

Chapter 7

Reservoirs

7.1 General

No new reservoirs are contemplated under the link project and also no additional storages are proposed either at the off-take point of link i.e. Nagarjunasagar reservoir or at the tail end point i.e. Somasila reservoir, for effecting the diversion of waters as proposed under this link project. The simulation studies of the Nagarjunasagar reservoir presented in Chapter on “Water resources and hydrology” show that without raising the storage capacity of the reservoir, all its irrigation demands including the link canal demand could be met successfully.

The details regarding the storages, levels and the criteria adopted for fixing the same for Nagarjunasagar and Somasila reservoirs are furnished in the following paragraphs.

7.2 Controlling levels and storages

7.2.1 Nagarjunasagar reservoir

Nagarjunasagar is the existing terminal reservoir on river Krishna. The project is formulated to provide irrigation facilities to about 8.95 lakh hectares situated in Guntur, Prakasam, Nalgonda, Khammam and Krishna districts apart from producing about 960 MW of seasonal hydro-electric power, navigation facilities, development of pisciculture and providing recreation benefits besides mitigating the flood hazards. Accordingly, the reservoir storages and levels have been fixed to fulfill the above needs. The principal levels and corresponding storages of the reservoir are furnished in Table 7.1.

Table 7.1

Principal levels and storages of Nagarjunasagar reservoir

	Level (m)	Storage Capacity (Mm³)
MWL	181.05	11918
FRL	179.83	11560
MDD L	155.45	5827
DSL	149.05	4727

7.2.2 Somasila reservoir

The Somasila reservoir is the terminal reservoir on Pennar river. The project is formulated by Govt. of AP to stabilise the existing Pennar delta system and the commands under the tanks under Kavali and Kanapur canals and also to provide irrigation to new areas through the South and North feeder canals. In addition, 409 Mm³ of water for supply to Chennai city and 890 Mm³ of water for irrigating 1.23 lakh ha under Telugu Ganga project will also be supplied from the Somasila reservoir. The component of Chennai water supply would be met from the 425 Mm³ of water to be diverted from Krishna through the Telugu Ganga Canal while the requirement of irrigation under the Telugu Ganga project would be met by diverting the flood flows of Pennar and Krishna rivers to the Kandaleru reservoir.

The principal levels and corresponding storages of the reservoir are furnished in Table 7.2.

Table 7.2

Principal levels and storages of Somasila reservoir

	Level (m)	Storage Capacity (Mm ³)
MWL	101.80	2483
FRL	100.58	2208
MDD L	82.30	214
DSL	82.30	214

7.3 Sedimentation studies and life of reservoirs

7.3.1 Nagarjunasagar reservoir

Silt observations on Krishna River are being made systematically for a long time. They show that the Krishna River carries less silt compared to many other rivers of our country. The Srisaillam reservoir, situated upstream of Nagarjunasagar reservoir, is having the storage capacity of 4461 Mm³ upto MDDL and the useful life of the reservoir is estimated to be more than 300 years by the Andhra Pradesh Irrigation authorities. As the Nagarjunasagar reservoir is having a dead storage capacity of 4727 Mm³ and is located downstream of Srisaillam reservoir, the useful life of the reservoir would be still higher. Further, due to the construction of large number of reservoirs in the upper reaches of the Krishna and its tributaries, the silt is likely to be trapped in those reservoirs and relatively silt free water would flow into the Nagarjunasagar reservoir.

7.3.1.1 Effect of the link proposal on the life of Nagarjunasagar reservoir

There are apprehensions by the Govt. of Andhra Pradesh that with the diversion of surplus Mahanadi and Godavari waters to the tune of 14200 Mm³ into the Nagarjunasagar reservoir, it might get silted up soon and thereby cause reduction in the useful life of the reservoir, as the Godavari river carries more silt as compared to the relatively silt free waters of Krishna river. The diversion of surplus Godavari waters into the Nagarjunasagar reservoir is proposed from the contemplated Inchampalli reservoir on Godavari, silt carried by the Godavari river to a large extent would get trapped in the Inchampalli reservoir itself and relatively silt free water is likely to flow into the Nagarjunasagar reservoir, through the Inchampalli -Nagarjunasagar link canal. As such, the effect of the diversion of surplus Godavari waters to the Nagarjunasagar reservoir on its life is likely to be minimal.

7.3.2 Somasila reservoir

As per the Somasila project report-1984, prepared by the Irrigation Department, Govt. of Andhra Pradesh, the rate of silting considered for the fixation of DSL of Somasila reservoir is 0.019 ha.m/sq.km./year. The silt volume that gets deposited below MDDL during its life period of 100 years is 171.32 Mm³ out of the total likely silt deposit of 398 Mm³ and the remaining silt will get settled in the live storage capacity of the reservoir i.e., between MDDL and FRL. The live storage of the reservoir between MDDL and FRL being 1994 Mm³, the utilisable live storage of the reservoir at the end of 100 years would be 1767 Mm³.

7.3.2.1 Effect of link proposal on the life of Somasila reservoir

As the silt carried by the diverted waters will get trapped to a large extent at the source reservoirs like Inchampalli, Nagarjunasagar etc; relatively silt free water flows into the Somasila reservoir. And as such, there may not be any effect on the life of the Somasila reservoir due to these inter basin link proposals.

7.4 Annual evaporation losses from the reservoirs

7.4.1 Nagarjunasagar reservoir

The Krishna Water Disputes Tribunal has allocated a quantum of 481 Mm³ (17TMC) of water towards evaporation losses for the Nagarjunasagar project. The monthly evaporation losses considered for simulation of Nagarjunasagar reservoir are furnished in Table 7.3.

Table 7.3

Monthly evaporation losses of Nagarjunasagar reservoir

Month	Evaporation (cm)	Month	Evaporation (cm)
June	23.7	December	10.2
July	15.2	January	10.2
August	15.2	February	9.8
September	15.3	March	2.9
October	15.2	April	30.6
November	10.2	May	30.4

7.4.2 Somasila reservoir

The average annual evaporation losses from Somasila reservoir are assessed as 266 Mm³ (9.4 TMC).

7.5 Submergence area

Since Nagarjunasagar and Somasila are the existing reservoirs and also no additional storage is proposed, there would be no additional submergence due to the Nagarjunasagar – Somasila link canal.