# The Oasis Plan: Man-made rivers and growth corridors to span the deserts

by Marcia Merry Baker

The Oasis Plan outlined by Lyndon LaRouche refers to a program encompassing already-proposed water management, transportation, and other projects, combined with the large-scale use of nuclear power to desalinate water, to establish systems of canals, energy supplies, and new freshwater sources throughout the Middle East-North Africa region, through strategic growth corridors, on a scale equivalent to adding the water volumes of new, "man-made River Jordans." By this means, along with agricultural and industrial facilities, and the related provision of social infrastructure—housing, schools, health care, towns, cultural centers—the foundation is provided for economic development and durable peace.

We present here a summary picture of the priority projects for the region, and also a summary account of the means to provide the critical inputs for realizing these projects, from the output potential of the "Productive Triangle" region of central Europe.

## Power to make water

First, consider what we can do with nuclear energy. Take an hypothetical case: Imagine an agro-industrial colony in the middle of a desert, in a location not conveniently reachable from a variety of freshwater management projects now on the drawing boards, but adjacent to salt water from the sea.

We take half a dozen high-temperature nuclear reactor (HTR) modules, of the type which today could be produced on assembly lines. We put together these modules into a power plant producing 1-2 gigawatts of electric generating power and an additional 1-2 gigawatts of usable heat output. We apply a portion of that electric and thermal output to desalinating seawater, using a combination of existing processes, at the rate of 70-100 cubic meters per second. This provides ample freshwater for the domestic, irrigation, and industrial needs of a self-sustaining agro-industrial colony of 1 million people—in the middle of a desert! The rest of the HTR power we use for pumping, between the sea and the location of our colony (at an elevation of, let us say, 400 meters). A few more nuclear units cover the electricity and process-heat requirements of the colony itself. The entire complex, centered on the nuclear power sources, is an updated version of the 1950s "nuplex" designs of Atoms for Peace and Project Plowshare.

Two dozen of such large-scale HTR desalination centers could produce rates of freshwater flows equivalent to that of the Nile and Euphrates combined—a man-made river system!

Project designs for smaller, modular HTR units are at the ready-to-go engineering stage from the German firm Siemens and the Swedish-Swiss combine Asea Brown Boveri; and also from California-based General Atomics. The HTR modules possess characteristics of stability and inherent safety which make them ideally suited for the region.

For example, the General Atomics power plant design, first proposed for a Pacific coast location in southern California, has four modules (each at 135 megawatts-electric), located underground, for a total power output of about 540 megawatts; which gives a net electrical output of 466 megawatts, after fueling the attached multi-stage flash distillation process for desalting sea water. In the most advanced design, electrical power can be drawn off the helium gas cycle directly, without the need for turbine generators. It would take about 22 of this type facility to provide the volume of water equal to the current 3,500 million cubic meters of renewable water in the Jordan River Basin—in other words, a second Jordan River.

Complete desalination units, including nuclear power sources, can be built in assembly-line fashion, and shipped into place on floating platforms for rapid transport and installation. The technology and most of the development work for such mass-produced units are already complete.

This application of nuclear power illustrates what can be done more generally, with the quality of productive power which nuclear technology embodies. Apart from the unlimited potential of desalination, it is eminently possible to transfer huge quantities of freshwater from areas with a surplus of such water—above all, the tropical rain regions of Central Africa—into the Sahel, North Africa, and even into the Middle East. Projects to accomplish this, through systems of

canals, reservoirs, and pumping stations, have long been on the drawing boards.

## The Great Projects

Engineering plans exist for the following projects:

- Transferring water from the Zaire (Congo) basin, out of the Ubangi River system, into the Lake Chad basin to stabilize the lake and provide water resources for Sahel development.
- Capturing more of the White and Blue Nile rivers to improve the headlands and downriver regions.
- Developing the groundwater resources from underneath the Sahara, from North Africa across to northern Somalia, and under the Arabian Desert. In particular, there is a plan for the Qattara Depression in northern Egypt, where a huge dry hole is a made-to-order lake bed for seawater to be transferred in via a 35-mile canal from the Mediterranean. In Libya, 1992 saw the opening of the "Great Man-Made River" project, in which water is pumped up from under the Sahara and carried by a huge underground pipeline to population centers on the Mediterranean coast which are otherwise running out of water.
- The centerpiece projects of the entire region are proposed canals that would connect the Dead Sea either to the Mediterranean, or to the Red Sea, or to both, serving as seawater channels, along which nuclear-powered desalination units can provide the water resource base for development corridors throughout the region. **Figure 1** shows schematically the possible routes of these canals.

Through these and related projects, significant improvements in the water supply of the Middle East and North African nations could be realized within a few years, with dramatic improvements accruing by the turn of the century.

## Man-made rivers and lakes

Thus, with plentiful power, a network of man-made rivers and lakes can be created to span strategic regions of North Africa and the Middle East, with water from the Mediterranean, Red Sea, Persian Gulf, and Arabian Sea. Then, at selected inland points, nuclear-powered desalinated seawater can provide required volumes of freshwater, that, in turn; can be piped, stored, and used as a new water resource base.

Where necessary, seawater must first be raised through pumping to points from which the water can then flow through the canal system of channels and lakes, or storage basins. The power for this can be supplied by nuclear reactors. Where the creation of canals and storage basins requires large earth-moving operations, nuclear excavation can be employed with advantage.

The volumes of salt water channeled inland from the seas will serve several purposes. First, they supply the desalination plants and various industries along their banks and shores. Second, they provide a means of transport, together with the canals. Third, the water from these lakes enhances the water cycle of the atmosphere; and there are potential hydrostatic benefits for the groundwater.

Along the canals and reservoirs we can construct "nuplexes"—complexes of nuclear power and various sizes of desalination units, generating freshwater for the spectrum of uses required—"protected" desert agriculture (hydroponics, drip-irrigation, greenhouses, etc.), food processing, industrial and chemical processing, and residential. Extensive tunnel and piping distribution systems can provide freshwater farther away, to more distant areas, thus creating "green bands" of growth based on new "artificial rivers."

The courses of the seawater canals, and the locations of freshwater creation and potential "green bands" must be determined on the basis of geographical, geological, and infrastructural considerations, bearing in mind the future growth of population and transport.

The ability to provide freshwater in the indicated fashion also points to the future potential of beneficial modifications of the climate in the region. Evaporation from lakes and reservoirs, and above all, transpiration from plants and the other effects deriving from large-scale, irrigated, intensive agriculture in desert areas, greatly enhance the natural processes for generation of rain. Provided that water management and agriculture expand in parallel with the increase in rainfall, this process becomes self-accelerating. The throughput of water among the atmosphere, sea, land, and biomass grows to the point that the deserts tend to diminish, in favor of a milder, "Mediterranean" climate.

## Inputs from the 'Productive Triangle'

The most essential precondition for the proposals outlined here, is the realization of Lyndon LaRouche's infrastructure development program for the "Productive Triangle"—the three corners of the spherical triangle defined by the cities of Paris, Berlin, and Vienna. The fate of the Middle East is inseparably linked to generating a new "economic miracle" in central Europe via high-speed rail and magnetically levitated rail systems and a renaissance of nuclear energy. **Figure 2** shows the core region of the Productive Triangle, and radiating outward, spirals of development corridors along the centers of population and economic activity.

Given the collapse of the U.S. economy, it is continental Europe, together with Japan, which must provide the decisive margin of technology for developing the Middle East. This includes the mass production of nuclear modules and desalination units over the next 15-20 years.

In this context, we must massively upgrade the transport infrastructure between North Africa, the Middle East, and the Productive Triangle region in Europe. This must include connections to the southern tip of Spain, a bridge to Sicily, high-speed rail connections to Istanbul, and connections to the Black Sea.

Among the proposed elements of this transport grid (**Figure 3**) are:

FIGURE 1

**Selected infrastructure projects for the 'New Mideast'**

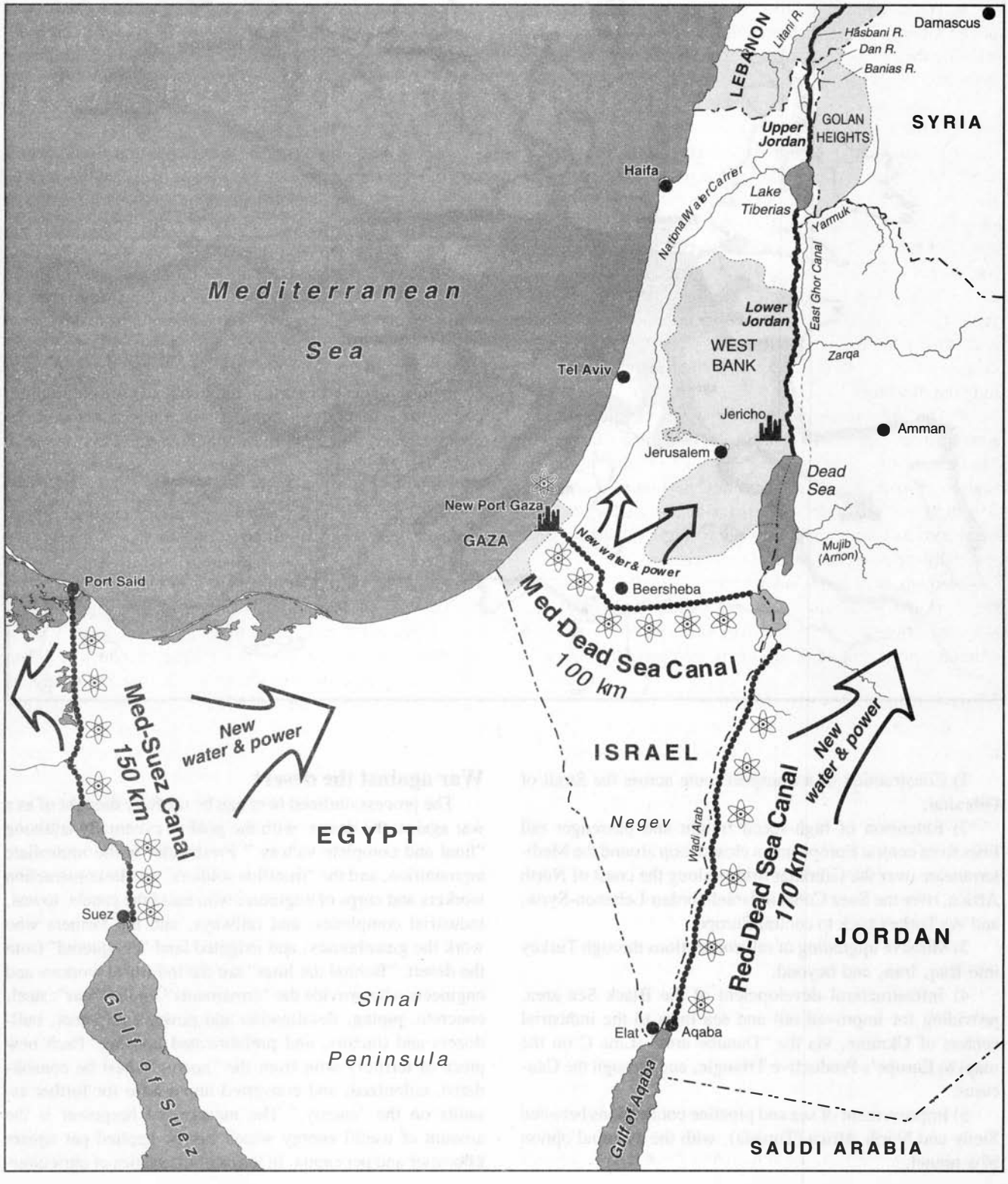
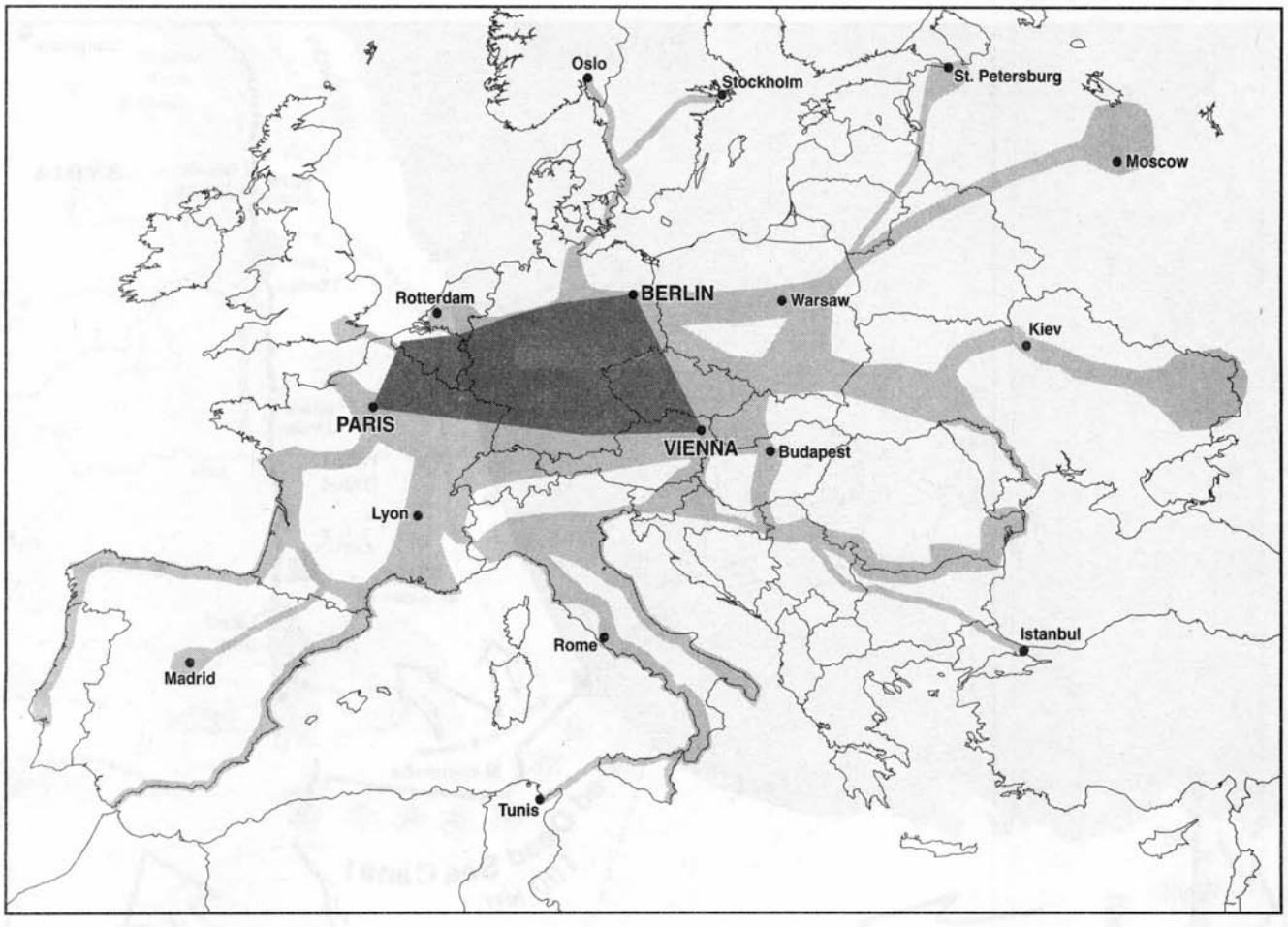


FIGURE 2

**Spiral arms extending from the European 'Productive Triangle'**




1) Construction of a transport route across the Strait of Gibraltar;

2) Extension of high-speed freight and passenger rail lines from central Europe into a closed loop around the Mediterranean: over the Gibraltar bridge along the coast of North Africa, over the Suez Canal to Israel-Jordan-Lebanon-Syria, and via Turkey back to central Europe;

3) Massive upgrading of rail connections through Turkey into Iraq, Iran, and beyond;

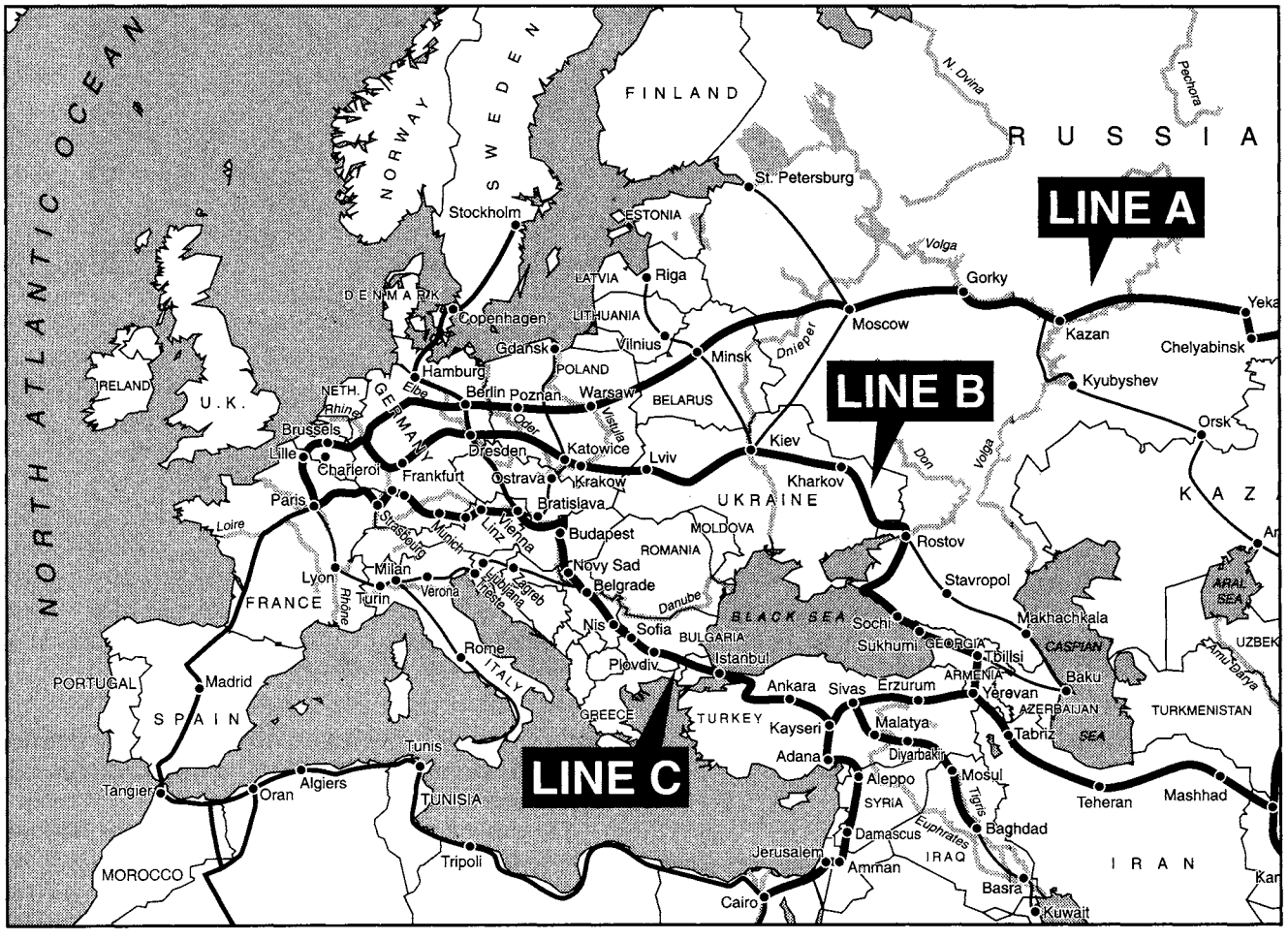
4) Infrastructural development of the Black Sea area, providing for improved rail and sea links to the industrial centers of Ukraine, via the "Danube arm" (Line C on the map) to Europe's Productive Triangle, and through the Caucasus;

5) Improvement of sea and pipeline connections between Sicily and North Africa (Tunisia), with the eventual option of a tunnel.

## War against the desert

The process outlined here can be usefully thought of as a war against the desert, with the goal of eventually attaining "final and complete victory." Freshwater is the immediate ammunition, and the "frontline soldiers" are the construction workers and corps of engineers who build the canals, towns, industrial complexes, and railways, and the farmers who work the greenhouses, and irrigated land "conquered" from the desert. "Behind the lines" are the industrial workers and engineers who provide the "armaments" for the "war": steel, concrete, piping, desalination and power equipment, bulldozers and tractors, and prefabricated housing. Each new piece of territory won from the "enemy" must be consolidated, colonized, and converted into a base for further assaults on the "enemy." The measure of firepower is the amount of useful energy which can be applied per square kilometer and per capita, in terms of intensities of agricultur-

FIGURE 3
**Eurasian rail system would link up with the Mideast**




al, industrial, and infrastructural activity.

Just as with real armaments, increasing the firepower is a question of the level of technology. In the face of such a formidable enemy as the deserts of North Africa and the Middle East, we would be foolish not to employ the most modern arms available—"nuclear weapons," such as the high-temperature reactor, combined with advanced desalination technologies, and so forth.

The ability to use these weapons of modern technology depends on the education, training, and moral qualities of the soldiers and those who must supply and maintain such weapons. To these are added the scientists and engineers who must constantly develop and perfect new weapons in the course of the war. Ultimately, it is the productive power of society, the expansion of its economic base, which determines whether or not the protracted war against the deserts will end in victory.

## Social infrastructure

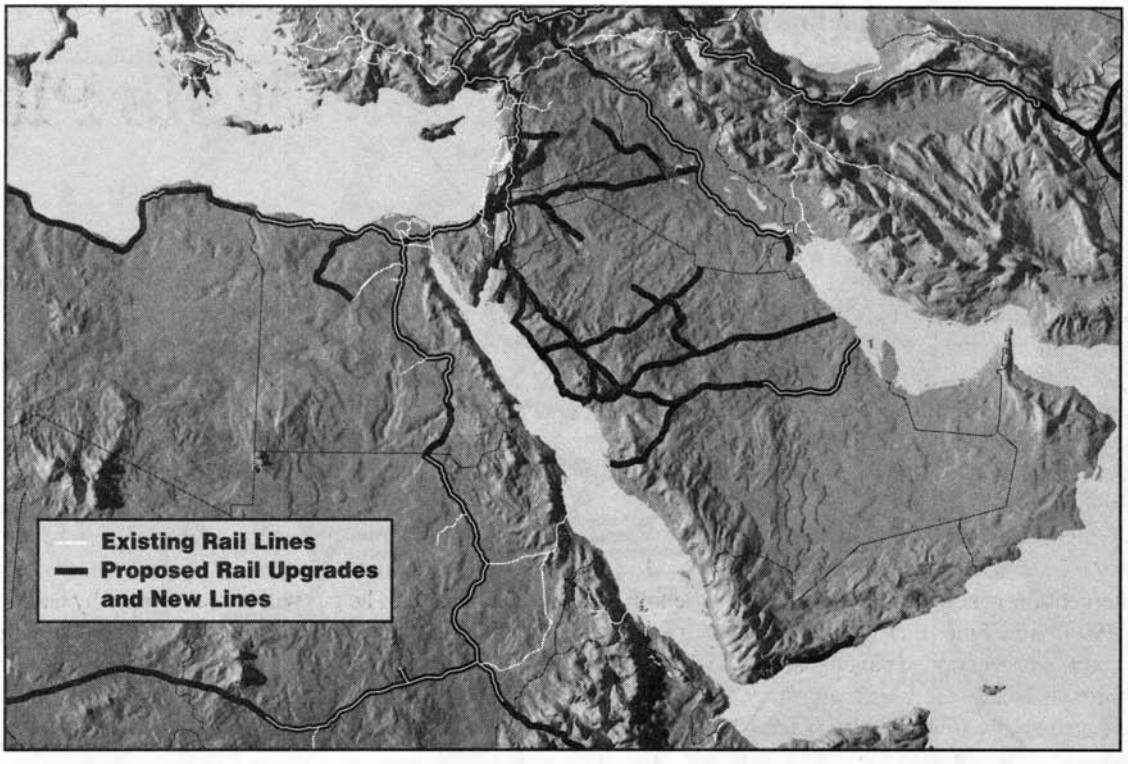
Ranking equally with the need for water in the region is the need for provision of housing, health care, education, cultural and religious centers, and all manner of social infrastructure. Despite strife and economic hardship, several local examples of new town development show the way.

For example, in the east Egypt desert, in the 1980s, agriculture complexes were created from the ground up, located at chosen sites convenient to new experimental agriculture development zones. Power was supplied for pumping groundwater. Where for the past 5,000 years only desert brush grew, water was supplied, and soils "created" by a scientific sequence of cropping, resulting in humus formation and good yields.

Wholly new towns were designed and built for the new residents, accounting for dwellings, schools, shops, religious and cultural centers, with attention to the architectural

FIGURE 4

**Greater Middle East, existing and proposed rail development (Arab League)**




features. Now the design and construction of new towns becomes the foremost Great Project of the accords.

## Let's complete the projects!

An immediate goal is to complete the rail lines along the main routes of Istanbul-Baghdad-Basra-Kuwait, Aleppo-Damascus-Amman-Jiddah-Mecca, Alexandria-Qattara, and Heluan-Bahariyah-Qattara.

Since the conceptual work done by the Arab governments in the 1970s (**Figure 4**), additional useful projects have been envisaged. Resuming work on the Syrian-Jordanian segment of the old Hedjaz railroad, in connection with a Jordan Valley development project with extended operations at the ports of Tripoli, Haifa, and Aqaba and with the modernization of rail links between these ports, would create a joint region of rapid economic growth that could define mutual, sound interests in peace between Israel and its Arab neighbors.

Furthermore, direct cooperation between the Suez Canal and the port of Aqaba could serve the development of a riparian urban culture along the western rim of the Arabian Peninsula, from Aqaba to Jiddah and Aden, and launch a mirror development on the western rim of the Red Sea, along the eastern African coast from Suez to Djibouti.

The natural extension westward of Egypt's Qattara development project would be the construction of a trans-Maghreb rail route from Alexandria to Oran to Tangier, along the Mediterranean coast of northern Africa, and the construction of another rail link from the Nile to the Lake Chad development project in northern Central Africa.

The creation of a rail ferry link from southern Italy and Sicily to the Libyan port of Tripoli, plus the drilling of two rail tunnels below the Strait of Gibraltar in the west and beneath the Dardanelles in the east (modelled on the Channel Tunnel between France and Britain), would establish three central connections of modern transport infrastructure among Africa, the Middle East, and the envisaged Productive Triangle in central Europe.

Generally speaking, the main trans-Arabian rail routes should be laid out in a two-track mode, at least, and eventually even in three or four tracks, to provide a basic, future-oriented rail grid that could last for the next 100 years. Electrification and broadening of many old tracks from the 1,000 mm gauge to the European standard gauge of 1,435 mm width is necessary to link the entire rail infrastructure of the North African and Middle Eastern regions to the modern rail grid of Europe.

If done properly, concentrated investments in the transport infrastructure, with emphasis on modernized and high-speed railroads, could lay the groundwork for a great region of economic cooperation among Europe, Africa, and the Middle East that would finally make the Mediterranean a lake of peace and development.