

RESOURCES

Some findings and conjectures from recent research
into resource development and use



*Our minds are finite, and yet even in these circumstances of finitude
we are surrounded by possibilities that are infinite.*

ALFRED NORTH WHITEHEAD

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Mekong Potentials and Problems

DESTRUTION AND DISORDER in the part of the world that formerly made up Indochina have not stood in the way of rising interest and activity aimed at harnessing to productive, peaceful purposes the flow of the Mekong River, which traverses the theater of warfare. This circumstance gives room for hope that when the war in Vietnam and the associated conflicts in the neighboring countries have come to an end, a long period of constructive development will ensue making full and intelligent use of the river and its tributaries.

Perhaps 1957 best marks the beginning of recent planning efforts for the Mekong basin. In that year, the Bureau of Flood Control and Water Resource Development of the UN Economic Committee for Asia and the Far East (ECAFE) produced a report on developing the Lower Mekong basin. The discussion the report engendered in the Thirteenth Session of ECAFE led to establishment of the Mekong Committee, a regional group that has been the driving force behind Mekong River development. It is made up of Thailand, Cambodia, Laos, and South Vietnam, the four riparian countries of the Lower Mekong. They have held continuous membership in the committee, regardless of the state of political relations between them.

In the course of twelve years, twenty-six other countries have contributed to the scheme, supplying funds, equipment, and personnel. Of the total funds of about \$200 million, nearly half have come from the riparians, about 15 percent from the United States.

In 1962 the Mekong Committee authorized the preparation of a more ambitious plan than that of

1957. A preliminary report was completed in 1970. It contains the grand design for the next thirty years—a construction program whose river-associated facilities alone will cost nearly \$8 billion.

The area affected by the course of the river and its tributaries measures nearly 250,000 square miles. It comprises practically all of Laos and Cambodia, two-fifths of South Vietnam, and one-third of Thailand. Close to 30 million people now live in the area of the watershed involved. That figure is likely to double by the end of the century.

The potential for power generation and irrigation is large: the proposed Pa Mong hydro station alone would eventually have a capacity of 4-5 million kilowatts, more than double the current capacity of Grand Coulee. Water controlled by the station could irrigate at least



2 million acres, perhaps 5 million.

Along the river's 2,600 miles that lie within the lower basin, the committee has identified locations for seventeen possible projects on the main stem and in the delta and about eighty projects on the tributaries. By mid-1970, three projects had been completed, at least with regard to power generation, for a total installed capacity so far of 33,000 kilowatts, and an eventual capability of supplying water to harvest crops from about 150,000 acres. Less than 3 percent of the total cultivated area in the basin is now reached by irrigation projects of any kind, and total power generation is a minuscule fraction of the potential.

A FUNDAMENTAL assumption of the committee is that the four riparian countries can achieve more development by collaborating in a basin system. While this probably is true, the social, institutional, and ecological difficulties of constructing such a system are so formidable that economic results will probably be achieved more fully by prior concentration on subarea development.

The cost of Pa Mong—an estimated \$1.1 billion—is equal to Thailand's average annual total investment or to one-fourth of its average national income. Such massive investments for single projects greatly affect the capacity of the country to make other investments and to respond to unforeseen future economic conditions. It also seems unrealistic to expect prompt benefits following the construction of Pa Mong; learning to manage it properly could require twenty-five years or more.

The total investment in tributary projects scheduled for the 1970s also will cost about \$1 billion. Although this large sum equals the cost of Pa Mong, it will be applied to a number of smaller projects and thus can be used more flexibly. With smaller projects, allowances can be made for trial and error in the early phases of development so that the later phases can benefit from the lessons learned. Furthermore, the detrimental impact on the rural society of one or more huge failures could be far more severe than the cumulative effect of a number of smaller failures. At least the latter would have contributed to enhancing the skills of the local popula-

tion, for the larger projects undoubtedly would require a sizable complement of foreign manpower.

An important criterion for development activities has to do with long-run threats of environmental disruption associated with these activities. Mekong development is likely to entail substantial modifications in the natural regimen of the river and its tributaries, which could have extensive ecological consequences. For example, the spread of schistosomiasis might be induced by the creation of canals and reservoirs. Farmers displaced by reservoirs will move to the highlands where the soils are vulnerable to erosion, and no one can predict the full effects of irrigation on basin soils. Sufficient resources should be allocated to keep the probability of unforeseen ecological damage low and to build into projects specific measures to mitigate such damage.

AGRICULTURE is the dominant economic activity in the Mekong basin and no doubt will remain so for many years to come. Data on production and employment in the basin alone are scarce. In the four riparian countries as a whole, agriculture accounts for from 30 percent of gross domestic product in Thailand and Vietnam to considerably more than that in Cambodia and Laos.

Since the major urban centers, Bangkok and Saigon, lie outside the basin, one must infer that the

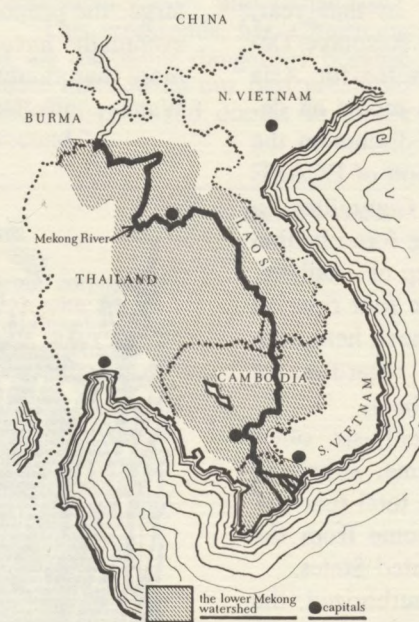
share of agriculture in production is substantially higher in the basin than in the countries as a whole. Output per man in agriculture is only a fraction of what it is in non-agricultural employment, and the labor force in agriculture is higher than agriculture's share of total production—ranging from at least 65 percent in Vietnam to 80 percent in Laos and Cambodia.

With agriculture ranking so high in output and employment, it follows that agricultural development is the key to general economic development in the basin. This is not to deny that the growth of towns and cities within the basin and the development of an infrastructure that binds urban and rural parts together is extremely important; but growth in total economic output and improvement in the welfare of ordinary people will be nearly impossible without major change in agriculture.

It is not unreasonable to expect demand for the region's agricultural production to grow at roughly 4 percent annually over the next decade or so. If production increases in response to this growth in demand, the performance of the agricultural sector will be consistent with the achievement of overall income growth targets of 5-6 percent. However, the necessary rate of increase in agricultural production is not likely to occur automatically. In fact, the rate is likely to fall well short of that needed unless productivity in agriculture increases markedly. Mekong agriculture must meet standards of price, product quality, and reliability of supply that are now beyond its capacity.

The reasons for the failure of farmers in the basin to adopt a more modern technology are complex. It is well, however, to dismiss the argument that farmers remain locked in a primitive technology because of the force of tradition and prejudice and from lack of interest in producing more. Substantial worldwide evidence indicates strongly that this argument is fallacious. When the risk-discounted payoff to more modern techniques is clearly above the yield of primitive technologies, peasant farmers will rapidly adopt the more modern practices.

The fact is that the physical and institutional infrastructure is incap-



ble now of supplying farmers with the input and marketing services required to implant and sustain a modern technology. Perhaps the most glaring weakness in this respect is in the water management systems commonly employed throughout the basin—for water from any source, not just that originating in irrigation projects.

This weakness goes far to explain the failure of farmers to adopt the new rice varieties on a larger scale. These varieties require precise control of water depths, but precision is difficult, if not impossible, with existing water management systems. The new rice varieties also require closer control of water quality than the traditional varieties. Until sufficient freshwater flows can be maintained in rivers and canals in the delta, the use of high-yielding rice varieties, especially during the dry season, will not be economical in much of that area.

In addition, the rural transport system is inadequate to provide farmers quick and economical access to markets. Storage, processing, and machinery repair facilities and skills are in short supply. Short-term credit on reasonable terms is hard to come by, and the prevailing land tenure systems discourage technological progress.



No uniform or comparable figures for landownership exist for the basin in all four countries. Absentee landownership is a serious issue in the rich delta area. In the Vietnamese delta about 70 percent of the farm families are primarily dependent on cultivating rented land for which they pay the landlord the equivalent of about one-third of their crops. In 1969 the Saigon government initiated a program to give land to the cultivators with fair compensation to the owners. If carried through, the program would have far-reaching effects on South Vietnamese rural life.

A survey of human resources in the region indicates that the people of the Mekong basin are generally

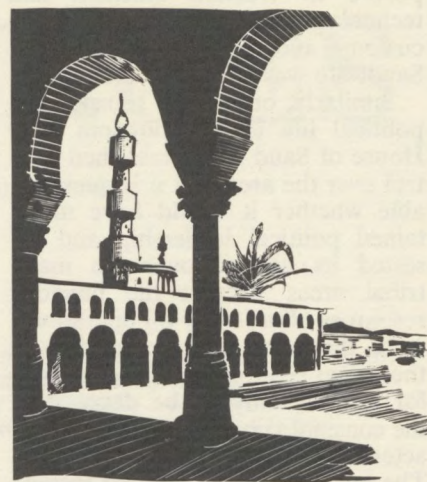
interested in acquiring more wealth, but their physical resources, abilities, and rewards are still organized around their traditional existence more thoroughly than around their modern attempts to improve their lives through development programs.

The hierarchical, centralized organization of government agencies is upward toward the capital rather than downward and outward toward the people. The commercial institutions—ethnic enclaves in the larger society and economy—are mistrusted. Much better organized and economically sounder than the farmers (and thus able to control prices paid to and by the farmers), commercial firms, on the other hand, have been obliged to make heavy graft payments to officials in order to compete with some government corporations and with a few international firms.

The people and governments in the Mekong basin can achieve large-scale development only by extensive modification of some of their social and cultural institutions. These changes can be successful only if they are undertaken as *mutual* accommodations between the current values, institutions, and rewards of basin countries and the requirements of basin agricultural development, with the active participation of basin villagers, merchants, and officials.

Given these complexities, international organizations no less than donor countries must beware lest their desire to see economic development proceed along certain lines lead them into assuming a primary responsibility which really is not theirs. At times it may even be better to see developments falter than to see primary responsibility pass out of the hands of the riparian countries. By the same token, any line of action that spells increased understanding and participation of people in the region, of local groups and organizations, and of governmental units should receive high priority in assistance. For only to the degree that the people in the basin make the plans for development theirs will they succeed in bringing development worthy of the name.

Adapted from Agricultural Development in the Mekong Basin, an RFF staff study made for the World Bank and published by RFF, 1971.



OIL-ARABIA'S OPEN SESAME

THE IMPACT of petroleum development on the political, social and cultural life of Saudi Arabia has perhaps been even greater than the direct economic impact. Oil was the wedge that gave Western culture, Western attitudes, and Western technology entry into Saudi Arabia. Given the earlier prevailing attitudes of Saudi Arabs toward foreigners, particularly non-Muslim foreigners, it is difficult to imagine Western penetration in the absence of the petroleum industry.

Except for Muslims, it is likely that only a few explorers and scholars (who could obtain visas) would have visited Saudi Arabia if oil had not been discovered. The Nejd area of central Saudi Arabia offered little but hardship to nonresidents. Westerners had traditionally been confined to Jeddah on the west coast, and most Westerners were there either for commercial reasons or as members of the diplomatic corps. The founder of the country, King Abd al-Aziz ibn Saud, made a strong effort to restrict the movements and the influence of the American oil community to the eastern province where oil operations were centered. The religious and political life of the kingdom he founded were so intertwined that he feared the eventual consequences of any undermining of traditional beliefs and customs.

Nevertheless, penetration was inevitable, and few traditional societies have undergone a more rapid tran-

sition than Saudi Arabia has in the period since 1933. The abrupt exposure to Western attitudes and technology has altered many of the customs and attitudes upon which Saudi life was based.

Similarly, oil income transformed political life in the kingdom. The House of Saud had established control over the area, but it is questionable whether it would have maintained political leadership and asserted its control over the many tribal areas without the financial resources afforded by oil operations.

In the past, one or another of the tribes had attained supremacy for a time, only to be deposed in the constant tribal warfare that characterized the Arabian Peninsula. The leverage afforded by oil income profoundly affected the relationships between tribes and was no small element in maintaining the Saud family in power and in achieving progress toward a unified national state and economy. The loyalty of both friends and former enemies was assured by cash payments.

The demonstration effect was considerable in Saudi Arabia. Not only were Saudis able to see firsthand the material comforts of the Western community established in Dhahran, but oil revenues made it possible for many Saudis to travel to Europe and North America, and many returned to Saudi Arabia determined to import as much of the Western standard of living as possible. Material comforts and luxury were coveted by those able to afford them. The relative isolation of the Arabian Peninsula was breached, and the substantial increase in the import bill for consumer goods was one of the major results of this increased contact with the rest of the world.

Excerpted from "Aramco: The Evolution of an Oil Concession," by Donald A. Wells, in Foreign Investment in the Petroleum and Mineral Industries, by Raymond Mikesell and others, published for RFF by The Johns Hopkins Press, 1971.



METERED WATER USE

ONE OF THE MAJOR factors affecting the consumption of residential water is whether or not the distribution system is metered. Water use in metered areas is significantly lower than in flat-rate areas, primarily because of the impact of metering on lawn-sprinkling. Peak demands, hourly and daily, tend to be very much lower in the metered areas, a fact that is of great importance in planning water systems. Household use (inside uses such as flushing and cooking) is relatively constant as between metered and flat-rate areas.

There are many examples of how universal metering affects the use of water. In Kingston, N.Y., a universal meter installation program was initiated in 1958. By 1963, with 98 percent of the system metered, average water use had decreased from 5.47 to 4 million gallons per day, even though the number of services had increased from 7,800 to 7,935. When Philadelphia completed universal metering between 1955 and 1960, demand for water declined from 370 mgd to 327.8 mgd (11 percent). In 1955, approximately 73 percent of the water services were metered; hence, metering was estimated to have reduced demand among the unmetered users by at least 28 percent. Another example is Elizabeth City, N.C., where, in 1931, universal metering of an originally flat-

rate system reduced average consumption from 1.8 to 0.3 mgd. Although demands later increased slightly, per capita consumption as of 1946 was still lower than for the period prior to 1931.

The future scope for this particular form of adjustment to water shortage, however, is somewhat limited; most municipalities in the United States have already installed individual water meters. There are some notable exceptions. For example, only 25 percent of the water users in New York City are metered, though in a recent report the former water commissioner of the city estimated that complete metering would reduce consumption by 125 mgd, or approximately 10 percent of average daily use in the early sixties.

From Drought and Water Supply, by Clifford S. Russell, David G. Arey, and Robert W. Kates, published for RFF by The Johns Hopkins Press, 1970.

NEW RFF BOOKS

Agricultural Development in the Mekong Basin: Goals, Priorities, and Strategies. An RFF staff study made for the World Bank. 108 pp. May 1971. Paper, \$2.50.

Interbasin Transfers of Water: Economic Issues and Impacts. By Charles W. Howe and K. William Easter. 216 pp. June 1971. Cloth, \$9.50.

Obtainable from booksellers or The Johns Hopkins Press, Baltimore, Md.

Middle Eastern Oil and the Western World. An RFF-Rand study by Sam H. Schurr, Paul T. Homan, and others. 208 pp. April 1971. Cloth, \$16.00.

The Agricultural Potential of the Middle East. An RFF-Rand study by Marion Clawson, Hans H. Landsberg, and Lyle T. Alexander. 284 pp. April 1971. Cloth, \$19.50.

Obtainable from American Elsevier Publishing Co., New York.

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