

BOOK REVIEW

An African Dam. Ecological survey of the Kamburu/Gtaru hydro electric dam area, Kenya. Ed. by R. S. Odingo, Stockholm, Swedish Natural Science Research Council, 1979, *Ecological Bulletins* No. 29, ISBN 91 546 0256 4, pp. 182. Price Sw Cr 40 (about \$US10. incl. airmail postage from the Council, Box 23136, S-104 35 Stockholm, Sweden).

The proliferation of man-made lakes is now a major feature of the development process that is occurring in many parts of the world. Relatively few dams have been constructed for electricity generation and the majority are used only for irrigation, a particularly expensive means of increasing agricultural production. The building of a large dam in a semi-arid area has far-reaching effects on the ecology of a region, quite apart from its possible effect on agriculture. The effects are so diverse and pervasive that only a well-integrated, trans-disciplinary study has much likelihood of predicting even the most significant of the consequences. The most important of these consequences concern the health and well being of the local population. There is ample evidence that the creation of dams frequently spreads water-borne disease, notably schistosomiasis. Fortunately it now appears that the spread of schistosomiasis can be limited by an appropriately trans-disciplinary approach to water management. Regrettably, studies of the broad ecological impact of proposed dam building projects are much less common in developing countries than in the developed nations, although they are particularly necessary in the Third World because of the greater vulnerability of people living in subsistence economies.

This bulletin is an attempt, within the limitations of modest funds and the availability of specialists, to assess the impact of dam building on the Tana River basin in Eastern Kenya. The Kamburu dam is the second of a series of relatively small water storages being constructed specifically for power generation. This dam was near completion when the study began and surveys were extended to include a future dam site (Gtaru) 5 km downstream as a means of obtaining baseline data. The Tana River is the largest in Kenya but the flow is seasonal and the area of the Kamburu dam ranges from 1500 ha when full to 220 ha in the dry season. Although this fluctuation may be undesirable from the viewpoint of power generation it has the advantage of preventing the buildup of aquatic vegetation and weeds. Aquatic weeds are the habitat for bilharzia-carrying snails and the report suggests that the lack of suitable habitat for the snails has been a major factor in discouraging the spread of schistosomiasis. Unfortunately, it is planned to construct a "high dam" upstream to regulate water flow, thus removing this natural control.

The book consists of a series of papers by a team of geographers, ecologists, epidemiologists and others, mainly from the University of Nairobi. The ten chapters cover studies of geology, hydrology, soil erosion and sedimentation; climate; vegetation and wildlife; aquatic ecology and wildlife; land-use and agricultural settlement; and epidemiological, sociological and demographic surveys. The book is edited by a geographer, Professor R. S. Odingo, who also wrote or contributed to six of the ten chapters. Despite the wide range of disciplines covered he has succeeded in making all sections clear and easy to read. The illustrations, maps and presentation of the whole volume are also of commendably high quality. Some contributions are less detailed and critical than others and some topics (such as aquatic vegetation) have rather sketchy treatment presumably due to the unavailability of suitable personnel. In at least one section more time could usefully have been spent on data collection and less on interpretation.

The dams are located almost on the Equator at an altitude of 1000–1200 m. Temperatures and evaporation rates are high and the rainfall ranges from 1000 mm to about 600 mm in the lower and drier part of the catchment. Before the hydro-electricity project began the Kamburu area was heavily infested with tsetse flies and

few people lived there. Wildlife was abundant. In these circumstances agriculture was, and is, precarious. An increasing population is attracted to the district in search of work, and their attempts to grow maize, the favoured crop, reputedly fail four years in five. Apart from the more normal hazards, near the river the ravages of elephants, buffaloes and hippos make cereal cultivation completely uneconomical. Cattle are a more reliable form of agricultural production and numbers are increasing but live-stock herding has serious implications for the dams: control of tsetse fly requires the cutting of brush and undergrowth and this increases erosion. Driving cattle daily to water at the river or dam provokes severe erosion along the tracks and their denuded margins. A highly significant finding by the team was that the silt load in some streams of the catchment was eight times greater in practice than had been allowed for in calculating the "useful life" of the dam.

The average reader of Tropical Grasslands will find this Bulletin interesting to browse through but I suspect that purchase orders and recommendations to libraries to acquire it will come mainly from geographers and those concerned with ecological impact studies elsewhere in the world. For the latter it will certainly prove, as the introduction rightly claims, a useful example for future studies connected with river basin development. It is also a good example of what can be achieved in a developing country at relatively small cost by a trans-disciplinary team drawn from its resident specialists.

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