

the situation prevailing in North West Africa, the two parties
and their indefectible support to the Western Sahara people's
struggle, under the sponsorship of its unique and legitimate
front, the Polisario Front.

ached an urgent appeal to Morocco and the Polisario Front to start
negotiations leading to the just and lasting solution of this conflict
by the peaceful way of negotiations.

the Egyptian Communist Party appreciated Algeria's good neighbourliness
with the other countries of the continent, and noted with interest the reaction
to the inter-Maghrebine relations and promising prospects, opened to the
region of the Arab Maghreb, which contributes to the reinforcement
of Arab nation unity and the African continent one as well as the cause
of national independence, peace and social progress in the region.

parties examined with a particular attention the (?situation) in
the East whose last developments constitute a (?serious threat to
regional peace) and security and show dangers that imperialism is
posing for all the peoples of the region. They condemned the criminal
Zionist policy of the Zionist entity as well as massacres and
oppression of the Lebanese and Palestinian peoples.

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EGYPT

POSSIBLE SHORTAGE OF NILE'S WATERS SEEN

Cairo UKTUBAR in Arabic No 335, 27 Mar 83 pp 32-33

[Article by Salwa Mutawa]: "So That the Nile's Waters Are Not Squandered,
Drop by Drop"

[Text] This whole Nile and we are talking of a shortage of water--a truth we
do not fully grasp, yet which officials and experts have measured with figures.
They know well that the Nile's waters are limited. So what shall we do? The
belief has weakened that we can increase what we use of these waters. That
belief is in the application of every drop of water in its appropriate place,
in an appropriate manner.

Perhaps many do not know that the rate of wastage of the water used for
irrigation has already reached an unbelievable level: it is now almost
equivalent to the amount we hope to increase through projects in which the
state will spend a fortune. Could this be because we are still irrigating
our land in the same manner as our grandfathers? Or because agricultural
land has extended over a greater area? Or is it because farmers have acquired
the habit of wasting the water in the belief that when they put more water
to the water they'll get a greater yield?

But is it true that the Nile's waters are limited?

The Minister of Irrigation, Mr 'Abd-al-Hadi Samaha says: "The sources of
water in our country are restricted to two sources, the Nile and subsurface
water. It is certain that there are studies which aim to discover other water
sources besides these traditional ones, such as desalinization of sea water.
Although relatively speaking, what has up to now been confirmed is that the
costs of desalinization remain excessively expensive. Where it is permissible
to attempt this is where drinking water insufficient for men's needs should
be regulated in certain regions, but there it makes irrigation uneconomical
up to now. It is true that science can make what is expensive today, cheap
tomorrow, but up till now it has not been economically feasible to rely on
ocean water desalinization. There are also rains. Egypt is considered an
arid country with sparse rainfall. It is certain that rainfall rates are not
reliable for the agricultural production out of which we hope to increase the
people's food and support the national economy. All the service that rain
can render is to continue to play its present role of watering the grazing
plants living in some desert regions.

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the size of the loans--or debts--will increase, but its ratio to the
exports, and the obtaining of foreign currency, will decrease from
15.5 percent. This point has been ignored by many, even though

during the past year, for example, increased by about 43 percent, while the
amount of production increased only by about 8 percent. The disparity between

Therefore we have only the Nile and subsurface waters at our disposal to rely on as the two principal sources of water, and they are in the end the sole hope for expanding agriculture--which we must expand.

The proven yearly inflow of the Nile's waters that reach Egypt after the building of the High Dam is 55.5 billion cubic meters. One strange thing, we know from before that the total of the Nile's waters lost--from its headwaters until it reaches us--amounts to nearly 36 billion cubic meters. When we set up actual projects and after we disregard the natural losses already accounted for along the entire course of the Nile, one possible result is that we may be able to salvage 18 out of the 36 billion cubic meters of the waters now lost. When we have divided this total up with Sudan, Egypt's share comes to some 9 billion cubic meters which in the future may be increased. That is, it is expected that our annual inflow of water may become 64.5 billion cubic meters. For the subsurface waters, studies up till now have not defined precisely to what extent we can rely on these waters as a source. But, in short, what we can rely on currently from subsurface sources amounts to nearly 350 million cubic meters.

This is the total of what flows to us now; since we know that the amount of water needed for agriculture currently amounts to 49.7 billion cubic meters annually, then we finally can say: "Our sources of water are limited, therefore we must prudently use our irrigation waters one way or the other."

The question is: how should we be guided in the consumption of irrigation water? If we hear today about modern means of irrigation for different agricultural crops--spray irrigation, for example, or drip irrigation (that is, giving the plant its water requirements one drop at a time) we can thus ensure that we use every drop! Does this mean we are required to change the traditional manner of irrigation, i.e. surface irrigation, to this new method which the entire world has begun to adopt?

Eng 'Izz-al-Din 'Awadallah, chief of the governorates' irrigation sectors said: "It does not mean changing or developing the means of irrigation from the traditional means to the modern ones, such as spray or drip (irrigation), or that we forsake forever the traditional means. The world up till now continues to employ the traditional means of surface irrigation in more than 90 percent of agricultural lands. In America, for example, considered a model of the advanced agricultural country, they rely on the method of surface irrigation in more than 60 percent of their lands. At the same time results of experiments and studies have confirmed that we have achieved very high yields without our using the modern methods of irrigation, like spray or drip, and all this means that we are required to define the areas where it is possible to irrigate by traditional or non-traditional means.

"Defining the proper means of irrigation at the present depends on a number of factors, the most important of which is the kind of soil itself. When it is sandy, then spray or drip irrigation is appropriate. If it is heavy clay, then there is no substitute for surface irrigation.

"There is also the variety of waters used for irrigation. It is known that spray and drip irrigation of plants results in great damage to the plants if the proportion of salts in the irrigation water exceeds a certain level. Then there is the kind of plants. It is proper to use drip irrigation for citrus fruits for instance, but rice requires being submerged in water. Then there are the economies of the project itself, and then accounting for the cost of the irrigation system, all of which factors are what will in the end determine the most appropriate method. There's no doubt that a great development has occurred in the techniques of irrigation. In Nigeria we find that they employ the spray irrigation method for sugar cane cultivation. Naturally this method saves a great deal of water. At the same time we use the surface irrigation method for sugar, and many do not know that currently we cultivate not more than 100,000 feddans of Egyptian territory using the spray irrigation method.

"As for drip irrigation, it is being used presently only in an area of 20 feddans in the Wadi Natrun region as an experimental and study farm in preparation for introducing it to further regions. Along with all this it is certain that we are compelled to determine precisely on which lands in our fertile country we should employ traditional methods and on which we should use nontraditional methods.

"It is strange that not a single study has appeared in Egypt until now making comparison between the different methods of irrigation with the sole exception of the study undertaken recently by the national council for production. It presented a comparison between the traditional and non-traditional methods of irrigation and the economies of integrating them together. The importance of this study springs from the important fact which confirms that the time has already arrived for us to conserve every drop of water before we have a problem with the Nile waters--which do not exceed in total more than 55.5 billion cubic meters.

"The study exposes the merits and defects of each method and with regards to surface irrigation, we find that amongst its virtues is that it does not require the great investment costs when compared with other irrigation systems. This method enables us to employ waters with relatively elevated saline content. Then it is the sole method which can leech the soils effectively from salts, and in addition it conforms with the peasants' ability to build and maintain the surface irrigation network. The defects of surface irrigation are summed up by the fact that it is used on about 5 to 10 percent of the area of cultivated lands where it has exposed the soil to the dangers either of over-saturation or salinization. Further it requires levelling the land and that is a costly matter requiring time and skilled laborers.

"Since these are the defects of the surface irrigation method, perhaps I can include the great improvements made upon it which include the use of asbestos pipe instead of open canals, which decreases the loss of water through evaporation and absorption. Also among these are the lining of the water-channels and canals with impermeable material. Also, re-employing the surplus runoff water at the ends of the irrigation furrows. Also, automatically regulating the distribution of waters, or adding chemical fertilizers to the irrigation waters.

"Then when we address ourselves to spray irrigation, we will find that it is very much in need, in spite of the elevated costs, for the highly porous soils which are unsuited for distributing surface irrigation waters, as well as for unlevel lands or greatly sloped lands, and for lands with shallow soils where levelling would damage their fertility. The truth is that the spray irrigation system has a number of merits, including that it is possible by its means to regulate the amount of water to where it is appropriate with the land's capacity to retain water and moisture. Also, this system permits the use of mechanized agriculture over wide areas. The most important merit of spray irrigation is that it does not need the exact levelling of the land, a costly and strenuous task.

"Then there remains the system of drip irrigation. This system was already known in the beginning of the 1960's and through its means the plants are watered in the furrows by dripping water from tubes that let the water out drop by drop at a very slow rate, which may fluctuate between 2 to 8 liters per hour for each tube. These tubes are set into distribution pipes at a distance appropriate with the type of crop, and the soil is moistened since each tube is positioned to spread the water in all directions. The soil becomes saturated according to the setting (of the rate of) dripping or is reduced in its moisture by having the dripping tubes removed. The most important virtue of the drip irrigation method is that it is the method which gives the highest relative efficient use of water because of the small (evaporation or absorption) loss. It is the method which results in increased yields of many crops, especially vegetables and that is because it applies water in small continuous spurts which is more suitable to the plants. This method does not require levelling the land or the use of a system of averting the water. Finally it does not allow the growth of weeds or grasses except within the most restricted bounds. The defects of this method can be summed up in the high investment costs and the elevated maintenance costs. The openings of the drip tube are prone to clogging up, which may result in exposing the life of the crop to danger. Also, the drip irrigation system results in an increased proportion of salinity in the gaps between the drip tubing. This can occur between 3 and 7 years depending on the type of soil. However, at any event, another type of irrigation is needed to leech the soil of these salts. These are all the merits and defects of the methods of traditional and non-traditional irrigation. Beyond that remains the factor of cost. Which is cheaper, which more expensive--and it is certainly a crucial factor.

"As for the costs of surface irrigation we find that the land requires precise levelling which usually fluctuates in cost between 500 and 800 pounds per feddan. Then it requires the setting up of a network of watering channels which perhaps costs 30 pounds per feddan or 210 pounds in the event that these channels should be lined, or 450 pounds in the case that concrete conduit is employed, or 710 pounds if expanded concrete conduits are employed. But it is necessary to consider that the use of concrete conduit will add three percent to the cultivated area of a plot, and expanded concrete conduits will add five percent. Then beyond that this system needs a network of drainage ditches specially for each feddan, costing from 191 pounds and perhaps rising to 230 pounds if covered drainage ditches are used. It should be remembered

as well that using covered drainage ditches can add seven percent to the area of the cultivable land. Beyond this there remains the costs of maintenance which do not exceed two percent of the total value of setting up the network. These are then the costs and expenses of setting up a surface irrigation system.

"As for spray and drip irrigation we find that the costs of equipment and installation amount to 750 to 800 pounds in the case of a fixed spray irrigation system per feddan. In the case of semi-fixed irrigation the costs per feddan vary between 500 and 650 pounds. In the case of the axial spray irrigation system a feddan costs from 800 to 900 pounds. For longitudinal sprayers it costs from 600 to 800 pounds.

"Drip irrigation costs per feddan from 750 to 850 pounds in addition to the costs of maintenance which usually come to about one percent of the costs of installation. The operating costs run between 30 to 50 pounds per feddan per year. Then there's the expenses of the electric power used and that depends on the amount of water used and the price of a kilowatt of electricity itself, with the current price being counted at a base level of 20 millimes per kilowatt/hour for the Lands Cultivation Companies, 32 millimes for the investment companies and the cooperative unions, all being subsidized prices since the actual price is 72 millimes. The significant fact is that it is clear, after laying all of these figures out, that the costs of levelling the land represents the greatest expenditure in the case of employing the surface irrigation method, while the costs of energy represent the greatest portion of the costs of using the non-traditional methods. It is certain, after all this, that the system of drip irrigation can be introduced to lands cultivated with fruits and vegetables where greater yield can offset the higher expenses of installing the system.

"It is also certain that it is possible to introduce many improvements into the traditional irrigation method, and it is true that we need to manufacture the spray and drip irrigation equipment here in Egypt.

"It is certain that before any of this becomes a reality we need to regard diligently the problem of what irrigation system to apply so that the Nile's waters are not squandered, drop by drop."

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CSO: 4504/299