
Planning and Execution of Nallamallasagar Reservoir and Link Canal

Chapter IV

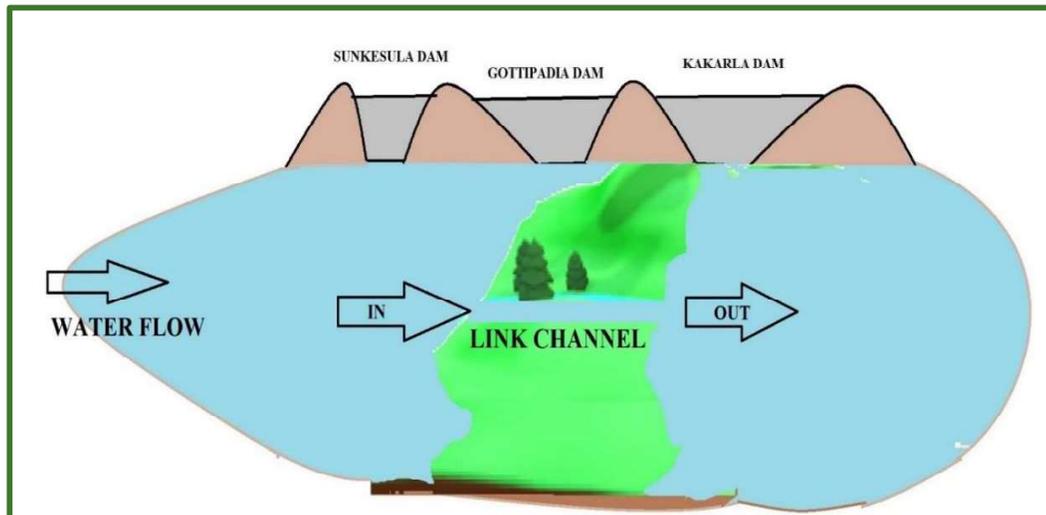
Planning and execution of Nallamallasagar reservoir and link canal

The department planned the construction of reservoir without ensuring the required dams which would prevent storage of water in the reservoir upto its optimum capacity. Erroneous deduction of Stage I quantity while arriving quantities for Stage II resulted in excess payment to contractor.

As a part of the project, it was proposed to form the Nallamallasagar reservoir with 53.85 TMC⁵¹ storage capacity. For this purpose, it was proposed (November 2004/August 2005) to construct three NOF concrete dams by closing three gaps between the hillocks near the villages Sunkesula, Gottipadia and Kakarla. These dams were initially proposed to be constructed at a height of (+) 230.00 m for Sunkesula, Gottipadia and (+) 220.00 m for Kakarla for Stage I and subsequently, the height was increased⁵² upto (+) 248.00 m each for Stage II.

The foreshore area of Nallamallasagar reservoir has two segments. Segment 1 covers Sunkesula, Gottipadia gaps and Segment 2 covers Kakarla gap. These two segments were separated by a land segment with higher ground level. To overcome the bottleneck of higher ground level for transferring water from one segment to the other, a link canal of 9.8 Km length with discharge capacity of 400 cusecs was proposed to be excavated. The excavation of link canal was initially planned for Stage I and subsequently widened to Stage II. The formation of reservoir with three dams and link canal is detailed pictographically in the following diagram (*Not to Scale*).

Line Diagram 4: Formation of Reservoir with three dams and Link canal



⁵¹ Live storage: 43.50 TMC plus Dead Storage: 10.35 TMC

⁵² Sunkesula (November 2007) Gottipadia (May 2008) and Kakarla (January 2009)

4.1. Planning for construction of Nallamallasagar reservoir and link canal

4.1.1 Construction of saddle dam not identified at planning stage

The Full Reservoir Level (FRL) of three NOF dams was (+) 244.00 m. As such, all gaps between the hillocks below the FRL have to be closed to prevent water leakage. Scrutiny of records showed that Department identified (August 2019) the fourth gap (+241.665 m). It was proposed to close this gap by constructing a saddle dam. Accordingly, detailed survey for construction of saddle dam was carried out and an estimate for ₹2.45 crore was prepared and submitted (December 2019) to Government for approval. The final approval from Government was still awaited as of November 2021.

Audit noticed that despite the Department being aware (January 2009) of the elevation of the dams for stage II, no provision was made to construct the saddle dam in the revised estimate. The Nallamallasagar reservoir cannot be filled to its maximum storage capacity unless the saddle dam is constructed.

The Government replied (January 2023) that the FRL of Nallamallasagar reservoir was (+) 244.00 m and Top Bund Level (TBL) was (+) 248.00 m. The ground levels at the proposed location of saddle dam were between (+) 242.00 m to (+) 243.00 m. Hence, the necessity of a saddle dam could not be identified. Due to formation of road in this location, the ground level was decreased to (+) 240.665 m. Further, it was replied that the reservoir could be filled upto (+) 240.665 m level immediately and in general practice, the new reservoir would be filled in three or four fillings to maximum storage capacity.

The reply is not acceptable, as the original ground levels, at the proposed location of saddle dam before formation of road, when compared to FRL of Nallamallasagar reservoir were less by 1.00 to 2.00 m. As such, the necessity to construct saddle dam in this location should have been envisaged at the time of grounding the project. However, the same was identified in August 2019 and final approval of the estimate is still pending.

4.2. Execution of Nallamallasagar reservoir and link canal

The construction of three NOF dams was divided into Packages II, III and IV respectively. The scope of work of these dams includes investigation and design for Stages I and II and initial execution was for Stage I⁵³. The works were entrusted (between 2005 and 2006) to three different contractors⁵⁴ on EPC contract system. Subsequently, the scope of work was revised⁵⁵ to Stage II by increasing the height of all dams. Accordingly, the additional quantities required for execution up to Stage II were worked out and IBMs were revised. The works were entrusted to the same contractors at original agreement rates and supplementary agreements were concluded.

The excavation of link canal was necessitated to transfer water from Segment 1 to Segment 2 in the foreshore area of the reservoir. The same was taken up (August 2005)

⁵³ Sunkesula and Gottipadia dams: + 230.00 m height, Kakarla dam: + 220.00 m height

⁵⁴ Package II: M/s. Jaiprakash Gayatri (JV), Package III: M/s. Larsen & Toubro Limited and Package IV: M/s. SCL-BSCPL (JV)

⁵⁵ Sunkesula (November 2007) Gottipadia (May 2008) and Kakarla (January 2009)

under Package IV initially for Stage I capacity. In Stage II, widening of link canal was proposed and revised IBM was prepared with additional quantities and entrusted to same contractor at original agreement rates and supplementary agreement was concluded (January 2009).

4.2.1 Erroneous deduction of Stage I quantity while arriving quantities for Stage II resulted in excess payment to contractor

Mention was made in Para No. 4.5 (v) of Report No. 2 of 2012 of Comptroller & Auditor General of India on GoAP (Jalayagnam) regarding erroneous deduction of Stage I quantity while arriving quantities for Stage II which resulted in excess payment to contractor. However, this omission continued as discussed below.

Scrutiny of records of link canal (Package IV) showed that the Stage I IBM was prepared and contract was entrusted on EPC contract system. Subsequently, the scope of work was enhanced (January 2009) to Stage II. The additional earth work involved to execute the link canal up to Stage II was arrived by revising the IBM. The execution of additional quantities was entrusted (January 2009) to the original contractor at the agreement rates of original contract.

Audit observed that the earth work excavation quantities adopted in IBM of Stage I was 32,39,459 cum. The total earthwork quantities required to execute the link canal up to Stage II was assessed in revised IBM as 50,11,837 cum. As such, the additional earth work quantities to be sanctioned was 17,72,378 cum at a cost of ₹13.39 crore. However, the Department sanctioned 23,55,186 cum at a cost of ₹22.34 crore by deducting the Stage I quantity of 26,56,651 cum instead of 32,39,459 cum. Erroneous deduction of Stage I quantity led to excess sanction of ₹8.95 crore. Out of this, an amount of ₹7.82 crore was already paid to the contractor up to Running Account (RA) Bill No.119.

The Government replied (January 2023) that executed earthwork quantities of stage I were less than IBM quantities. Further, the earth work quantities of Stage I as per execution was, all soils (1,32,833 cum), HDR (2,65,665 cum), F&F (5,31,330 cum) and Hard Rock (17,26,823 cum). Despite there being a reduction in quantities, the cost was increased due to increase in quantities of hard rock. Hence, the actual quantities as per execution was deducted to arrive the additional quantities required for Stage II.

The reply is not acceptable, as the earthwork quantity as per stage I execution in respect of Hard Rock classification was considered as 17,26,823 cum as against the total quantity of 1,365 cum, as per investigation for Stages I and II together. Further, no documentary evidence was supplied in support of the reply. As such, there was huge variation in quantities, despite the IBM for Stage II is prepared based on the investigation carried out by the same contractor.