Water projects for the Mideast, Africa

by Marcia Merry

The map on page 30 shows the basic target areas for water development in the Mideast and Northern Africa. In what follows, we analyze these projects in greater detail.

I. Lake Chad-Congo Basin development

This massive hydraulic project is the centerpiece for transforming the continent of Africa, and beginning the de-desertification of the northern Sahara. The concept is to construct a link canal to channel water from the Congo River basin, northward to flow into Lake Chad.

The Congo River, which ranks second only to the Amazon in volume of water discharge, could be dammed and channeled to create a "Central African Lake," in place of its current meandering flow through Zaire to the Atlantic Ocean. From this body of water, a canal could be cut north—probably involving a lift pump over the relatively narrow divide, to send water northward to Lake Chad. Now a seasonal lake, Chad could be stabilized at a high water level, to benefit the five nations on its shores—Nigeria, Chad, Niger, Central Africa, and Cameroon—which together have more than one-quarter of the population of the entire continent.

Lake Chad water in turn can be used for further irrigation and transport routes north, even potentially to interconnect with old, dried-up river beds and underground water sources in the Sahara Desert.

The overall project would bring into cultivation an estimated 800,000 square miles of land, which is more than five times the arable terrain of Japan, where 110 million people live.

The new Central African Lake and Lake Chad would become a man-made "Great Lakes" of Africa, to serve, as the glacier-formed Great Lakes of North America once did, as the center of gravity for industry, transportation, electrical power supply, and agriculture for many developing areas. This project, in combination with mosquito eradication and

Desalination: an advanced solution for the Mideast

Turning the abundance of the world's salt water into drinking water requires reducing the parts per million (ppm) of dissolved solids (80% of which is sodium chloride or salt) from 35,000 ppm to less than 500 ppm, a reduction of 70 to 1.

Distillation (evaporation using steam heat), is one of the three basic methods of desalinating, and has been used for more than 100 years on oceangoing steamships. Today, about 95% of the world's desalination plants use modern distillation methods: multi-effect distillation, multi-stage flash distillation, or vapor-compression distillation.

The two other basic desalination methods are the reverse osmosis membrane system and electrolysis, both of which are used mainly for purifying brackish water, which can contain up to 10,000 ppm of dissolved solids.

In the past two decades, more than 1,500 desalination units (each with a capacity of 100 tons per day of fresh water) have been installed with a total capacity of approximately 7 million tons per day. About 60% of these plants are in the Mideast, and almost all the Mideast plants use multi-stage flash distillation. Worldwide, 82% of the large desalination plants (those producing more than 1 million gallons per day) use multi-stage flash distillation.

The efficiency of desalination plants, termed performance ratio, is measured in terms of the pounds of fresh water produced per 1,000 BTU of heat input. The performance ratio of present Mideast plants is 8, which is quite low and is acceptable only because of the low cost of local energy (flare gas, for example, which would otherwise be wasted).

The relatively high cost of current desalination technologies, although on a per capita basis within the range of other types of essential infrastructure, could be improved if more intensive and efficient methods were developed. Jonathan Tennenbaum, director of the Fusion Energy Forum in Europe, has suggested that advances in optical biophysics and laser chemistry and laser isotope separation be applied to solve the problem, making use of the inherent *harmonic* properties of living organisms. For example, Tennenbaum notes that the amount of sodium in living cells differs from that in the surrounding medium. He suggests that it would be fruitful to examine the electromagnetic structures of water and the role of nuclear magnetic resonance.

vaccines, would end the plague of malaria, which now afflicts 160 million Africans—fully two-thirds of the population of sub-Saharan Africa. The additional element to the river control and central lakes system is a net of cross-African rail lines.

There are a number of options and designs for this grand African water project. The Ministry of Construction of Japan has officially designated Lake Chad development as one of its five priority world "great projects," along with a new Panama Canal, a canal through the Isthmus of Kra in Thailand, flood control in Bangladesh, and a bridge between Sumatra and Java.

In Paris on Sept. 8, a conference of the Schiller Institute considered detailed proposals to link the Congo-Chad Basins. Water can be pumped up from the Ubangi River into the Chari (flowing into Lake Chad), through 200 kilometers of reinforced pipeline. There needs to be on the order of 50 billion cubic meters of water in order to recover the 90% of lost lake surface—some 20,000 square kilometers (almost the size of Belgium.)

II. Yonglei Canal and improvements in the Nile headwaters

In southeastern Sudan, where the upper White Nile River rises, before joining the Blue Nile and flowing on as the Nile River into Egypt, there are extensive marshy areas known as the Sudd swamp (see **Figure 1**). Construction of a channel from Yonglei, at the swamp, downwater to Malakal, and construction of a canal system, would regulate the swamps of southern Sudan, where large quantities of water are now lost by evaporation. Much of this water would be conserved, and the flow of the White Nile increased. Hundreds of thousands of acres of prime farmland would be created in the process in Sudan.

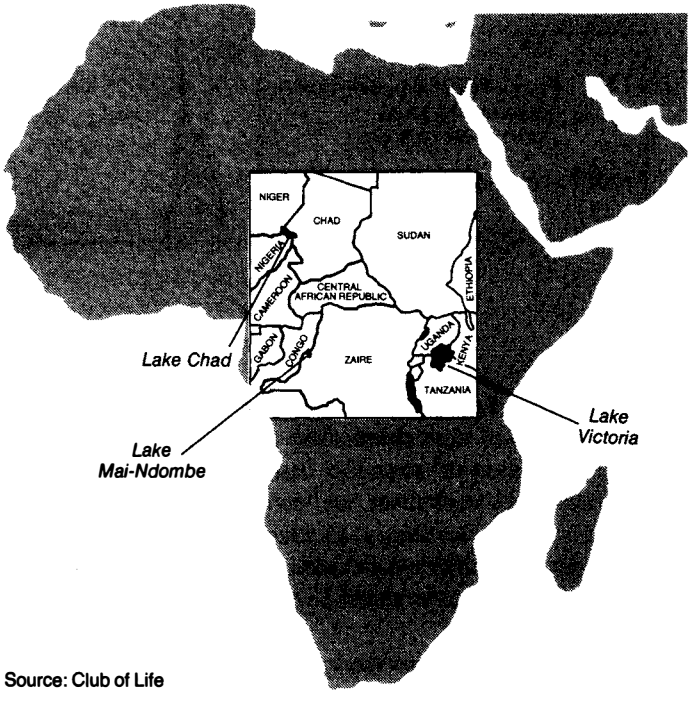
The project was started, then halted because of funding problems, and the obstructionism of the ecology movement, which has made preserving swamps and "wetlands" the excuse for stopping water improvement programs.

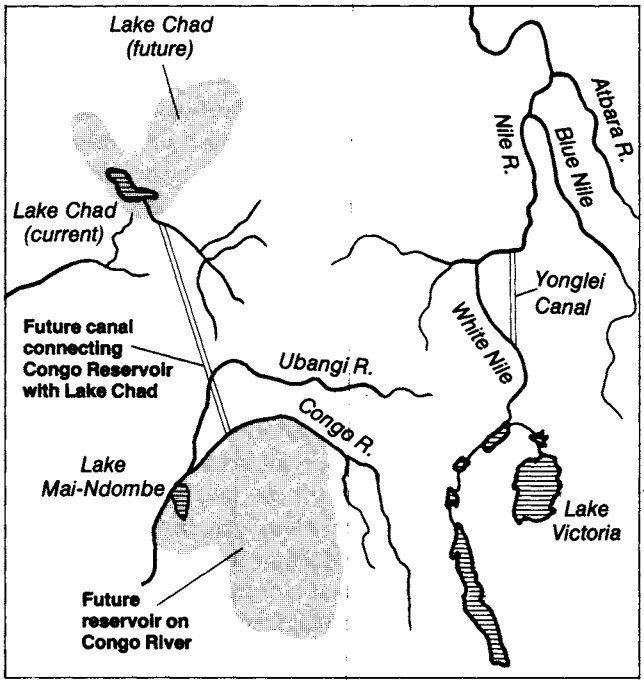
III. The Peace Pipeline and development of the waters of Turkey and Iran

The "Peace Pipeline," shown schematically on the map (page 30), is a $14.5 billion project, organized and managed in Turkey, designed to pipe water from Turkey south all the way to Yemen on the Arabian Ocean, with branch tap lines going out to the Jordan River nations, and to Iraq. In return, a twin pipe would bring petroleum back from the Arabian oil fields.

This water-for-oil peace project was funded in part through a public offering of shares to investors in Turkey and

FIGURE 1
Lake Chad-Congo Basin, and Yonglei Canal projects





Source: Club of Life

throughout the Middle East. Construction on the pipelines has begun; but now, with the crisis in the Persian Gulf, the program is halted.

The mountainous ranges of the Anatolian Plateau region continue through the Caucasus into the mountainous highlands of Iran, where water development projects can greatly enhance the agriculture and industrial output of the entire region.

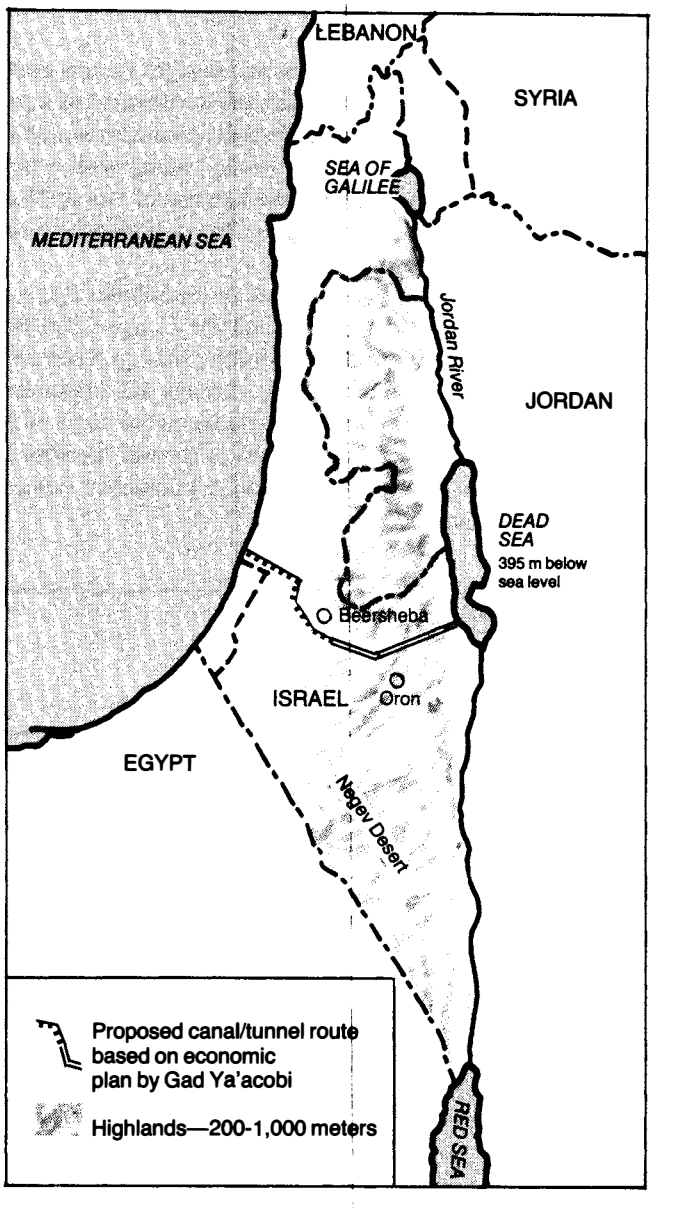
The famed Euphrates and Tigris Rivers rise in Turkey, and provide water for farmland in Syria and Iraq, before discharging into the Persian Gulf at the Shatt al-Arab. Improved water management systems would greatly enhance the use of these waters all along the course of the watershed, which has been studied in depth. In addition, there are millions more of acre-feet in Turkey that can be utilized within the nation.

The "GAP" project in Turkey, originally planned by the State Hydraulic Works, would make use of the waters of the Firat and the Dicle rivers and their tributaries, in the southeastern Anatolian region. The project envisages the building of 21 dams and 17 hydroelectric plants, and at full development, would irrigate 1.6 million hectares of land, and provide 26 billion kwh of electricity a year, with installed capacity of 7,500 MW.

The total planned irrigation amounts to 19% of the total economically irrigable area in Turkey (8.5 million hectares) and the GAP electricity output would materialize 22% of the hydropower considered viable in Turkey (118 billion kwh). A master plan was prepared as a joint venture with Nippon Koei Co. Ltd. of Tokyo.

A priority project in Iraq has been the Badush Dam, near Mosul, on the Tigris River, whose headwater reaches include the Dicle River—targeted for development by the Turks. The dam would have been part of a scheme to build an entire system of dams, irrigation, and water and sewage treatment facilities, to boost food output and living standards. The Italian Banca Nazionale de Lavoro was involved in funding the project, and for that reason among others, was targeted in 1989 by British anti-development circles, using the London *Financial Times,* in a contrived scandal about allegations of loans to gun-runners.

FIGURE 2
The Mediterranean-Dead Sea Canal proposal



IV. Ground water development

In 1984, satellite overflights of the Mideast and North Africa, and use of the "Big Camera" remote sensing (from Itek Optical Corp.), confirmed the location of significant bodies of underground water, whose existence was previously known only in part. The satellite data give only the location; the depth, quality, and size of the water deposits must be confirmed by on-site hydrological measurements.

Subsequent tests show quantities of underground water in the western Egyptian desert that could provide sweet water for 50 years of agriculture. One proposal is to undertake the construction of strings of oases, forming corridors of agriculture and settlement, and converting the sands of the desert into sod. The siting and archeological features of these water deposits indicate the existence of rivers flowing northward into the Mediterranean Sea from highlands in central Africa.

In the western Sahara there are at present extensive under-

ground flows of water, whose direction and quantities could be programmed for use, and for re-charging in the process of greening the desert. Like rivers, underground bodies of water course across political boundaries, and require cooperative development plans.

In Saudi Arabia, the underground water in the northeastern region has been utilized to create 3 million hectares of wheatfields, turning the country from a grain-importing nation into an exporter. The aquifers of the Arabian peninsula are famous, including upwellings of sweet water in the Persian Gulf, bubbling up through the salty sea.

V. Dead Sea Canal, Qatarra Depression, and the creation of water corridors

There have been many grand designs for linking the waters of the Mediterranean into the Dead Sea (**Figure 2**). As proposed by Prof. Haim Ben-Shahar, former president of the Tel Aviv University, the project was more an energy program, and not a water project. But the strides that have been made in desalination processes and nuclear power reactor technology make the old dreams come alive again.

In Ben-Shahar's plan, there would be a canal, and then a tunnel, proceeding from the Mediterranean and passing in between between Beersheba and Oron, into the southern area of the Dead Sea. There were protocols envisaged to involve Jordan in the development benefits. As of the 1970s, the plan called for the water going into the Dead Sea through a series of waterfalls.

Today, the plan—as most recently proposed by Lyndon LaRouche—calls for lining the canal with a number of nuclear plants. Besides using distilled sea water for their own functions, the plants can produce water for use in the entire region. The water course thus becomes a development pathway. It is a zone of urban development, and location for industries and efficient agriculture production in the adjacent region.

Another proposal for a canal from the Mediterranean is to channel water into the Qatarra Depression—a large, dry sinkwell in northern Egypt, 35 miles from the seacoast, and 140 miles from Cairo (see map, page 30). The dank hole lies about 200 feet below sea level, and extends 185 miles from north to south. If filled, it would create a large inland salt water lake the size of Lake Ontario.

Like the earlier Dead Sea Canal plans, the Qatarra Depression Lake was conceived in the post-World War II era as an energy development scheme. The hollow is rimmed by steep escarpments, perfect for hydropower, were water available.

Egyptian President Gamal Abdul Nasser engaged German scientists and engineers to study the possibilities. The proposed scheme involves digging a canal from the sea to within 9 miles of the depression, and then running water through a tunnel into the cliff wall. The German plan estimated that 2.7 billion kilowatt hours of electricity a year could be recouped.

Besides transmission of power to the Cairo metropolitan area, power could be used to pump up sweet ground water in the surrounding desert region.

Desalination plants could play a role in recharging the underground waters, and, with agriculture and other vegetation, a new hydrologic cycle could be created because of the man-made lake.

Even without this, engineers estimate that 100 years of salt water fishing could be supported in the lake. Because of evaporation in the desert heat, the lake would most likely remain at about 150 feet below sea level, but this could be regulated.

The Qatarra Depression Lake was one of the early proposals for use of PNEs—peaceful nuclear explosives—in the "Project Plowshare" program of U.S. science and defense agencies.