

Chapter 7

Reservoirs

7.1 General

The dam Srisaillam was constructed on the river Krishna across the narrow gorge, about 1.6 km downstream of Patalganga bathing ghat near Srisaillam town. Srisaillam project is the first major hydro-electric project constructed on the river Krishna in Andhra Pradesh. The project forms part of the scheme for integrated development and utilisation of the water resources of the river Krishna. The construction of the project was completed and the first power unit was commissioned in the year 1982.

The reservoir has a gross storage capacity of 8723 Mm³ at FRL 269.75 m. The catchment area of Krishna basin up to Srisaillam dam site is 211657 km².

7.2 Controlling Levels and Storages of Srisaillam Reservoir

The controlling levels and corresponding storages of the Srisaillam reservoir are given in Table 7.1.

Table 7.1
Controlling levels and corresponding storages of Srisaillam reservoir

	Level (m) above MSL	Storage (Mm³)
MWL	271.88	10153
FRL	269.75	8723
MDDL	260.30	4461
Dead storage	244.75	1645

The crest level of the spillway is fixed at 252.98 m.

7.3 Sedimentation Studies and Life of Srisaillam Reservoir

Silting of reservoirs on Krishna river has been extensively studied by Govt. of A.P at the time of preparation of Pulichintala project report (on the river Krishna) and later at the time of Krishna-Pennar project and

lastly for the project Nagarjunasagar. All these studies have shown extended life for the reservoirs. Col. Elis calculated the useful life of the reservoir as 370 years for a dead storage capacity of 4643 Mm³ (164 TMC) . At Srisaillam reservoir, the storage capacity up to MDDL is 4461 Mm³ (158 TMC) and therefore the useful life of the reservoir based on the study is predicted to be more than 300 years by Andhra Pradesh irrigation authorities. The life may perhaps be even longer due to the fact that a large number of reservoirs have been constructed or under construction in the upper reaches which will trap most of the silt.

7.4 Submergence Area

Srisaillam reservoir is an existing project. Due to the formation of Srisaillam reservoir, 38 villages in Kurnool district and 62 villages in Mahaboobnagar district of Andhra Pradesh were affected. The total area of submergence at FRL was 61642 ha. From the water spread map it is observed that almost all the villages that were submerged under the reservoir were lying upstream of Siddheswaram village and that the submergence between Siddheswaram and Srisaillam was very little. This is due to the fact that the river flows in a deep gorge between Siddheswaram and Srisaillam and submergence in this reach is confined to the gorge portion. The affected villages and the population were rehabilitated by the Government of Andhra Pradesh.

7.5 Annual Evaporation Losses from Reservoir

The submergence area of the reservoir lies in Kurnool and Mahaboobnagar districts of Andhra Pradesh state. Month-wise rates of evaporation in mm/day observed at Kurnool IMD station are given in Table 7.2. The same have been considered for simulation studies of Srisaillam reservoir.

Table 7.2

Monthly evaporation losses observed at Kurnool IMD station

Month	Evaporation losses (mm/day)	Month	Evaporation losses (mm/day)
Jan	3.6	Jul	4.5
Feb	5.2	Aug	4.0
Mar	7.0	Sep	3.9
Apr	8.0	Oct	3.3
May	8.5	Nov	3.4
Jun	6.9	Dec	2.9

Source : India Meteorological Department

7.6 Balancing Reservoirs

It is proposed to divert water from Srisaillam reservoir to Gorakallu and Owk balancing reservoirs of SRBC and Velugodu and Sri Pothuluri Veera Brahmendra Swamy balancing reservoirs of Telugu Ganga Canal to the extent possible and the actual field requirement to be met from these balancing reservoirs.

7.6.1 Balancing Reservoirs on Srisaillam Right Branch Canal

Srisaillam Right Branch Canal off takes from Banakacherla cross regulator drawing the supplies required through head sluice provided therein and runs for a length of 112.73 km upto Owk. One balancing reservoir at Gorakallu at 50.22 km of canal and another balancing reservoir at the end of canal at Owk are proposed to be formed for storing Krishna water during the flood period and releasing subsequently for irrigation.

7.6.2 Balancing Reservoirs on Telugu Ganga Canal

Telugu Ganga Canal takes off from Banakacherla cross regulator drawing the supplies required through head sluice provided therein. One balancing reservoir at Velugodu at 7.78 km and another Sri Pothuluri Veerabrahmendra Swamy reservoir at 106.66 km of canal are proposed to be formed for storing Krishna water during the flood period and releasing subsequently for irrigation.

7.7 Additional Studies

From the survey and investigation conducted for the link alignment, it is observed that except for a few kilometers stretch in the initial reach, the natural streams can carry more quantity of water than that proposed for the link. Accordingly, studies have been made to ascertain the possibility of increasing the quantity of water transfer through the link canal from Srisaillam reservoir. From these studies, it is observed that any increase in the transfer quantity results in the reduction of firm power production at Srisaillam. It is found that a maximum quantity of 3200 Mm³ in the pattern given in Table 7.3 could be diverted from Srisaillam reservoir with firm power production of 60 MW.

Table 7.3

Month	Quantity (Mm³)
July	58
August	464
September	1168
October	582
November	464
December	464

However, adopting the above pattern may require extensive modifications to the head works and also construction of huge flood embankments for the entire length of the natural streams. As this is not considered feasible at this stage, the transfer of 2310 Mm³ as originally contemplated has been considered for the link.

7.8 Operation policy of the Link canal

Water will be released from Pothireddipadu head regulator only when water level in the Srisaillam reservoir is above 266.70 m.

The yield that would be available through the natural streams does contribute to the yield required to meet the demands contemplated by Andhra Pradesh State Government. The link discharge is to be let in to the same natural streams in addition to this natural flow. However, in the case of floods in these streams, it is proposed to regulate the release of Krishna waters from Srisaillam in to these streams in such a way that the combined flow would not inundate the surrounding areas.