

development has been rapid in recent years, Madras State still has a long way to go before its supply of electrical energy will approach the levels reached in other parts of the world. Only 2,500 of its approximately 30,000 villages have electric service, and electricity generated in the State is only 30 kilowatt hours per capita per annum, as compared to average rates of 1,000 kilowatt hours in Western Europe and 2,400 kilowatt hours in North America.

Because of the vital importance of maintaining food production in those parts of Madras where rainfall is light, irrigation has a prior claim on electrical power, large quantities of which are required for pumps used to bring water to areas not reached by irrigation canals (25,000 of these pumps are now in service and 3,000 more are being added each year). Hydro and steam plants devoted to power production can be operated whenever required throughout the year to meet load demands within the limitations of their plant capacity and the water available. However, since water is more important than power, hydro plants using irrigation water can only be operated as and when water is required for irrigation. Hence, during the irrigation season of about seven months each year (July to January) there is abundant water for power generation at these plants, but during the remaining five months, when irrigation requirements are reduced and water is being stored in the reservoirs, the output of electric energy is drastically restricted. It is, therefore, essential that the power system have substantial generating capacity which can be used as desired at any time of year.

The Canadian engineers who studied the Kundah development have reported to the Canadian government that it will help materially to make up existing shortages, to provide for the industrial and agricultural expansion of the State, to raise the standard of living, and to reduce the threat of recurrent drought and famine.

The Project

The Kundah River is in the Nilgiri Hills, 300 miles west of Madras. Its main stream is formed at an elevation of about 6,200 feet above sea level by the confluence of the Avalanche and Emerald Rivers near the southern edge of the Nilgiri Plateau. It then cascades down the mountain side in a southeasterly direction for a distance of some 14 miles to join the eastward flowing Bhavani River at an elevation of 1,340 feet. The Bhavani in turn joins the Cauvery River and empties into the Bay of Bengal. Although the Kundah is a relatively small stream and its drainage area above the confluence of the Avalanche and Emerald is only 24 square miles, three tributaries downstream make significant contribution to its flow.

Above the confluence of the Avalanche and the Emerald the gradients of both rivers are relatively flat and the valleys widen out into basins with gentle side slopes that lend themselves to the construction of reservoirs. Below the confluence the valleys are deep and narrow, and are separated by high ridges.

The Kundah River possesses most of the attributes of a good power river—good rainfall, steep gradients, high ridges on each side, and sound underlying rock. On the other hand, as pointed out above, the drainage area is relatively small, and only the flow from the area above the confluence of the Avalanche and Emerald can be controlled in storage reservoirs.