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THE JORDAN VALLEY PLAN

The Jordan Valley Plan now under consideration by the Governments of Israel, Lebanon, Syria and Jordan is the product of twenty-four months of detailed and painstaking negotiation between representatives of these Governments and Ambassador Eric Johnston, personal representative of the President of the United States. In comparison, the plan originally proposed by Ambassador Johnston in November, 1953, was no more than an outline of an idea. Through many discussions with officials and technical experts of the Arab countries and Israel that original idea has been refined into a definite plan. Compromise and concessions have been made; suggestions offered by both sides have been accepted on many points. The result has been the evolution of a development plan for the Jordan Valley which both sides regard as equitable, workable, and economically justifiable.

In September, 1955, Ambassador Johnston was informed that this plan, from the technical viewpoint, is acceptable to all four of the States concerned. The Arab Countries, however, have requested additional time to study the implications of the plan from the political point of view.

The main provision of the plan as it now stands may be summarized as follows:

Provided to Israel on Dec. 20, 1963

1. - Storage

A. The Maqarin Reservoir

The Plan envisions the construction of a dam 126 meters high on the Yarmuk River near Maqarin to impound 300 million cubic meters (mcm) of water for irrigation and make possible the generation of some 150 million kilowatt hours of electric energy a year.

Originally, a dam 47 meters high, capable of impounding 47 million cubic meters (mcm) of water, was proposed for the Yarmuk River at Wadi Khalid, on the assumption that as much as 550 mcms of Yarmuk water would be stored in Lake Tiberias. During the negotiations, however, it became apparent that this arrangement, while technically adequate for irrigation purposes, would not satisfy the requirements of the Arab countries for electric power or for secure storage of their irrigation reserve.

Particularly in the case of Syria, though also in the case of Jordan, the argument in behalf of a larger dam to permit the maximum possible development of electric power was a convincing one. So was the argument of the Arab countries that as much as possible of the water needed for Arab crops should be under direct Arab control. Taking these two considerations into account, engineers determined that the 126 meter dam on the Yarmuk, as now proposed, would be justifiable both from the standpoint of economic soundness and of practicality.

The Plan leaves it open for the Arab states to increase the height and capacity of the Maqarin Dam if they wish to do so at their own expense. The United States seriously questions the advisability or necessity of doing so; but it has been willing to agree that the privilege should be retained by the countries directly involved. In view of its own financial connection with the project, however, the United States has felt obliged to insist that the Arab states make known their firm decision on this matter within the next five years, before installations involved in the use of Lake Tiberias are undertaken.

B. Lake Tiberias

Every plan advanced in recent years for the development of the Jordan Valley has recognized the utility of Lake Tiberias as a storage reservoir for the waters of the river system.

The Plan proposes to utilize these advantages to a limited extent for the storage of Yarmuk flood-flows which cannot be economically captured elsewhere. In flood years, the Yarmuk flow will greatly exceed the storage capacity of any reservoir that has yet been proposed at Maqarin or elsewhere on the stream. Unless this flood flow is caught and stored for use as needed during periods of low streamflow, millions of cubic meters of water will be lost. This water is

absolutely essential for complete irrigation of Arab lands. The normal flows of the river are not sufficient; if flood waters are not impounded, the possibilities for Arab agriculture in the valley will be reduced.

Theoretically, it might be possible to construct a second dam on the Yarmuk below Maqarin to receive and hold these flood-waters. But the expense of building two reservoirs would push the project beyond the limits of economic practicality. The ratio between cost and benefit would be so unfavorable as to make the undertaking economically unjustifiable. This is especially true in view of the availability of adequate storage space in the natural reservoir of Lake Tiberias.

The Plan, therefore, contemplates the storage of Yarmuk flood-flows in Lake Tiberias. Averaged out over a period of years, these flood flows will amount to approximately 80 million cubic meters a year. Allowing for variable annual streamflows and needs for irrigation, it has been determined that storage space for about 300 million cubic meters will be required in Lake Tiberias. The Plan would assure the Arab states of space up to this amount when needed.

The Yarmuk flood flows spilling from the Maqarin dam would be diverted at Adasiya into a conduit leading to Lake Tiberias. They

would be released, as needed for irrigation in the lower valley, through another conduit leading from the southern end of the Lake to an appropriate point on the East Ghor canal in Jordan.

The water deposited in the Lake to the credit of Jordan, so to speak, would be recorded by automatic gauges under the supervision of a neutral Watermaster. The total amount entering the Lake during any period of time would be precisely known. Withdrawals from this "account" would also be gauged automatically under the supervision of the Watermaster, and would be made in seasonal patterns pre-determined to meet the needs of the irrigation system in the lower valley. The full amount of water entering the Lake from the Yarmuk River over a period of years would thus be released to Jordan under neutral supervision as needed. No charge for evaporation or other losses would be made against the quantity of Yarmuk water stored in the Lake.

The plan thus proposes to provide the total storage space required for Jordan's irrigation needs through the construction of the 300 mcm Maqarin reservoir on the Yarmuk and through the utilization of approximately 300 mcms of storage capacity in Lake Tiberias. The remaining storage potential of the Lake--approximately 700 mcms--would be available to Israel.

C. Deferred Use of Tiberias

The Plan envisions a delay of five years, however, before Arab water is actually stored in Lake Tiberias. This is compatible with the normal "phasing" of the total development program and will involve no extra delay in the completion of the total plan.

At the end of this five year period, the neutral Engineering Board (see below) would determine the necessity of storing Yarmuk flood waters in Lake Tiberias or whether more feasible and economical storage might be found elsewhere. In making this determination, the Board would base its decision solely on irrigation requirements of lands in the lower Jordan valley. The decision would be final; and the Arab states and Israel would be committed in advance to accept.

D. The Hasbani

In recognition of Lebanon's interest in increasing its irrigated lands, the Plan provides for an immediate survey to obtain hydrologic and land-use data in the watershed of the Hasbani river in Lebanon. Funds for this survey in the amount of $250,000 would be made available by the United States. The information thus obtained would be used to determine the necessity of constructing a storage dam on the Hasbani to assure that water allocated for Lebanese lands could actually be made available. The decision as to the kind and the size of the dam required would await the

conclusion of the survey. Construction of the necessary facilities would then be undertaken as part of the overall Valley development program.

2. - Distribution

Once stored, the waters of the Valley must be conveyed, under careful regulation, to the lands they are to irrigate. The Plan therefore contemplates the installation of the following main facilities:

(a) A diversion dam near Adasiya to supply the East Ghor canal and, if necessary, to divert excess flood waters to Lake Tiberias for later delivery to Jordan;

(b) A main canal net-work in Jordan, including:

(1) The East Ghor Canal running from Adasiya southward to the vicinity of the Dead Sea;

(2) A siphon or other structure for conveying water from the East Ghor to the West Ghor;

(3) The West Ghor canal in Jordan feeding from the siphon;

(4) A feeder canal from Lake Tiberias to a junction with the East Ghor Canal;

(5) A canal from Adasiya to Lake Tiberias, if necessary, to capture and store Yarmuk flood flows in the Lake.

(c) A distribution system to convey waters from the main Ghor canals to the farm lands.

(d) Pumping plants to raise water to lands above the main Ghor canals;

(e) Small generating plants on the main canals to supply power for pumping. These power installations would not produce excess power for sale and are intended only to pump water to lands lying above the canal.

(f) Main drainage facilities for removing excess water and salts from irrigated lands;

(g) Regulating and control works on Lake Tiberias if the Lake is used to store Yarmuk flood flows.

(h) A new diversion structure and canal from the Jordan River to Boteiha Farm in Syria, together with 50 K.W. of electric power to replace water power.

(i) A diversion structure north of Lake Tiberias to permit Israeli withdrawals from the upper Jordan.

(j) A main canal network from this upstream diversion to irrigable areas in the Galilee hills.

(k) A short canal from Lake Tiberias down the west side of the river to serve irrigable lands in the Beisan area in Israel.

3. - Division of Water

International law recognizes that each of the nations on an international river system has a right to a portion of the water. There is no single, generally accepted principle, however, on which the division of the water can be based.

In evolving the present plan, the basic principle was adopted of assuring to the Arab states enough water to meet the needs of all their lands that could feasibly be irrigated; and the division of water in the present plan accomplishes this objective.

In the original proposal offered for discussion two years ago, no specific provision was made for an allocation of water to Lebanon because of the lack of engineering data. The Arab Technical Committee provided information as to Lebanese needs, however, recommending an allocation of 35 mcm from the Hasbani River. This full amount has been accepted in the Plan.

The first estimates discussed did not take into consideration the possibility of expanding the irrigable area in the vicinity of Boteiha Farms

in Syria, nor was adequate information available at that time as to irrigation prospects from the Banyas River and on the Yarmuk Plateau. The Arab Technical Committee recommended allocations for Syria of 20 mcm from the Banyas, 22 mcm from the Jordan for the Boteiha Farm area, and 90 mcm from the Yarmuk for Syrian lands on that stream. All of these allocations have been incorporated in the Plan.

The allocation to the Kingdom of Jordan is based on a comprehensive land classification survey and a scientific determination of the water required. Two well-known American engineering firms--Michael Baker, Jr., Inc., and the Harza Engineering Company--were employed by the Jordanian Government to make a complete survey of the 943,000 dunums of land in Jordan within the valley. Standards somewhat lower than are customary in the United States and other countries were applied in this survey in consideration of Jordan's pressing need for agricultural land and the historic ability of the Arab farmer to grow crops under adverse conditions. While this resulted in the inclusion of some land not normally considered to be adaptable for cultivation, it was found that about 520,000 dunums were arable.

From this gross figure of about 520,000 dunums, the Plan deducts 8 percent, as an allowance for land that would be used for roads, ditches,

drains, houses, farm buildings, etc., and for lands not actually cropped at any given time for social reasons such as, the death or absence of the farmer, rotation, etc. Allowing for this deduction and computed on the basis of standard formulas and a reasonable cropping pattern, the total water requirement for Jordan became 720 mcm per year. Of this requirement, 243 mcm can be met from local wadis and wells. The Yarmuk River can supply 377 mcm after making due allowance for an allocation to Syria of 90 mcm on the upper Yarmuk, an allocation of 25 mcm to Israel for uses in the Jordan-Yarmuk triangle, and allowing 14 mcm for evaporation and other losses from the Yarmuk reservoir. The remaining 100 mcm needed by Jordan will be derived from the upper Jordan River. The Plan would assure this amount.

In view of long established usage rights in the area known as the Jordan-Yarmuk triangle, Israel would receive an allocation of 25 mcms annually from the Yarmuk River.

Israel would receive in addition the total flow of the Jordan after the diversions indicated above for Lebanon and Syria and the delivery of 100 mcms annually to the Kingdom of Jordan.

On this basis, the three Arab states would receive approximately 61 percent, and Israel approximately 39 percent, of the total waters available in the River System.

A technical factor affecting the division of the water however is the need to assure that the quality of the water in the system as a whole is maintained at a usable standard of salinity and yet permit as much as possible of all the waters to be used. As Lebanon, Syria, and Israel use more and more of the natural flow of the upper Jordan River, the volume of water reaching Lake Tiberias will decrease. The Lake will then tend to become more salty, since it is fed, in part, by a number of saline springs and since some 300 mcm is lost annually through evaporation from the Lake surface. The Plan, therefore, contemplates the possibility that some of these springs around the edge of the Lake might be collected and prevented from flowing into the Lake as a means of keeping the salinity of the Lake within usable limits.

If conditions develop making this desirable, the Plan proposes that up to 15 mcm of this saline water so diverted be considered as part of the 100 mcm allocated to Jordan from the upper Jordan River. The increase in the salinity of Jordan's allocation would be negligible, while the loss of the 15 mcm to the system as a whole would be prevented.

4. - Supervision

The Plan proposes the creation of an impartial Engineering Board together with a Watermaster for the purpose of supervising operation of the water system and compliance of the parties. The Engineering

Board would consist of three eminent engineers who would be selected from a list prepared by the Secretary General of the United Nations. One of the engineers would be selected by the participating Arab states and one would be selected by Israel. Being selected from the proposed list, these two engineers would be expected to perform their functions as engineers and not as spokesmen or representatives of the sides that chose them. The two engineers so selected would choose a third, who would serve as chairman. None of the members of the Engineering Board nor the Watermaster could be a national of any Arab state or of Israel, or be in their employ.

The Engineering Board would have certain functions which are stipulated in the Plan. It would review the engineering designs of the diversion structures and other project features comprising the total development program. This would be for the purpose of ensuring that the structures and project features would not be inconsistent with the implementation of the agreement on the division and distribution of water and on the operation of the Jordan River System within the accepted framework of the Plan. It would also establish patterns for withdrawals, releases and deliveries of the water of the river system.

The Engineering Board would appoint a Watermaster whose stipulated duties would include supervising the deliveries and withdrawals

of water and all regulatory and gauging facilities. He would make the calculations required in connection with the releases of Jordan's water from Lake Tiberias. He would also keep the necessary records and make the necessary reports concerning the operation of the system. Most important of all, in the event of a violation or threat of a violation of the Plan, he would take such steps as might be necessary to enforce compliance or remedy the violation.

As indicated above, through the means of established fixed flow patterns and through regulatory and gauging facilities, it would be, in fact, quite easy to anticipate or detect a violation of the Plan. Since the Watermaster would have unimpeded access to all project features and all points on the water course, it would be impossible for any State to make an unauthorized or clandestine diversion of any substantial quantity of water. The proposed system for the delivery of water would also be to a large extent self-enforcing since any substantial or complete stoppage of water by Israel anywhere in the system could be countered by Jordanian stoppage of deliveries of water to the Yarmuk Triangle. Obviously the converse is true.

Given the erection of suitable diversion features and other necessary physical control mechanisms and given established flow patterns ensuring the prompt detection of violations, there would be no need for

numerous and omnipresent supervisory personnel. With these enforcement procedures and with the Watermaster able to appeal to the United Nations as a last resort, the supervisory system as now proposed in the Plan would be efficient and economical, ensure the strictest impartiality, and impinge to the minimum possible extent upon the functions and authority of the governments concerned. The Plan proposes that the precise duties, rights and responsibilities of the Engineering Board and the Watermaster will be defined in detail through a subsidiary agreement to be negotiated with the Arab states on the one hand and with Israel on the other either by U. S. or some other appropriate intermediary. The supervisory system proposed in the Plan would obviate the need for direct contact or negotiation between the Arab states and Israel.

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