, p. 360). In other words, it attempts to take the point of view of the fish.

Such an exercise, clouded by two destructive wars in the same area, is fraught with difficulties. Nevertheless, the scars of war eventually heal with time, while the peaceful developments impinging on the natural hydrology and ecology of the twin rivers are intended by their planners to last as long as possible. The acceptable phrase now used to describe such durability is "sustainable development." It is through sustainable development that the welding of lasting cooperation between the three riparians can be brought about, and it is with a few of the problems facing such cooperation that this article attempts to deal.

Totality of Use

The importance of the view expressed above is demonstrated by Table 1 and Diagram 1. These describe the history and future of agricultural development via irrigation on the Euphrates and Tigris Rivers, and by extension the impact of such developments on downstream destinations, i.e. the Shatt al-Arab and the Gulf. The data used here are admittedly estimates and surrogates for a much more complicated situation. The surrogate chosen to measure impact is the hectarages irrigated -- past, present and future -- by each of the three riparians. Such a measure does not take into account differences in soils, delivery systems, drainages, and variations in the use of fertilizers, herbicides, and insecticides which will be referred to in the pages ahead. Nor does such a measure consider the impact of domestic and industrial uses and returns. Nevertheless, the dominant role of agriculture in the use of the waters under consideration does allow insight into the shares of total impact each riparian -- Turkey, Syria and Iraq -- have had, are having, and will have upon the entire hydrologic system including its delta and recipient marine basin, the Gulf.

TABLE 1
Estimated Land Irrigeted from the Euphrates-Tigris Rivers and the percent of Shared Impact by the three Riparians on the Arabian Gulf
[1 x 10^6 hecrates -- % impact shown in ( )]

Country Time/Period	Iraq	Syria	Turkey	Total
Pre-1917	.58 (100)	—	—	.58 (100)
Pre-1950	1.44 (100)	—	—	1.44 (100)
1950-1968	1.15 (86)	.1865 (14)	—	1.3365 (100)
1969-1985	2.875 (92.3)	.24 (7.7)	?	3.115 (100)
1985-1992	2.6 (88.3)	.2793 est. (9.5)	.06486 (2.2)	2.9941 (100)
2010	4.0 (86.8%) E: 1.31 T: 2.75	.3186 est. (6.9)	.290166 (6.3)	4.6088 (100)
2020	4.0 (76.9)	.3579 est. (6.9) *sic*	.845986 (16.2)	5.20389 (100)
2040	4.0 (66.0)	.3972 est. (6.6)	1.662189 (27.4) E: 1.134 T: .573	6.05939 (100)

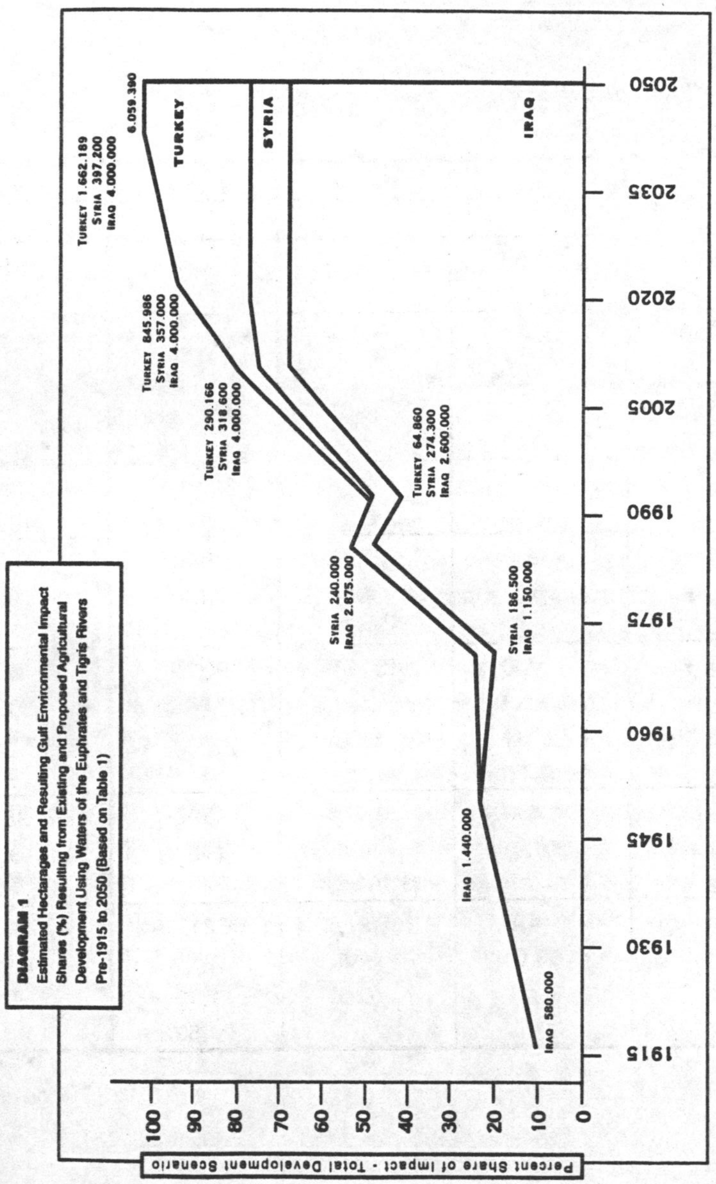


DIAGRAM 1
Estimated Hectarages and Resulting Gulf Environmental Impact Shares (%) Resulting from Existing and Proposed Agricultural Development Using Waters of the Euphrates and Tigris Rivers Pre-1915 to 2050 (Based on Table 1)

Why be concerned about such remote destinations? There are two answers to this. First, the results of this approach suggest that the sharing of the rivers' resources are and will be somewhat different than is currently thought. Given this new interpretation, the sharing of management responsibilities and results seems more attainable. Second, downstream ecological and economic impacts of dams, reservoirs, and irrigation, as shown by existing examples, can be severe. The Nile, Danube and Colorado Rivers have all experienced upstream manipulations with subsequent negative repercussions involving downstream nations and ecologies. In the words of an expert on the biology of the Nile:

I am led to question the validity of the unilateral acts of any country which may have influence on the ecology of a region shared by a group of countries. The High Dam (i.e. in Egypt) is not unique. Dams of nearly comparableinfluence are planned for the Mesopotomian Valley and Iran. ... The influence of such acts is invariably more accentuated when the marine waters involved are partially land - locked such as the Mediterranean, Persian Gulf and the Caribbean. ... International regional ecological studies and planning seem an essential feature if there is to be any hope of avoiding an enduring misuse of natural resources (Geogre, 1972).

Returning to the diagram, the time line begins during Ottoman rule (pre-1917) when traditional systems of irrigation existed, and can be traced well into the 21st century (2050) when total use of the rivers, per existing national scenarios, may be the case. The hectarages shown are based on the best possible hictoric records and on estimates of future total use per nation given by experts from within each country.

Begining on the left of the diagram, estimates suggest little or no use of the rivers by Syria and none by Turkey in Ottoman times. The area which is now Iraq had somewhat more then half a million hectares (80,000) irrigated by gravity flow and simple lifts at that time (The comments and data which follow are based on personal interviews with an Iraqi hydraulic engineer.) Study and development of the Euphrates followed during the British mandate (1917-1932). The Hindiya Barrage built 1908-13 and reconstructed 1921-1922 was the first on the river. The Kut Barrage on the Tigris (1934-1943) and the Diyala Weir (1927-1928) allowed further expansion of irrigated agriculture (U.K., Naval Int. Div., pp. 438-439). In the years that followed, the Kingdom of Iraq established a Board of Development, the Ministry of Development, and the Ministry of Agrarian Reform. By 1954 irrigation along both rivers had nearly tripled to approximately 1,440,000 hectares. From an Iraqi point of view, this early use of the rivers establishes a claim, through prior usage, on the water in question.

The Revolution of 1958 temporarily disrupted irrigated farming, but following the nationalization of the petroleum industry in 1972, a master plan, "General Scheme for Planning Water and Land Resources of Iraq," was developed with the help of the Soviet Union, and irrigated agriculture continued to expand to approximately 2.875 million ha. In 1979 the Ministry of Agrarian Reform was abolished and the Ministries of Agriculture (established 1970) and the Ministry of Irrigation were combined. Thereafter, the Iran-Iraq War and the invasion of Kuwait reduced irrigated agricultural production in the country (2.6 million ha).

Despite such setbacks, recovery is slowly progressing and important new features are being added to the irrigation scene in Iraq. The Main outfall Drain (The Saddam River or the Third River) which will collect drainage from farmland between the two rivers, thus eliminating severe problems of water logging and salination, has been completed. Five hundred kilometers in length, with an average depth of 4 meters and width of 180 meters, its most southerly section, which discharges into the Shatt al-Basrah Canal and subsequently into the Khor al-Zubair estuary, is 220 km in lenght and has a discharge capacity of 300 m^3/sec (9.46 bcm/yr). This and other measures will facilitate the expansion of irrigated agriculture, and a recent estimate of the total amount of irrigated land on the twin rivers, which may be attained circa 2010, is between 4.5 and 6.0

million donums. Using an average of 5.25 million donums (1 Iraqi d= 2,500 m^3), 4 million hectares of irrigated land are thus anticipated.

From an ecological or Gulf view, Iraq was the first to impact the natural environment of the Shatt al-Arab, its delta, and the Gulf. Nevertheless, Syria, and thereafter Turkey, have contributed to the total environmental impact. Syrian utilization of Euphrates' waters prior to the 1950s was slight, if not negligible, until the introduction of gasoline pumps for cotton production. Irrigated hectarage on the Euphrates, Orontes (Asi), and Khabur leaped from 284,000 ha in 1956 to 583,000 ha in 1957. Unlikely as such an increase may seem, this "miracle in the desert" is reported to have taken place (Sanlaville 1979, p. 231). Irrigation was largely in the hands of private entrepreneurs and by 1970 reached 160,000 ha in the Euphrates valley (Treakle, 1970).

The construction of the Tabqa (Ath-Thawrah) Dam and the filling of Lake Assad in 1974 ushered in a new era of river management. The story of the estimates, ambitions, and re-estimates of land to be irrigated with waters from the reservoir is too complex to be told here (see: Kolars and Mitchell, 1991, Chap. 8). Estimates show that about 240,000 ha of land were being irrigated through government and private means at the beginning of the 1990s.

Careful evaluation of available soils and alternative locations for irrigation indicate that Syria may show a slow but steady increase of irrigated lands dependent upon Euphrates waters, which should reach a maximum of almost 400,000 ha in 2015. Use of the Tigris, while recently reported, is conjectural considering that only 45 kilometers of that river touch Syria and form a boundary in part with Turkey and in part with Iraq. Thus, the downstream impact that Syria shares with Iraq and Turkey is shown to level off shortly after the turn of the millennium.

Turkey is the late comer to this history of river use (see Bagis for a complete account of GAP). As of 1992, about 65,000 ha were being irrigated in Turkey with water from the Euphrates River (45830 ha) and another 19,030 ha from the Devegecedi, Silvan I & II, and Nerdus projects on the Tigris (EKA, "Heavy Construct . .., n.p. #). The goals and achievements of the Southeast Anatolia Development Project are too well known to recount here, although most of the results, beginning with the development of the Harran Plain south of SanliUrfa, are only now beginning to be realized. Turkey, like its neighbours faces a host of challenges and difficulties in order to realize its plans in their totality. Nevertheless, predictions indicate steady growth of irrigated areas dependent upon the twin rivers. What is sometimes currently overlooked is that Turkey as yet has had little lasting impact upon the twin rivers.

Downstream sharers cite the reduction in the flow of the Euphrates which occurred during the filling of the Keban and Atatürk reservoirs as an indication of massive Turkish impact upon the river system. This argument should be considered in light of the accepted wisdom that upstream reservoirs are absolutely necessary to smooth the seasonal and multi-annual variance in river flow in semi-arid regions. Table 2 shows the efficiency of upstream reservoirs vis a vis reserovir area, depth, and evaporation loss. The more cubic meters stored per square meter of surface area, the greater the efficiency. Thus, Turkish reservoirs are critical components of any regional water management scheme. In fact, evaporation losses from upstream reservoirs should be prorated and shared among <u>all</u> riparians on a given system. There is a saying, "You can't make omelets without breaking eggs," which may well apply in this is case.

TABLE 2
Surface Areas and Volumes of Some Middle Eastern Reservoirs

Country	Dam/Reservoir	Vol ($1x10^6$ m^3)	Area ($1x10^6$ m^2)	Ratio: V/A
Turkey	Keban	30,600	675	44.4
	Karakaya	9,580	298	32.1
	Atatürk	48,700	817	59.6
	Birecik*	1,220	56.25	21.7
	Karkamis**	200	28.4	7.0
Syria	Tishreen	1,300	70	18.6
	Tabqa(A. Tha.)	11,700	628	18.6
	Ba'ath	90	2.7	33.3
Iraq	Haditha(Qada.)	10,000	?	—
	Fallouja	3,600	?	—
Egypt	Lake Nasser	78,500	3,500	22.4

Sources: Kolars and Mitchell &
Army Corps of Engineers
(Computations by author)

* Under construction. ** Proposed but unlikely to be built.

The above ratios indicate the average number of cubic meters of water beneath each square meter of reservoir area. The larger the number, the more efficient the storage vis a vis evaporation losses. Mountain (i.e. headwater) locations provide the best and deepest reservoir sites. In the case of the Euphrates reservoirs, it should be noted that the farther downstream the reservoir in question is located, the higher will be the average annual ambient air temperature, resulting in greater evaporation losses per square meter of surface. This constitutes a multiplier effect when considering the best (or worst) places to store water.

Returning to Diagram 1, Turkey's increasing impact share can be seen after about the year 1995. If total development were to take place, Turkey's impact on the twin river system and the Gulf might reach slightly more then 25 percent. Syria's share could be as low as 7 percent, and Iraq's about two-thirds of the total.

Needless to say, it is unlikely that this absolute scenario will occur. It is more possible that the figures shown in Table 1 for the year 2020 will prevail, but this changes the equation only slightly. Iraq's share increases to about 77 percent, Turkey's drops to 16 percent, and Syria's remains about 7 percent.

These are very crude estimates, and it will be absolutely necessary to refine and weigh such figures using additional parameters. Perhaps Syria should accept responsibility for a greater part of the impact because of its very saline soils which must be restored, maintained and drained. If Turkey practices cautionary use of fertilizers and insecticides, and releases relatively clean water downstream, perhaps its share might be less. On the other hand, Iraq of the three riparians has almost its entire population within the drainage system of the twin rivers, and will be increasingly dependent upon those waters. Should this be reflected by lessening their share? But Iraq of the three riparians also has its petroleum industry which in ideal times would provide additional revenue with which to find other sources of food. Conversely, this same industry may well increase river pollution. This list of conjectures might go on and on.

The point of all this is not to assign responsibility to one or another contry, but rather to point out that all three riparians have a role in sharing both the largess and the responsibility for sustained

development of the Euphrates and Tigris Rivers. How this might be done, and also a brief review of the relationship of the twin rivers to the Gulf constitute the remainder of this discussion.

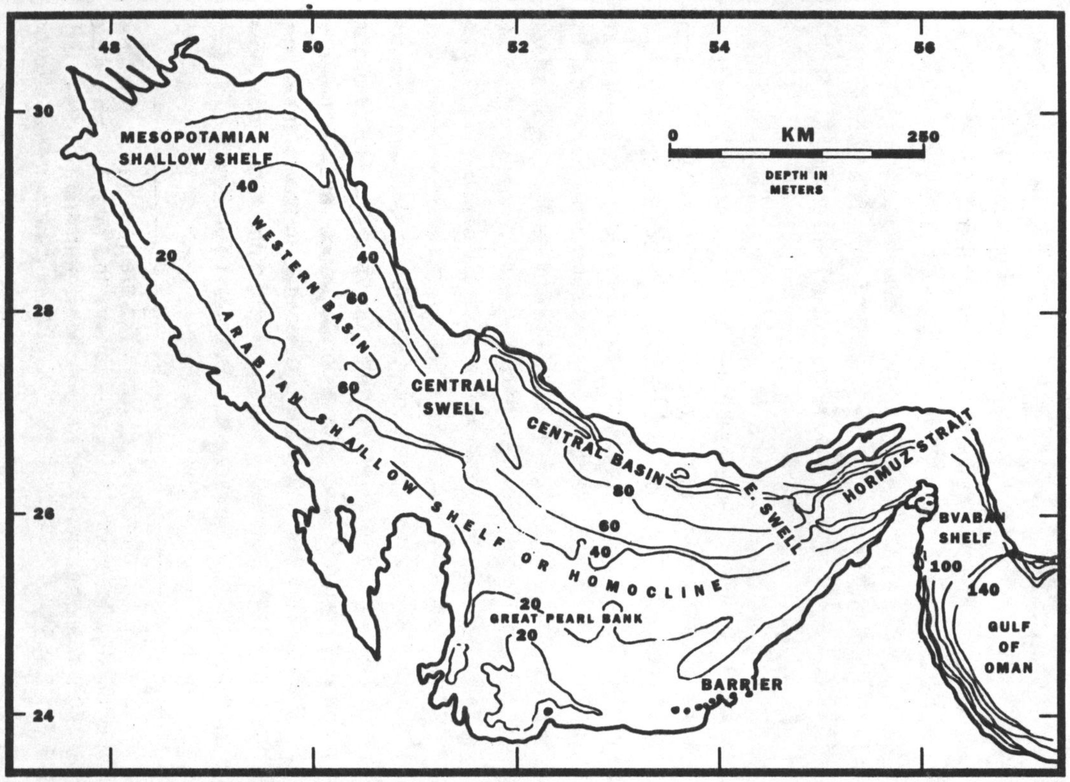
The Relationship of the River to the Gulf

The Gulf is a marginal sea with one narrow opening at its southern end. It is shallow, with an average depth of 35 meters. It reaches its greatest depth (100 meters) near the Straits of Hormuz, and ends in an estuarine slope, the Mesopotamian shelf, in the north where its major tributary, the Shatt Al-Arab enters. Evaporation is great and because of the Gulf's land locked nature a slow surface current enters from the Gulf of Oman and moves along the east (Iranian) shore (Purser and Seibold, p. 1-9).

The bottom of the Gulf is shallow and shelving on the western. Arabian, side, while its deeper parts parallel the Iranian shore (Map 1). Small streams which enter the Gulf on the Iranian side in the form of flash floods emanate from the Zagros Mountains and carry quantities of terrigeneous material into the marine basin. It should be noted that the much greater flow of the Shatt Al-Arab contributes very little solid material to the Mesopotamian shelf (Purser and Seibold, p. 5) although the accumulation and scouring of millennia does give a distinctive "comb like" appearance to the submarine topography of the northern shallows. It is possible that more alluvium reached the Gulf before deposits from the Karun River blocked the twin rivers, direct access to the Gulf, but that event would predate historic times. As a consequence, alluvial materials carried by the Euphrates and Tigris were deposited in the swamps near Lake Hammar and very little silt or sand reached the Gulf from those sources. At the present time, reservoirs in Syria and Turkey remove much of the silt load of the Euphrates before it reaches Iraq.*

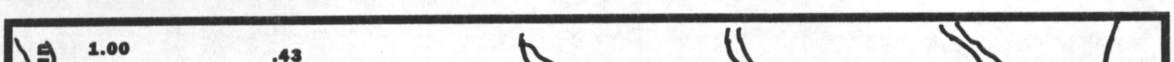
* The waters of the Euphrates west of Baghdad are reported at this time to be running clear, and green algae now covers the river bottom as the result of sunlight reaching new depths (Interview with Iraqi hydrologist). Whether or not this will create problems of eutrophication remains to be seen.

MAP 1



Map showing the principal bathymetric provinces of the Persian Gulf.
(Mainly after Seibold & Vollbrecht, 1969) Seibold, Diester, et all

MAP 2 - DISTRIBUTION OF COMBINED NUTRIENTS AND Toc



TOC thus: .35

Contour shows combined phosphorous and nitrigen mg g-1

Source: Fig. 1, Tanle 1

Abaychi, et al

Another significant source of deposition in the Gulf may be wind blown materials originating in Iraq. Kukal and Saadallah show that as much as 2.1 cm/yr of aeolian materials accumulate on the western side of the Gulf from sand storms.

It should be noted that a similar situation has been found in the northern portions of the Gulf of California, where "stability in the mass accumulation rate and texture . . . between 1930 and 1965 indicates that sediment carried into the Delfin Basin is derived from sources independent of the Colorado river" (Baba, et al, p. 600). The authors hypothesize that the damming of the Colorado River and its subsequent disappearance from the Gulf of California would effect sedimentary deposition, but they discovered that was not the case. They suggest that aeolian transport of materials from the Mexican mainland to the east may possibly account for the continuing accumulation of sediments. If a parallel between these two bodies of water exists, it may be hypothesized in turn that the impoundment of silt in upstream reservoirs on the Euphrates and Tigris apparently does not, of itself, constitute a threat to the ecology of the Gulf. The impact of such removals on the marshes to the north may be another matter.

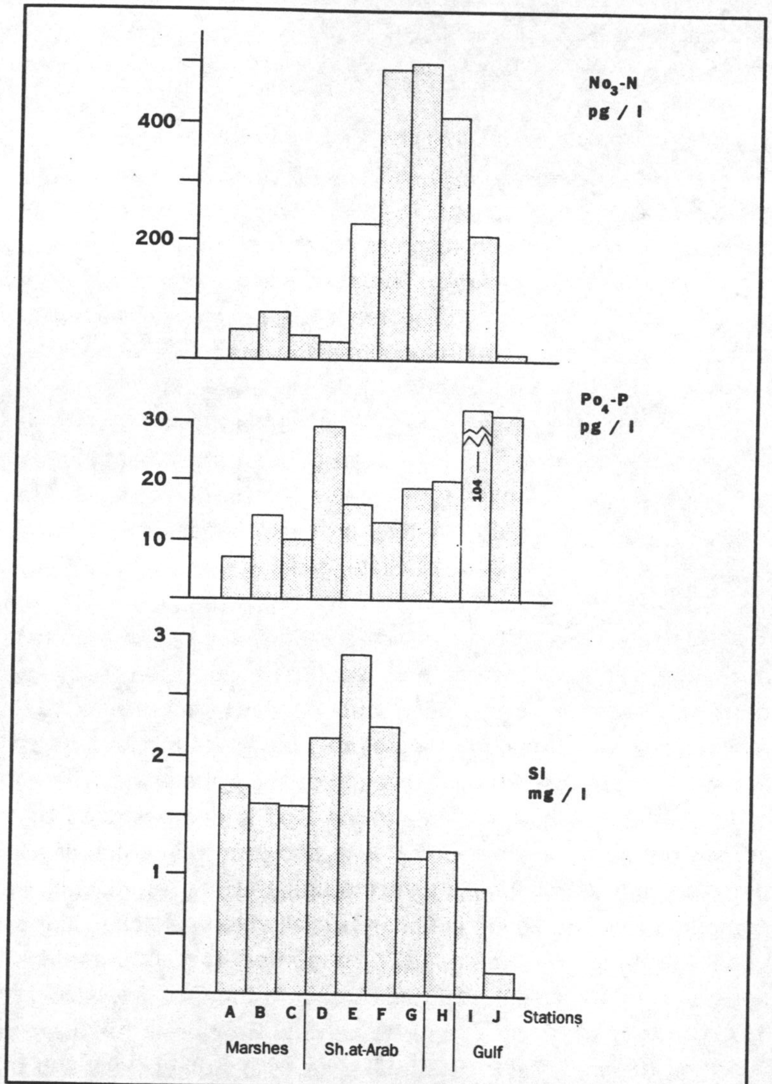
The importance of such considerations is not conjectural. Attention was called in 1972 to the negative results caused by the High Dam on the Nile River at Aswan to the fishing grounds in the eastern Mediterranean Sea. Beginning in 1965 the sardine catch of the Egyptian fleet in the eastern Mediterranean declined by 59 percent (18,000 mt from 30,600 mt) (George, p. 159). This was directly attributable to the impounding of the annual flood waters and the loss of silt and other nutrients, as was subsequent deterioration of the delta forelands. It is not suggested that an exact parallel exists between these situations; rather that it is best to prepare for the unexpected through anticipatory research.

The load of dissolved substances carried by rivers can also be significant. Nutrients in the form of nitrogen and phosphorous contribute

to the growth of phytoplankton which are the basis for larger marine life. Total Organic Carbon (TOC), while a solid, is often included in discussions of aquatic nutrients and will also be considered at this point.

There can be little doubt that the Shatt Al-Arab is a source of nutrients for the Gulf (Abaychi, *et al*), although the Gulf, in general, is poorly supplied. This can be seen in Map 2 which shows the extension of nutrient concentrations in samples taken progressively farther from the mouth of the Shatt al-Arab. The map shows combined nitrogen and phosphorues as mg g^{-1}. (The reader is referred to Abaychi, *et al* for details.) Talling (pp. 76-79) confirms the presence of nitrate-nitrogen, phosphate-phosphorous, and silicate-silicon in the marshes and the Shatt al-Arab, though silicon and nitrogen appear diluted as marine waters are approached (Figure 2). In general, the effect of the Shatt al-Arab appears to be limited to an area north of 29 N lat. This places the impact of the river, whether natural or human modified in Kuwaiti, Iranian, and Iraqi waters (U.S. Dept. of State, #94).

The ability of the Gulf to provide a sustainable catch of food fish, shrimp and other crustaceans, and molluscs is the focus of these considerations. A secondary but no less important goal is the maintenance of as much of the natural ecology of the area as possible in line with similar aims and directives throughout the world. The importance of the northern fishing grounds in the Gulf is demonstrated by research carried out by Kuronuma (p. 92) who shows a total catch of all types of fish and prawns of 9.44 kg/km through trawling in Kuwaiti waters as compared to 11.85 kg/km in Qatar-Trucial waters. Catches along the Gulf coast of Saudi Arabia in 1977 amounted to 6,000 metric tons as compared to 10,000 mt off Saudi Arabia in the Red Sea (Morgan, Table 15). The total catch of all types landed in Bahrain in 1979 amounted to 3,800 mt (Morgan, Table 1). Thus, sustaining Gulf ecology and the



Distribution of concentrations of nitrate - nitrogen, phosphate - phosphorus and silicate - silicon along a downstream from marshes near lake Hammar - Shatt al - Arab - estuary in February 1978.Average values from several depths.(From Maulood *et al.* 1979.)Talling, p. 78

marine catch will remain important to all the members of the GCC as well as to Iraq and Iran.*

The completion of the Main Outfall Drain (MOD), referred to above, is an event of ecological and commercial significance. This canal will collect runoff from irrigated fields between the Euphrates and Tigris Rivers and lead the flow south, crossing the Euphrates by siphon and emptying it into the Shatt al-Basrah canal (opened March 1983) which thereafter empties into the Khor al-Zubair (estuary) and subsequently into the Gulf on the inland side of Bubiyan Island in Kuwaiti waters (Al-Daham and Yousif, p. 412). A possible discharge of 9 billion m^3 could significantly change the quality of the waters involved. Salinity would increase sharply in the canal. Research must also be carried out to determine the increase, if any, of pesticides and herbicides and to take action to control such inputs..

Floodwaters of the Euphrates formerly reached the Al-Basrah canal in late spring and early summer with an abundance of freshwater species of fish appearing in April (Al-Daham and Yousif, p. 419). Increased salinity would destroy the habitat of these fish. On the Euphrates itself the predicted sharp decrease in flooding -- to be replaced by a sustained flow in order to even out seasonal variance -- will change the nature of the marshes and Lake Hammar. More freshwater species may possibly appear with the diversion of saline waters, but as stated, those same diverted waters may in turn inhibit fresh water species in the estuary. Conversely, the habitat of salt water species may not be affected, or

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* While it is not the intention of this discussion to analyze the impact of the two wars recently fought in the region, it is reported that small species (shrimp, etc.) may have actually benefitted from the hostilities in that fishing was restricted during those times. Khordagui and Hamoda report (p. 26) that "the marine ecology of the Arabian Gulf was shown to be relatively resistant to damage from oil spillage." Certainly, a full study of the relationship of the twin rivers and the Shatt al-Arab to the Gulf would require detailed reference to such matters.

perhaps increased in area. In counterpoint to these events may be the absolute reduction in flow of the rivers (particularly that of the Euphrates) resulting from upstream activities. Nevertheless, a bare minimum of at least 5 billion m^3 must be retained in the latter river in order to provide surge flow for gravity fed irrigation systems (Interview with engineer).

The above comments on these complex relationships are not intended to be either comprehensive or definitive, but rather are presented in order to suggest future possibilities for the twin rivers, the Shatt al-Arab, and the Gulf. It should be kept in mind that activities in Iraq are being paralleled by those in Syria and Turkey, and it is imperative that their combined potential impact be recognized and plans made for studying and responding to possible ecological and economic consequences before they occur.

It is in this context that a further comment is pertinent. Global climatic change is likely to impact the Middle East as elsewhere throughout the world. Lonergan and Kavanagh in an analysis of potential climatic change ask four questions regarding the Middle East (Lonergan and Kavanagh, pp. 287-290).

(1) "Have there been environment/resource conflicts in the past in the Middle East that have posed a threat to the region and to international forces that participate there? Their answer is "Yes," for which they cite the GAP*, the 1967 war between Israel and the Arab States, and new irrigation projects as examples.
(2) "Are such conflicts over resource use likely to continue in the future at levels where they impose a security threat?" Their answer is that sharing the waters of the Nile, sharing waters between Jordan, Palestine and Israel, and resolving the issue of the Euphrates and Tigris Rivers all have such potential.

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* Their evaluation of GAP is countered by the view based on Diagram 1 of this discussion.

Given the above, (3) "Are there other environmental factors that may exacerbate this situation?" and (4) "Is climate warming one of these factors?" To which they reply that

"It appears that the warmer temperatures and moderately lower rainfall projected by the climate models will affect the supply of surface water and the replacement of groundwater supplies (*i.e. in the Middle East*). Evaporation could increase by 5-20% and soil moisture... could decline by a similar amount. (Emphasis added.) These impacts on the water supply, however, are expected to occur gradually over the next 50 to 60 years (p. 289)"

It should be emphasized that the ideas presented in this discussion posit a developmental horizon of the year 2040, that is, 50 years in the future, *the same time cited by Lonergan and Kavanagh.*

Given an ecological rather than national approach to the problems of the twin rivers, the Shatt Al-Arab, and the Gulf, the time has come for a multi-national treatment of the problem, one in which ecological responsibility supersedes nationalistic feelings. While some may consider this an impossible goal given the events of the last fifty years, there are examples that show such cooperation is possible.

The Danube and its delta is one of these. This river drains 70 percent of Central Europe (Pringle, et al). Its basin is the home of 86 million Europeans (12 percent of the total) and is heavily polluted from untreated domestic and industrial waste as well as agricultural runoff. More then 30 dams alter its flow, and the consequent impact upon its delta has been disastrous. "Beyond the delta, the eutrophication of the Danube has been responsible, at least in part for declining water quality in the Black Sea" (Pringle, et al, p. 357).

The disaster facing the Danube's delta is now being studied and rectified by a multi-national team of Roumanians, Ukranians, and Americans which has embarked with the help of the World Bank, through the Global Environmental Facility (GEF), on a number of projects which are connected to existing GEF projects, the Black Sea Environmental Problem with which Turkey is already concerned, and the Environmental Problems of the Danube River Basin project.

This lightning sketch of the Danube River and its problems and the responses to them is presented for one specific reason. Consider the history of the Danube basin. Two devastating wars have been fought there is the last 75 years. This political "shatter belt" has seen not only the Iron Curtain come and go, but also has seen the demise of the Austro-hungarian Empire. The political antipathies inherent in the region may have seemed unbreachable even a few years ago, and yet, cooperative efforts are now taking place which at that time were unimaginable. The ideas and information needed for such a response to the problems of the Shatt Al-Arab and the Gulf are already available (O.E.C.D., Ch. XVIII). The time to begin is now.

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