

life forms have evolved. This interconnectedness also implies that geology not only determine the locus of civilization but also provides for only agroforestry methods of food grain production on a regional scale in a river basin. The complex interconnections among geologic, hydrologic, climatic and ecological processes need to be studied in detail as this knowledge is essential for better policy options of land and water uses and ensuring food security. This emerging field of research, I call Farmland Geology, is an important area of sustainability science.

The subject, applied geology, has been taught at the Master's degree level in many academic institutions to train manpower in the exploration of minerals, fossil-fuels and of groundwater. These earth materials have been the driving capital in the productive sector of world's

economy. Economic development based on raw materials was initially responsible for industrial revolution, followed by agricultural revolution, which together led to human population growth and degradation of earth's life-supporting environment. One area of major global concern today is land degradation, soil erosion and, therefore, food security. The earth science community need to develop the science of Farmland Geology as this knowledge would save their own species, if not the entire mankind, from extinction.

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The Mettur Dam fisheries

The Cauvery Irrigation System dates from time immemorial. Improvements to the system under the British rule date from 1801 when the *East India Company* took over the Tanjore District: reforms on modern lines may be stated to have commenced from 1836 when Sir Arthur Cotton, the father of most of the irrigation systems of South India, built the upper anicut. Further improvements followed which rendered the distribution of water when available in the river complete. But there still remained the problem of fluctuating supplies and long periods of drought. The solution was a storage reservoir and the Stanley Reservoir was finally decided on in 1910. The construction of the Mettur Dam, the second largest in the world, was commenced in 1925 and completed in 1934. The lake comprises a thirty-three mile length of the river and has an area of

sixty square miles. It holds 93,500 million cft of water and is expected to irrigate no less than 1,352,000 acres.

Unfortunately the effect of the Dam on the fisheries of the river below was disastrous. The number of valuable Indian Shad or Hilsa, the most important sea-fish ascending the Cauvery for breeding purposes, has seriously declined as the high floods which enabled them to ascend the river no longer occur. The heavy scores and the consequent deep pools all along the river caused by natural floods are gradually disappearing and the breeding fish of all kinds which sheltered in them are gradually decreasing in number. The serious decline of the fisheries of the Cauvery will be evident from the fact that the fishery rentals of the river below the Dam in the Salem, Coimbatore, Trichinopoly, Tanjore and South Arcot Districts which used to amount to over 80,000 rupees annually has steadily declined since the formation of the Dam to about 42,900 rupees. When these fisheries which used to be under the control of the respective District Boards were taken over by the Fisheries Department for scientific organization and development two decades ago, the average annual rentals used to be only about Rs. 41,000 which was paid as compensation every year to the five District Boards concerned. . . .

If the problems of development necessitated by the formation of the Reservoir

are complex and difficult, equally so are those of judicious exploitation. From time immemorial our inland fishermen have never fished deep and perennial lakes. Their methods and implements are poor and suited only for fishing shallow or transient waters, especially when the rivers and tanks dry up in the hot weather. If a lake with a capacity of 93,500 million cubic feet and a depth of 165 feet is to be fished to maximum advantage, all known methods of fishing deep waters have to be introduced by the Department by demonstration and the nets perhaps even supplied by subvention. It is hoped that the Co-operative Society which has just been formed will form the nucleus of a scientifically organized agency for the fishing and marketing of the produce of the lake.

To prevent the advent of large capitalists who are apt to monopolise the profits to the detriment of the actual workers, it has been decided to license coracles and tackle and not to auction the fishery.

The system of licensing will, it is hoped, enable a closer control of these new and great fisheries in the early years, help the Department in educating the fishermen individually and through the medium of Co-operative Societies in improved methods of fishing and wean them from the clutches of middlemen. . . .

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