

SECTION II

IMPACTS UPSTREAM

Chapter 3

Upstream impacts

3.0 INTRODUCTION

The environment of a Water Resources Project (WRP) can be significantly influenced by other WRPs apart from the general environmental factors operating in the upstream. These would influence the quality and quantity of water that is dammed downstream.

We have made an attempt to identify the environmental conditions prevailing upstream of the Sathanur project. The direct and indirect implications of the upstream environment on the project and the eco-restoration measures adopted by the authorities have also been evaluated.

3.1 STATUS

Prior to the construction of the Krishnagiri and Sathanur reservoir projects, there were no storage reservoirs in the Ponnaiyar river basin except for a small barrage across the tributary Markandanadhi. It was built in 1942 to irrigate an area of 400 ha. The main river and its tributaries had only four barrages across them. Currently two of those, i.e. Aliyalam and Nedungal, are situated upstream of

Sathanur reservoir and the other two Thirukoilur and Ellischoultry are located downstream, irrigating a vast tract of land under direct (canal) and indirect (tank) system (Figure 3.1).

Krishnagiri project lies 113 km upstream of Sathanur dam near Krishnagiri town, Dharmapuri district. It has 3647 ha of land under direct canal irrigation, covering some thirteen villages and 920 ha under indirect tank irrigation. The supply is regulated for two crop seasons. Nedungal barrage lies about 16 km below Krishnagiri project.

The Ponnaiyar river basin is approximately 12986 km². Total catchment of Sathanur reservoir is 10826 km² and the independent catchment is 5397.5 km². The basin and catchment details are furnished in Table 2.0 (Chapter 2).

The important projects below Krishnagiri reservoir till Sathanur are Pambar reservoir on the Pambaru river, a main tributary of Ponnaiyar river, about 3 km from Uthanagarai and Vanairu reservoir near Harur constructed on the Vanairu river. Vanairu is one of the major tributaries of Ponnaiyar and serves the irrigation demands of its region.

Paddy (*Oryza sativa*), ragi (*Eleusine coracana*), and millets (*Pennisetum typhoides*) are the major crops cultivated upstream of the Sathanur reservoir. On river bank betel (*Piper betel*) vine are grown. Pulses (*Phaseolus mungo*, *P. aureus*, *Cajanus cajan* etc.) millets, and mango (*Mangifera indica*) orchards on the foot hill slopes are grown as monsoon crops.

The catchment of Ponnaiyar between Krishnagiri and Sathanur reservoirs is a rolling country mixed with hills and plains. The hills are Shervarays, Javadi, and Chitteri. The catchment upstream of the Sathanur mostly lies in Ponnaiyar reserve forest. The forest consists of dense scrub and open mixed tropical trees like *Acacia amara*, *Acacia initia*, *Eucalyptus* hybrid, *Acacia sundra*, *Azadirachta imitea*, *Zizyphus xylophyrus* etc. The extreme heat and drought conditions supplemented with insufficient rains in the tract have reduced the reserve forest into a degraded forest, as evident from the thorny trees that abound. The soil is red gravelly loam to loam in the forest region.

3.2 IMPACTS

The major portion of the independent catchment, upstream Sathanur reservoir, consists of dry, degraded, deciduous open forest, rocky terrain, uprising hills and agricultural plains. The soil erosion hazards are thus exacerbated by these environmental conditions prevailing upstream. Cattle grazing and illegal felling of the trees in the forest, as confirmed by the authorities, lead to soil loss. The efforts of the authorities to afforest the denuded natural forest fail due to the extreme hot and drought-like conditions. The sediment-laden water flows downstream and the sediments get trapped in the Sathanur reservoir. An increase in the solid contents in the reservoir has been observed over the past years (Figure 9.6, Chapter 9).

Sedimentation studies undertaken for the Krishnagiri and Sathanur reservoir (Chapter 5) reveal that the, specific erosion from the gross catchment of Sathanur reservoir is higher compared to that of Krishnagiri reservoir despite the fact that Krishnagiri project is situated upstream of the Sathanur hence should trap more silt than the Sathanur reservoir.

The reservoirs and their command areas upstream Sathanur project indirectly affect the water quality of the Sathanur reservoir. All the reservoirs upstream Sathanur reservoir have been constructed to meet the irrigation demands of their respective commands. Thus, the agricultural practices upstream and the agricultural runoff draining into the Ponnaiyar river lead to the alterations in the water quality downstream as evident by the increased value of alkalinity, chlorides, hardness, phosphorus, nitrogen (nitrate) and other ions in the Sathanur reservoir (Chapter 9).

3.2.1 Ameliorative steps taken by the authorities

To check the erosion from the catchment, several silt retention dams have been constructed upstream of the reservoir. The forest officials often undertake afforestation programmes but most of them fail to deliver results because of prevailing dry and hot conditions. Only thorny, deciduous and sturdy trees with meagre canopy cover survive in these conditions, as explained by the forest officials.

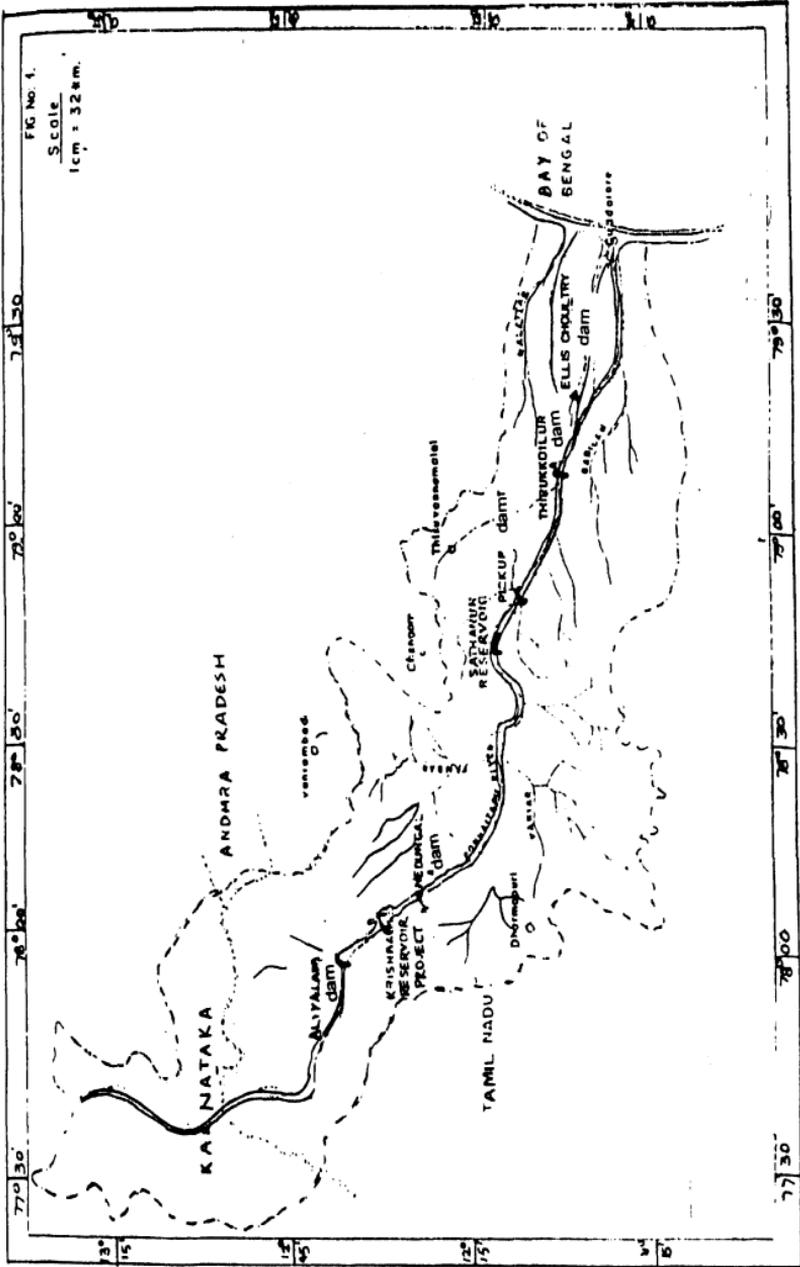


Figure 3.1 Location of various projects in Ponnaiyar river basin