MANMADE LAKES AND SOCIAL CHANGE

by Thayer Scudder

Thayer Scudder is assistant professor of anthropology at Caltech. At the invitation of the Rhodes-Livingstone Institute (now the Institute for Social Research of the University of Zambia) he spent the year 1956-57 in the Middle Zambezi Valley studying the African population soon to be resettled because of construction of the Kariba Dam. Their relocation was completed in 1959, and Dr. Scudder returned to Zambia in 1962 for a follow-up study, the first of a series he expects to make at several-year intervals.

In Egypt during 1961-62 Dr. Scudder was involved in the base-line studies of the project to relocate the Nubians because of the construction of the Aswan High Dam. This study was initiated by the Social Research Center of the American University in Cairo. More recently he has been involved in the planning of similar research in connection with Nigeria's Kainji Dam, on which construction started in 1964.

Dr. Scudder originally undertook this work because of the opportunity to study human behavior under conditions of accelerated social and economic change. He is now also interested in the use of such research in the planning and implementation of development at the time of resettlement and during and after the period of reservoir formation.

An anthropologist uses population relocation to study cultural evolution on a speeded-up scale

In recent years the formation of large manmade lakes has begun to transform the landscape of Africa. Rhodesia and Zambia's Kariba Lake, which has a surface area of nearly 2,000 square miles, is responsible for the relocation of 50,000 people. Currently the world's largest impoundment, its storage capacity is approximately 130 million acre-feet, which is more than four times that of Lake Mead. The lake now filling behind Ghana's Volta Dam will eventually inundate more than 3,000 square miles, or approximately four percent of the surface area of Ghana. Lake Nasser (to be formed behind Egypt's High Dam) in time will cover a similar area. Once filled, it will inundate the villages and towns of 120,000 Nubians, while the Volta Dam has already been responsible for the relocation of more than 70,000 people, or approximately one percent of the Ghanaian population.

These three projects represent only the beginning of a trend that will affect most of Africa. On the Niger, construction is proceeding on Nigeria's Kainji Dam. Three river basin surveys involving seven countries and financed by the United Nations Special Fund are currently under way along the Senegal, Mono, and Kafue Rivers. In South Africa, planning continues in connection with the Orange River Development Project. Eventually all the great rivers of Africa and many of the smaller ones will be af-

fected by similar development programs.

Such projects present an exceptional opportunity for an integrated river and lake basin development program. This will involve not only power generation, flood control, and improved transport, but also fisheries and agriculture, market and small industrial centers, conservation areas and parks, and recreational, residential, and tourist facilities. Population relocation on such a scale can be used to provide a more meaningful life for the African population. With proper timing and planning, new environments with improved social services can be created in carefully selected relocation areas. Through experimentation before and after resettlement, new production techniques can be developed to increase per capita income without depleting soil fertility and other local resources.

Lack of perspective

In spite of the opportunity, the development potential of African manmade lakes is not being realized. There are a number of reasons for this, and the most important one relates to a lack of perspective on the part of regional, national, and international development agencies. Instead of thinking in terms of the whole range of human and natural resources, planners tend to overemphasize such tangible benefits as increases in electrical power and gross national product. Development is seen primarily in terms of spiraling per capita income, as opposed to the emergence of relatively creative, relatively productive, and relatively integrated human populations. Manmade lakes, at worst, are viewed merely as dam by-products, while the people requiring relocation are seen as an expensive nuisance.

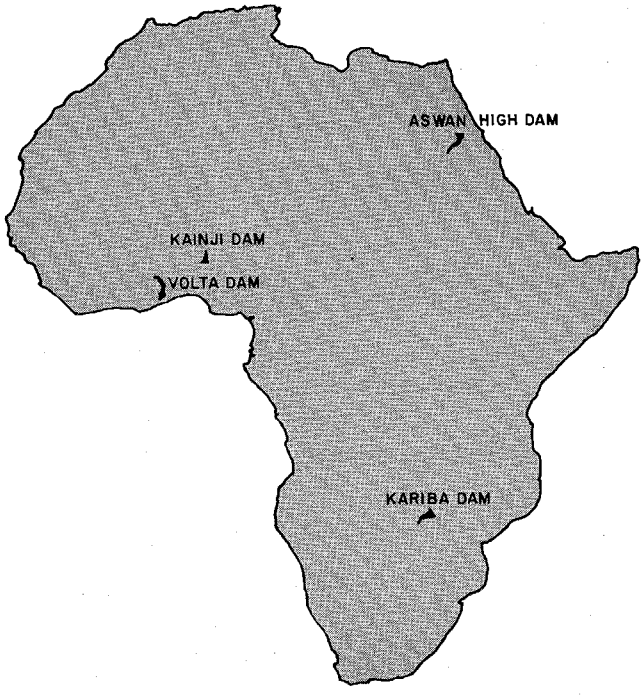
A good example of this lack of perspective is seen in fisheries development in connection with Nigeria's multi-purpose Kainji Dam Project. Once the reservoir is full, it is possible that up to 10,000 tons of fish might be caught each year. This catch could support up to 2,500 fishermen and their dependents. This exceeds the number of laborers who will eventually be employed, for example, by Ghana's aluminum smelter at Tema—which, as the main consumer of Volta power, may well employ a larger labor force than any of the industrial plants associated with Nigeria's Kainji Project. Furthermore, the expected income accruing to individual fishermen (over £130 per capita) should enable them to realize a standard of living little different from that of industrial workers.

The realization of this potential requires certain preparatory measures, of which the most important is selective bush clearing in the lake basin area. Though costly (at least £10 per acre), bush clearing is an important precautionary measure against the possible rapid buildup of aquatic weeds. Not only would the weeds reduce the recreational and tourist potential of the lake, but they could also hamper lake transport. The actual expense of clearing would be about equal to the retail value of two years' catches of fish.

In spite of the benefits to be gained, the amount of money allocated to bush clearing and other preparatory measures (including those whose purpose is to help the present fishing population convert to commercial fishing methods) is totally inadequate. In large part I believe this is because international consultants involved in pre-investment studies have seriously underestimated the attitudes of the local population toward fishing. In fact, policy-influencing statements have even been made to the effect that the people have no special interest in fishing.

More recent surveys have shown that this is definitely not the case. Not only is fishing now a respected part-time activity, with a wide range of techniques used to procure fish, but some fishermen are active throughout much of the year on a full-time basis.

Developments elsewhere in Africa (which have involved less-skilled fishermen and a less-diversified fish population) lead one to expect commercial fisheries to develop within a few years after lake formation, as opposed to the often-stated ten-year minimum. Ten years is a long time. Because it exceeds the duration of the present Nigerian development plan, it is not unreasonable to expect that such



The Tonga living along the Zambezi River used a variety of fishing methods before Kariba Dam was built, but none produced more than a meager catch. Here, women fashion a crude basket that is dragged through shallow water in an attempt to catch small fish.

a negative appraisal has influenced the allocation of funds. Of course, if selective bush-clearing is not carried out prior to dam completion in 1968, commercial fisheries may never develop—which would support the uninformed projections of the original planners! The main losers, of course, will be the local population and, in the long run, Nigeria.

A second factor impeding the realization of the development potential of manmade lakes in Africa relates to inadequate coordination between and within local, regional, national, and international agencies, including the relevant River Authority. Lack of coordination at Kainji already has led to a series of unfortunate events. For example, though the East Bank Soil Survey was completed in 1963, resettlement officers searching for new village sites had not received copies of the maps by mid-1965. Moreover, the Soil Survey of the major township (New Bussa) was carried out too late to influence site selection and town planning. Though the survey results suggest that there is not enough land to support expected population densities under existing techniques of agriculture, insufficient capital and personnel have been set aside for the intensification of agriculture. The problem is aggravated by the location of an airstrip which has so bisected one area as to reduce the suitability of the adjacent pieces of land.

To limit the occurrence of such situations, a high-level coordinating council is necessary. Its membership should include representatives from government, the scientific community, the National Development Bank or its equivalent, and the local population. Along with the River Authority, it should be set up before the first feasibility surveys are made. Since these are often in the hands of international firms of consulting engineers as well as the World Bank, the Special Fund, and the Food and Agriculture Organization, close liaison with such agencies is essential to ensure that continuity between basin surveys and subsequent development is maintained.

In the Kariba Dam scheme, there was neither a Zambezi River Authority nor a lake basin coordinating body. Though the Kariba Lake Coordinating Committee was formed to deal with the lake, its jurisdiction did not extend to the lakeshore hinterland. Furthermore, it was not established until two years after the decision to proceed with the dam. As for the Federal Power Board, it became interested in the lake only when events there threatened operations at the dam itself.

Inadequate research is a third factor preventing realization of the full potential of manmade lakes. Ideally, research should have both immediate and long-range effects. The first type of research relates to surveys and base-line studies which have a direct relationship to local development. The second relates to studies which can be expected to increase

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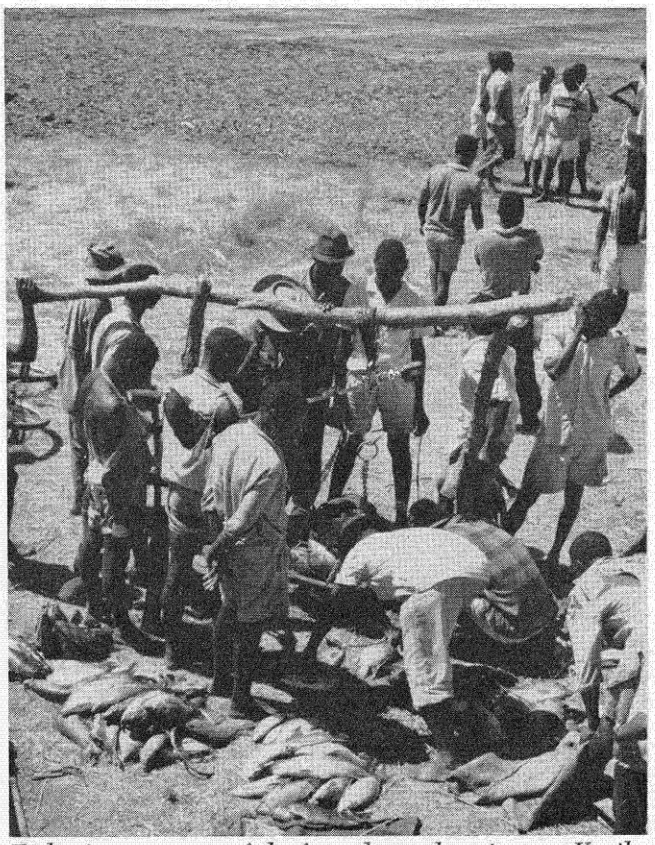

Fisheries were one of the few planned projects at Kariba Lake. The impressive results show how much human potential exists. These Tonga now enjoy a much higher standard of living, and they have become valuable members of the national economy.

man's control and intelligent manipulation of his physical, biotic, and cultural surroundings.

To the scientist, the formation of large manmade lakes presents a unique opportunity to carry out fundamental research involving a wide range of disciplines. Rates of change are accelerated through such massive human interference, and studies that are carried out before, during, and after inundation can be expected not only to increase knowledge but also to contribute directly to planned developments.

Unique chance for research

In other words, the dichotomy between pure and applied research simply does not apply to such manmade situations. This is true whether the investigator is a geophysicist studying possible crustal movements arising from the added weight of millions of acre-feet of water, or a behavioral scientist interested in the effects of relocation on human populations. We really know very little about how people will behave under different types of resettlement, but population relocation presents us with an important opportunity to widen our knowledge of human behavior under conditions of increased stress. Such knowledge will also increase our ability to induce the type of social change that is meaningful in terms of both individuals and the societies to which they belong.

In spite of the excellent opportunities presented by manmade lakes, research—whether involving meteorologists, hydrologists, biological ecologists, or behavioral and social scientists—*has been totally inadequate*. Furthermore, much of that undertaken has been completed too late to be useful in terms of lake basin development. In part, this is because development planners have not been sufficiently aware of the need for ecologically oriented research. In part, it is because universities and research institutions have not taken advantage of the opportunities offered.

The words *too late* bring up a fourth bottleneck, which relates to poor scheduling of relevant activities. The record of resettlement is particularly revealing in this regard. Resettlement is a complicated process. Costs—in terms of capital, personnel, and equipment—are continually underestimated. Effective timing requires careful planning based on hydrological, ecological, medical, social, and other surveys.

Regardless of government attitudes toward lake basin development, little serious attention has been paid to the resettlement process in the major African schemes until after the commencement of dam-site preparations. This leaves insufficient time to undertake the necessary research and to relate it to effective resettlement and development. Rather, resettlement becomes a crash program to get the people physically moved before the dam is closed and the waters rise. One result is relocation prior to the ability of resettlement areas to support the population.

At Kariba it took the evacuees approximately two years to prepare enough farm land to meet their subsistence needs. Inadequate harvests prior to that time forced them to rely on government-organized famine relief. Though government policy in connection with the Volta and Aswan High Dam projects was to prepare (at government expense) more productive environments, again relocation occurred before these could support the people. Hence, a year after some communities were moved, the Ghanaian government's ambitious agricultural program was well under way in only one of 52 planned communities. In Egypt, less than 10 percent of the acreage set aside for the people had been reclaimed at the time of resettlement. In both cases the opportunity to fit people into a more productive environment from the start has been lost. During the demoralizing transition period that must elapse before development requires the people's full participation, there is a definite risk that the more progressive individuals will seek work elsewhere. As for the less highly motivated, they may become accustomed to living off relief supplied by the government on the one hand, and wage-earning kin on the other.

Future projects

The logical corrective here is to broaden the feasibility studies, which are apt to stretch out over a number of years prior to site selection. To date, the scope of these has been much too narrow, which brings us back to the problem of inadequate perspective. Though expansion of the usual geological, economic, and engineering surveys will increase costs, these are slight in terms of the cost in both human and financial terms of a prolonged period of famine relief. They are even smaller when measured against the benefits that could accrue from a well-planned, well-timed, and well-implemented program of river and lake basin development whose ultimate purpose is to make regions more habitable for people.