

## Chapter 7 Reservoirs

### 7.1 General

The proposed Godavari (Inchampalli) – Krishna (Pulichintala) link canal project envisages to transfer a quantity of 4370 Mm<sup>3</sup> of surplus water from the proposed Inchampalli reservoir on river Godavari. This link proposal envisages the construction of Inchampalli reservoir with FRL 112.77 m as was originally planned by the three states viz., Maharashtra, erstwhile Madhya Pradesh (now Chattisgarh) and Andhra Pradesh as a joint project at its head.

The link project also envisages construction of Pulichintala reservoir at its tail end which was also originally contemplated by the Govt. of Andhra Pradesh across Krishna River. The Government of Andhra Pradesh has already initiated the construction of the project and is in its initial stage.

### 7.2 Controlling levels and storages

#### 7.2.1 Bhopalpatnam reservoir

Bhopalpatnam dam site is situated on the river Indravati 9 km from Mattimarka village in Bijapur Tahsil of Bastar district in the state of Chattisgarh. The site is about 31 kms from Bhopalpatnam and is connected with Jagadapur by a metalled road. The details of principal levels and storages of Bhopalpatnam reservoir are given in Table 7.1.

**Table 7.1**  
**Principal levels and corresponding storages of the**  
**Bhopalpatnam reservoir.**

Particulars	Levels (m)	Storage (Mm <sup>3</sup> )
M.W.L	201.160	-
F.R.L	200.254	9494
M.D.D.L	174.48	1073

#### 7.2.2 Inchampalli reservoir

The Inchampalli project is a joint project between states of Maharashtra, Chattisgarh and Andhra Pradesh. The dam site is 12 km downstream of the confluence of Indravati with Godavari River. The river Godavari forms the boundary between states of Chattisgarh and Andhra Pradesh at dam site.

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

**Table 7.2**  
**Principal levels and storages of Inchampalli reservoir \***

<b>Particulars</b>	<b>Level (m)</b>	<b>Storage (Mm<sup>3</sup>)</b>
MWL	112.77	10374
FRL	112.77	10374
MDDL	106.98	6089
DSL	103.62	4452

\* As per original area capacity tables.

### **7.2.3 Pulichintala reservoir**

The Govt. of Andhra Pradesh has proposed to construct a reservoir across Krishna river, upstream of Prakasam Barrage at Pulichintala village with a gross storage capacity of 1296 Mm<sup>3</sup> at FRL 53.34 m . The project is mainly proposed for stabilization of existing ayacut in Krishna delta for paddy crop only. The principal levels and corresponding storages of the reservoir are furnished in Table 7.3.

**Table 7.3**  
**Principal levels and storages of Pulichintala reservoir**

<b>Particulars</b>	<b>Level (m)</b>	<b>Storage (Mm<sup>3</sup>)</b>
MWL	53.30	1296
FRL	53.30	1296
MDDL	42.70	270
DSL	38.70	--

## **7.3 Sedimentation studies and life of reservoirs**

### **7.3.1 Inchampalli reservoir**

As per the Inchampalli Joint Project Report, Vol-I 1988 prepared by the Irrigation Department, Govt. of Andhra Pradesh, it is assumed that the useful life of the reservoir gets terminated when it's capacity is reduced to 20% of the designed capacity. On the above assumption and taking into account the net dependable yield and sediment flow at Inchampalli site with all upper existing, committed and contemplated schemes, the useful life of the reservoir is worked out as 265 years. However, in the project report, the life of the reservoir is considered as only 100 years for the purpose of sediment distribution.

### **7.3.1.1 Effect of the link proposal on the life of Inchampalli reservoir**

Due to the construction of large number of reservoirs in the upper reaches of the Godavari and its tributaries, the silt is likely to be trapped in the reservoirs and relatively silt free water would flow into Inchampalli reservoir and thus the life of the reservoir has been assessed as 265 years as indicated above. Inchampalli is not a terminal reservoir for any of the link canals proposed. But it is a diversion point for two major link canals viz., (i) Godavari (Inchampalli) – Krishna (Nagarjunasagar) (ii) Godavari(Inchampalli) – Krishna(Pulichintala) link and hence the life of the reservoir is likely to be improved because of the link canal proposals. As such, the effect of the diversion of surplus Godavari waters through this link on the life of Inchampalli reservoir is minimal.

### **7.3.2 Pulichintala reservoir**

As per the Pulichintala Project Report – 1985 prepared by the Irrigation Department, Govt. of Andhra Pradesh, the silt volume that gets deposited below MDDL during its life period of 100 years is 283 Mm<sup>3</sup>. The rate of silting considered for assessing the same is 0.5 acre. Feet/sq.mile/year.

#### **7.3.2.1 Effect of link proposal on the life of Pulichintala reservoir**

As explained earlier mostly silt free water is anticipated from the upper reaches. Even if there is any silt from the free catchment, the same will get trapped to a large extent at the source reservoirs like Bhopalpatnam, Inchampalli etc. and relatively silt free water flows into the Pulichintala reservoir. And as such, there may not be any effect on the life of the Pulichintala reservoir due to this link proposal.

## **7.4 Annual evaporation losses from the reservoirs**

The average monthly pan evaporation data as available from the nearby station is made use for computing the evaporation loss of the reservoir. While doing so, 70% of pan evaporation is assumed and applied for reservoir.

### 7.4.1 Bhopalpatnam reservoir

The monthly evaporation losses of Bhopalpatnam reservoir considered for simulation studies carried out by NWDA are furnished in Table 7.4.

**Table 7.4**  
**Monthly Evaporation losses at Bhopalpatnam Reservoir**

<b>Month</b>	<b>Pan Evaporation (cm)</b>	<b>Month</b>	<b>Pan Evaporation (cm)</b>
June	18.1	December	11.9
July	10.3	January	15.7
August	19.6	February	20.2
September	22.6	March	30.3
October	17.7	April	38.9
November	17.3	May	49.7

### 7.4.2 Inchampalli reservoir

The monthly pan evaporation data considered for simulation of Inchampalli reservoir is furnished in Table 7.5.

**Table 7.5**  
**Monthly evaporation losses of Inchampalli reservoir**

<b>Month</b>	<b>Monthly Pan Evaporation (Cm )</b>	<b>Month</b>	<b>Monthly Pan Evaporation (Cm)</b>
June	23.1	December	10.2
July	15.2	January	10.2
August	15.2	February	10.1
September	15.3	March	15.5
October	12.1	April	23.1
November	10.2	May	23.3

The average annual evaporation losses from Pulichintala reservoir are assessed as 261 Mm<sup>3</sup> (9.2 TMC).

## 7.5 Submergence area

### 7.5.1 Inchampalli reservoir

The reservoir would submerge areas in all the three states of Maharashtra, Chattisgarh and Andhra Pradesh. The total submergence area in all the three states is about 94620 ha. The submergence area consists of 31.9% of forest, 38.3% cultivable lands, 23.3% open water

bodies, 5.8% shrubs, fallows, rock out crops & grazing lands and 0.7% of other varieties.

Table 7.6 and 7.7 give the state-wise breakup about the area of submergence and affected number of villages and population.

**Table 7.6**  
**Break up of submergence area (Area: ha)**

Sl No	Particulars	Andhra Pradesh	Maha-rashtra	Chhattis-garh	Total	Perce-ntage
1.	Total submergence Area	36875	24131	33614	94620	100.0
2.	Forest Land	9024	14392	6754	30170	31.9
3.	Cultivable lands	15296	5769	15146	36211	38.3
4.	Shrubs, fallows & Rock out crop	3744	1263	513	5520	5.8
5.	Open water bodies	8718	1901	11201	21820	23.3
6.	Other uses	93	806		899	0.7

**Table 7.7**  
**Villages and the population affected**

Sl No.	Name of the State	No. of villages	Population to be displaced
1.	Andhra Pradesh	65	38815
2.	Maharashtra	100	43186
3.	Chhattishgarh	64	18079
	<b>Total</b>	<b>229</b>	<b>100080</b>

The river portion of the submergence area namely Godavari and Indravati is 21820 ha. The cultivable land is mostly agricultural land and rain-fed crops like jowar and dry paddy are grown.

### 7.5.2 Pulichintala reservoir

The Pulichintala reservoir, when formed, submerges an area of 14399 ha. at the FRL of 53.34 m. About 875 ha of ayacut of the Nagarjunasagar project is also getting affected due to submergence under this reservoir. It has been proposed in the project report prepared by the Govt. of Andhra Pradesh to construct protection bunds to avoid submergence of this ayacut. In all, 16 villages with 5000 families get affected due to submergence and the population affected will be 25,000.

Under the link project proposal, the water will be let into the Pulichintala reservoir and picked up on the other end lifting water into the Pulichintla right bank canal to serve the part command of NSRBC as substitution. Hence neither additional storage nor additional submergence is involved in the Pulichintla reservoir by the link project.