



Roots of the Water Conflict in the Middle East

Jad Isaac and Leonardo Hosh

Submitted to
*The Middle East Water Crisis
Creative Perspectives and Solutions*
University of Waterloo
Canada
May 7-9 1992

INTRODUCTION

Water has historically played a significant role in shaping the geopolitical boundaries of the Middle East. Few realize that the lines on present day maps of the region are, to a great extent, the result of a continuous parade of water related wars, occupations, cease-fires and imposed peace plans. Today's boundaries in the Middle East are, primarily, artificial frontiers imposed within the past 75 years by distant foreign powers.

Water considerations continue to inhibit regional cooperation and agreement. To a large degree, water resources in the area have been taken over by force and military action. Accordingly, the interrelationship between water resources, conflict, competing ideologies, nationalistic agendas and basic human needs cannot be overlooked. Unless, this complex interplay is taken into consideration during future plans, water issues will guide the peoples of the Middle East into further conflict.

Past attempts at solving water disputes have, for the most part, failed. Previous solutions were too often based on political objectives, securing the emergence of the State of Israel and ensuring adequate resources for its projected growth. The need for a more satisfactory plan is beyond dispute. Such a plan must account fairly for the needs of the region's neighbor states. To do so, an exploration of the the contexts of previously proposed solutions is enlightening. Previous mistakes are revealed and a new path forward begins to emerge.

BACKGROUND

Geographical Palestine has a rich history of agricultural productivity. Soils and climatic patterns range widely within a small area, from fertile plains and hills to stark deserts. That which is tillable depends on seasonal rainwater, or, if irrigated, upon water from subsoil aquifers or surface sources.

Most of the surface waters in Palestine lie in the northern and north-eastern regions, with the headwaters of the Jordan River System lying in Lebanon and Syria. The Southern parts of the country, particularly the Negev area, have been left dry.

To establish a Jewish State in Palestine, it was deemed necessary to bring together large numbers of immigrants and provide good land for cultivation, industry and living. Palestine, as it was then, did not have the resources to absorb the millions of Jews brought to fulfill this Zionist dream. Thus, the Zionist Movement began studying ways of developing the natural resources of Palestine to enable the absorption of large numbers of Jewish immigrants.

Much of the initial research and data collection was conducted by the British Royal Society and the Zionist Movement, with the aim of assessing Palestine's natural resource potential. The studies carried out mainly concentrated on the *Negev* area. Charles Warren, in 1875, estimated, in The Land of Promise, that Palestine and the Negev could easily absorb 15 million people. From this point on, efforts towards gaining control of the waters of Palestine received top priority.

At the same time that Jews were launching a political campaign to establish a new home in Palestine, they were also formulating plans to utilize the area's water resources. After the declaration of the British Mandate in 1922, the Jewish Agency formed a special technical committee to conduct studies on the utilization of water and irrigation of unarable and desert land. This committee performed several studies, with the assistance and cooperation of Jewish and pro-Jewish experts and governments, in particular the British Mandate Government.

Concurrently, to serve as a guide to future political resolutions in the area, the British Mandate Government carried out studies on water issues in Palestine and East Jordan Valley. Most of the studies conducted were used to evaluate both water plans designed by the Jewish Agency and also the United Nation Partition Plan of Palestine.

The Arab inhabitants of the area, who opposed previous water plans, found it imperative to protect their water resources and thus, began designing their own plans. Arab water plans necessarily contradicted the objectives of others. Whereas, these water plans posed a direct threat to Arab rights in

the area, Jewish demand for water was increasing, to essentially facilitate the absorption of new immigrants.

Rising political tension in the region and the lack of a solution acceptable to all parties, exacerbated and eventually exploded into several rounds of water wars between Arabs and Jews.

PREVIOUS PLANS AND EVENTS

The following pages summarize the main water plans and events which have taken place since 1922. Although, many important events preceded the British Mandate and contributed vastly to the ideological underpinnings which supported later plans, post-1922 plans were critical in shaping today's water crisis. Two important water-related events highlight the British Mandate of Palestine, 1922 - 1948, the *Rutenberg Concession* and the *Ionides Plan*.

In 1926, the British High Commissioner granted the Jewish owned Palestine Electricity Corporation, founded by Pinhas Rutenberg, a 70 year concession to utilize the Jordan and Yarmouk Rivers' water for generating electricity. The concession denied Arab farmers the right to use the Yarmouk and Jordan Rivers' water upstream of their junction for any reason, unless permission was granted from the Palestine Electricity Corporation. Permission was never granted.

In 1937, the government of Great Britain assigned M. Ionides, a hydrologist, to serve as the Director of Development for the East Jordan Government. His actual task was solely to conduct a study on the water resources and irrigation potentials of the Jordan Valley Basin. This study served as a main reference in the preparation of the proposed United Nations Partition Plan of Palestine.

Published in 1939, the *Ionides Plan* suggested three recommendations. Firstly, Yarmouk flood waters were to be stored in Lake Tiberias. Secondly, the stored waters in Lake Tiberias plus a small quantity (1.76 cm/sec) of the Yarmouk River water, diverted through the East Ghor canal, were to be used to irrigate 75,000 acres (300,000 dunums) of land east of the Jordan River. And finally, the secured irrigation water of the Jordan River System, estimated at a potential of 742 mcm, were to be used primarily within the Jordan Valley Basin. [*Ionides p. 8, 255-259*]

Since the Jordan and the Yarmouk Rivers were at that time still under the authority of the Palestine Electricity Corporation, the plan was difficult to implement.

Zionist supporters worldwide were not satisfied with the findings and recommendations of Ionides. Their aspiration to utilize the Jordan River

Basin for the irrigation of the Negev and the southern parts of Palestine was fulfilled by *Walterclay Lowdermilk*. Lowdermilk was commissioned by the United States Department of Agriculture to conduct such a study.

Lowdermilk devised a plan calling for the irrigation of the Jordan Valley; the diversion of the Jordan and Yarmouk rivers to create hydroelectric power; the diversion of water from northern Palestine to the Negev desert in the south; and the usage of the Litani River in Lebanon.

In striking contrast to the Ionides plan, Lowdermilk concluded that 1800 mcm of water is available in the Jordan Basin for the purpose of irrigation. A canal was recommended to connect the Mediterranean Sea with the Dead Sea. Also, an authority similar to the Tennessee Valley Authority should be formed to assume full control over all activities concerning water resources. Such water management would ideally ensure adequate water resources and job opportunities for 4 million new Jewish immigrants in addition to the 1.8 million Arabs already living in Palestine and East Jordan at that time.

Control over the proposed project should be solely in the hands of Jews, with a limited amount of input allotted to the United Nations. Arabs unable or unwilling to live under such conditions were to be transferred to areas near the Euphrates and the Tigris Valleys. [*Lowdermilk p. 169*]

Lowdermilk's plan and suggestions were enthusiastically embraced by influential Zionists. Technical experts were subsequently contracted to implement and interpret this plan into feasible schemes. James B. Hays was selected for this assignment.

The *Hays Plan* of 1948 called for half of the Yarmouk River water to be diverted into Lake Tiberias, replacing water diverted from the upper Jordan River, as outlined in the Lowdermilk plan from which Hays worked. Two additional stages were suggested to be implemented in the future, although not stated, they most likely included the diversion of the Litani River water into geographical Palestine in order to be used for Israeli projects.

As a continuation of the Lowdermilk-Hays Plan, the new government of Israel, soon after the War of 1948, began to prepare practical plans for the utilization and control of the area's water resources. A *Seven Year Plan*, approved publicly in 1953, centered around the diversion of the Jordan River water south toward the Negev desert and establishing a unified and comprehensive water network that would cover all parts of Israel.

In September 1953, the construction of the *National Water Carrier* began, and thus plans to divert the Jordan River water, south to the Negev, were activated. Diversion originated at the Banat Yacoub Bridge in the demilitarized zone between Israel and Syria. After Syrian objection to the excavation process, and United States' economic sanctions against Israel, a

temporary freeze on the work at Banat Yacoub Bridge was announced in October 1953.

During the 1948 war, the Rutenberg electricity generating plant was destroyed by the Jewish army in an attempt to avoid exclusive Arab control over the use of the Jordan and Yarmouk Rivers. The war forced a great number of Palestinian refugees to flee and settle in the eastern part of the Jordan Valley. The Jordanian Government and UNRWA (The United Nations Relief and Works Agency) agreed to develop irrigation schemes in the area to assist Palestinian refugees to cultivate the land and resettle. For this purpose, the Jordanian Government commissioned a British consultant, Sir Murdoch MacDonald, to conduct a study on their behalf.

The *MacDonald Plan* was finalized in 1951. It is considered a compliment to the Ionides Plan. The plan called for Jordan Basin water to be exclusively used for irrigation of both banks of the Jordan River by storing surplus water from the Yarmouk River in Lake Tiberias and constructing canals down both sides of the Valley. Arabs were uneasy with the suggestion of the storage of water in Lake Tiberias, as they were in previous plans.

Therefore, Arabs favored the plan put forth by the American engineer *M. E. Bunger*. He identified a suitable location for the construction of a water storage dam along the Yarmouk River at the Moqarin area, where three valleys join together. The impounded water would be diverted to another dam at Addassiyah into gravity flow canals along the East Ghore area in the Jordan Valley. The plan included two hydroelectric generating plants at the site of the two dams to supply water and electricity to both Jordan and Syria.

The Bunger Plan addressed several of Jordan and Syria's needs and intended to resolve, to some extent, the Palestinian refugee problem by increasing the productivity of available agricultural lands in the East Jordan Valley and parts of Syria.

As soon as work began in July 1953, Israel vocalized its concern about increasing Arab control over the area's water resources. Israel objected on the grounds that the original Rutenberg Concession gave it exclusive rights to the Yarmouk River. As a result, pressure was exerted on the United States Government and UNRWA to cease support for the project. To the surprise of the Jordanian Government, work halted soon thereafter and the project was terminated.

In October 1953, the United States prepared the *Johnston Plan* as an attempt to solve the area's water crisis. The rising tension caused by the Israeli initiation of the National Water Carrier project, encouraged the United States to mediate between the two parties. The plan sought to satisfy the minimum requirements of riparian Arab states, as well as Israel.

Eric Johnston implemented a water plan prepared by *Charles Main* under the supervision of the Tennessee Valley Authority. Essentially, the Johnston Plan was a combination of the Lowdermilk-Hays and the MacDonald-Bunger Plans. The new plan included water distribution quotas of the Jordan Valley Basin, estimated at 1,213 MCM annually, among the riparian states. [*Encyclopedia of Palestine, p 153*]

The plan was not well received by either Israel or the Arab States. Consequently, Arabs and Israelis submitted counter proposals for dividing water shares - the Arab *Technical Committee* and the *Cotton Plan*, respectively.

Development of Johnston Plan 1953-1955

Country	Johnston 1953		Arab Technical 1954		Cotton 1954		Revised 1955	
	Water	Area	Water	Area	Water	Area	Water	Area
Jordan/ Palestine	774	490	861	490	575	430	720*	
Syria	45	30	132	119	30	30	132	119
Lebanon	—	—	35	35	450.7	350	35	35
Arab States	819	520	1028	644	1055.7	810	887	
Israel	394	420	200	234	1290	1790	450*	
Totals	1213	940	1228	878	2345.7	2600	1337	

Water = million cubic meters

Area = thousands of dunams

* = *an estimate*

Because the available irrigation water in the Jordan River Basin does not exceed a maximum of 1,213 MCM, the Cotton Plan included, within its scope, the Litani River to cover the water shortfall. The Cotton Plan allocated 400 mcm of the Litani's water to Israel and 300 mcm to Lebanon.

The period between October 1953 and July 1955 was a negotiating and bargaining stage over the Jordan River system. By the end of 1955, the Johnston Plan became more favorable to Israel, whose share rose to 450 mcm while Jordan's shares dropped to 720 mcm. [*Brecker p. 204*]

The final form of the Plan, even though it was rejected by Arab States,

was employed by the United States as a basis for its future plans in the region.

The failure to reach bilateral agreement reinforced each country's inclination to proceed independently.

In 1958, Israel reinitiated the National Water Carrier project but with some technical changes and also the Seven Year Plan was replaced by the *Ten Year Plan*. The new plan shifted the diversion point to Eshed Kinort, at the north-west corner of Lake Tiberias. The new diversion project was carefully designed in accordance to Israel's water allocation in the Revised Johnston Plan. It also refrained from invalidating its general principles.

Arab reaction to Israel's National Water Carrier was to build dams on tributaries of the Jordan and Yarmouk Rivers, thus reducing the water flow to Israel. In 1965, Syria began building dams to divert water from the Banias and Dan Rivers in the Golan Heights. These headwater diversions threatened to deprive Israel of 35% of its water potential from the Upper Jordan. Israel, as a riparian state of the Jordan Basin, considered this action an aggression on its water resources and sent fighter planes to destroy working sites.

Israeli occupation of the Syrian Golan Heights in 1967 and subsequent control over the Jordan's headwaters in the area ended Arab dreams and plans for utilizing the water of the Jordan Basin.

In 1969 Israel bombed the East Ghor Canal in Jordan, keeping it out of order for four years. After secret negotiations between Jordan and Israel in 1969-1970, Israel permitted the repair of the East Ghor Canal while Jordan, in return, reaffirmed its adherence to the Revised Johnston Plan quotas.

CURRENT SITUATION

No water plans were devised after the Johnston Plan of 1954. However, many events have taken place, further altering water distribution quotas. Since the 1967 occupation of the West Bank, Gaza Strip and the Golan Heights, Israel vastly expanded its control over water resources in the area, including Mount Hermon, West Bank aquifers and the entire length of the Jordan River. As an outcome of the 1982 Israeli invasion of South Lebanon, Israel extended its command even further, to include part of the Litani River. Israel's strategy is to control and derive maximum benefit from all water resources in the occupied territories.

According to 1991 figures, Israel consumes 1,655 mcm of both surface and ground water. Of this amount, 950 mcm originates in neighboring Arab States, Golan Heights and the West Bank. Whereas, only 155 mcm of water originating in the West Bank actually remains there. A considerable

amount of this water is consumed by Israeli settlements and kibbutzim , inside the West Bank itself (Figure 3).

WHY PREVIOUS SOLUTIONS FAILED

The failure to reach binding agreement on water rights among the riparian states of the Jordan River System may be examined in relation to international water law. Riparian states have failed to abide by the general principles of international water law, and have thus, contributed greatly to the difficulty of solving today's water crisis.

Although international water law is still underdeveloped and not uniformly adhered to, the following principles are normally observed by the world community:

1. An equitable share of water is entitled to each basin state.
2. Actions which damage the land or property of one state, must be avoided and if not, compensated for.
3. Every state must notify others of any actions which may affect it.
4. Basic water resource data should be shared.
5. All basin states should share in the developing and protecting shared water resources.
6. All disputes should be resolved by without resorting to force.

If the general principles of international water law were adhered to, it is likely that many of the past water related conflicts would have not taken place. Nevertheless, the following analysis attempts to assist in answering the question, why previous water plans failed.

Unrealistic Demands

The dream of the Zionist Movement to settle millions of Jews in geographic Palestine, placed an unsustainable demand on all its natural resources and the resources of neighboring states, as well. In order to do so, Jews sought control over the headwaters of Jordan-Yarmouk River System and the Litani River in Lebanon.

Chaim Weizman wrote to the British Minister David George, describing the minimum requirements of a Jewish State in the land of Palestine and explaining the Jewish perspective on the issue of water, stating that:

"The whole economic future of Palestine is dependant upon its water supply for irrigation and for electric power, and the water supply must mainly be derived from the slopes of Mount Hermon, from the headwaters of the Jordan and from the Litani River in Lebanon ... We consider it essential that the Northern Frontier of Palestine should include the Valley of the Litani, for a distance of about 25 miles above the bend, and the Western and Southern slopes of Mount Hermon.." [Jewish Observer, p. 22]

Such ambitions completely neglected Arab historic rights, and were thus rejected once they were incorporated into many of the proposed water plans. Both the Lowdermilk and Hays Plans called for Jewish control over headwaters in the area, as well as the Litani River. The Plans also called for the diversion of and storage of Arab river water (Jordan and Yarmouk) in the Israeli controlled Lake Tiberias. Even though in 1944, at the time of the Hays Plan, the Arabs constituted about 69.6% of the total population of historic Palestine, the Plans allowed Jews to assume full control over the water projects. Consequently, Arabs were prevented from irrigating vast areas of rich land in the Jordan Valley.

The scarce water resources of the Jordan River Basin were threatened by Israeli plans to irrigate and bloom the Negev. The National Water Carrier, included in the Israeli Seven Year Plan, Cotton Plan and the Revised Johnston plan, proposed to divert this water exclusively inside the Green Line. This was unrealistic to the Arabs as it dropped water levels of the Jordan River and prevented Arab farmers, on both sides, from cultivating their lands.

Inequity and Neglect of Inhabitant's Rights

The Arab inhabitants of the land of Palestine, who historically had control over all natural resources, rejected many of the plans that were threatening their civil rights. The Arab population recognized that accepting such plans would enable aggressive violations of their water rights and threaten the survival of the projects they supported on the Jordan River.

On the other hand, the occupying authorities of Palestine supported the establishment of a Jewish State and provided secured natural resources for its projected development. In order to actualize this objective, the British Government neglected the Arab presence in the land. Decisions regarding water plans and water rights in area were taken solely by the British Mandate or French. Palestinians, in particular, were not consulted regarding any of the proposed plans, both during and after the Mandate period. The Revised Johnston Plan, which is still in effect today, neglected to mention the Palestinian people. Undoubtedly, this is one of the most blatant violations of water rights of region's indigenous peoples.

Throughout the Mandate period, the British Government granted the Jewish people many privileges, including control over the natural resources

in the area. In 1926, even though Arabs constituted a majority of the population with 749,402 inhabitants out of a total of 898,902, Jews were granted the following:

- 1- A 70 year concession to utilize The Jordan and Yarmouk Rivers' water. [Rutenberg Concession].
- 2- Concession for reclamation of the Huleh Lake and swamps. The Concession were resold to the Jews for a 70 year period.
- 3- Utilization of Al Oja (Yarkon) River in Jaffa area.
- 4- A 70 year concession to utilize the Dead Sea water to produce salts and minerals.
- 5- Concession of oil prospecting in Palestine.

Although, all of the Yarmouk River's and most of the Jordan River's water is located inside Arab territories, the concession, later known as the Rutenberg Concession, to utilize this water was given solely to the Palestine Electricity Corporation. Profits of this project were shared between the British Government and the Corporation, depriving Arab countries their rightful share of the profits.

The Lowdermilk Plan was even more extreme and unjust. After presenting his plan, Lowdermilk suggested that if the Arabs are unable or unwilling to live in an industrial developed Jewish state, then they should be transferred to areas near the Euphrates and the Tigris Valleys.

Although the Lowdermilk-Hays project neglected the rights and furthermore the presence of the Arab inhabitants in the area, it served as a reference point for almost all of the future Israeli schemes and also to the Partition Plan of Palestine. The Zionist Movement forced the Lowdermilk-Hays plan onto the table of those partitioning Palestine in 1947. Dr. Immanuel Newman, President of the Zionist Organization of America, confirmed this by stating that, "Those who had been responsible for working out details of the United Nations Partition plan, were familiar with the basic aspects of the Lowdermilk-Hays project and took it largely into account in drawing the boundaries of the new state". [Saliba, p. 20]

Increasing Mistrust and Lack of Cooperation

The Zionist Movement, since its establishment in 1882, vocalized its aim of settling the land of Palestine and controlling its natural resources. This desire to control the natural resources was considered intolerable by the Arabs.

The Jewish claims to the Land of Palestine, significant parts of the Arab States of Jordan, Lebanon and Syria and their plans to seize control over its natural resources created a rift of mistrust and hatred between the Arabs and the Jews.

Since most of the schemes were hostage to political agendas and geographical fears, they could not possibly succeed unless all the parties concerned accept them and commit to cooperate and maintain them. This was a major factor in the rejection of the Johnston Plan. The Plan was rejected by the Arab States due to political fears since it grants Israel de facto rights over Arab water resources in the area. Georgiana Stevens, one of Eric Johnston's assistants, wrote that "The Arab Government could not bring themselves to give acceptance to an arrangement that would also help Israel's development .. [and] accept a plan that was tantamount to tacit acceptance of Israel's existence .. thus the momentum achieved during the Johnston negotiations died out" [Stevens, p. 32, 33]. All of the proposed water plans were devised by only one of the parties involved. A total absence of cooperation among the riparian states led to the failure of these plans.

Lack of Scientific Objectivity

To achieve political aims, many of the water plans lacked technical and scientific objectivity and were therefore difficult to apply. Scientific data, such as the estimation of water potential in the area, was not accurate and consequently, most of the schemes were technical failures.

In the Lowdermilk Plan, which was a reference to all later Jewish/Israeli water plans, the total irrigation potential was estimated as 1.2 million dunums (300,000 acres). This figure is almost double the area of irrigable land in the Jordan Valley. Such a falsified estimation created a substantial surplus, allowing irrigation water to be used elsewhere. This surplus is utilized in, for example, the "out basin" Negev area, presently used to grow roses and "to make the desert bloom."

The Anglo-American Committee of Inquiry's evaluation of The Hays Plan noted that, "The [British] Water Commissioner is doubtful of the validity of the use to which much of the data accepted by Mr. Hays and predicted by Mr. Savage is put". Also the report stated that "Without close checking and reference to more detailed information that is now available, it is impossible to accept the estimated costs of the [Hays's] scheme ... The scheme envisages the irrigation of two and a half million dunums with nearly two thousand million cubic meters of water a year ... It cannot be agreed that this continual flow would be available for use in a dry year after allowing for losses in transmission ... This and many other features in the scheme demand very careful scrutiny. The dams proposed at Hasbani, Yarmuk and Beisan and their complementary canals, the elimination of the present hydro-electrical works at Jisr Majami, all highly expensive items, will not, it would seem, ensure an increased water supply of more than a few cubic meters per second. The quantity of storm-water available for storage in hill reservoirs has been estimated optimistically, ... This and the

economic implications of the proposal to convey irrigation water from the Lebanon to the Egyptian frontier cannot be accepted without further examination." [Survey of Palestine p. 413]

The idea of diverting and storing Yarmouk River water in Lake Tiberias, mentioned in Ionides, Hays, MacDonald and Johnston Plans, was technically and scientifically unacceptable. Lake Tiberias water is saline, exceeding 300 ppm, while the Yarmouk River's water does not exceed 80 ppm. Storing water in Lake Tiberias would increase the salinity of water used for irrigation and agricultural purposes by Arabs. Also, the high evaporation rate and water loss in Lake Tiberias may reach as high as 300 MCM each year, while such loss would be reduced if water was stored in a site along the River's route.

Neglect of Geopolitical Boundaries

Several water plans failed to take into consideration the existing geopolitical boundaries and cease-fire lines. Arab water control stations, such as dams, hydroelectric plants, and water reserves, were often designed to exist outside Arab boundaries. The storage of Yarmouk River water in Lake Tiberias is one clear example.

Therefore, not only the Ionides, Hays, MacDonald and Johnston Plans were technically and were scientifically inaccurate, but they also neglected the geopolitical boundaries between the Jewish/Israeli State and the rest of the Arab States.

Lack of Arab Expertise

It is unfortunate that none of the water plans prior to 1953 were conducted by Arab experts. The plans commissioned by Arab governments were conducted by non-Arabs. The Arab commissioned MacDonald Plan and Bunger Plan were conducted by a British and American experts, respectively. The lack of expertise prevented the Arabs from formulating plans in accordance to their needs and aspirations.

CONCLUSION

A binding agreement regarding water rights among the riparian states in the region has never been obtained. With the constantly changing political and demographic conditions as well as de facto boundary alterations in the area, water distribution quotas and schemes must necessarily adapt and develop. The current disproportional distribution of water resources is no longer sustainable. In the past, unsustainability has grown into conflict. Hopefully today, the use of force and military power to gain control of water resources is no more acceptable to the international community.

It is time for this community to take action, reversing unjust water distribution and ensuring a fair and ecologically sound future. Without a clear and equitable settlement of the water crisis combined with an increasing demand for water, will eventually exacerbate into yet another war driving at control another's water resources. A water war.

References:

1. **A Survey of Palestine**, Anglo American Committee of Inquiry, The Government Printer, Palestine 1946, Vol. 1
2. Basheer, Nijim, **Water Resources in the History of the Palestine-Israel Conflict**, GeoJournal April 21, 1991, P. 317-323.
3. Brecker, Micheal, **Decisions in Israel's Foreign Ministry**, New Haven, CT, Yale University Press, 1975.
4. Dillman, Jeffrey, **Water Rights in The Occupied Territories**, Journal Of Palestinian Studies, Vol XIX No. 1, Jerusalem, Autumn 1989.
5. **Encyclopedia of Palestine**, Palestinian Encyclopedia Committee, Damascus 1984, Vol 1.
6. Gleick, Peter, **Water and Conflict**, submitted to "Environmental Change and Acute Conflict", Canada, June 15-19, 1991.
7. Ionides M. G., **The Water Resources Of Transjordan and Their Development**, London 1939.
8. Jewish Observer and Middle East Review, London, Nov. 16, 1973.
9. Lowdermilk, W.C., **Palestine, Land of Promise**, Harper and Bros, New York 1944.
10. Main, Charles, **The Unified Development of the Water Resources of the Jordan Valley Region**, Gordon Clapp, Boston, MA: United Nations, 1953.
11. Saliba, Samir N., **The Jordan River Dispute**, The Hague: Martinus Nijhoff, 1968.
12. Stevens, Georgiana, **Jordan River Partition**, Stanford, CA: Stanford University Press, Hoover Institution on War, Revolution and Peace, 1965

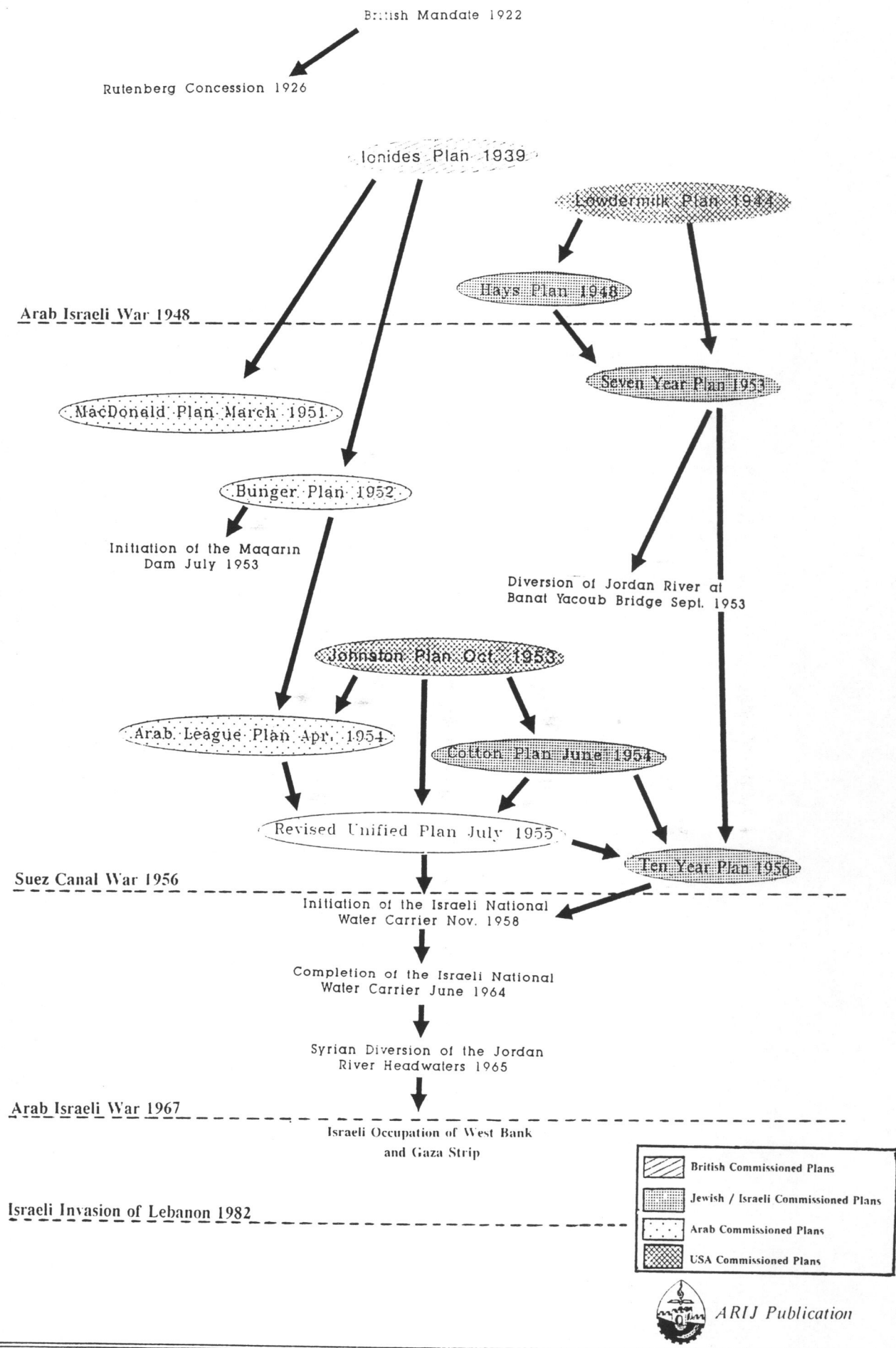


Figure (1) Middle East Water Crisis
Attempted Solutions and Major Events

Figure (2) Jordan River
Major Existing and Proposed Projects
Modified after: Middle East Research Institute

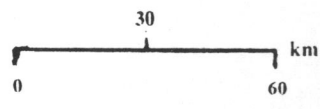
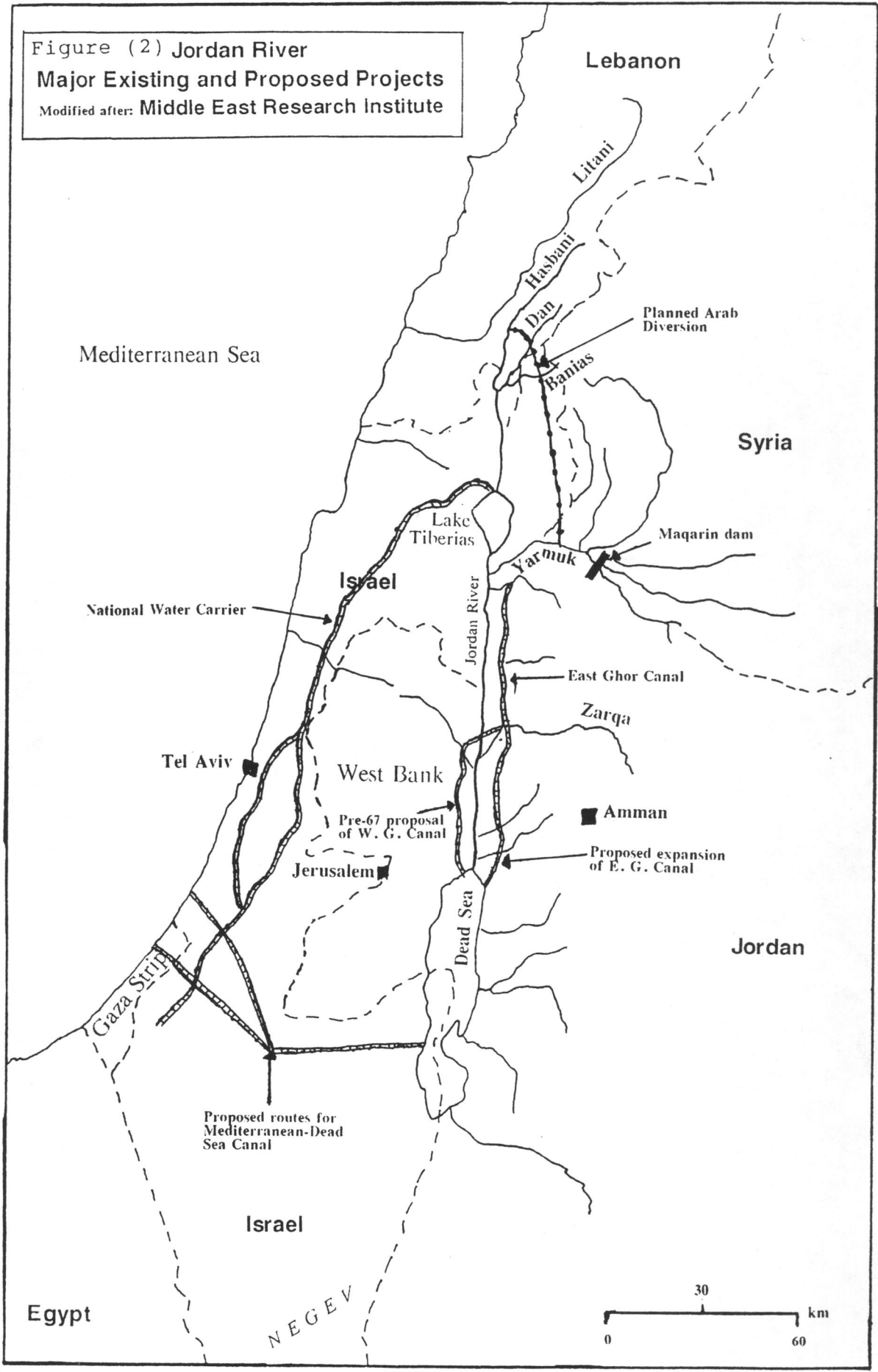


Figure (3) Sources and Consumers of Water Used in Israel and the Occupied Territories *

