

Feature Development

BANGLADESH river system drains an area of about 2 million square kilometers of the Catchment areas of the Ganges, the Brahmaputra and the Meghna of which only 7 per cent lies in Bangladesh. The extreme variation of availability of water in the monsoon and in the dry season is a major constraint to the development of agriculture which dominates the economy. The excess water during the monsoon causes wide spread flooding which damages crops; and scarcity of water in the dry season hampers irrigation.

The unilateral withdrawal of the Ganges water at Farakka by India has caused damage to the northern and western region of Bangladesh affecting 40 million people. The adverse impacts caused widespread salinity intrusion and desertification of the northern region, affected navigability of the rivers and brought destruction to fish resources and the Sunderbans, the largest mangrove forest in the world. All these posed an overall threat to development of industries and agriculture and the eco-system as a whole. Environmentally, the damage done by the Farakka Barrage can be considered as the worst by any man-made intervention of natural flows of an international river, the Ganges.

The Ganges Water Agreement

The drastic reduction in the dry season flow of the Ganges at Farakka due to upstream withdrawal by India is a serious concern to Bangladesh. As per Ganges Water Agreement of 1977 which was in force from 1978 to 1988, the shares of Bangladesh and India based on the flows reaching Farakka are shown in Table-1.

The agreement provided for approaching Nepal in the side letters for their cooperation in augmenting the Ganges flows. The agreement also provided for 80% guarantee clause to Bangladesh in case of exceptionally low flows.

While signing the MOU in 1982, India deleted the 80% guarantee clause. India also refused to approach Nepal on some plea or the other. A statement showing the availability of the flows to Bangladesh during the period covered by the Ganges water agreement (1978-88) and that during the period when there was no agreement (1989-93) is shown in Table-2.

The critical situation occurred in 1993 dry season in March and April as can be seen below:

Period	Flows reaching Farakka 75% availability	Share of India	Share of Bangladesh
1993, March	1-10 12,533 cusec		
	11-20 11,084 cusec		
	21-31 10,014 cusec		
April	1-10 9,587 cusec		

The lowest flow was recorded on 7th April, 1993 as 9,437 cusec.

Impacts of Farakka Barrage

The reduction of Ganges flow in the South Western region of Bangladesh wholly dependent on the Ganges has produced disastrous effects on Agriculture, Fisheries, Navigation, Hydro-morphology, Salinity Intrusion, Industry, Drinking Water and Forestry.

Water Problems of Bangladesh and Suggested Solutions

by Amjad Hossain Khan

The unilateral withdrawal of the Ganges water at Farakka by India has caused damage to the northern and western region of Bangladesh affecting 40 million people. The adverse impacts caused widespread salinity intrusion and desertification of the northern region, affected navigability of the rivers and brought destruction to fish resources and the Sunderbans, the largest mangrove forest in the world.

— GK project operate at 60% of its potential giving irrigation to 1/3 of the command area.

— Fishery:— Severe dislocation to the life cycle of fish population. Fish production reduced drastically.

— Navigation:— Dislocation of navigation routes due to shallow depth.

— Ferry services closed.

— Hydro-morphology:— Hydraulic efficiency of channel reduced due to siltation.

— Gorat offtake dry.

— Char formation.

Salinity:— Surface water salinity at Khulna increased to 20000 micro mhos/cm in April, 1993 (pre diversion figure 1800 mho/cm).

— 500 mm/cm salinity front moved 280 km further north.

Industry:— Industrial belt around Khulna sustained heavy losses for replacement and repair of corroded parts and import of sweet water by barges from other sources.

Drinking water:— Drinking water both surface and ground water has become unfit for human consumption.

— Increase of diarrhoeal diseases.

Forestry:— Increased salinity has led to top dying of Sundri trees in the Sunderbans.

— Damage to environment.

A study conducted in 1991 show that the direct losses in agriculture through soil moisture depletion, delayed plantation and increased salinity exceeded taka five hundred crore annually. The direct losses resulting from sacrificing the additional benefits which could be achieved if we could get sufficient water (pre-diversion situation) amounts to taka twenty-three hundred crore in a year estimated at 1991 prices.

Table-1
Ganges Water Agreement

Period	Flows reaching Farakka 75% availability	Share of India	Share of Bangladesh
January	1-10 98,500	40,000	58,500
	11-20 89,750	38,500	51,250
	21-31 82,500	35,000	47,500
February	1-10 79,250	33,000	46,250
	11-20 74,000	31,500	42,500
	21-28/29 70,000	30,750	39,250
March	1-10 65,250	26,750	38,500
	11-20 63,500	25,500	38,000
	21-31 61,000	25,000	36,000
April	1-10 59,000	24,000	35,000
	11-20 55,500	20,750	34,750
	21-31 55,000	20,500	34,500
May	1-10 56,500	21,500	35,000
	11-20 59,250	24,000	35,250
	21-31 65,500	26,750	38,750

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India started unilateral withdrawal of the Ganges at Farakka from June 1975 and continued to unilaterally withdraws water of the Ganges in 1975, 1976 and 1977.

The Ganges water agreement was signed in 1977 followed by a MOU in 1982 whose salient features have been given above.

India refused extension of MOU on Ganges water sharing in 1984. An MOU was signed in 1985 on the Ganges for 3 years with directives to complete joint study in 12 months. Indian insistence on a study of link canal proposal frustrated any meaningful study for a solution of the issue.

The MOU expired in 1988. Since then there has been no agreement on sharing of the Ganges waters. India refused to sign any interim agreement in spite of repeated requests from Bangladesh.

The Prime Ministers of Bangladesh and India in May 1992, agreed that efforts would be made for achieving an acceptable settlement including interim arrangements for sharing the dry season flows of the Ganges. The Prime Minister of India assured that every possible efforts will be made to avoid undue hardship to Bangladesh.

In spite of these categorical statements by the Prime Minister of India, no progress has been made for the last 12 months.

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Water Negotiation

The Joint Declaration of the

Prime Minister of India and Bangladesh in May, 1974 expressed their determination that before Farakka Barrage was commissioned, they would arrive at a mutually acceptable solution of water available during the periods of minimum flow in the Ganges.

The Farakka Barrage was commissioned in April 1975 for a period of 41 days from 21st April to 31st May 1975.

India always underplayed the need for Nepal's involvement in the Ganges talks categorically stating that the potential of Nepalese dams is not good and cannot augment the dry season flow of the Ganges.

India is now, however, going ahead with schemes in Nepal for exploiting the water resources of Nepal for her own use while informing Bangladesh that flows of the Ganges will gradually decline.

Flood is a recurring phenomenon in the region causing enormous damage to the economy of all the three countries. Structural measures like construction of high dams could be the solution to his problem. With the co-operation and understanding among riparian states it should be possible to put this in place. Nepal expects India and Bangladesh to jointly approach her for harnessing the vast water resources of the common rivers of the region.

Potentials of Nepal

Nepal has vast hydropower potential if she can construct high dams in her main river system. Nepal contributes about 71% of the total dry season flow of the Ganges. Nepal is willing to help in regional co-operation among the riparian countries.

It is interesting to note that

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What Bangladesh Should do Now?

The long drawn discussion on water sharing has gone more in favour of India than

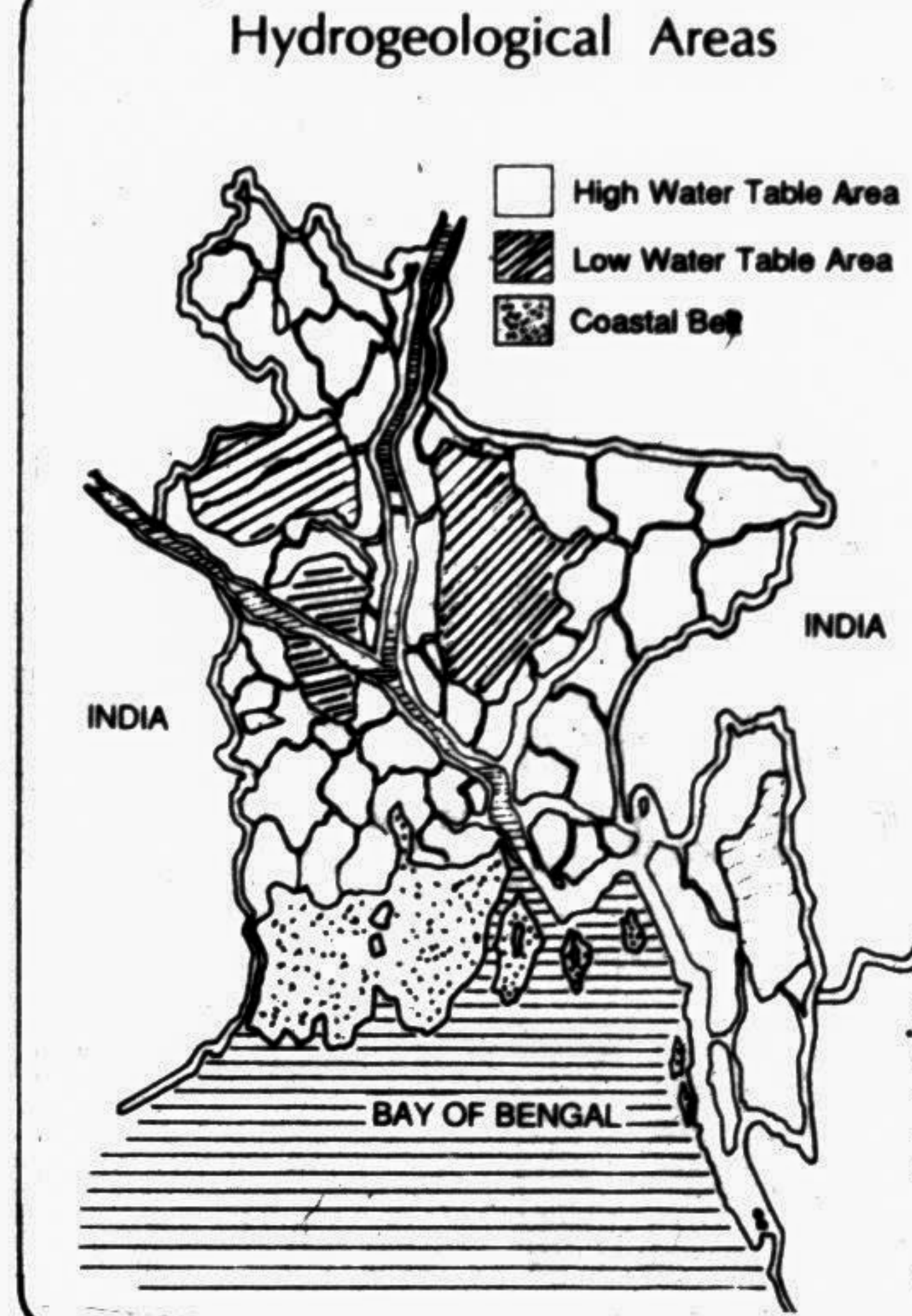
account for more than 90% of the total surface water flow in Bangladesh. The irrigation system of the two barrages will cover more than 60% of the arable land. Unfortunately none of the governments, since creation of Bangladesh, has taken any firm decision on these barrages nor on water resources development of Bangladesh in particular.

The Engineering Appraisal of the Ganges Barrage was done by Sir William Halcrow of UK in 1984 including the technical feasibility to supply irrigation water to South-West of Bangladesh. The estimated cost was taka 7667 crores in 1984 prices. The barrage is to

Discharge of the Ganges at Hardinge Bridge (1978-93)

Period Expected share of Bangladesh as per agreement (cusec) Observed Discharge (1978-88) Agreement (cusec) No-Agreement (1989-93) (cusec)

January	1-10 58,500	73,733	53,137
	11-20 51,250	63,918	49,097
	21-31 47,500	55,293	40,574
February	1-10 46,250	51,841	31,277
	11-20 42,500	49,219	23,957
	21-28/29 39,250	46,830	21,585
March	1-10 38,500	45,479	20,350
	11-20 38,000	41,396	18,981
	21-31 36,000	37,708	17,844
April	1-10 35,000	37,020	17,797
	11-20 34,750	40,062	21,751
	21-30 34,500	44,317	24,707
May	1-10 35,000	49,291	26,183
	11-20 35,250	52,322	35,925
	21-31 38,750	59,563	49,497



term development of the water resources of the region.

Our study indicates that the demands for water in Bangladesh exceed the available resources during the critical months from February to April.

We have to maximize use of all the water resources in the country and to construct necessary infrastructures with distribution networks to allow surplus water to be transferred to areas of critical shortage.

Mobilization of water resources require major investments in structures which are expensive and require sacrifices by the nation. We must therefore look for an optimum solution designed to utilize our resources in a most efficient way.

The question of what Bangladesh should do now is very much in the minds of the people. Knowing the trend of water negotiations during the last 42 years, we cannot expect any overnight solution to the problem. What is needed now is a national strategy to meet the future course of action. At one time when the two augmentation proposal were rejected by each other, discussions took place on two Barrages in Bangladesh — one on the Ganges and the other on the Brahmaputra. The barrages are needed for maximizing the use of surface water of the Ganges and the Brahmaputra which together

be located near Pangsha about 60km below the Hardinge Bridge.

The Engineering Appraisal of the Brahmaputra Barrage including its technical feasibility was completed in 1984.

We must now start feasibility and detailed engineering studies of the Ganges barrage project. We should also start feasibility study of the Brahmaputra Barrage. These studies will take 4/5 years. This will give time to the government for negotiations on sharing of waters of the Ganges, Teesta and Brahmaputra.

We have constructed Teesta Barrage without any agreement with India on sharing its water. We can start construction of the barrage on Dharla and Dhudkumar and with canal and aqueduct bring enough water to Teesta command's to irrigate more than 60% of land.

The construction of barrages in Bangladesh is not to counter construction of barrages by India. We need these barrages to maximize the use of scarce surface water flows for increasing agricultural production.

We have depended too much on donors and expatriate consultants to advise us on our problems. It is time that we do our own homework to solve our problems. Preliminary works were done from time to time on piece-meal basis for political reasons. Let us not do

any politics with water any more.

We need a national water policy. It is high time that we take this up as a priority. The water policy will be our long term strategy for development of the water resources.

There are 230 rivers flowing through Bangladesh. Many of the rivers have silted up lowering their carrying capacity. A nation wide planned programme is needed to maximize use of water by re-excavating the rivers with control structures to retain water for irrigation and recharge the ground water.

Bangladesh suffers from flood damages every year which is straining our economy. Why should Bangladesh suffer from floods 93% of which come from upper riparian states like India and Nepal? If we have to give passage of flood water, then Bangladesh must be compensated for flood damages.

Earlier negotiations on sharing were confined to 5 months of the dry season, from January to May. Any future water negotiation for sharing must cover full 12 months covering both dry and wet seasons.

The joint declaration of 1974 linked the two issues of sharing with augmentation. It will appear from records that augmentation got more priority from the Indian side than sharing. It is high time that Bangladesh delinked the two issues of sharing and augmentation. Our immediate priority is sharing. Bangladesh should seriously consider the benefits of constructing dams in Nepal at a cost of 25-30 billion dollars.

We need cooperation of riparian states for integrated water management of the basin. This approach was endorsed by Rio Earth Summit of 1992 which considered environmental degradation as a serious concern for the next century. The environmental impact of Narmada Project in India financed by the World Bank made the public agitate it. The project had to be dropped. The people are not fully aware of the adverse environmental impact of the Farakka Barrage. We must mobilize public opinion in Bangladesh as well as in regional countries on the grave issue.

We will continue our efforts for regional cooperation for the well being of our future generations. Nepal is willing to cooperate. India must come forward for a meaningful dialogue. The SAARC forum must be explored fully. Bilateralism in SAARC should be replaced by multilateralism among member-states if we really mean something to achieve something through the SAARC. A pragmatic approach and a vision for future are needed to solve the water problems.

The writer is a former chairman of the Water Development Board.

WATER, it has been said, will be the cause of the next Middle East war. But Gil Elon of the Jewish National Fund (JNF) believes the opposite is true — that a shared interest in keeping the water flowing will contribute to stability in the region.

The Palestinians, for example, want the impending autonomous region of Jericho extended a few miles to the northern shore of the Dead Sea to enable them to develop their own tourist industry.

For though lifeless, the Dead Sea is far from valueless. Its waters have curative powers known since ancient times. Israel has a thriving tourist industry along the Dead Sea shores serving both the healthy wishing a little bodily rejuvenation and thousands of sufferers of such ailments as arthritis, psoriasis and respiratory diseases from all over the world who flock to the spas each month.

The Sea is fed by the river Jordan. Since water from the river entering the salty inland lake is effectively useless, in recent years practically all the Jordan's water is utilised before reaching the Sea. That has caused a significant drop in the level of the Dead Sea, in turn causing shore recession and the practical disappearance of the shallow southern end of the salt lake.

If Israel does extend the borders of the Jordanian entity to the Dead Sea, the Palestinians will not have much of a tourist industry unless shore recession is stopped.

And that, says Elon, "will require joint cooperation between Israel, Jordan and the Palestinians on the issue of the water allocation of the Jordan river."

Pointing out that the Jordan has helped maintain peace between Israel and Jordan, he says "It's possible that a shared common interest in keeping the water flowing will contribute to stability in the region. Certainly, current Jordanian-Israeli cooperation is a hopeful precedent."

One of those areas of cooperation can be seen in the Is-

The Jordan Waters will Bring Peace, Not War

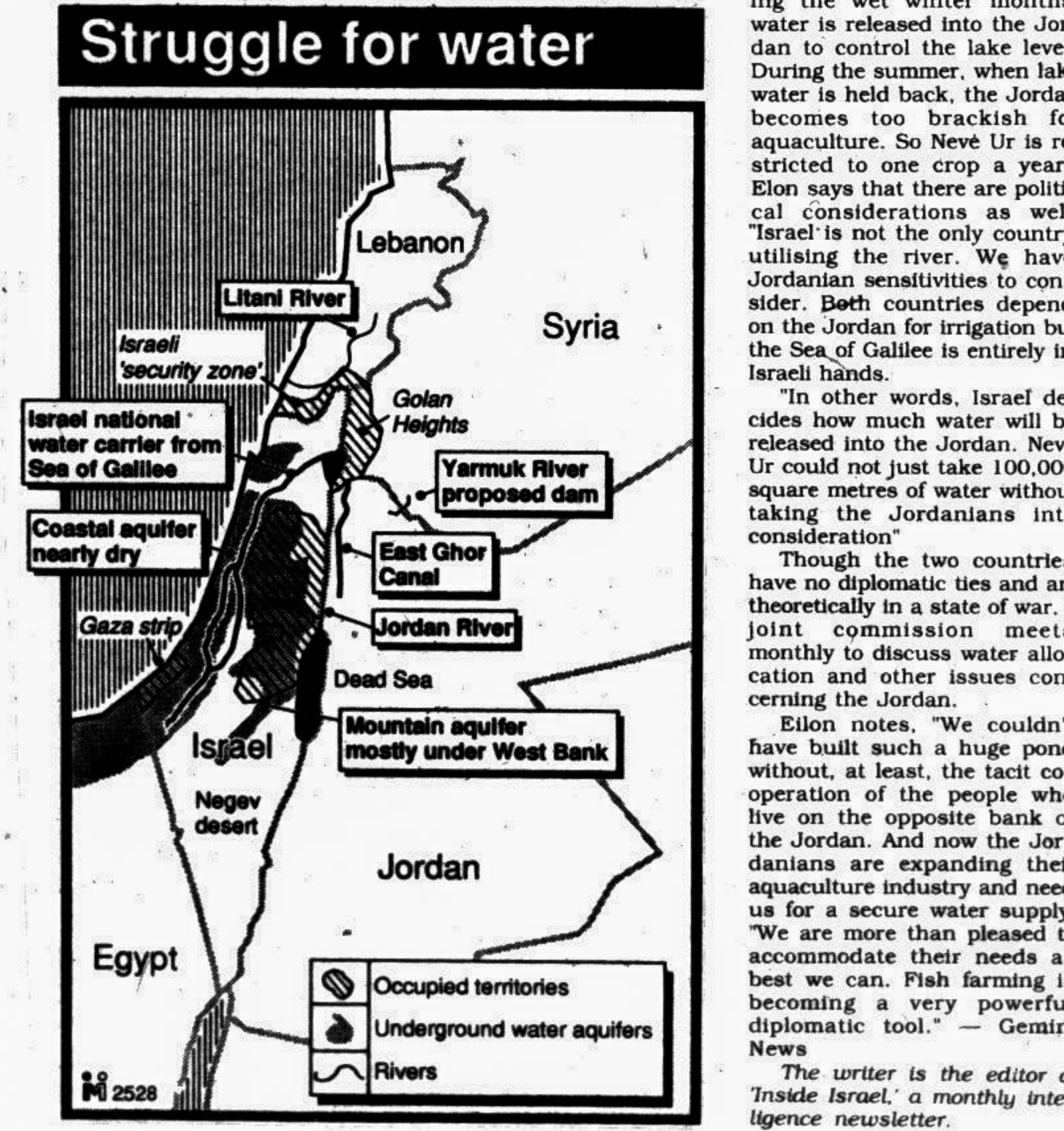
by Barry Chamish

raeli kibbutz (collective settlement) Neve Ur, which is about to complete and 85 acre aquaculture pond, the largest in the country.

Alongside the main pond are two harvesting pools of six acres each.

The pool will require 100,000 square metres of water, all of which will be pumped from the Jordan River, only a few metres distant. The kibbutz will initially farm carp and tilapia and anticipates it will earn \$400,000 a year from the pool.

Neve Ur has been using Jordan River water for more than two



PAYING for water is considered an offensive idea by millions of people, but these days everything has a price, including basic services once considered a right.

The latest to learn the lesson of modern economics are a community of 100,000 peasant farmers in Ngerwere, 40 kilometres north-east of the Zambian capital, Lusaka.

"I have told the people here the advantages of paying a fee and they have agreed," says local commercial farmer Robert Dean, the moving spirit behind the Ngerwere Water Project.

"This is a blessing in disguise because by the next century water will be more expensive than petrol."

The traditional community spirit of the people in times of epidemics, funerals and traditional functions has helped gain support for the approach.

Self-help actions fit in with attempts by the government to formulate a national water policy based on greater local control over funds and management of wells, dams and reservoirs — and with its free enterprise philosophy that it promised would end 30 years of unsuccessful state-directed development.

Gaining public acceptance for a pay-for-your-services approach is helped by the failure of the previous government to meet the water needs of the people, particularly those in rural areas.

Ngerwere, for example, suffered from constant shortages. Reservoirs and wells are contaminated at the best of times and, along with the rivers, yield little in the dry season between April and November. Yet the World Bank has said that "improving basic water and sanitation services is an important first step in alleviating poverty, protecting the environment and promoting human development."

Privileged people — police, teachers, medical staff — were provided with water brought in by train from Kabwe, a town 150 kilometres to the north of Ngerwere.

As a result of these hard-

ships, Dean and other residents started the water project, which depends mainly on rehabilitation of disused boreholes.

The specific aim is to make the water project financially self-sustaining and therefore durable. About 100 groups of homes now have access to clean water, and health workers say that cholera and dysentery which previously dogged the settlements have disappeared.

Nevertheless, a large section of Ngerwere people are still uncatered for.

So work has started on the rehabilitation of a huge water pump constructed by white farmers in the 1940s and abandoned when they left the country at the time of independence.

Dean has raised 10 million kwacha towards the cost of repairing the pump, which can generate 5,000 litres of water an hour, and the money is being supplemented by the 500 kwacha monthly payments by

local residents.

He says the approach will help change attitudes away from expectations of "something for nothing" towards self-help.

The aim is to complete work on the pump by the end of the year and to achieve financial self-sufficiency in three years, after which management of the water project will be handed over to the local council.

President Frederick Chiluba's Movement for Multiparty Democracy government — which allocated only 2.9 million kwacha for the project this year, not enough to ensure its viability — is enthusiastic.

Urged deputy agriculture minister Gobson Nkausu: "Ensure that the project adopts commercial tactics. It must operate as an enterprise in the economic sense to meet operational costs on its own and improve the water situation in the area."

Energy and Water Development Minister Edith Nawakwi says Ngerwere residents are well ahead of the rest of rural Zambia in realising that water is a resource that must be paid for.

She says the government regards the project as a showcase. When it sees the project is succeeding and is providing people with adequate supplies of clean water, similar schemes will be started throughout the country.

The writer is a Zambian journalist.

Preparing for the Day When Water is Costlier than Petrol

by Venarcious Mwansa

Governments which once believed that basic services such as water and health should be provided free are changing their mind and introducing charges. They argue that they do not have the money to do the job themselves and that in any case people do not value services provided without charge. Gemini News Service looks at a self-financing, self-help project in Zambia.

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