

Chapter I

Introduction

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1. Background of the Project

The Polavaram Irrigation Project (PIP), contemplated as a multipurpose project, is located in Andhra Pradesh on the river Godavari, near Ramayyapeta Village of Polavaram Mandal in erstwhile West Godavari District, about 42 Km upstream of Sir Arthur Cotton Barrage, Dowlaiswaram.

The first conceptual proposal and survey for PIP originated (July 1941) from the erstwhile Madras Presidency named as “Ramapada Sagar Project”. However, the project did not materialise due to various reasons *viz.*, high cost involved, non-agreement on submergence aspects among neighbouring States, *etc.*

After a chain of deliberations, the States of erstwhile Andhra Pradesh, erstwhile Madhya Pradesh¹, Maharashtra and Odisha entered into an agreement in 1980 resolving the submergence aspects of PIP. This agreement was made part of the final order (Clause VI) of the Godavari Water Disputes Tribunal (GWDT). The Tribunal issued final orders directing the Government of Andhra Pradesh (GoAP) to obtain clearance for PIP from Central Water Commission (CWC) for Full Reservoir Level (FRL) of (+)150 feet.

Subsequently, based on the final adjudication of GWDT, the reports on the PIP were presented (1982) to CWC for the first Phase comprising Headworks and Left Main Canal (LMC) and second Phase (1984) namely Right Main Canal (RMC) at an estimated cost of ₹2,665 crore (as per Standard Schedule of Rates (SSR) 1985-86). CWC, Government of India (GoI) while communicating² further comments on hydrological aspects, requested (July 1989) to submit modified updated project report. The project report was updated time to time and a comprehensive modified project report as suggested by CWC was prepared and the project cost was arrived/estimated for ₹10,151.05 crore³.

The project was designed to irrigate 2.91 lakh hectares⁴ (7.20 lakh acres) in four districts⁵ of Andhra Pradesh, besides generation of 960 Mega Watt (12 turbines X 80 Mega Watt) of Hydel power, transfer of 80 Thousand Million Cubic feet (TMC) to the Krishna basin and supply of water to Visakhapatnam city for drinking and industrial use. Major part of the project is spread in Andhra Pradesh and also certain parts of Telangana, Chhattisgarh and Odisha States. The Index map of PIP is depicted in **Picture-1.1**.

¹ now Chhattisgarh is the participant State of this agreement, along with Telangana (carved out of erstwhile Andhra Pradesh)

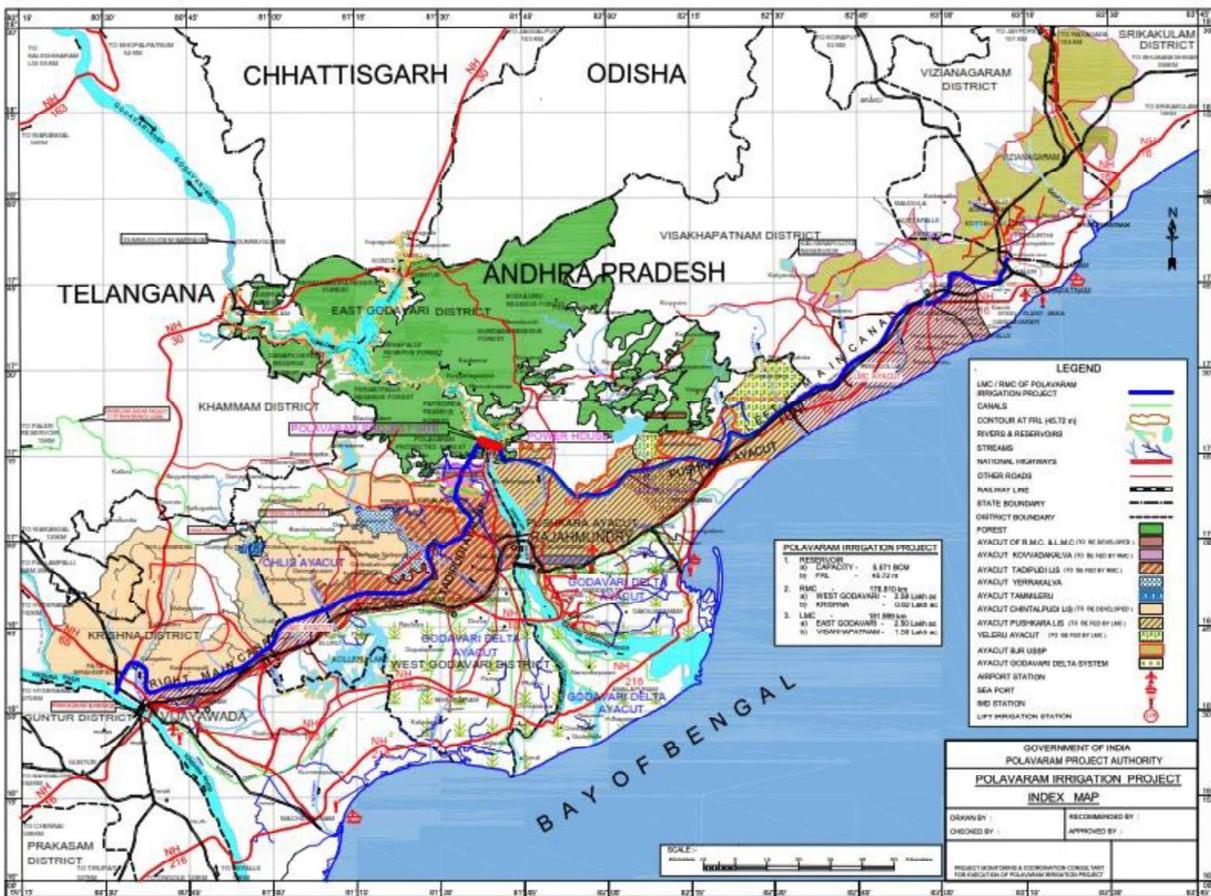
² letter No. 6/125/87-PA(S)/866 dated 27.07.1989

³ based on Standard Schedule of Rate 2003-04 to 2005-06

⁴ one hectare = 2.47105 acre

⁵ erstwhile districts of East Godavari, West Godavari, Krishna and Visakhapatnam

Picture 1.1: Index Map of Polavaram Project



Source: Polavaram Project Authority (ppa.gov.in)

The Government of Andhra Pradesh (GoAP) grounded the Polavaram Irrigation Project in 2004 comprising of three main components, *viz.*, Headworks along with left⁶ and right⁷ connectivities, LMC and RMC. The Headworks contemplates construction of 2,454 m long Earth-Cum-Rock-Fill (ECRF) dam, a Spillway⁸ on the right flank saddle, to regulate the design flood discharge of 36 lakh cusecs at an upstream flood disposal level of (+) 42.62 m. The Reservoir, thus formed, submerges an area of 601 Sq. Km at FRL (+) 45.72 m with a live storage capacity of 75.20 TMC. The Powerhouse is to be constructed at the slope of the ‘D’ hill, to the left of ECRF dam with an installed capacity of 960 Mega Watt (MW).

The LMC, proposed as a lined canal and designed for a discharge capacity of 496.21 cumecs, takes-off from the left connectivities planned for a length of 211.27 Km⁹. The RMC, proposed as a lined canal and designed for a discharge capacity of 497.77 cumecs, takes-off from the right connectivities planned for a length of 178.81 Km. The Right Main Canal is proposed to drop in the Budameru River and ultimately empties into the River Krishna through the Budameru Diversion Canal.

⁶ comprises of a Leading Channel, Off-take Regulator, Head Regulator, Navigation Lock, Navigation Channel, Navigation Tunnel, Irrigation Tunnel, Saddle Dam KL, Head Locks, *etc.*

⁷ comprises of a Head Regulator, Off-take Regulator, Saddle Dams E&F, two Bunds, two Twin Tunnels with Entry and Exit Channels, *etc.*

⁸ 1,128.40 m long with crest level of (+) 25.72 m with 48 numbers of radial gates (each 16m (width) x 20m (height))

⁹ Main canal: 177.81 Km + Existing water supply channel: 22.61 Km + New water supply channel: 10.85 Km

For the feasibility of execution, the project works were divided into 22 packages (Headworks: One package; Left connectivities including Navigation Channel: three packages; Right connectivities: three packages, LMC: eight packages and RMC: seven packages).

The PIP was accorded (January 2009) clearance by the Technical Advisory Committee (TAC) of Ministry of Water Resources (MoWR), Government of India (GoI) for an estimated cost of ₹10,151.05 crore based on 2003-04 to 2005-06 Price Level (PL), with scheduled completion in 12 years. In 2011, GoAP revised the Cost Estimate (1st RCE) of the project to ₹16,010.45 crore with 2010-11 PL, which was accepted¹⁰ (January 2011) by TAC of MoWR. As of March 2014, the total expenditure incurred on the project by GoAP was ₹4,730.71 crore (₹562.47 crore received as Central Assistance under Accelerated Irrigation Benefit Programme) and the balance estimated cost to be incurred was ₹11,279.74 crore. Investment clearance was accorded (February 2017) for 1st RCE for ₹16,010.45 crore with revised scheduled completion date as December 2018.

1.1 Declaration as National Project

On bifurcation of the State of Andhra Pradesh, PIP was declared (March 2014) as a National Project under Section 90 of Andhra Pradesh Re-Organisation Act, 2014. As per terms of the Act, GoI shall fund the cost of irrigation component¹¹ starting from April 2014.

As per present arrangement between GoAP and GoI, GoAP would execute the project on behalf of GoI and the expenditure incurred by GoAP through its budgetary resources would be reimbursed by GoI. The project proponents, *i.e.*, Chief Engineer, PIP and Project Administrator, PIP would prepare and submit bills every month to Polavaram Project Authority¹² (PPA). The PPA would scrutinise the bills and recommend to the Ministry of Jal Shakti¹³ (MoJS), GoI for payment.

After declaration as National Project, the Cost Estimate of the project was further revised (2nd RCE) by GoAP to ₹55,548.87 crore (at 2017-18 PL) and was accepted (February 2019) by TAC, GoI. A Revised Cost Committee (RCC) was constituted (April 2019) by GoI under the Chairmanship of Joint Secretary & Financial Advisor, MoJS, DoWR, RD & GR¹⁴ to examine the cost escalation of PIP. The RCC recommended (March 2020) the 2nd RCE for ₹47,725.74 crore at 2017-18 PL. The recommendation was yet (as of March 2023) to be accepted by GoI.

The main reasons for increase in cost estimate were time overrun, change in designs, delay due to frequent changes in contract agencies, increase in quantities and increase in amount of compensation as per new Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013.

¹⁰ during 108th meeting of TAC held on 04.01.2011

¹¹ except power generation component being executed by GoAP through its own resources

¹² established by GoI in accordance with sub-section 4 of section 90 of Andhra Pradesh Re-organisation Act, 2014 *vide* Gazette Notification No. 129 dated 28.05.2014

¹³ formerly Ministry of Water Resources and changed to MoJS since May 2019

¹⁴ Department of Water Resources, River Development and Ganga Rejuvenation

The benefits¹⁵ that would be accrued through PIP upon completion are enumerated in *Appendix 1.1*. The major components of PIP consisting of engineering works, Land Acquisition (LA) and Rehabilitation & Resettlement (R&R) are detailed in *Appendix 1.2*.

1.2 Organisational setup

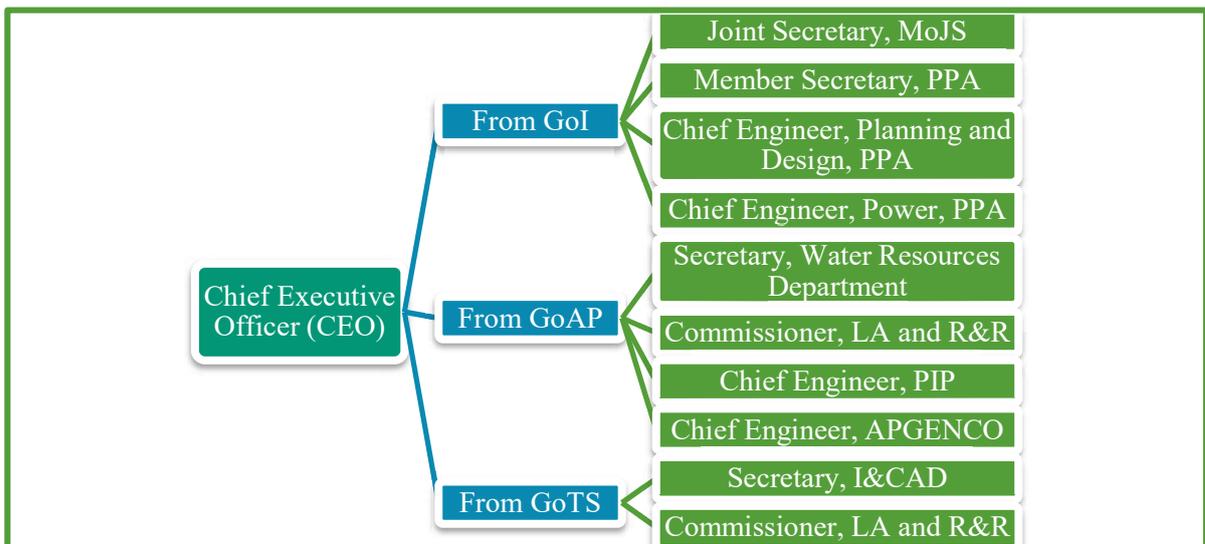
The organisational setup of various Departments/authorities involved in PIP are as detailed below.

(a) Governing body of Polavaram Project Authority

The Governing Body of PPA shall obtain all requisite clearances including environmental and forest for acquisition of land, *etc.* It is responsible for supervising the functioning of PPA. The Governing Body is headed by a Chairman (Secretary to GoI, Ministry of Water Resources) along with eight members¹⁶ and a Member Secretary.

The PPA shall execute the project, preferably through the concerned State Departments and/or any other expert agency and shall be charged with the regulation and development of PIP. The composition of PPA is depicted in *Chart 1.1*.

Chart 1.1: Composition of Polavaram Project Authority



Source: ppa.gov.in

(b) Water Resources Department

As per the present arrangement between GoI and GoAP, the Water Resources Department (WRD) of GoAP, headed by the Principal Secretary is responsible for execution of the project on behalf of PPA. The execution of engineering works is the responsibility of Chief Engineer (CE), PIP, construction of Powerhouse is overseen by CE, APGENCO¹⁷ and Commissioner

¹⁵ domestic water supply, inter-linking of rivers, industrial water supply, tourism, *etc.*

¹⁶ Chief Secretary to GoAP; Chief Secretary to Government of Telangana State (GoTS); Secretary to GoI, Ministry of Environment and Forest; Secretary to GoI, Ministry of Finance (Department of Expenditure); Secretary to GoI, Ministry of Power and Secretary to GoI, Ministry of Tribal Welfare (or their nominees not below the rank of Joint Secretary); Chief Executive Officer, PPA and a representative from NITI Aayog (not below the rank of Joint Secretary)

¹⁷ Andhra Pradesh Power Generation Corporation Limited

(R&R), Special Collector (LA) and Project Administrator (R&R) are responsible for implementation of LA and R&R.

1.3 Audit Objectives

The Performance Audit of Polavaram Irrigation Project was taken up with the following objectives to assess whether:

- **Headworks including Powerhouse**, were planned, designed and executed economically and effectively for required water storage and power generation capacity respectively.
- **Canals (LMC and RMC works)** were planned and executed economically and effectively with required last mile connectivities to cater to the industrial, irrigation and drinking water requirements as envisaged.
- **Land Acquisition** was done in a fair, transparent and efficient manner by balancing public interest and project requirements at large; and
- **Rehabilitation and Resettlement** envisaged for socio-economic benefits to the affected Project Displaced Families (PDFs), were effectively assessed and efficiently achieved.

1.4 Audit Criteria

The Audit findings were benchmarked against the criteria sourced from the following documents:

- Guidelines and circulars/instructions issued by the Ministry of Jal Shakti /Central Water Commission on irrigation projects;
- National Project guidelines issued by GoI;
- GoAP guidelines relating to Engineering Procurement Construction contracts and Government Orders/Circulars/Memos issued from time to time;
- Detailed Project Reports, feasibility studies and Internal Benchmark /estimates;
- Conditions stipulated by the Ministry of Environment, Forest and Climate Change and the Ministry of Tribal Affairs in the clearances given for PIP;
- Andhra Pradesh Financial Code, Andhra Pradesh Public Work Department Code and Andhra Pradesh Detailed Standard Specifications;
- Land Acquisition Act, 1894, GoAP Rehabilitation and Resettlement Policy 2005, Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013 and Andhra Pradesh RFCTLARR Rules, 2014;
- Terms and conditions of the works contracts entered into by the Department with the contract agencies; and
- Guide to Village Revenue Administration, issued by Andhra Pradesh Rural Development Corporation.

1.5 Audit Scope and Methodology

The Comptroller & Auditor General of India has reviewed the implementation of PIP as a part of the Jalayagnam Report (Report No. 2 of 2012) covering the period April 2006 to March 2010 and also in the year 2017 (Report No. 4 of 2018) covering the period April 2012 to March 2017 of Government of Andhra Pradesh. The Jalayagnam Report was partially discussed by the Public Accounts Committee (PAC), however, no recommendations were given. The Report No. 4 of 2018 was yet to be discussed by the PAC.

The present Performance Audit, carried out during June 2022 to June 2023, reviewed the implementation of the project from 2017-18 to 2022-23 duly covering the execution of project including Land Acquisition (LA) and Rehabilitation & Resettlement (R&R). This report also includes the updated position of the issues covered in the earlier Audit Reports, wherever such issues have contemporary relevance. It also covers the events that occurred during the prior period but not covered in the earlier Audit Report.

Field Audit covered the offices of the Principal Secretary, WRD, Chief Engineer (CE), PIP and sampled (based on SRSWOR¹⁸ method) implementing units *viz.*, three out of five Superintending Engineers (SEs)¹⁹, eight out of the 19 Executive Engineers (EEs)²⁰, three out of five Land Acquisition Offices²¹, three out of six R&R offices²², and two²³ out of three Quality Control Divisions involved in implementation of the project. Further, the offices of CE, APGENCO, Vijayawada, SE, APGENCO, Dowlaiswaram and SE, APTRANSCO²⁴, Visakhapatnam were also covered during the audit.

The Audit methodology involved scrutiny of documents relating to decisions/ pronouncements, policies, circulars, budgetary allocations, *etc.*, at the Department level, and estimates, tendering, payments, quality control, joint inspections, *etc.*, at the Circles/Divisions of the project. Regarding LA and R&R, the audit methodology involved scrutiny of documents along with joint inspections. Discussions were held with the Departmental Authorities at various levels, questionnaires were issued, and photographic evidence was obtained wherever necessary.

The project involves displacement of 1.06 lakh Project Displaced Families (PDFs). However, a meagre progress (both physically and financially) was registered in R&R of PDFs, since the commencement of the project. The woes of PDFs also attracted widespread attention from the media. Hence, Audit took up beneficiary and amenities survey to assess the socio-economic benefits extended to PDFs. The R&R activities were divided into two Phases, *i.e.*, Phase-I upto Elevation Level (EL) of (+) 41.15 m and Phase-II above (+) 41.15 m. Under Phase-I, 20,946 PDFs were identified to be rehabilitated and under Phase-II, 85,060 PDFs. For the feasibility of survey, audit categorised PDFs under Phase-I into two categories:

- Category-I: PDFs rehabilitated to R&R colonies.
- Category-II: Habitations from where PDFs are yet to be rehabilitated.

The data obtained from the Department was sampled (SRSWOR method) duly covering the above categories for the survey.

An Entry Conference was held in May 2022 wherein Audit objectives, scope, methodology, criteria, *etc.*, were discussed with the Principal Secretary/WRD, GoAP. The Exit Conference

¹⁸ Simple Random Sampling Without Replacement

¹⁹ SE, Polavaram Irrigation Project Headworks (PIPHW), Dowlaiswaram SE, PIPLMC, Tuni SE, PIPRMC, Eluru

²⁰ EE, PIPHW Division 1, Polavaram EE, PIPHW Division 3, Polavaram EE, PIPHW Division 5, Seethanagaram, EE, PIPHW Division 6, Purushothapatnam, EE, PIPLMC Division 1, Rajamahendravaram, EE, PIPLMC Division 3, Jaggampeta EE, PIPRMC Division 4, Eluru & EE, PIPRMC Division 5, Vijayawada

²¹ SDC PIPLMC Unit-1, Rajamahendravaram, SDC, PIPRMC Unit, Kovvur & PO ITDA, KR Puram

²² Sub-Collector, Rampachodavaram, RDO Jangareddigudem, PO, ITDA, KR Puram

²³ Quality Control (QC) Division Mylavaram at Polavaram & QC Division, Dowlaiswaram

²⁴ Andhra Pradesh Transmission Corporation

with the Government was held in November 2024 wherein, the major audit findings were discussed. The replies of the Government and responses given during the Exit Conference have been suitably incorporated in this Report at appropriate places. The recommendations made by Audit were discussed during the Exit Conference and were accepted (November 2024) by the Government.

1.6 Acknowledgement

Audit acknowledges the co-operation extended by the Water Resources Department, Engineer-in-Chief, Chief Engineer, Superintending Engineer and officials of Engineering Divisions of Polavaram Irrigation Project, Polavaram Project Authority, Project Administrator, Special Collector (Land Acquisition), the Chief Engineer, APGENCO and their officials in the conduct of this audit.