Without water, there is no life: a program to make the deserts bloom

by Jonathan Tennenbaum

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Without water there is no life. He who can bring fresh water to the deserts, wields a power greater than any force of arms, a life-giving power which alone can bring stable peace to Africa.

Contrary to the conceptions of British "economics," fresh water is not a limited resource. Based on the expansion of human productive powers, through science and technology, we can generate as much fresh water as human needs will ever require—anywhere on this planet, at any level of population, and at any time in the future. The same is true of every other commodity needed to sustain and enrich human life. The doctrine of "limited resources" is a lie, propagated by imperialists who seek to control nations and populations by imposing artificial scarcity.

We call for combining a series of already proposed water-management projects with the large-scale use of nuclear power to desalinate water, to establish a system of reservoirs and man-made freshwater canals and rivers throughout the Middle East-North Africa region. By this means, we can meet all foreseeable water needs and provide the foundation for economic development and peace into the next century.

Nuclear energy and desalination

Consider what we can do with nuclear energy. Take an extreme case: an agro-industrial colony in the middle of a desert, in a location not easily reachable from freshwater-management projects now on the drawing boards. We take half a dozen high temperature reactor (HTR) modules of a type which today can be produced on an assembly line. We put 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 desalinate sea water, using a combination of existing processes, to the rate of 70-100 cubic meters per second. This provides ample fresh water for the domestic, irrigation, and industrial needs of a self-sustaining agro-industrial colony of 1 million people. 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.

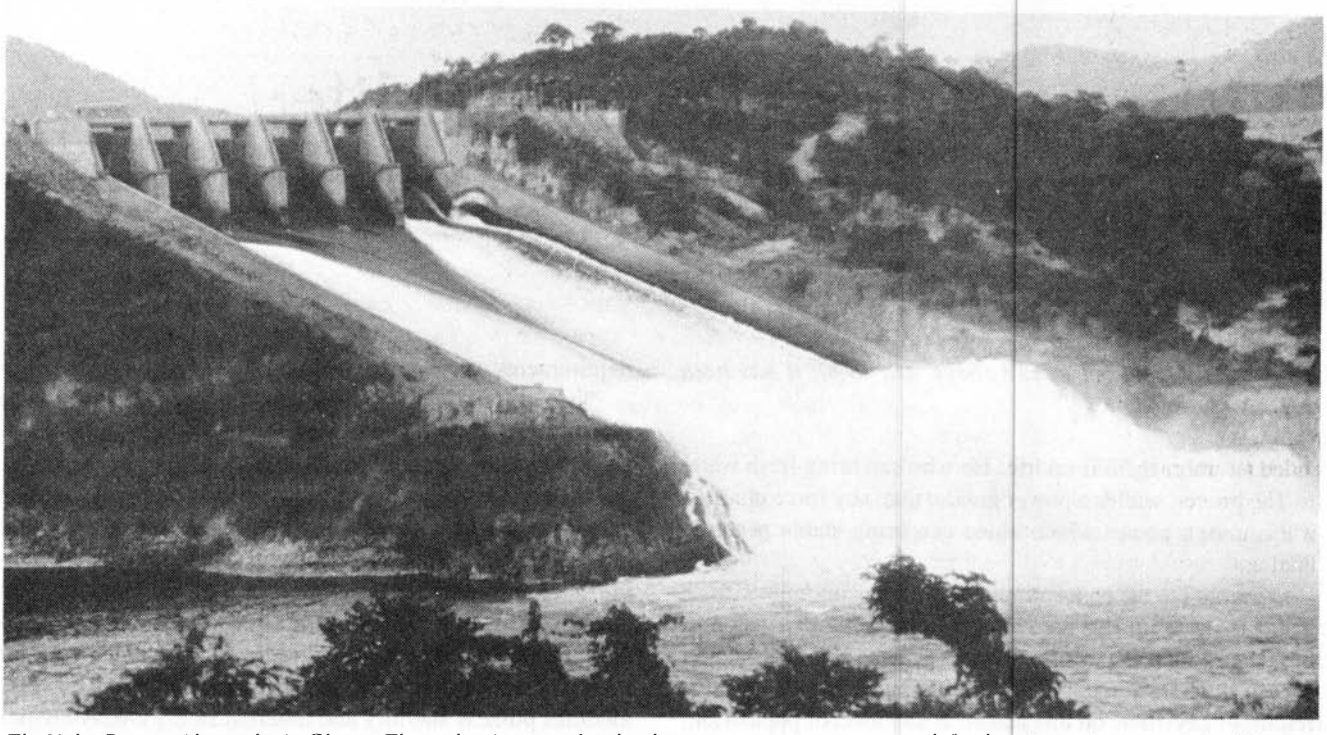
Two dozen such HTR-desalination centers produce a flow of fresh water equivalent to that of the Nile and Euphrates combined—a man-made river system.

In practice, the actual size of desalination complexes can vary over a wide range, using recently perfected modular nuclear reactor designs. Complete desalination units, including nuclear power sources, can be built in assembly-line fashion on floating platforms for rapid transport and installation. The technology and most of the development work for such mass-produced units are already complete. The HTR modules possess stability and inherent safety characteristics which make them ideally suited for large-scale use throughout the region.

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 fresh water from areas with a surplus of such water—above all the tropical rain regions of Central Africa—into the Sahel, North Africa, and the Middle East. Projects to accomplish this, through systems of canals, reservoirs, and pumping stations, have long been on the drawing boards. Included are projects for channeling water from the Congo River system (Ubangi) to expand Lake Chad, and for generating a "second Nile" by further developing the source regions of the "White Nile." To this is added a smaller, but significant and expandable fresh water potential which could be pumped from Turkey to its southern neighbors, as proposed by the Turkish government in its "Peace Pipeline" plan. Through these and related projects, significant improvements in the water supply of the Middle East and North Africa could be realized within a few years, with dramatic improvements by the year 2000.

It is crucial that the water flows thus generated not be dispersed in an arbitrary manner, but be organized and concentrated in a network of man-made rivers and lakes.

Water from the Mediterranean, Red Sea, Persian Gulf, and Arabian Sea can be channeled via canals into a series of artificial reservoirs. The variants of the Qattara Depression reservoir project in Egypt and the plan to refill the Dead Sea from the Mediterranean, are illustrative of some ways in which this can be accomplished. Where necessary, water



The Volta Dam at Akosombo in Ghana. Through science and technology, we can generate as much fresh water as human needs will ever require, anywhere on this planet.

must first be raised through pumping to points from which the water can then flow to reservoirs via canals. The power for this can be supplied by nuclear reactors. Where the creation of canals and reservoir basins requires large earth-moving operations, nuclear excavation can be employed with advantage. Canals provide both the water flow to fill the reservoirs, and also a transport means. Along the canals and reservoirs we can construct complexes of nuclear power and large desalination units, generating fresh water for a system of freshwater canals. Large-scale use of desalination is complemented by channeling and pumping of fresh water from natural sources.

Instead of simply spreading the fresh water around evenly in an irrigation system, we can create with these rivers a network of interconnected "green bands" of development. As opposed to mere isolated "green islands," these green bands become at the same time transportation axes for the movement of goods and persons by ship, rail, and road, and the locations for new towns, cities, and industrial complexes. In this way, the development of the Middle East and Africa will re-create the history of Europe, which is inseparably linked to the natural water infrastructure of the Rhine, Seine, Loire, Rhone, Danube, Elbe, Oder, Vistula, Po, and other great rivers.

The locations and courses of the new rivers and "green bands" must be determined by geographical, geological, and infrastructural considerations, bearing in mind the future growth of population and transport as well as the regime of water flows which will arise through increase in natural rainfall.

The reservoirs of (salt) water channeled inland from the seas will serve to supply the desalination plants and various industries along their shores; provide a means of transport, together with the canals; and evaporation from these lakes enhances the water cycle of the atmosphere. The Qattara Depression and Dead Sea projects would have these benefits, in addition to their hydroelectric potential.

The ability to provide flows of fresh water gives us also the power to modify the climate of the region. Evaporation from lakes and reservoirs and transpiration from plants and the other effects deriving from large-scale, irrigated, intensive agriculture in desert areas, enhances 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 finally disappear, and a mild, "Mediterranean" climate is established.

Link to the 'Productive Triangle' in Europe

The most essential precondition for the proposals outlined here, is the speedy realization of Lyndon LaRouche's infrastructure development program for the Paris-Berlin-Vienna "Productive Triangle." The fate of Africa and the Middle East is inseparably linked to generating a new "economic miracle" in Central Europe via high-speed rail and magnetic levitation systems and a renaissance of nuclear en-

ergy. 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 Africa. This includes the mass production of nuclear modules and desalination units over the next 15-20 years.

In this context, we must upgrade the transport infrastructure between North Africa, the Middle East, and the "Productive Triangle" in Europe. The LaRouche "Triangle" program provides for a series of infrastructure corridors known as "spiral arms," which link the core Paris-Berlin-Vienna region to the entirety of continental Europe and which include connections to the southern tip of Spain, a bridge to Sicily, high-speed rail connections to Istanbul, and connections to the Black Sea. These infrastructure corridors must now be extended to embrace North Africa and the Middle East.

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." Europe's Productive Triangle is the decisive ally in this war. To cement this alliance, we must clarify that the common interest lies in the securing of long-term peace and the generation of real wealth for the present and future generations. This requires a common understanding of what constitutes real wealth, as opposed to fraudulent (British) notions.

There is no wealth apart from the power to maintain human life. In the war against the desert, we must maintain and extend human life in a hostile environment, just as man one day in the future will conquer Mars and other planets. It is the power to do that which constitutes, in first approximation, real wealth.

Wealth resides in the power to advance the productive powers of labor, as measured by the relative potential population density of a society: the maximum density of population which could sustain itself, by the forms of economic activity prevailing in that society, per square kilometer of any given quality of land.

It is growth of productive powers—to *produce* what human beings require to live and work *productively*—that constitutes real wealth, not "natural resources" in and of themselves. This is proven by the huge population density in Japan and Western Europe, which are poor in natural resources compared to many other regions of the world, but have achieved high rates of progress.

Oil, for example, has no intrinsic value in and of itself. It is useless without the technologies which extract, refine, and consume that oil. Only through technology does oil become useful for the maintenance of human life. And the progress of technology will one day make exploitation of oil obsolete.

Water would seem to be immediately valuable, for life is impossible without it. But, is it the immediate possession of some quantity of water now which constitutes wealth, or the power to *generate* sources of water in any quantity into the future? If we have water to drink today, but are going to thirst tomorrow, is that wealth?

The question of cost

The following discussion is excerpted from an article by Jonathan Tennenbaum, "Reflections on the Cost of Water and Mideast Peace," in EIR, *Oct. 12, 1990:*

The provision of freshwater supplies is limited only by the development of productive power, through technology. Often however, this fact is obscured by misplaced emphasis on apparent monetary cost. There are two points to be made in this connection. The economic costs of water supplies are determined by two major factors: 1) the natural environment of the region (climate, geology, hydrology, ecology, etc.); 2) development of the productive powers of labor, as reflected in technology.

It is obvious that to provide a given flow of fresh water per square kilometer of a desert area, requires a relatively greater effort (other things being equal) than to provide the same flow density in an area with abundant rainfall or in the vicinity of a great river. This circumstance is reflected in the widely varying supply costs of fresh water in different areas of the United States, for example.

Apart from differences in natural environment, the cost of water is a function of the level of technology. Employing the full potentials of nuclear and other advanced technologies, the nations of North Africa and the Middle East might provide fresh water to their arid regions at a lower overall social cost, than the inhabitants of Central Europe expended for their water requirements three generations ago. We have only to compare the present projected costs of delivering nuclear-desalinated water to Middle Eastern deserts with effective cost (expressed in labor time) of freshwater supplies in Central Europe today and 75 years ago. The key to the matter is the dramatic increase in labor productivity over that period. That is the first point.

This being said, we must still assume a significantly higher cost of water than would prevail in less dry areas of the world *where the same technological level were employed.* So, the cost of nuclear-desalinated water pumped from sea level into the Arabian Desert, for example, would be about twice the present cost of municipal water supplied to the city of Munich. Given that nearly the entire water consumption for agriculture in Germany is provided "free" from rainfall, this high cost of water translates into a higher cost for domestically produced food, a higher cost of maintaining labor at any given living standard, and a higher relative cost for nearly every branch of production. This is particularly the case in an early phase of economic development, and raises an important point of economic policy.

Should we then conclude, as economists of British "free market" persuasion do, that there is no point in developing agriculture and industry (apart from extraction and refining

of oil) in the region, since these could not be competitive on the world market? . . .

Friedrich List's answer in the 19th century, which Lyndon LaRouche has sharpened in crucial respects more recently, is essentially this: The goal and measure of economic activity is not to acquire various commodities at the lowest possible cost, nor to gain the largest margin of monetary profit. Rather, the purpose is to accomplish the *highest rate of growth in the productive powers of labor*. Wealth resides exclusively in the expansion of those powers.

So, by concentrating its efforts on developing science and technology, and a higher level of education of its labor force, Germany became the most powerful industrial nation in the world. Crucial to this was List's dual tactic of protective tariffs and development of infrastructure. The tariff system of the German Customs Union, or Deutsche Zollverein, ensured that none of a broad array of industrial commodities could be imported and sold at less than the cost of production of those same commodities in Germany, plus a certain margin which the fledgling German industry required for investment into technological improvements. The relative price level maintained in this way is known as a "parity price." (There are other means to achieve the same effect of parity, but the principle involved is always the same.)

Naturally, at first this meant paying a much higher price for various commodities than the "world market price" as determined, essentially, by the City of London. Within a short time, however, the construction of railroads and other infrastructure, together with development of technology, boosted the productivity of German industry to the point that the costs of production became generally much less than those in Britain—despite the British Empire's vast exploitation of slave labor and looting of raw materials!

The same principles apply to developing the labor power of the Middle East and North Africa today. That is the second point. Were the equivalent of "parity prices" to be introduced in systematic fashion for a variety of agricultural and industrial products, combined with crash programs of water and other infrastructure development, we would see an unprecedented boom in the internal economies of the region—despite the relatively high apparent costs of water.

This brings up a deeper point concerning "cost."

We must consider, both on the local level of individual regions and nations, as well as on the level of the human race as a whole, how we can achieve the highest rate of development of the productive powers of labor. For, ultimately, in real economic terms, "cost" has only the significance of the difference in rate of development of the powers of labor resulting from alternative courses of policy. We "pay" for a wrong policy in a deficit of that development which would have occurred had we followed a more correct policy. Whereas, properly considered, we do not "pay" for a correct policy at all, but only gain from it.

The restoration of the Lake Chad basin

by Yves Messer

The following was adapted from a 1990 Schiller Institute study in France on "The Role of Europe in Promoting an African Renaissance":

Geography: Lake Chad is in a strategic position for Africa as a whole, situated at the crossroads of the largest axes between west and east (from Dakar to Djibouti) and from north to south (Tunis to the Cape of Good Hope). Bordered by Chad, Niger, Nigeria, and Cameroon, the basin is surrounded by a mountainous massif or by plateaus that open out toward various directions: in the north toward Libya, in the east toward Sudan, in the south toward the Central African Republic, in the west toward Niger.

History: Lake Chad, and in a larger sense the pan of the Chadian basin, has often played the role of historical crossroads for civilizations, for trade of goods, merchandise, and ideas. According to Kotto Essomé and other historians, it was around Lake Chad that the Bantu civilization split up in its progression toward the south and east.

Geology: The Chadian basin is the result of the collapse of the Pre-Cambrian crystal shield, probably during the Ice Ages. A part of the glacier would have been trapped giving rise to an inland sea. Four different incursions over the last 50,000 years have produced different sediment beds which make up the natural soil richness of the Chadian basin.

Climate: The dry climate we are familiar with today is far from what this region always had; during the last Ice Age, that is, from about 32,000-20,000 years before the present (BP) up to 14,500 BP, major pine forests accompanied by grasslands were dominant all over the Sahara. Since this period, up to about A.D. 200, we see an alternating succession of dry and wet periods, both over the Sahara and the Chadian basin. After this date, the two climates came into phase toward a dry climate.

Lake Chad is at an advantageous location from the climatic standpoint, at the inter-tropical front between the dry air masses from the Sahara and the tropical air masses. This singularity allows Lake Chad to directly act as a lever to change the continental climate.

The present situation

The lake has lost over 90% of its surface area, of open water, going from 22,000 km^2 before 1970 to less than 2,000 km^2 only 15 years later. This loss corresponds to 15 years of