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national and international politics in the last fifty years such arguments are sheer nonsense. Minorities have been very effectively liquidated, windows have been violently slammed and hardly a ripple has stirred in the conscience of the world. I should like, in conclusion, to recall to the reader H. G. Wells' very fine story, *The Country of the Blind*. You may recall that the two-eyed man who strayed into that country was *not* made king.

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RIVER SCHEMES AND THEIR EFFECT
ON ECONOMIC DEVELOPMENT IN
JORDAN, SYRIA, AND LEBANON

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AGRICULTURE must be the foundation of economic development in most Arab countries of the Middle East during the next few decades. In other than exceptional cases, such as Lebanon and Kuwait, developmental possibilities in industry, commerce, and similar non-agricultural pursuits will continue to rest upon an agricultural base. Even in Egypt, the most advanced Arab industrial nation, increased farm productivity will be the source of expanding possibilities in other economic sectors. In Lebanon, where the land provides a relatively small part of national income, the majority of the population lives, and will continue to live during the foreseeable future, from their crops.

The urgency of agricultural expansion is underscored by the explosive population growth in the Arab East. Present rates of natural increase in Egypt, Jordan and Lebanon threaten their internal stability. Even in Syria and Iraq, where there is no shortage of land and water, population growth should not be regarded with equanimity.

While wider use of scientific techniques, improved infrastructure, and more practical financing methods are essential to appreciable expansion of crop production, the key to agricultural, and hence to general economic development in the Arab nations, is development of water sources, mostly derived from the flow of the region's rivers.

A decade and a half ago when the United Nations Economic Survey Mission for the Middle East examined possibilities of major river development in the above mentioned countries its final report concluded that: "The region is not ready, the projects are not ready, the people and Governments are not ready, for large-scale development of the region's basic river systems or major undeveloped land areas. To press forward on such a course is to pursue folly and frustration and thereby delay sound economic growth."¹ At the time little

1. United Nations, CCP, *Final Report of the United Nations Economic Survey Mission for the Middle East, Part I*, 1949, p. 3. (hereafter referred to as CCP.)

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work had been done on a significant scale in any of the region's river valleys. According to the mission the reasons were: lack of capital due to low *per capita* national income, thus low levels of savings available for development; lack of agreement among riparian states on development of international water sources; lack of proper engineering studies; lack of supporting agricultural and economic surveys of crop patterns, land holding, and agrarian legislation, and lack of skilled technical and administrative personnel to implement such projects.

Since 1949 there has been progress toward overcoming several of these obstacles and there are practical accomplishments in development of water resources in several Arab countries. Projects have been financed by Middle East governments with foreign assistance; agreement has been reached on international use of some waterways; a number of blueprints have left the drawing boards and are being implemented; in some areas economic and crop surveys have been completed; in several countries agrarian reform legislation has been passed and implemented, and there is a growing number of skilled Arab technicians and administrators who are involved in major projects.

The major reason for progress was the change in attitude toward development. During the 1950's the concept spread widely and development was accepted as a realistic goal. Development boards assumed responsibility and the institutions prerequisite to economic progress began to be established. Local banks were set up to mobilize finance capital; there was increased investment in transport and communications, and in modern industrial enterprise; the United States, Germany and other Western nations began to compete with the Soviet Union to use their aid for political influence.

Today economic development schemes are no longer oddities; they are being implemented in several countries. The proportions of public investment resources (still the principal source of development funds) devoted to agricultural enterprise range from 14 per cent in Lebanon to over 50 per cent in Syria and irrigation through use of major rivers constitutes the largest share of agricultural investment.² In each of the Arab countries agriculture claims the largest share in the planning of government investment since during the next decades farming will provide the largest source of employment.

The purpose of this article will be to survey major river developments in geographical Syria, that is in Jordan, Syria and Lebanon; to analyze some of their effects on the economic progress of the countries involved; to examine a number of the problems in implementing the projects, and to inquire into the possibilities of their development on a regional basis.

2. United Nations, *Economic Developments in the Middle East 1959-1961, Supplement to World Economic Survey, 1961, 1962*, p. 17. (hereafter referred to as UN Eco. Dev., 1961).

Jordan

At the end of the Palestine war, when the United Nations Economic Survey Mission surveyed Jordan, its development possibilities were far from encouraging. Barely five per cent of the country's approximately 37,500 square miles were cultivated. Of that area a mere 26,000 hectares (five per cent of the cultivated area or .25 per cent of the country) were irrigated—from several wadis and a few isolated springs.³ Work on irrigation projects using the Jordan or Yarmuk rivers had not yet begun.

The vastness of Jordan, containing sixteen acres per person, was deceptive. The greater part of the east bank was desert and most of the 2,165 square miles acquired in Palestine during 1948 was desert or poor mountainous land. Much of the latter had become so eroded that only bare rock was left. In other areas the soil was so shallow and patchy that it was scarcely able to produce low standard cereals.

An exception to this dismal picture was the region north of Jerusalem where there were some villages that were "models of land use, with their terraced hill slopes, large areas of olives, apples, pears, plums, peaches, apricots, figs and extensive cereal crops. They give a picture of prosperity in striking contrast to the conditions in other parts. . . ."⁴

By 1949 the Jordan government had established a new Development Board, but it had not yet begun to function. There were no comprehensive plans for extensive agricultural or other development to absorb the large number of unemployed local population to say nothing of the approximately 400,000 refugees who poured in from Israel. Some years before the Palestine war M. G. Ionides had worked out a preliminary plan which estimated that approximately 100,000 persons could be provided with land at a capital cost of £150 per head to cover irrigation works. A few preliminary surveys had already been conducted of the Jordan Valley, the Hashimite Kingdom's chief unused land asset. But there was no international agreement among the major riparian states on use of the Jordan and Yarmuk rivers, the principal sources of water for development of the Valley. Furthermore, land ownership in the area was still disputed. A third of the tenure in the Jordan was in doubt or unregistered. Sixty-eight per cent of the better quality land was owned by less than 400 people.⁵ Even if the necessary capital had been available and land tenure had been equitably settled, the government was unprepared to carry out the complicated tasks of development.

Considering the situation fifteen years ago, there has been relative progress

3. CCP, Part II, p. 10.

4. *Ibid.*, p. 11.

5. UNRWA, *Bulletin of Economic Development, No. 14, Special Reports on Jordan*, Beirut, 1956, p. 6; Hashemite Kingdom of Jordan, Department of Statistics, *The East Jordan Valley, A Social and Economic Survey*, Amman, 1961, pp. 154-169.

in Jordan although the country is still far from resolving its economic dilemmas. The major accomplishment has been progress in the Jordan Valley. The main thrust of the country's development efforts culminated with completion of the East Ghor irrigation canal in June 1963.

The new canal is a modified version of the first stage of development recommended in the Baker-Harza plan for irrigation of the Jordan Valley. This approach, which provided Eric Johnston with a basis for his unified Jordan development plan, was adopted in large part by Jordan after recognition that the Johnston proposals⁶ themselves, requiring agreement with Israel would not be acceptable to the other Arab states, especially to Syria. The present Jordan government version of the Baker-Harza plan provides for unilateral development of a major scheme to store Yarmuk River water within Arab territory at Maqarin on the upper Yarmuk.

Completion of the original 12-year project would provide 720 *mcm* of water from the Yarmuk, Jordan and other small wadis and streams for irrigation of 513,700 *dunums* and would supply 167 million *kwh* of power, at a total cost of \$169,993,000. Of this amount, \$116,874,000 would be for irrigation and the balance for the hydroelectric features of the project. Surplus Yarmuk flood waters would be stored in Lake Tiberias which is entirely under Israel's control, according to the plan. It stated that storage in Lake Tiberias "is an absolutely essential element . . . for complete development of the Jordan Valley within the Kingdom of Jordan. Without it, adequate water supply for all irrigation needs in Jordan cannot be met." Nevertheless, the Hashimite Kingdom has decided to proceed with most of the major phases of the Baker-Harza plan which would not require use of Lake Tiberias.⁷

Implementation of the total Baker-Harza plan would approximately double net farm income in the Jordan Valley from the \$725,000 produced in 1953. Some 160,000 persons—farm operators and their families—would be directly supported from agriculture by the project. Ancillary employment would provide work for another 64,000. The total—224,000—is 143,000 more people than were employed in agriculture and its ancillary occupations in the Jordan Valley during 1953. Net agricultural income for the 30,700 farms envisaged under the plan would average \$463 per farm annually compared with \$190 per holding for the 3,825 farms in the valley during 1953.⁸

The East Ghor project was undertaken after consideration of several plans and after extended international negotiations, including those of Johnston.⁹ While there has been no agreement with Israel on use of the Jordan River, the

6. For details of the Johnston proposals see: Georgiana G. Stevens, *The Jordan River Valley, International Conciliation No. 506*, 1956; Don Peretz, "Development of the Jordan Valley Waters," *MEJ*, vol. 9, no. 4, 1955.

7. UNRWA, No. 14, *op. cit.*, pp. 100-118.

8. *Ibid.*, pp. 108-109.

9. *Inter alia*, the Ionides Plan, 1939, the Bunger Plan, 1952, the TVA Plan, 1953, the Arab Plan, 1954, the Baker-Harza Plan, 1955.

Hashimite Kingdom successfully negotiated a convention in 1955 with Syria for use of the Yarmuk, the principal source of water in the first phase of Valley development.¹⁰ The 43-mile long canal completed last year will draw 140 *mcm* of water annually from the Yarmuk at the Syrian frontier to irrigate 120,000 *dunums* in a three to five mile strip between the canal and the Jordan River. Since construction was begun in 1958 the United States government has contributed about \$18 million and Jordan \$5 million toward implementation.

Shortly after the project was begun the Jordan government established an independent East Ghor Canal Authority to plan, construct, operate, maintain and carry out all operations related to development of the waterway and the country's first land reform legislation was passed to control tenure. The land law limits holdings in the Jordan Valley to between 7.5 and 50 acres; forbids subdivision of holdings below 7.5 acres; authorizes the Authority to take over improperly used land and to select only those qualified and capable of working the area. The legislation thus broke up the prevailing pattern of large absentee land holdings.¹¹

Present developments indicate that implementation of Johnston's unified plan will be thwarted, although most of its objectives will be realized with river development schemes presently being undertaken by Israel and Jordan. Both countries are apparently staying within the limits of water allocated by the Johnston plan. However, the existing *de facto* balance of control over waters in the Jordan Valley could be toppled if diversion occurs beyond the Johnston-proposed quotas.* On the one hand Jordan is planning to build a large storage dam at Maqarin which could deprive Israel of water which its planners have hoped to use from Yarmuk sources. On the other hand, Israel's full implementation of its long-range unified water development scheme will drain off the major flow of the Jordan River into the Lake Tiberias-Negev conduit. Completion of Jordan's Yarmuk and Israel's Jordan River diversion plans could make the water of the lower Jordan River practically useless for agriculture in the Jordan Ghor, according to some experts. Both Israel and

10. Reprinted in *Recueil Des Accords Internationaux conclus par la Syrie depuis 1946*, Bureau des documentations syriennes et arabes, Damascus, 1953.

11. For detailed description of the East Ghor project and Authority see: Joseph L. Dees, "Jordan's East Ghor Canal Project," *MEJ*, vol. 13, no. 4, 1959.

* The Johnston compromise is based on the premise that the Jordan basin should have priority in use of the Jordan River system although water available after these needs have been met might be used outside the basin. The diversion of water which Johnston proposed for Israel and the Arab states assured that the Kingdom of Jordan, principal beneficiary of the river system, would have access to the largest amount of water which could be economically utilized in cultivable areas of the Kingdom. The water allocated to Israel represented the amount after equitable Arab claims had been met, in Johnston's opinion. The plan divided the water in the Jordan system as follows: to Lebanon, 35 *mcm* from the Hasbani; to Syria, 20 *mcm* from the Banyas, 22 *mcm* from the Jordan, 90 *mcm* from the Yarmuk—total to Syria, 132 *mcm*; to Jordan, 377 *mcm* from the Yarmuk, 100 *mcm* from the Jordan, 243 *mcm* from Jordan's side wadis—total to Jordan, 720 *mcm*; to Israel, 25 *mcm* from the Yarmuk plus all residue from the upper Jordan (residue in the upper Jordan waters, including Lake Tiberias, was estimated to be approximately 375 *mcm* when the plan was worked out).

Arab farmers in the Hashimite Kingdom's lower Jordan Valley and a number of Israeli settlements in the so-called Jordan triangle at the south end of Lake Tiberias could be deprived of water which now flows from the Lake, although Israel is planning to supply its settlers from other sources. Israel would be compensated for its loss through diversion of the upper Jordan mainly to the Negev. The Arab states, on the other hand, are planning to compensate Jordan through a scheme now being drafted would divert much of the Banyas and Hasbani, sources of the Jordan River in Syria and Lebanon, into the Litani in Lebanon or to the Yarmuk for use in the Ghor. This scheme, however, is fraught with complicated technical difficulties and would be far more expensive than continuation of the present *status quo* in which Israel permits water from Lake Tiberias to flow into the lower Jordan and the Hashimite Kingdom does not interfere with the flow of surplus Yarmuk water into Israel. Contrary to some reports, the Arab diversion of the Hasbani and the Banyas would not "cut off" their flow into Israel, but would divert some 200 to 250 *mcm* to the Yarmuk. The remaining flow of these streams, about 100 *mcm*, would continue to flow into the Jordan River in Israel. This water, with other Israel controlled sources of the Jordan, would be more than adequate to provide the flow which will pass through the Lake Tiberias-Negev conduit, approximately 150-180 *mcm* per year in its first phase. However, it would not permit full utilization of the conduit planned within the next five years when the flow should reach its maximum capacity of 320 *mcm*. Some Israelis maintain that it would destroy the total pattern of irrigation in the Jordan Valley and may even eventually drain away Lake Tiberias. If Israel takes reprisals for Arab diversion of the Jordan headwaters, it could deprive the Kingdom of Jordan of approximately 100 *mcm* of the 720 *mcm* envisaged for irrigation in the Baker-Harza and Johnston plans.

While completion of the Baker-Harza master plan would considerably increase Jordan's agricultural output and create work for a sizeable number of presently unemployed farmers, it cannot solve the country's economic problems. So scarce are Jordan's land, water, and other resources that its industrial and agricultural development is severely limited. Nevertheless, agriculture must remain the principal source of economic sustenance. Because of the country's limited water resources "the potential for increased production lies far more in rain-fed than irrigated agriculture, even taking account of the estimated increase in production through irrigation in the Jordan Valley. Since the area planted to rain-fed annual crops cannot be expanded, increased production must depend on an increased yield per *dunum*. This in turn will require expansion of research . . . and expansion of extension work throughout the country."¹²

All existing plans are inadequate to cope with the anticipated population

12. International Bank, *The Economic Development of Jordan*, Baltimore, 1957, p. 12.

of Jordan which will be over two million by 1970. Future development plans will result in a man-land ratio of rain-fed land per person of 4.15 *dunums* compared to 4.57 *dunums* in 1955. "The implication of this fact is that Jordan will need not only to irrigate the Jordan Valley but also to implement many other economic development projects, if living standards are to improve greatly . . ."¹³ *pre 67*

In view of these conclusions, the present low living standards can be substantially raised only if up to 20 per cent of the population emigrates by 1970.

Syria

The 1949 United Nations Economic Survey indicated that Syrian development possibilities were also far from encouraging. Despite the country's great land and water resources, the majority of its population were in dire poverty. Although more than two thirds of the people lived directly from the land, less than 10 per cent of the cultivated 2.2 million hectares was irrigated. Plans were visualized for nearly doubling the irrigated area, but no major development projects had been started. The country even lacked an efficient, adequately staffed and equipped agricultural department to undertake research, education and extension work.¹⁴

The prevailing land tenure system was yet another obstacle. Until 1958, two and a half per cent of all the landowners owned 45 per cent of the irrigated land and 30 per cent of the rainfed farms.¹⁵ Most land was owned by absentee city notables and cultivated on short leases by small sharecroppers whose poverty and insecurity made it difficult for them to improve methods and output. The tenure system was both a result of and a cause of peasant impoverishment since it perpetuated poverty by blocking long-term investments.

Although industry has expanded since World War II, the land will continue to be Syria's chief source of income. The World Bank survey of Syria indicated that an effective development program must focus primarily on agriculture. However, the country's crop output has been subject to great fluctuations caused by periodic severe droughts. Consequently the expansion of irrigation is vital. Variations in the world market have also undermined agricultural prices and emphasize the need to diversify crops through expansion of irrigated areas. According to the World Bank report, "irrigation is the principal means for expanding cultivated areas, increasing and stabilizing yields and diversifying agricultural production by developing summer crop cultivation."¹⁶ At present, about 6 million hectares, or nearly a third of Syria's total area, is suitable for agriculture. However, only some 8.3 per cent is irrigated. According to estimates in Syria's first five-year plan, irrigated areas could be tripled,

13. UNRWA, No. 14, *op. cit.*, p. 122.

14. CCP, Part II, *op. cit.*, p. 41.

15. Cf. Eva Garzouzi, "Land Reform in Syria," *MEJ*, Vol. 17, nos. 1 & 2, 1963.

16. International Bank, *The Economic Development of Syria*, Baltimore, 1955, p. 41.

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in the country's twelve rivers, wells, underground water and springs were used. The five-year plan proposes to increase the present irrigated area by 50 per cent, from 500,000 to 750,000 hectares, principally through work on three projects: the Ghab, the Euphrates, and the Khabur.¹⁷

The principal areas in Syria that have held promise of potential development are the Ghab Valley, a large swampy depression in the northwest, and the Euphrates Valley of Jezira province in the northeast. Both sites depend upon river control if they are to be agriculturally productive. The Orontes River, which flows into Syria from Lebanon, is the principal source of water in the Ghab Valley. In the Jezira, observed the Economic Survey Mission, "Syria possesses one great asset which no other Middle East country enjoys in equal measure. Here there is a large tract of incompletely developed land over a large part of which rainfall is adequate for the practice of arable farming and through which flows a river [the Euphrates] whose waters, if controlled and canalized, would make possible the cultivation of a very considerable area further south where rainfall is inadequate for rainfed cultivation."¹⁸ At the time not more than 800,000 of Jezira's 2,500,000 cultivable acres were under the plow. The region was still underpopulated and isolated because of political insecurity and the lack of communications.

The largest water development so far completed is the Ghab project on the Orontes. Begun in 1950 and completed in 1961, the project includes drainage of the Ghab marshes, an area thirty miles long by six miles wide, flooded by the Orontes River; construction of two storage dams, and a 580-mile network of subsidiary canals. The two dams, Rastan and Mhardeh, were planned by a Swiss engineering firm, built by the Bulgarian Technoimpex Agency, and financed by Syrian capital. The total cost was some £S 140,000,000.

Nearly 100,000 additional acres have been added to the irrigable area in the region. Additional benefits include provision of 7,500 kilowatts of seasonal power for the 30-mile district between Homs and Hama. The project will provide a livelihood from agriculture for some 100,000 people in one of the most overcrowded sections of the country. Secondary effects from indirect employment might contribute to the support of an additional 50,000. Although the Ghab project is a major step, its impact on the total economy will be relatively slight. The principal value will be its psychological effect as a pilot project on the country's larger development efforts. The project represents the first major accomplishment through Syrian government planning, finance and action to exploit a valuable national resource.¹⁹

17. Syrian Arab Republic, Ministry of Planning, Damascus, *The Syrian Five-Year Plan for Economic and Social Development 1960/61-1964/65*, pp. 36-43.

18. CCP, Vol. II, *op. cit.*, p. 26.

19. General description of project in: UNRWA, *Quarterly Bulletin of Economic Development*, no. 15, *The Economic Development Projects of Syria*, Beirut, 1958, pp. 53-59.

The largest undeveloped irrigation source is the Euphrates River which produces nearly 85 per cent of the aggregate flow of all Syrian rivers. The proposed Yusuf Pasha dam on the Euphrates, a structure three miles long and 230 feet high, has been studied since 1948 and was considered until nearly two years ago. In the early 1960's German technicians suggested changing the dam site to Tabqa or Kuban, where a much larger structure could be built. It could actively store 7 billion *mcm* for irrigation of 528,000 hectares. The 300-meter high structure would generate electricity for three 100 megawatt units which would be mostly for irrigation pumping. Although work has yet to begin on the dam, tentative plans have been drawn up by a group of Swedish experts and a preliminary agreement has been drafted with the West German government to finance the scheme up to \$87.5 million. Total cost estimates at this stage are rather tentative, but they range around \$250,000,000. To cultivate all the potentially irrigable land in Syria's Euphrates basin might require 75 per cent of the river's usable flow leaving only 25 per cent for Iraq. Before Syria can begin work on the Euphrates dam, and before the West Germans will finally agree to the loan, international accords must be reached with Turkey and Iraq, the other riparian states.²⁰

Until 1958 the main obstacle to widespread distribution of the benefits from development of Syria's land and water resources was the tenure system referred to above. Agrarian reform legislation passed in 1958 and since modified has made possible a more equitable distribution, but only a small number of farmers have benefited so far. Since September 1958 the first land law has been revised three times due to the vagaries of frequently shifting governments. The principal obstacle to pervasive and effective change in the land system has been political instability. Without a much larger measure of stability than has existed since 1948 no effective long-range development plans can be implemented. In the present environment there is little possibility of financial security, administrative consistency, or the reliability of international commitments required to carry out large projects such as development of the Euphrates Valley.

Lebanon

Lebanese economic development, like the country's political and social affairs, is unique in the Arab world. Although two-thirds of the population earn their living from the soil, agriculture provides less than a fifth of the nation's income, and *per capita* farm earnings are considerably below those in other economic sectors. Because of the extensive mountainous terrain, cultivable land is limited to a quarter of Lebanon. The rapidly increasing population has settled nearly all land that can now be used for agriculture. In 1950 *per capita* cultivated land holding among the agricultural population was only

20. *Ibid.*, pp. 63-65.

of which less than a fifth was irrigated. At the time unfarmed but cultivable areas totaled 115,000 hectares but because of the mountainous terrain of this land its development would have required an uneconomic capital outlay.²¹

Until recently, 80 per cent of all farm land was sown in wheat, the largest crop, and barley, indicating the need for crop diversification through irrigation. Extension of irrigated areas would also lessen the dangers of drought, which, as in other countries in the region, has in recent years played havoc with the output of dry crops. While the area planted in wheat has remained about the same, output rose from 35,000 tons before World War II to 65,000 tons in 1957-58, but then declined to 40,000 in 1960-61.²² The decline was caused by drought more than by any other factor.

Although dry crops are still the basis of most Lebanese agriculture, farming differs from that in the neighboring Arab countries. The value of Lebanese fruits and vegetables is well over half the total agricultural output. Fruits, which in 1954 provided 59 per cent of the gross value included olives, grapes, apples, oranges, bananas, pears, cherries, watermelons and peaches. Vegetables and leguminous crops accounted for 12 per cent of the gross value.²³

Land tenure and agricultural methods compared more favorably with those of Europe than in the other Arab countries. About half the rural population were small freeholding peasants who owned compact plots rather than the scattered, divided strips so common in the Middle East. The more advanced technique of the Lebanese farmer was revealed in greater crop diversification and higher yields per acre.

However, this relative prosperity has been threatened by the natural growth of Lebanon's population against the background of land shortages. In 1949 there were dire predictions that the population would double in ten or twenty years. "The trend threatens to deteriorate dangerously unless increased opportunities for earning a livelihood are provided in time, which will require outlay on a relatively large scale."²⁴ By the 1940's urban population was being inflated by peasants who could no longer earn a living from the land. In the last fifteen years, the population has increased by one third from the 1,200,000 living in the country at the time of the United Nations Economic Survey.²⁵

The greatest potential resource, development of which would raise appreciably the income of the farming population, is the Litani River. "It is the key to the economic future," reported the United Nations Economic Survey Mission in 1949. "Its waters properly conserved and efficiently utilized could provide an abundant supply of low-cost electric power—power to light and facilitate

21. UN *Eco. Dev.* 1945-54, p. 152.

22. *Ibid.*, p. 155, also 1959-61, p. 108.

23. HRAF, *The Republic of Lebanon*, New Haven, 1956, (unpublished), p. 591.

24. CCP, Part I, p. 49.

25. The estimated population of Lebanon in 1960 was 1,646,000.

development of water supplies for homes in all the cities, towns and villages—power to increase pumped water supply for irrigation and provide for the preservation of food, thus enlarging agricultural opportunities, and finally for industrial expansion to provide more jobs for more people."²⁶

The Lebanese government began to face up to the urgent need for economic development in 1949 when the Council of Ministers drew up a six-year plan. Although of modest proportions, the plan hoped to add 43,000 hectares to the agricultural area through development of the Kasmieh, Akkar, Yannouneh, Orontes and Litani irrigation projects.

The general scope of the Litani, the largest project, envisaged irrigation of 30,000 hectares of which about 10,000 were in the Biq'ā plain. Most of the rest was on the coast and along the immediate river banks. Power would be provided by six hydroelectric stations. The plan envisaged construction of three major and five smaller dams, 210 kilometers of irrigation canals, 41 kilometers of tunnels and 12 kilometers of high tension transmission lines. Total cost of the project, including irrigation, power plants and transmission was estimated at 342 million Lebanese pounds. Annual operation, maintenance and repayment charges were estimated at about 20 million Lebanese pounds. Construction time for the project would be twenty-five years. Benefits were calculated at some 12 million Lebanese pounds in the annual gross value of crops, and a net average annual return of 19 million Lebanese pounds from the sale of power. The effect on the total economy would be to increase the irrigated area by 50 per cent and to expand electric power by three or four times.²⁷ According to some observers, the scheme would "entirely revolutionize the country's economy and might even transform the Lebanon into the most important industrial country in the Middle East after Egypt."²⁸

Work on the first phase of the Litani project began in 1956. However, progress was seriously set back in 1959 when one of the main tunnels collapsed and plans for the Karoun dam had to be completely altered. Construction was begun again in 1961 after the project was revised by a French company, Electricité de France. Work on the first phase is now near completion. The Karoun dam in the Biq'ā has now been built creating a lake several kilometers long. The principal benefits of this stage of the Litani project will be from power rather than from irrigation.

In the context of Lebanon's total economic development the Litani and other proposed river developmental projects will not substantially raise national

26. CCP, *op. cit.*, Part I, p. 99. Israel's irrigation planners have hoped to use the surplus waters of the Litani although it is not an international river. When Great Britain and France were negotiating the boundaries for the Palestine mandate after World War I, Zionist leaders attempted unsuccessfully to include the lower Litani within Palestine's borders. According to the TVA "desk plan" drafted in 1953, the surplus waters of Litani would be used in Israel.

27. UNRWA, No. 11, pp. 113-128.

28. Europa Publications, *The Middle East*, 10th Edition, London, 1963, p. 257.

per capita agricultural income because of the rapid increase in rural population. The above quotation concerning the potential effects of increased production of electricity also seems overly optimistic. Industry is not expanding at a rapid enough rate to absorb the ever-increasing population. Net industrial income provided less than a fifth of the national income in 1948-49 and fewer than 30,000 were employed in all phases of manufacturing, including handicrafts.²⁹ Although the number of factories increased by nearly 1,100 to 3,190 during the next decade, factory employment grew by fewer than 5,000 to 21,200.³⁰

Despite the potential increase in electric power, there seem to be few prospects in Lebanon for a major industrial breakthrough in the near future. The greatest limitation on industrial expansion in proportions large enough to "entirely revolutionize the country's economy" is the traditional attitude of the Lebanese businessman who prefers to invest in commercial ventures which do little to increase local employment or lead to wider distribution of wealth. While these transactions have considerably increased national income, wealth remains concentrated in the hands of the merchant élite. Only a relatively small proportion of the profits from their investments are ploughed back into agriculture or industry. Other factors limiting production are the inadequate supply of raw materials, most of which have to be imported; high fuel costs due to delivery and inefficient transport; the small market base, and shortage of skilled and experienced managerial and technical skills.

Conclusions

Expansion of agricultural areas and increased crop production through irrigation remain the foundations of economic development in the Arab East. The key to agricultural expansion is development of the region's river systems. In the areas surveyed by this article, the major systems are the Jordan-Yarmuk, the Litani, the Orontes and the Euphrates. In each of the countries concerned—Jordan, Lebanon and Syria—there has been progress during the past fifteen years. Work or significant planning has been accomplished on important phases of development in each of the river systems mentioned. However, major obstacles still remain, many of which cannot be overcome without regional planning and cooperation.

Of the projects mentioned, only the Litani in Lebanon is entirely within the jurisdiction of a single nation and requires no international agreement for development. Syria and Jordan have agreed on the use of the Yarmuk. But before actual work begins on the largest and ultimately most promising project, the Euphrates dam, Syria must reach accords with the other riparian states, Turkey and Iraq.

29. UN *Eco. Dev.* 1945-54, pp. 153, 158.

30. UN *Eco. Dev.* 1958-59, p. 22.

Capital to implement these projects fully is another requirement. Both Jordan and Lebanon have received extensive financial aid from the United States government. Syria has been promised conditional aid from West Germany for the Euphrates project, although the Syrian government did finance the Ghab scheme from its own resources. A significant step toward inter-Arab financial cooperation is the recent accord between Kuwait and Jordan in which the latter has received a loan of \$21,000,000 for agricultural and industrial projects from the \$280,000,000 Kuwait Fund for the Economic Development of the Arab Countries. At the Cairo Summit conference of Arab League states in January 1964, another step toward regional cooperation was indicated by agreement on diversion of the Hasbani and Banyas rivers in Lebanon and Syria, largely for the benefit of Jordan. The UAR, Kuwait, Saudi Arabia, Algeria and Libya undertook to bear the initial cost of the project estimated at about \$20,000,000.

Population explosions in Lebanon and Jordan are of such proportions that maximum development of their land and water resources will not prevent serious overcrowding in the near future. On the other hand, when Syria's Euphrates scheme gets underway, that country will face labor shortages in which Jordan's surplus labor could play an especially active role. However, despite the theoretical possibilities of further development and the growing awareness of the need for regional economic cooperation, little additional progress can be made until the existing political instability, particularly in Syria, is ended.