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Report of the Comptroller and Auditor General of India on

Jalayagnam

Government of Andhra Pradesh

Report No. 2 of 2012

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Preface

This Report has been prepared for submission to the Governor under Article 151 of the Constitution. The Report contains the results of the Performance Audit of 'Jalayagnam' in Andhra Pradesh since 2004-05 to 2011-12. The programme envisages development of irrigation infrastructure in backward, tribal and drought prone areas, involving construction of reservoirs and lift irrigation schemes, for creation of 97.46 lakh acres of ayacut and stabilization of the existing ayacut of 22.53 lakh acres.

Some of the irrigation projects taken up under Jalayagnam by the Government of Andhra Pradesh were covered in the Comptroller and Auditor General of India's Audit Reports for the years 2006-07, 2008-09 and 2009-10. The earlier audits were confined to a review of execution of some individual projects, performance of Godavari Water Utilisation Authority, implementation of Accelerated Irrigation Benefit Programme and Third Party Quality Control. The current Performance Audit focuses on the broad and macro issues in the implementation of Jalayagnam as a whole, by examining the core areas vital to the achievement of the stated objectives of the programme, while at the same time bringing out the specific concerns relating to execution of the 26 test checked projects.

The Audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India. The report has been finalized after considering the responses of the Government/Department in the Exit Conference held in July 2012 as well as its written replies.

Audit wishes to acknowledge the co-operation extended by the Irrigation and Command Area Development Department during the conduct of this audit.

Executive Summary

1 Background

Jalayagnam is the most important and ambitious programme taken up by the Government of Andhra Pradesh, both in terms of budgetary allocation as well as the socio-economic reach envisaged. The programme comprised 86 projects (44 major, 30 medium, 4 flood banks and 8 modernization works) and was estimated to cost ₹1.86 lakh crore. Twelve of these projects were taken up prior to 2004-05 (approved cost: ₹2,139 crore) and were brought under Jalayagnam to expedite their completion. 74 projects were sanctioned between 2004-05 and 2008-09 (approved cost: ₹1,83,470 crore). The programme aimed at developing infrastructure for irrigation, mainly in the backward, parched and drought prone areas of Telangana and Rayalaseema regions of the State, to create an ayacut of 97.46 lakh acres and stabilize the existing ayacut of 22.53 lakh acres. It also envisaged provision of drinking water to about 1/4th of the State's population and generation of 2700 MW of power. Considering that a majority of the State's eight crore population is dependent on agriculture for their livelihood, and the fact that over 50 *per cent* of the cultivated area in the State is rain fed, the priority accorded by the Government to the irrigation sector is extremely timely and laudable.

The Comptroller and Auditor General of India (CAG) has been reviewing a number of irrigation projects in the State every year. During the period 2004-2010, 18 irrigation projects were examined. Almost all these projects formed part of Jalayagnam and are currently under discussion by the Public Accounts Committee of the State Legislature. The issues flagged in the earlier reports with regard to implementation of these projects, *EPC*[1] mode of contracting, and the need for building safeguards in the contracts with regard to variation in scope, specifications, designs etc., have not been addressed by the State Government, on the ground that, these issues are not applicable in fixed price contracts like EPC model. In the earlier reports, concerns have also been expressed by Audit on the impact of non-acquisition of land and pending clearances from *CWC*[2]/*MoEF*[3]/*MoTA*[4] etc., before awarding the contracts, in terms of time and cost overrun. The current Performance Audit is an attempt to review not only the individual irrigation projects taken up by the Government of Andhra Pradesh under the Jalayagnam programme since 2004-05, but also discuss at a macro level, several other issues relevant to the implementation of the programme itself including macro level planning, availability of water and power to operationalise the projects, detailed project level planning, tendering and contract management in respect of multiple packages of these projects, and project execution.

[1] Engineering, Procurement and Construction
[2] Central Water Commission
[3] Ministry of Environment and Forests
[4] Ministry of Tribal Affairs

The Performance Audit was carried out during June-December 2011 and involved a scrutiny of 26 out of the 74 major and medium irrigation projects taken up by the Government under the programme. Although Jalayagnam envisaged creation of new ayacut, stabilization of existing ayacut, provision of drinking water and generation of power, the focus of this Performance Audit is only on irrigation projects. Some of these projects have been reviewed earlier as individual projects, or as part of a review of AIBP or *GWUA*[5] or a thematic audit of mobilisation advances and third party quality control (TPQC) in irrigation projects. None of the earlier audit findings have been repeated in the current report. Significant audit findings that emerged from this Performance Audit are detailed below.

2 Planning

Jalayagnam includes projects which have been in the pipeline for several years; and some taken up ab-initio. Irrespective of the date of their inclusion in the programme, test check of projects revealed that they were taken up without adequate planning. This was especially so, in respect of the projects on river Krishna and Pennar, where, the water required for successful implementation of projects is far above the available quantity. The State Government was conscious of this aspect and therefore, proposed to utilize the surplus/flood water in these two river systems. However, there was no evidence in the records made available to Audit, to indicate that the flood data of these rivers was analysed to assess the average number of days that flood flows are available annually. There was also no uniformity in the number of flood days adopted for designing the projects that use flood flows of Krishna. This was despite the opinion expressed by the Expert Committee constituted by the State Government in July 1997, to examine the feasibility of implementing Galeru Nagari project, that, the number of flood days on river Krishna was only 30 and that too, at only 40 *per cent* dependability. Going by the observations of the Committee, some of the projects taken up on river Krishna are not viable, as the water that can be drawn in 30 flood days would be less than the requirement of these projects. This was corroborated by the CWC in returning the project proposals of Galeru Nagari, Veligonda and Srisailam Left Bank canal projects to the State Government, stating that the latter could not establish clear and firm availability of water on a long term basis for these projects.

(Paragraph 3.1)

Almost all the test checked projects were taken up and contracts awarded without obtaining necessary clearances like investment clearance (24 projects) from Planning Commission, forest clearance (21 projects), environmental clearance (18 projects) from MoEF, in-principle clearance from CWC (16 projects) and R & R clearance from MoTA (14 projects). 11 projects were taken up without preparation of Detailed Project Reports and four projects were taken up without even feasibility studies.

(Paragraph 3.2)

Out of the 74 irrigation projects in Jalayagnam, 31 were lift irrigation schemes (LIS). The power required for these projects, which were taken up essentially on river Godavari and Krishna, works out to nearly 54.43 *per cent* of the total installed

[5] Godavari Water Utilisation Authority

capacity of the State and around 30.93 *per cent* of the total consumption of the State. Andhra Pradesh being a power deficit State, the average power requirement of the new LIS during the pumping period vis-à-vis the average power consumption of the entire State would leave a shortage of 18.64 MU per day, at current levels. Considering the crippling power shortage in the State during the current year (2012), when the gap between the demand and supply has been 7413 MU, i.e. 15.34 *per cent* of the demand during the period (April to September 2012), and the fact that the State is forced to purchase power at very high rates, providing the required power to operate the lifts and release water for irrigation to the farmers under all the LIS would be a huge challenge for the State Government.

(Paragraph 3.3)

3 Contract Management

Contracts for all the works relating to the projects under Jalayagnam were awarded on turnkey basis through the EPC method. However, the tendering and contracting process lacked transparency and the financial interests of the State were not safeguarded adequately, as detailed below.

- The EPC model of contracting followed by the Government differed in many respects with the system recommended by *"Federation Internationale des Ingenieurs – Conseils (FIDIC)"* for contracts of this nature.

(Paragraph 4.1)

- The qualification criteria fixed for empanelment of contractors was less stringent than that followed in conventional tendering system. Some of the contractors garnered most of the works packages, largely through cross-formation of JVs amongst themselves.

(Paragraph 4.2)

- Contracts for all the works under Jalayagnam were composite contracts, which required the contractors to quote a fixed lumpsum price for conducting detailed survey and investigation, designing the project and executing the works on turnkey basis. For the purpose of cost estimation, the Department prepared internal bench mark (IBM) estimates, to compare with the price bids of the contractors. Government did not frame any guidelines for preparing the estimates with regard to EPC contracts. In the test checked projects, in a number of cases, IBMs were inflated on account of higher quantities, higher costs and inclusion of exempted duties/taxes etc. The total impact of these in increasing the IBM values in the test checked cases was ₹3129.51 crore. This has cost implications, since these increased estimates were used to benchmark the bid prices for award of works packages.

(Paragraph 4.3)

- In a majority of cases, technical sanction was obtained after receipt and opening of bids. While adequate time was not given for ensuring competitive bidding, there were abnormal delays in opening and acceptance of bids. Several contracts were awarded on single tender basis.

(Paragraph 4.4)

- There were several instances of variations to specifications/designs during execution. While the EPC agreements entered into by other Departments in the State contain clauses to deal with variations, there was no installed mechanism to deal with such variations in contracts under Jalayagnam. The benefit of reduction in specifications did not accrue to the Government and in some cases, it took upon itself the contractor's costs/responsibilities.

(Paragraph 4.5)

- Contractors were permitted to prepare the payment schedules to their advantage, by revising the costs of items executable in the initial phases upwards, resulting in front end payments.

(Paragraph 4.5.1)

- Substantial funds given as mobilization advances were blocked with the contractors, as recovery thereof could not be affected due to poor progress of works. This was especially so in respect of Pranahita Chevella and Dummugudem Nagarjunasagar Tail Pond projects.

(Paragraph 4.6)

4 Project Execution

Jalayagnam was taken up to fast track the irrigation projects languishing for a long time and to complete them in a time bound manner, so as to bring succour to the arid and drought prone areas. Initially, Government identified 26 projects as 'prioritized' to be completed within a span of two (8 projects) to five years (18 projects). Subsequently, this number increased to 86 projects, including 12 Flood Banks and Modernization works. As of September 2012, while four projects (sanctioned in 2008-09) were yet to be initiated, 13 projects have been completed and created an ayacut of 1.37 lakh acres and stabilized 1.89 lakh acres. Apart from the 13 projects that have been operationalised, as and when a project is partially completed, Government has been releasing water to the ayacut. So far (September 2012), it had released water to a new ayacut of 12.74 lakh acres and stabilized 2.07 lakh acres this way.

(Paragraph 5.1)

Delay in completion of the projects, along with changes to the specifications and scope of work pursuant to detailed survey and investigation and designs, pushed up the cost of the projects by ₹52,116 crore (as of September 2012) with reference to the original sanction.

(Paragraph 5.1)

The main reason for the time and cost overrun in these projects was delay in acquiring the required land, clearances, and rehabilitation and resettlement activities. Government could not acquire adequate land required for any of the projects on time although the original agreement periods in respect of several of these projects expired. While 9.19 lakh acres of land was required for executing the envisaged projects, Government could acquire only 5.97 lakh acres as of March 2012. Added to that, non receipt of forest clearance contributed to the delay in taking up construction activities in forest areas. Government could not also co-ordinate effectively with statutory organizations like the Indian Railways and National Highways Authority of India to obtain permissions to execute works in their lands.

(Paragraph 5.2.1)

Rehabilitation and Resettlement (R&R) activities in the projects involving submergence of land have not been planned properly. Government was yet to approve the draft plan for R&R of over 50 *per cent* of the 546 villages, estimated to be affected during the implementation of the projects. Further, provision of houses for the population anticipated to be affected by the projects, was particularly slow, with just about 13 *per cent* progress in constructing houses for the families.

(Paragraph 5.2.2)

5 Recommendations

EPC system of contracting is followed the world over for time bound execution of projects and minimizing risks to the owners. In this mode of contracting, the contractor carries the entire risk of the project for schedule and budget in return for a fixed price. The owner (State Government in this case) has to define clearly, scope and specifications of the project, time frame, quality parameters and cost. The EPC system followed by the Government left too many gaps in this regard due to the following.

Contractors were required to carry out detailed survey and investigation, design the project and execute it. Coupled with this, the bidders were not given adequate time in several packages for carrying out preliminary survey before offering their bids. This entailed changes to project specifications indicated at the time of awarding works, and in some cases, the scope of work has also changed, rendering the IBM estimates superfluous. There was no in built mechanism in the contracts to deal with such variations. Project duration specified by Government was not realistic, since it could not obtain the requisite clearances, acquire necessary land and complete the rehabilitation and resettlement activities within the agreement periods. All these have had a cascading effect on the time and cost budgeted for execution of the projects.

1. Government should consider the desirability of dividing the EPC system of contracting into two stages:

   a. **Stage-I**: Detailed survey and investigation, approval of alignments and designs, freezing the scope of work, preparation of cost estimates, and initiating the processes of obtaining statutory clearances, land acquisition and R&R activities;

   b. **Stage-II**: Execution of works.

2. Government should assess the availability of utilizable water in various rivers in the State, especially the duration of availability of flood waters in river Krishna, and rework the feasibility of implementing the projects that are dependent on flood water utilization.

3. Government should undertake a comprehensive review of all the projects taken up under Jalayagnam and prioritize them based on (a) technical viability, (b) present stage of physical progress, (c) immediate possibility of clearing the bottlenecks viz. land acquisition, forest clearance etc., which are hampering their progress, (d) availability of power in case of lift irrigation schemes and (e) the State's capacity to sustain the fund flow. A long and short term scenario should be developed and prioritized projects should be fast tracked for obtaining the requisite clearances, funds, land, R&R etc.

4. The desirability of continuing projects where approvals have been given more than two years back but are yet to be tendered; may be objectively re-assessed by the Government.

5. Government should also streamline the procedures relating to EPC contracts as under.

   a. Ensure accuracy in estimation of costs; works should be put to tender only after firming up IBM and obtaining technical sanction;

   b. Ensure transparency in tendering process; empanelled list may be reviewed and updated with inclusion of firms which may have gained eligibility during the last seven years since empanelment. In case the empanelled list is no longer applicable for awarding contracts, it may be considered for scrapping;

   c. Avoid changes to the specifications in the intervening period after call of tenders and award of work;

   d. Define the deliverables under the contracts more clearly and accurately; and

   e. Incorporate appropriate clauses in all the future EPC agreements enabling adjustment of the contract price in case of variation in designs, specifications or scope of work.

6. Government should institute a mechanism for finalization and approval of designs and drawings within a specified timeframe.

7. Coordination with other statutory organizations like Indian Railways, National Highways Authority of India and Oil companies needs to be improved.

8. Payment schedules of all the packages should be reviewed to ensure that payments are not frontloaded to the detriment of State interests.

Overview

1.1 Introduction

Andhra Pradesh is primarily an agrarian State with over 70 *per cent* of its population dependent on agriculture. However, the agriculture sector is largely dependent on monsoon with more than 50 *per cent* of the cultivated area being rain-fed, although, over the years, there has been an increase in exploitation of ground water for irrigation purposes in non-command areas. While the State is endowed with a cultivable area of 362.90 lakh acres, the irrigated area was only 125.65 lakh acres as of 2004-05. Further, out of the State's share of 2769 TMC[1] of dependable flows from all the rivers, the water utilized was only 1933 TMC (70 *per cent*). While the entire dependable flow of Krishna and Pennar rivers was harnessed through the construction of several irrigation projects, the water potential of river Godavari was not tapped to its full extent, with only about 720 TMC out of the available 1480 TMC, being utilized. The State Government therefore, decided in mid-2004 to take up the construction of new irrigation projects and completion of the existing projects in a focused manner.

1.2 What is 'Jalayagnam'?

Jalayagnam refers to the programme initiated by the Government of Andhra Pradesh in 2004 to bring vast tracts of land under irrigation and stabilize the existing ayacut in the State. The programme aimed at:

i. Developing infrastructure for irrigation in backward, tribal and drought prone areas, involving:

- construction of reservoirs and lift irrigation schemes, especially on Godavari and Krishna rivers;
- creation of 97.46 lakh acres of ayacut and stabilization of the existing ayacut of 22.53 lakh acres;

ii. Providing drinking water to 2.11 crore people of the State, covering 6310 villages in 425 Mandals, utilizing 65.14 TMC of water; and

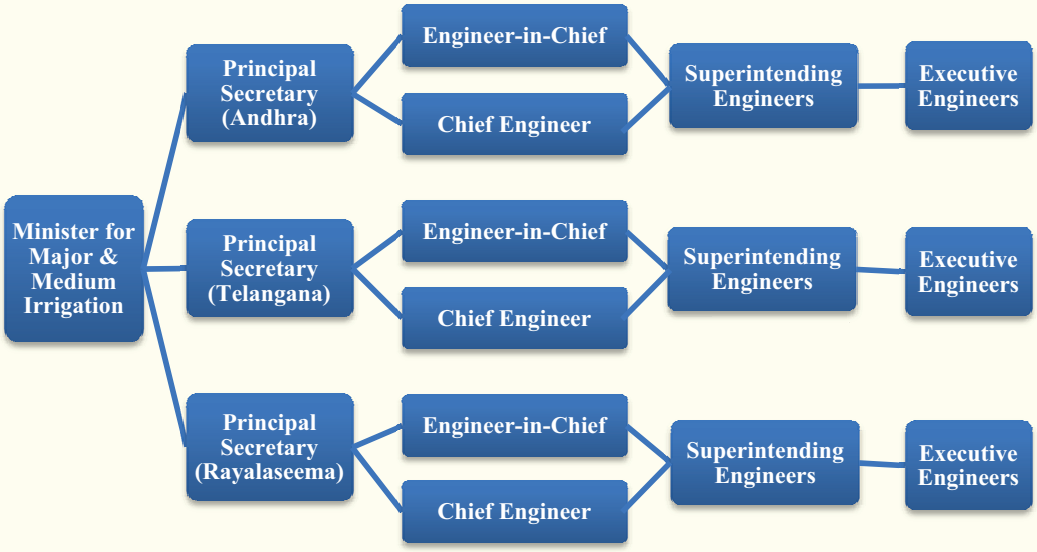
iii. Generating 2700 Megawatt (MW) of power.

The programme comprised 86 projects (44 major, 30 medium, 4 flood banks and 8 modernization works) and was estimated to cost ₹1.86 lakh crore. Twelve of these projects were taken up prior to 2004-05 (approved cost: ₹2,139 crore) and were brought under Jalayagnam to expedite their completion.74 projects were sanctioned between 2004-05 and 2008-09 (approved cost: ₹1,83,470 crore).

[1]Thousand million cubic feet

1.3 Organizational set up for the programme

At the Government level, the policies relating to the Irrigation and Command Area Development (I & CAD) Department, including Jalayagnam programme, are dealt with by the Principal Secretaries/ Secretaries (one each for the three regions[2] of the State), who are assisted in the discharge of their responsibilities by Joint Secretaries. Project implementation is the responsibility of Engineers-in-chief (5), Chief Engineers (33), Superintending Engineers (88) (at the Circle level), Executive Engineers (447) at the Division level, and other functionaries down the line. The organogram of the I&CAD Department is given below.



[2]Coastal Andhra, Rayalaseema and Telangana

Audit Framework

2.1 Background

During the period 2004-10, several aspects of selected Jalayagnam projects were scrutinized in successive audits. The results of these audits were reported to the State Legislature as follows.

- Performance audit of Godavari Water Utilisation Authority (GWUA), covering 7 projects, in the 2006-07 Audit Report.
- Audit paragraph on Third Party Quality Control (TPQC) and Performance Audit of Government of India (GoI) funded Accelerated Irrigation Benefit Programme (AIBP), which included 8 Jalayagnam projects, in the 2008-09 Audit Report.
- Performance Audit of Kalwakurthy lift irrigation scheme and audit paragraphs on Mobilisation Advances and selected aspects of 4 other projects, in the 2009-10 Audit Report.

Significant audit findings from these reports are listed in ***Appendix-2.1*** along with the recommendations made to the Government. All these reports/paragraphs are currently under discussion by the Public Accounts Committee of the State Legislature.

The key issues flagged in these reports/paragraphs relate to delays in completion of projects, non-synchronization of activities involved in execution of projects like acquisition of land, obtaining clearances from CWC/MoTA/MoEF, construction of canals before head works, lack of variation clauses in the contracts with regard to changes to the scope, specifications and estimates etc. Government took the stand that variation clauses are not applicable to fixed price EPC[1] contracts, and that, the project timelines would have to be extended if it were to synchronize all the activities and obtain approvals/clearances before commencing the projects.

The current Performance Audit provides a holistic perspective of all significant aspects in respect of 26 projects of Jalayagnam, including macro level planning, availability of water and power to operationalise the projects, detailed project level planning, tendering and contract management in respect of multiple packages of these projects, and project execution.

2.2 Audit objectives

Performance Audit of the Jalayagnam Programme was carried out with the objective of assessing whether,

- Planning for the programme was comprehensive, and individual projects were formulated properly,

[1] Engineering, Procurement and Construction

- Tendering and contract management, at all stages of project implementation, followed the canons of financial propriety and transparency; and
- Projects were executed within the time and cost budgeted and the envisaged target of creation of irrigation potential was achieved.

2.3 Audit Criteria

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

- AP Financial Code and AP Public Works Department Code;
- State Government guidelines relating to EPC contracts and Government orders/circulars issued from time to time in this regard;
- Conditions of contract for EPC turnkey projects by 'Federation Internationale des Ingenieurs Conseils' (FIDIC)
- Guidelines of Central Water Commission (CWC), Planning Commission, Union Ministry of Environment and Forests (MoEF) and Ministry of Tribal Affairs (MoTA).
- Detailed project reports (DPRs), feasibility studies and Internal Bench Mark (IBM) estimates;
- Annual Action Plans and Outcome budgets;
- Rehabilitation & Resettlement (R&R) Policy of the State Government; and
- Awards of Krishna and Godavari Water Disputes Tribunals and Inter State Agreements.

2.4 Audit Scope

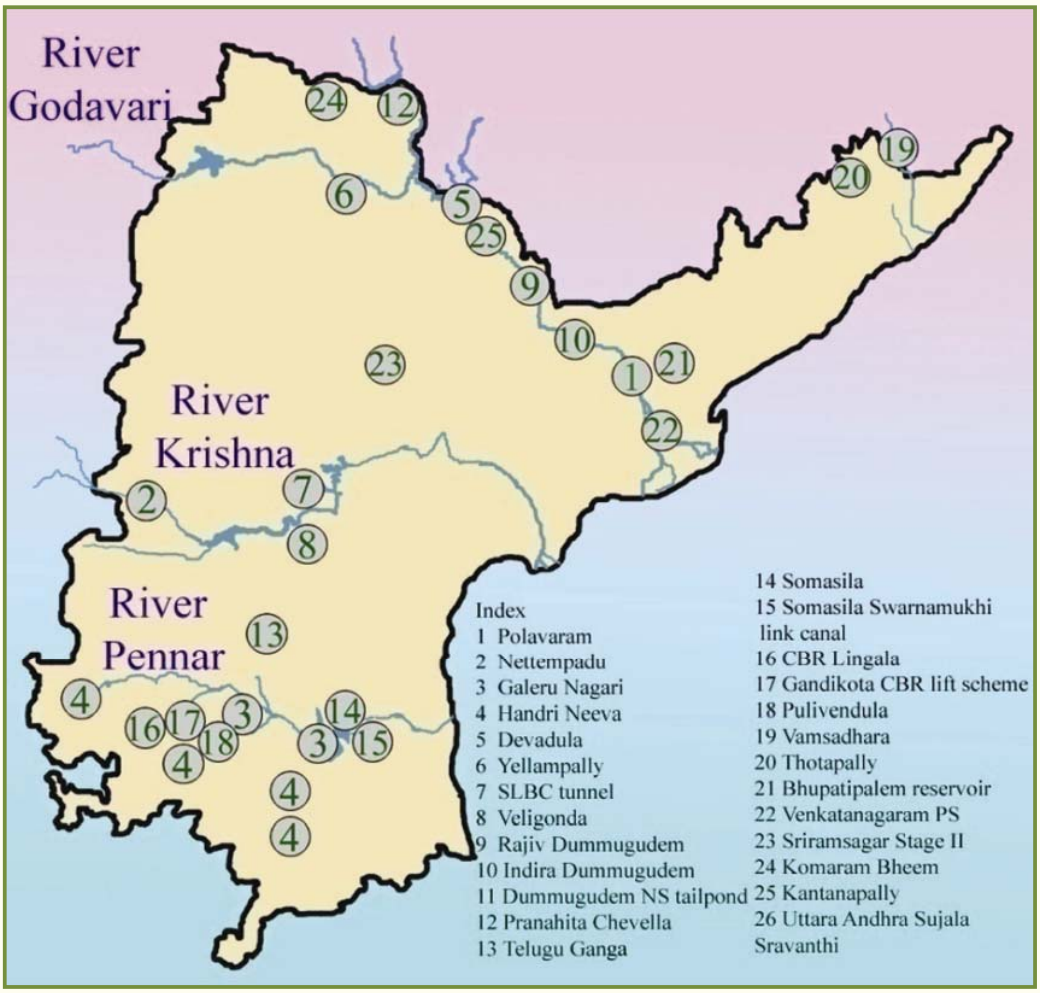
Audit was carried out during June-December 2011 and covered the implementation of the programme since its inception in 2004-05 to 2011-12 (up to December 2011). Figures have been updated based on the discussions with the departmental authorities in the Exit Conference and their written replies as well as further information/progress reports furnished by them. Although Jalayagnam envisaged creation of new ayacut, stabilization of existing ayacut, provision of drinking water and generation of power, the focus of this Performance Audit is only on irrigation projects.

2.5 Audit Methodology

Audit methodology involved scrutiny of documents relating to Government decisions/pronouncements, policy, circulars, budgetary allocations etc., at the Department level, and estimates, tendering, payments, quality control etc., at the Circles/Divisions/sites of selected projects. Discussions were held with the departmental authorities at various levels, questionnaires were issued and photographic evidence was obtained wherever necessary. Audit objectives, scope, methodology, criteria etc., were discussed with the Principal Secretaries to the Government of Andhra Pradesh, I&CAD Department in an Entry Conference in May 2011 and their inputs were obtained. Audit findings were discussed with Principal

Secretaries (Coastal Andhra, Telangana and Rayalaseema regions) and the project authorities in an Exit Conference in July 2012 and the responses of the Government, including their written replies, have been incorporated in the Report at appropriate places.

2.5.1 Audit Sample



Out of the 74 irrigation projects, detailed scrutiny was carried out in respect of 26 projects (**35** *per cent*) involving a capital outlay of ₹1.43 lakh crore (**85** *per cent* of the total outlay on Jalayagnam excluding Modernization and Flood bank packages) based on financial materiality and overall prioritization accorded by the State Government[2]. Further, out of 278 packages of contracts awarded with regard to these 26 projects, Audit selected 180 packages (**65** *per cent*) for detailed scrutiny. Details of the projects and packages selected for detailed audit scrutiny are given in ***Appendix-2.2***. Details of the test checked projects are also marked out (except Uttarandhra Sujala Sravanthi and Dummugudem NS Tail Pond) in the State map given above.

[2]This did not include the 13 completed projects, some of which were covered in earlier audits

Planning

Planning at the macro level as well as micro level is essential for successful implementation of the programme entailing investment of over ₹1.86 lakh crore. Audit review to assess whether planning for the programme was comprehensive, and formulation of individual projects was proper, revealed as under.

3.1 Project formulation

While 86 projects were taken up under Jalayagnam on Engineering, Procurement and Construction (EPC) basis during 2004-09, Government has not prescribed any specific procedure for planning and project formulation with regard to these. Therefore, Audit has assessed the comprehensiveness of the planning process and individual project formulation with reference to the Andhra Pradesh Public Works Department Code (APPWD Code), which provides for the following, while formulating any irrigation project.

Preliminary investigation	Report from this stage should contain a general description of the work and estimated cost of the project including *inter alia*, • Availability of water, having regard to possible claims of other States to the proposed source and rights of other riparian owners of lands irrigated lower down. • Approximate extent of ayacut and its general location.
Detailed investigation	Report from this stage should include the details required from the preliminary investigation stage, as well as the following key details, among others. • The ayacut should be definitely fixed by the department with the written concurrence of farmers. • Ayacut registers should be prepared village wise. • The alignments of the main and minor distributory channels should be fixed. • Land plans and schedules for lands to be acquired should be prepared and preliminary notifications under Land Acquisition (LA) Act, 1894 may be issued. However, care should be taken to see that no measures should be adopted which would actually commit the Government to the expenditure on execution of the project. • The report on complete investigation should include a revised financial cost. The Officer should exercise very careful foresight in framing estimates of the cost of works. • The general description of proposed works should follow, sources of supply of water, quantity of water available at different period of years, quantity proposed to utilize, area of land commanded, average area usually cultivated, area probably irrigable, lengths of main channels and distributaries.

The I&CAD Department has been following the above prescribed procedure all along while formulating the projects. However, in respect of the projects taken up under Jalayagnam, Government entrusted the responsibility of carrying out the detailed survey and investigation, and design of the projects to the contractors. Feasibility of

the project, including availability of adequate water and overall ayacut to be created, is the responsibility of the Government. During detailed investigation, the contractors are to suggest the exact ayacut feasible, as well the best alignment possible for execution of the project.

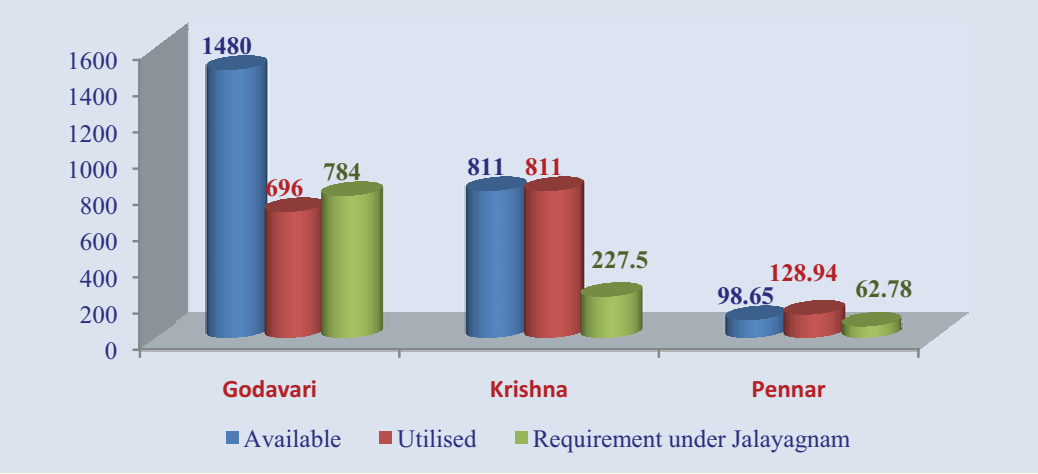
The Department replied (July 2012) that while formulating the projects under Jalayagnam, the foremost consideration was the felt need for having such a project and based on this need, the techno-economic feasibility and viability of a project is assessed. It was further stated that only such projects, which have techno-economic viability, financial concurrence and requisite political will, will be implemented.

Audit scrutiny of the records relating to the 26 test checked projects revealed the following with regard to project formulation.

3.1.1 Assessment of water availability

Jalayagnam involved implementation of 74 irrigation projects (excluding flood banks and modernization works) on the three major rivers of the State, viz. Godavari, Krishna and Pennar. The availability of water in these rivers and the requirement for the programme is given below.

Chart-3.1 (in TMC)



Source: Outcome budget of I&CAD Department for the year 2011-12

3.1.1.1 Projects on River Krishna

Audit observations in this regard are as follows.

i. Water required for successful implementation of the projects taken up under Jalayagnam on Krishna and Pennar is far above the available quantity. Therefore, Government decided to utilize the surplus/flood water in these river systems. However, there was no evidence in the records made available to audit, that the flood data of these rivers was analysed to assess the average number of days where flood flows were available annually. Such an analysis is vital in assessing the chances of success of the projects which are proposed to be solely dependent on flood water, and in deciding,

- the number of days when water is proposed to be drawn/pumped;

- the level/location from where the flood water is to be drawn;
- capacity of the intake canals/pumps required to carry water to the ayacut; and
- capacity of the storage reservoir to be built.

ii. Eight out of the 26 test checked projects contemplate using flood water of river Krishna. However, there was no uniformity in the number of flood days adopted for designing these projects, as can be seen below:

Table-3.1

Sl No	Name of the project	Source of water	No. of days proposed for drawal of water
1	Veligonda	Srisailam Reservoir	30
2	Telugu Ganga	Srisailam Reservoir	30
3 4 5	Galeru Nagari; Gandikota Reservoir – CBR Lift Scheme *; &CBR Lingala Canal *	Srisailam Reservoir	30
6	Handri Neeva	Srisailam Reservoir	**120**
7	SLBC Tunnel	Srisailam Reservoir	**87**
8	Nettempadu	Jurala Reservoir	**90**

*Gandikota–CBR Lift Scheme proposes to draw Krishna waters from Gandikota Reservoir, which is a part of Galeru Nagari project for utilization in the CBR Lingala Canal. Thus, the requirements of these projects are included in the requirements of Galeru Nagari

Source: DPRs of the concerned projects

iii. Out of the eight projects mentioned above, the projects at Sl No. 1 and 3 were initially designed to draw the required water in 45 days, and some of the project works were awarded during 2004 and 2005 accordingly. However, the designs of these projects were later revised (May 2006 and November 2006 respectively), and the number of flood days in river Krishna was reduced to 30.

iv. The Expert Committee constituted by the State Government in July 1997 to examine various alternatives for the Galeru Nagari project observed that the number of flood days on Krishna was only **30** and that too, at only 40 *per cent* dependability[1]. Considering this observation of the Expert Committee, some of the projects based on Krishna flood water are technically not viable, as the water that can be drawn in 30 flood days would be far less than the requirement of these projects, as shown below:

Table-3.2

Sl No.	Name of the project	Total design discharge of the intake pumps/ canal system	Qty. of water that can be drawn in 30 days[2] (TMC)	Qty of water required for the project (TMC)	Shortage of water (TMC)
1	Handri Neeva	3,850 cusecs	**9.979**	40.000	**30.021**
2	Nettempadu	3,000 cusecs	**7.776**	21.425	**13.649**
3	SLBC Tunnel	4,000 cusecs	**10.368**	30.000	**19.632**

Source: DPRs of the concerned projects

[1] i.e. flood water would be available for 30 days in only 40 *per cent* of the years

[2] One cusec means a discharge of 'one cubic feet per second'. Thus, the total water that can be drawn in 30 days = {(design discharge of the intake system in cusecs X 30 days X 24 hours X 3600 seconds) ÷ (1,000 X 1,000,000)} TMC

v. Even though flood water are in addition to allocated water, the chances of availability of flood water of river Krishna are limited, with the upper riparian States of Maharashtra and Karnataka getting allocation of more water under the Award (2010) of Krishna Water Disputes Tribunal (KWDT)-II.

vi. Further, with every new project taken up on river Krishna, the availability of surplus water would progressively get reduced. Since 1997, the Government of Andhra Pradesh (GoAP) has taken up many new projects which depend on Krishna water like Kalwakurthy (25 TMC), Bhima (20 TMC), Koilsagar (3.9 TMC), etc., in addition to the projects mentioned in Table-3.1 above.

vii. Although the Planning Commission stipulates that all the projects that have inter-state ramifications should be cleared by the CWC, Government did not obtain CWC clearance for these projects as of September 2012. In fact, CWC did not approve SLBC Tunnel, Galeru Nagari and Veligonda projects, as the GoAP could not establish firm and clear availability of water for these projects. There was no evidence in the records produced to Audit to show that the proposals in respect of Gandikota-CBR lift scheme and the CBR Lingala Canal were sent to the CWC at any stage for approval.

viii. While the GoI constituted (April 2004) KWDT-II to review the sharing of Krishna waters, GoAP went ahead and took up Galeru Nagari (June 2004), Handri Neeva (July 2004), Veligonda (July 2004), SLBC tunnel (August 2005) and Nettempadu (June 2005) projects on this river, involving a huge investment of ₹23,093 crore.

During the Exit Conference in July 2012, the Department did not contest the observations of the Expert Committee, but stated that the Government is not bound by the observations or recommendations of the Committee. In its written reply (July 2012), the Department stated that as per the Bachawat Award of 1973, the average annual yield in Krishna was 2390 TMC, out of which, 2060 TMC at 75% dependability was allocated among the three riparian states[3] (the share allocated to AP being 800 TMC plus 11 TMC return flows), and that, AP was permitted to utilize the surplus waters. It was further stated that there was a surplus of about 330 TMC on an average (2390 TMC - 2060 TMC), and that, even at 50% dependability, there will be an average surplus of 245 TMC, out of which, 227.50 TMC had been planned to be utilized for the ongoing schemes in Krishna basin.

The reply is not acceptable on account of the following reasons.

- The KWDT-I (Award of 1973 and further report of 1976) had allowed Andhra Pradesh to utilize the surplus waters, with a rider that AP shall not acquire any right over the surplus waters and nor would it be deemed to have been allocated to AP.

[3]AP (811 TMC), Maharashtra (585 TMC) and Karnataka (734 TMC)

- The Supreme Court, while adjudicating between the Governments of Karnataka and AP in April 2000 (in OS No. 1 and 2 of 1997), observed that, *"……the lowest riparian state should not be allowed to proceed ahead with large-scale water projects for utilisation of surplus water in excess of the allocated quantity over which, the State has no right. ……..In the context of the expenses involved for such major projects and the national loss, which the country cannot afford to sustain in a federal structure like our country, it is the duty of the Central Government to bear this in mind while sanctioning any such major project of the lowest riparian State ……"*.

As regards the inconsistency in the number of days of surplus/flood flows projected for various projects on river Krishna, the Department replied that the entire 110.5 TMC of water required for Telugu Ganga, Veligonda and Galegu Nagari would be drawn during 30 days flood period, and that, out of the total requirement of 117 TMC in respect of Handri Neeva, Kalwakurty[4], Nettempadu and SLBC Tunnel, 36 TMC would be drawn from the 30 days flood flows and the remaining 81 TMC would be drawn from the Srisailam and Jurala reservoirs. The Department stated that drawal of this 81 TMC from storage reservoirs would not affect the carry over storage of Srisailam reservoir, since AP can utilize 45 TMC of Godavari water by diverting it from Polavaram to the Krishna delta and that, for the balance 36 TMC, additional storage was being created under Pulichintala project.

The contention of the Department is not acceptable due to the following reasons:

- Drawal of water by a new project will affect the availability of flows for other existing, ongoing and proposed projects which depend on the same river. However, in the DPRs of all the projects[5] mentioned in Table-3.1, it was stated that the proposed project would not have any impact on other projects since only flood waters are proposed to be utilized.
- The basis for arriving at the number of days (30/45/87/90/120 days) of availability and drawl of flood waters for these projects was not discussed in the DPRs.
- Fresh allocation made to the upper riparian States by the KWDT-II will affect the surplus flows available to AP, both in terms of quantity and duration. In the absence of a detailed and scientific study of the flood flows and the duration of their availability, considering the new allocations to the upper States by KWDT-II, and the impact of the combined drawl of water from Srisailam reservoir by all the existing and new projects in AP, the possibility of the projects in question being able to draw the water required to serve the entire contemplated ayacut, without tapping the carryover storage of Srisailam reservoir and adversely affecting the flows available for the projects located on its downstream, is remote.

[4] There is no water allocation to Kalwakurthy LIS also. The project proposes to draw 25 TMC of flood waters in 90 days from Srisailam reservoir

[5] DPRs were not prepared in respect of Gandikota–CBR Lift Scheme and CBR Lingala Canal

- Jurala reservoir has a live storage capacity of 6.798TMC[6], while it is expected to supply 63.74 TMC to four projects – Jurala (17.84 TMC), Bhima (20 TMC), Koilsagar (3.9 TMC) and Nettempadu (22 TMC). Therefore, the likelihood of it being able to source the requirements of these projects is not certain.

As regards the impact of further allocations made to the upper riparian States by KWDT-II, the Department, while accepting the audit observation that there could be a reduction of surplus flows in Krishna in AP due to the Award of KWDT-II, stated that the Dummugudem – Nagarjuna Sagar Tail Pond project was envisaged to divert 165 TMC of flood waters of Godavari keeping in view such a future exigency, to make the projects on Krishna functional at higher success rate than would be possible with surplus waters alone.

- The technical viability of Dummugudem - Nagarjuna Sagar Tail Pond project, which depends on flood waters of Godavari, has not yet been established.

3.1.1.2 Projects on River Godavari

Three lift irrigation schemes (LIS) were taken up on river Godavari without ensuring availability of adequate water, as discussed below.

(i) Indirasagar Dummugudem

Water for the Indira Sagar Dummugudem project would be available only if the dam of Polavaram project is constructed with a Full Reservoir Level (FRL) of EL +45.72 m and water is impounded in that reservoir. However, this project was taken up in 2007, when the design of the Polavaram dam was not yet finalized by CWC and the project was embroiled in inter-state disputes and litigations relating to submergence of tribal areas in the neighbouring States.

The Department replied that the Indira Sagar Dummugudem project was taken up on the presumption that the Polavaram project would be completed at the same time as this project and accordingly, the drawl point of the scheme was fixed at +45m, i.e. within the water spread area of the Polavaram reservoir. It was further stated that keeping in view the delay in completion of Polavaram headworks, it is now proposed to excavate an approach channel from a lower elevation and also to construct an auxiliary pumphouse to lift water directly from River Godavari.

The reply confirms the audit contention that the project was taken up prematurely without proper studies. In fact, even after the lapse of over four years since sending the project proposals to the CWC, the Government had not been able to establish the availability of water for this project and the CWC had returned (January 2012) the project proposals citing the same reason.

(ii) Rajiv Dummugudem

Rajiv Dummugudem project was also taken up (June 2007) without obtaining clearance from the CWC. The latter did not approve the DPR relating to this project since the impact of this project on the other existing and planned projects was not

[6] Gross capacity of Jurala reservoir is 11.941 TMC out of which 5.143 TMC is dead storage

analyzed. The CWC stated (October 2007) that since the Polavaram Project was under finalization and simultaneously a number of new projects were being proposed and linked to Polavaram, it would be difficult to consider the proposal in isolation without an integrated study.

The Department replied that sufficient unutilized water is available in Godavari, which is proposed to be utilized for this project, and that, the CWC had given 'in-principle' clearance for the project in June 2007.

The reply is not acceptable since the in-principle consent of CWC is only a preliminary clearance for preparation of DPR and not for tendering and executing the project. Besides, the audit observation is on the taking up of projects without the requisite studies. Further, despite a lapse of five years since the DPR was sent (September 2007) to the CWC, the Department has not established the exact quantum of water available for the project.The CWC has not approved the proposal till date (July 2012).

(iii) Uttarandhra Sujala Sravanthi

This project contemplates lifting 63.20 TMC of flood water from river Godavari at Purushottapatnam in East Godavari district to create an ayacut of 8 lakh acres in Visakhapatnam, Vizianagaram and Srikakulam districts of north coastal AP. The project proposes to pump the Godavari flood water for a period of 90 days from the downstream of Polavaram project. Availability of water for this project can be established only by assessing the net surplus flows that would be available after taking into account the proposed water drawls for the ongoing projects like Polavaram, Indira Sagar Dummugudem, Rajiv Dummugudem, Dummugudem-Nagarjunasagar Tail Pond, Pranahita Chevella, Devadula, Yellampally, Sriramsagar (Stages-I & II), etc. However, availability of water even for the ongoing projects on Godavari is yet to be established.

The Department replied that there would inevitably be wastage of water below Polavaram project into the sea and that the data of flood waters flowing past the Dowlaiswaram barrage for a period of 40 years from 1965 to 2005 shows the water availability. The reply is not acceptable since it takes into account surplus flows available, without reckoning the ongoing projects on Godavari.

3.1.1.3 Projects on River Pennar

The following two testchecked projects which contemplate using Pennar water also did not have dependable water source.

(i) Somasila Project and Somasila-Swarnamukhi Link Canal

- Extension of the Gottipati Kondapa Naidu (GKN) Canal of Somasila project was taken up under Jalayagnam (May 2006) to create a new ayacut of 40,000 acres besides stabilizing 18,500 acres of the existing ayacut. There is no assured availability of water for the proposed expansion of this project, as the utilization of Pennar water by the already existing projects (128.94 TMC) was in excess of the water allocated to the State (98.65 TMC).

- The Somasila-Swarnamukhi Link Canal (SSLC) proposes to draw 4.45 TMC of Pennar flood water from the Somasila-Kandaleru Flood Flow Canal (SKFFC) and carry it to Mannasamudram tank to create a new ayacut of 23,266 acres and to stabilize an ayacut of 87,734 acres existing under 316 tanks in Nellore and Chittoor districts, besides providing drinking water facilities to various Mandals enroute. Since the SKFFC itself depends on flood water and does not have assured water source, the possibility of providing assured water for SSLC is open to question.

As regards availability of water for GKN canal of Somasila project and the SSLC, the Department replied that the observed yield of river Pennar at Somasila project after deducting the upstream utilization was 50.38 TMC at 75 *per cent* dependability and 92.65 TMC at 50 *per cent* dependability, and that, after meeting the requirements of Somasila project (48.543 TMC), additional water of 44.11 TMC would be available, which would be utilized in the following manner:

Table 3.3

Sl. No.	Project component	Proposed utilization
1	Telugu Ganga Project (Kandaleru component)	30.00 TMC
2	Somasila Swarnamukhi Link Canal	4.45 TMC
3	GKN Extension of Somasila Project	3.91 TMC
4	Difference in Somasila Reservoir	5.21 TMC
5	For new additional uses over original proposals and drinking water	1.60 TMC
	Total	**45.17 TMC**

It was further replied that additional storage of about 130 TMC has been created at Somasila and Kandaleru, which would cater to all the above projects at 50 *per cent* success and would also keep some carry over storage in surplus years for use in the following years and improve the success rate of these projects.

(ii) Chitravathi Balancing Reservoir (CBR) Right Main Canal

At the time of commencement of Jalayagnam, the Chitravathi Balancing Reservoir (CBR) was under construction on river Chitravathi, a tributary of Pennar, to augment irrigation to an ayacut of 60,000 acres already existing under the Pulivendula Branch Canal (PBC). Later, under Jalayagnam, Government took up (June 2004) the right main canal of CBR (called the Lingala Canal) with the objective of providing irrigation to 25,000 acres in Kapada District. Later, this was increased to 59,400 acres by utilizing 3.60 TMC of water, assumed to be available in the CBR[7]. However, as per the I&CAD Department's records, the PBC was unable to serve even 25 *per cent* of its existing ayacut due to insufficient inflows from river Chitravathi (including the flows from the TBPHLC[8]). In fact, the inflows never exceeded 2.16 TMC during the

[7] The capacity of CBR was 10 TMC. Out of this, the water required for the already existing Pulivendula Branch Canal (PBC) System was 6.40 TMC. The remaining water of 3.60 TMC was proposed to be utilized for the Lingala canal system

[8] The Pulivendula Branch Canal (PBC) is at the tail end of the Tungabhadra Project High Level Canal (TBPHLC) system. The water from TBPHLC flows into the Chitravathi river and after travelling for a length of 11.5 KM in that river, the water is diverted into the PBC

previous 22 year period (1982-83 to 2004-05) and the average annual release was a meagre 1.26 TMC.

Later, in December 2006, to supplement water to CBR from other sources, the GoAP took up a lift scheme from Gandikota reservoir at a cost of ₹2,059 crore. However, supplementation from Gandikota Reservoir also remains a question since the Gandikota Reservoir (which is a part of Galeru Nagari project) itself does not have assured water since it is dependent on flood waters of Krishna. As of September 2012, an expenditure of ₹300.57 crore had been incurred on Lingala Canal, the success of which is not assured.

The Department in its reply agreed that there were insufficient inflows in Chitravathi including the flows from TBPHLC. The reply does not address the question as to why Lingala Canal was taken up without any detailed studies, despite the fact that there was no water for the project.

3.1.2 Identification of targeted ayacut

Government did not identify the specific villages where the ayacut was proposed to be developed under the projects taken up in Jalayagnam. Only Mandals were identified in the targeted districts. Further, the extent of ayacut proposed in each Mandal was also not identified.

The Department replied (July 2012) that under the contracting system adopted in Jalayagnam, the task of conducting detailed survey and investigations and also identification of the target ayacut has been entrusted to the contractors, and that, the details of village wise ayacut would be known only after finalization of ayacut registers after completion of detailed survey and investigations by the contracting agencies.

Audit scrutiny of the ayacut details in the test checked projects revealed the following.

i. ***Telugu Ganga***: As per the DPR of 1983, the ayacut proposed under Sree Pothuluri Veerabrahmendraswamy Balancing Reservoir (SPVBR) in Kadapa district, which is a part of Telugu Ganga Project, was 1.50 lakh acres. While taking up the works under Jalayagnam, the proposed ayacut was increased to 1.62 lakh acres by adding additional ayacut under subsidiary reservoirs I and II. As of July 2012, a total ayacut of only 1.3 lakh acres was identified, leaving a shortfall of 30,952 acres. The details of shortfall and the reasons are given below.

Table-3.4

Package	Target ayacut	Shortfall	Reasons
II	65,600 acres	5,384 acres	Shortage in block ayacut
III	96,303 acres	14,518 acres	Already covered under the existing tanks
		5,157 acres	Coming under submergence of Somasila Project
		5,893 acres	Due to extension of Municipal/Panchayat agglomeration area and environmental reasons
Total	**1,61,903 acres**	**30,952 acres**	

Source: Project records

This indicates that the works were awarded without conducting adequate survey to assess the availability of the ayacut. The Department is yet to adjust the contract prices for the reduction in the distributary network, the estimated cost of which was ₹28.79 crore (@ ₹9,300 per acre).

The Department replied that payments to the contractor for distributary network will be made only for the ayacut created on acre basis as per the agreement which has a clause for reduction in ayacut upto 20 *per cent*. The reply does not address the issue relating to deficiencies in identification of target ayacut. Further,

- The accuracy of bid amount will be affected if the ayacut details are not clearly spelt out in the DPR;
- There is a possibility of overlap of projected ayacut across multiple adjoining irrigation projects, which could affect the accuracy/ validity of the potential economic benefits.

Specific issues relating to ayacut of individual test checked projects are discussed under key issues in Chapter 5.

3.2 Clearances for the projects

As per the guidelines of the Planning Commission and the CWC for 'Submission, Appraisal and Clearance of Irrigation and Multipurpose Projects', for all the major and medium irrigation projects which are proposed on inter-state rivers or their tributaries, investment clearance is to be accorded by the Planning Commission.

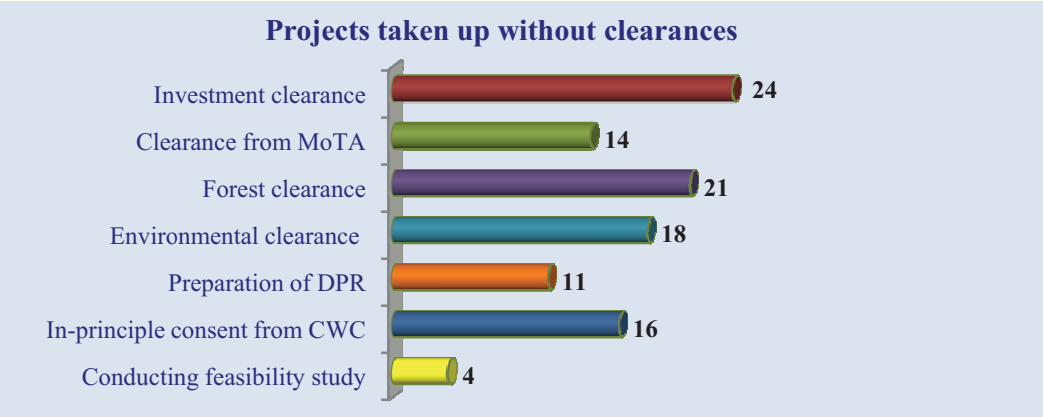
The stages involved in investment approval for any major or medium irrigation project are as follows:

Requirement	Description
Preliminary (Feasibility) Report	Should contain brief chapters on general data, irrigation planning, inter-state issues, survey & investigations including hydrological, geological, seismic, preliminary assessment of environmental aspects etc.
In-principle approval of CWC	In respect of the projects proposed on inter-state rivers or their tributaries, the preliminary/feasibility report has to be sent to the CWC, which examines the basic soundness of planning of the proposed project, and if found acceptable, gives '**in-principle'** consent for preparation of DPR.
Preparation of Detailed Project Report (DPR)	To be prepared after detailed surveys and investigations in accordance with applicable guidelines issued by GOI, MoWR/ CWC
Clearance from MoEF and MoTA (where required)	Environment Impact Assessment and Forest area being utilized/ diverted is to be discussed in detail (MoEF). Tribal population being affected would be examined and R&R plans cleared (MoTA)

Requirement	Description
Submission of DPR to CWC	The final estimate should be based on finalized designs and details of civil and hydraulic structures and economic analysis
Clearance by Technical Advisory Committee	Technical clearance for the project will be given by CWC
Investment clearance by Planning Commission	Investment Clearance by Planning Commission for inclusion in the Five Year Plan/Annual Plan

Out of the 26 projects test checked by Audit, tenders were invited/works were awarded without fulfilling these requirements in several cases. While the details of the projects and current status (July 2012) of clearances are given in ***Appendix-3.1***, the status of clearances as on the date of award of works is depicted below.

Chart-3.2



Source: Compiled from records of I&CAD Department

Some of the specific instances observed during test check with regard to these clearances are discussed below:

3.2.1 In-Principle clearance and Feasibility study

i. ***Uttarandhra Sujala Sravanthi***: This project is expected to irrigate 8 lakh acres in upland areas of Visakhapatnam, Vizianagaram and Srikakulam districts at an estimated cost of ₹7214 crore. As of September 2012, it is still in the preliminary investigation stage. Feasibility study report, stated to have been prepared in November 2008, was not produced to Audit. DPR for the project has not yet been prepared. Though the Department stated that BCR of the project was worked out at 1.62, the calculation sheets were not furnished to Audit. In fact, even the preliminary study report of this project has not been sent to CWC for grant of **'in principle'** clearance, though the project is proposed on river Godavari, which is an inter-State river and the approval of CWC is a pre-requisite for obtaining investment clearance from the Planning Commission. Further, although, as per the preliminary estimates of the Department, the project requires diversion of about 16,278.74 acres of forest land, proposals for forest clearance have not been submitted to MoEF. However, tenders for six packages were invited in February 2009 and till September 2012, the tenders were neither opened nor cancelled.

ii. ***CBR-Lingala canal***: Neither a feasibility report nor a DPR was prepared for Lingala Canal before awarding the works. However, a feasibility report was prepared for micro-irrigation system. The dates of preparation and approval of even this report were not forthcoming from the records furnished to Audit.

The Department replied that in the EPC contract system, detailed investigation is done by the executing agency and in view of the urgency felt by the Government to start the works, the DPR was not prepared. It was further stated that since the scheme was taken up with flood water, no feasibility report was prepared. The reply is untenable. In the EPC contracting system being followed by GoAP, only detailed engineering is entrusted to the contractors and the Department should have established the feasibility of the overall project including the availability of flood water, the primary requirement for the project, before entrusting the works. While the reply confirms that the Government awarded the works without establishing water availability for the project, it is pertinent to mention that the CE sanctioned an estimate with increased scope of the project, invited tenders and awarded (October 2004) the works for ₹148.05 crore, contrary to the administrative approval given by the Government for ₹32 crore.

3.2.2 Preparation of DPR

i. ***Gandikota-CBR Lift scheme:*** Works relating to this project were awarded without preparing a DPR. One of the components under the project was improving an existing anicut, viz. Goddumarri anicut, constructed across the river Chitravathi in Anantapur district in 1977, from a capacity of 0.0174 TMC to 0.07 TMC. The cost of this component was estimated at ₹4.14 crore and was included in one of the lift packages (L1-04) entrusted (August 2007) to an agency.

The designs for improvement of the existing anicut submitted by the agency required several modifications. The expert committee headed by the CE,CDO while scrutinizing the designs, concluded that modifications to the existing structure were detrimental to the functioning of the structure and the stability and safety. The committee finally proposed (May 2008) construction of a new anicut on upstream of the existing anicut.

The Department replied that no DPR was prepared since the scheme was formulated mainly to supply water to the existing ayacut of PBC system and CBR Lingala canal. The reply is not acceptable, since irrespective of whether the project proposes to serve new or existing ayacut, preparation of DPR before taking up a project is critical in firming up the techno-economic feasibility of the project duly covering its design, execution and functional aspects. This project has not received any of the requisite clearances, including in-principle approval of CWC.

3.2.3 Forest clearance

i. ***Veligonda***: The alignment of certain reaches of the project is passing through forest areas in Prakasam district and an extent of 3,069.91 hectares of forest land was required for the excavation of the canal. Forest clearance was required for excavation of tunnels also, since the tunnels were being excavated beneath the

Rajiv Wild Life Sanctuary. However, contracts were awarded and the works are being executed without obtaining forest clearance.

The Department replied that Stage-I clearance was obtained and lands required for compensatory afforestation had been identified, and that, these would be handed over to Forest Department.

ii. ***Somasila***: In South Feeder channel of this project, water was being released only upto Km 58.700 since 2004, due to non-construction of an aqueduct at Km 58.720. The aqueduct was not constructed due to non-receipt of forest clearance from MoEF. Despite this, the work of providing CC lining to the SFC and formation of distributory network for irrigating an ayacut of 1,912 acres beyond Km 58.720 was awarded in March 2005 at a cost of ₹28.81 crore. As the forest land was not handed over, the contractor requested and Government approved (June 2011), closure of contract after executing work valuing ₹12.39 crore. Thus, due to non-obtaining of forest clearance, the aqueduct was not completed and the intended objective has not been achieved, even after a lapse of more than six years from award of works.

The Department replied that the issue was before the Supreme Court and that the works would be taken up after receipt of forest clearance.

3.2.4 Investment clearance

Two of the projects under Jalayagnam viz. Polavaram and Pranahita-Chevella are being pursued by the State Government with the Government of India for according **National Project** status. While all the clearances have now been received for Polavaram, works relating to spillway and ECRF dam were taken up before clearance of the DPR from the CWC, which later entailed change in the design, resulting in foreclosure of contracts.

Pranahita chevella project was originally estimated to cost ₹17,875 crore (May 2007) and was later revised to ₹38,500 crore (December 2008). All the works relating to the project were awarded between May 2008 and May 2009, while the DPR was submitted in April 2010. There was a mismatch between the time stipulated for completion of the project as per the agreements and the DPR. The numerous changes to the scope of the project (detailed in Chapter 5) and consequent increase in the cost of the project by over 100 *per cent*, could have been avoided, if the Government had ensured preparation of a comprehensive DPR and its approval by CWC.

The Department stated (July 2012) that it cannot afford to wait for fulfillment of these pre-requisites, since this would take an unduly long time, and that, advance action for tendering, contracting and project execution was initiated, alongside action for obtaining of clearances/ land acquisition. It was further stated that, a policy decision was taken to take up the works simultaneously with the process of obtaining CWC clearances and that, water being a State subject, there was no requirement for obtaining prior approval of CWC unless the project involves funding from GoI.

The reply is not tenable due to the following reasons.

- Awarding contracts without comprehensive DPRs (including a reliable and validated assessment of the available water, ayacut, and land requirements) resulted in changes to the scope and specifications, escalation of cost and time budgets in several projects, contractual disputes, foreclosures etc.
- Further, all these clearances are pre-requisites for posing any irrigation project for funding under AIBP and also for according National Project status by the GoI, as per the guidelines of those schemes. Considering that the State Government is pursuing with GoI for granting national project status to Polavaram and Pranahita Chevella, it is imperative that it obtains CWC approval and investment clearance for these projects.
- In the absence of a DPR and clear specifications, both, the Government as well as the contractors, would not be able to estimate the costs involved in completing a project.

3.2.5 Economic viability (Benefit-Cost Ratio) of projects

Benefit-Cost ratio (BCR) refers to the ratio between the net annual benefit to net annual cost of the project and tells us whether the proposed project gives value for money invested in it or not. As per the norms fixed by the Planning Commission/CWC, a project is considered economically viable, when the BCR is more than 1.5 in normal areas and more than 1.0 in case of the projects proposed in scanty/drought prone areas.

In the following test checked projects, the BCR will work out to less than one, if the guidelines issued by the CWC are taken in to account.

Table-3.5

Project	BCR as per Govt.		Factors ignored by Govt	BCR taking factors in col.4 in to account
	Initial	*Revised*		
(1)	*(2)*	*(3)*	*(4)*	*(5)*
Pranahita Chevella	1.43	---	• Capital cost of irrigation component of the project understated • Value of pre-project crop benefits under valued by taking less yield per hectare	0.97
Handri Neeva	1.80	1.32	• Net annual benefits overstated by ₹647.68 crore • Reduced project cost taken for calculation • Crop benefits taken on maximum prices rather than average prices • Loss in agricultural produce under estimated	0.86
Nettempadu	2.00	1.65	• Cost of distributory network under stated • Interest on capital cost computed @ 6% instead of applicable rate of 10% • Power charges taken @ 20 paise per KWH instead of tariff fixed by APERC @ ₹2.41 per KWH for 2004-05 • A number of cost components were not included in the project cost	0.87
Galeru Nagari	1.93 (1990) 1.63 (1993)	2.023 (2006)	• Interest on capital computed @ 4% instead of applicable rate of 10% • Project cost has now increased to ₹7,216.36 crore as against ₹4,541.29 crore considered for computing BCR • Pre-project crop benefits ignored	0.96

Source: DPRs of the projects and records of I&CAD Department

3.3 Requirement of Power

Lift irrigation schemes (LIS) require electricity for running the motors and pumps to provide water to the ayacut. Therefore, assured availability of adequate power assumes importance in planning and execution of LIS.

Out of the 74 irrigation projects taken up under Jalayagnam, 31 are LIS (involving a cost of ₹1,18,996 crore). The combined ayacut contemplated under these projects is 95.39 lakh acres[9]. As per the information furnished by the Department (July 2012), the total power required for these 31 new LIS is 8,746.37 MW[10] with a requirement of nearly 210 million units (MU) per day. Details are given in ***Appendix-3.2.***

Audit observations in this regard are as follows:

i. The total installed capacity of power generation (including private and central sectors) of the entire State as of March 2012 was 16,069 MW[11]. The power required for the new LI schemes, after their commissioning, works out to nearly 54.43 *per cent* of the total installed capacity of the State.

ii. The total power consumed in the entire State during 2011-12 was 69,848 MU[12]. The 31 new LIS, on their completion and commissioning, are estimated to consume 21,604 MU of power during the pumping season, which works out to 30.93 *per cent* of the total consumption of the entire State, at 2011-12 levels.

iii. More importantly, during pumping season, the 31 new LIS would require about 210 MU of energy per day, which is more than the average daily energy consumption (of 191.36 MU) of the entire State in 2011-12.

iv. Andhra Pradesh is a power deficit State and it purchases power from independent power producers every year at high rates. Even if the unit rate of ₹2.60 chargeable by the Power Distribution Companies (approved by the APERC[13] for the year 2011-12) in respect of Government LIS is considered, the total funds required to meet the electricity consumption charges alone for these 31 new LIS works out to ₹5,617.04 crore every year.

The Department replied that out of the total requirement of 8,746.37 MW for the 31 LIS, two projects, i.e. Uttarandhra and Kanthanapally, requiring 329.95 MW and 878 MW, are yet to be taken up, and that, the balance power requirement was 7,538.42 MW. It was further stated that the requirement of the projects already commissioned, either fully or partly, as of March 2010 is only 254.14 MW and that all the remaining LIS are scheduled to be completed only by 2017-18 and that there would not be any

[9] New ayacut: 62.82 lakh acres; and Stabilisation of/Supplementation to the already existing ayacut: 32.57 lakh acres

[10] As per the information furnished by the I&CAD Department earlier (October 2011), the total power requirement was shown as 8,494.30MW. We have taken the revised figures for the purpose of audit analysis.

[11] Thermal: 5092.5 MW; Hydel: 3832.36 MW; Gas: 2766.70 MW; Wind: 228.89 MW; Others: 801.01 MW; Share from Central sector: 3347.54 MW (source: APTRANSCO)

[12] These are the figures of total recorded sales (provisional) furnished by APTRANSCO

[13] Andhra Pradesh Electricity Regulatory Commission

problem in supplying power to these LIS since by that time, the State's installed capacity would be significantly higher.

In its reply, the Department also referred to an assurance given by the APTRANSCO[14] regarding power availability for the LIS including Pranahita Chevella, wherein it was stated that the expected installed capacity of the State would increase to about 19,812 MW by March 2014 as against the estimated total power demand of 17,551 MW, and that power **'may be'** available to all the major LIS.

The reply is not acceptable due to the following reasons:

- As per the contract period stipulated for the works of all the ongoing LIS, 29 out of the 31 projects (except Uttarandhra and Kanthanapally projects) were originally scheduled for completion by 2014-15 and the power requirement of these LIS would have reached 7,538.42 MW by 2014-15 itself and not by 2017-18 as contended by the Department.
- In response to a specific query from Audit, APTRANSCO furnished (July 2012) an action plan on power requirements of AP including LIS upto 2016-17, wherein, it projected the capacity addition of 11,100 MW[15] during the period from 2012-13 to 2016-17[16]. As per the information furnished (June 2012) by APTRANSCO, despite the capacity addition, the State would still face energy deficit ranging from 11,339 MU to 32,894 MU during the five year period 2012-17.
- The increase in availability of power to the State as projected by APTRANSCO was based on assumptions like, capacity addition of 11,100MW including huge addition of 5,212MW of wind and 380MW of solar power in the next five years; reduction of T&D losses from the present level of 18 *per cent* to 14 *per cent* by 2016-17; getting power share from Central generating stations like Vallur, Tuticorin and Neyveli and also from UMPP Cheyyur and UMPP Orissa-II. In the event of non-materializaion of any of these assumptions, the State would be under even more stress to provide the required power to the LIS.

Further, considering the crippling power shortage in the State during the current year (2012), with the gap between the demand and supply being 7413 MU (April to September 2012) (15.34% of total demand for the period), provision of power to all the LIS is a daunting task.

[14] Transmission Corporation of Andhra Pradesh Limited
[15] APGENCO: 3,210MW; CGS: 1,248MW; Wind & Solar: 5,592 MW; Singareni: 1,050MW
[16] 2,768MW in 2012-13; 3,359MW in 2013-14; 1,267MW in 2014-15; 2,466MW in 2015-16; and 1,240MW in 2016-17

Tendering and Contract Management

Jalayagnam marked a departure from the regular mode of contracting for irrigation projects in the State. All the works relating to the projects under this programme were awarded on turnkey basis through Engineering, Procurement and Construction (EPC) method. Tendering and contract management assume greater importance in this context, since the survey and investigation, design and execution of projects are entrusted on a fixed price basis. Audit review of the tendering and contracting processes revealed the following.

4.1 EPC system of contracting

EPC system of contracting is being followed world over based on "Federation Internationale des Ingenieurs – Conseils (FIDIC)" for time bound execution of projects and minimizing risks to the owners. In this system, the contractor is to design a project or work, procure all the necessary materials and construct it, either through own labour or by subcontracting part of the work and deliver it to the employer. The contractor carries the entire risk of the project for schedule, as well as budget, in return for a fixed price, and hence this mode of contracting is also called "Lump-sum Turnkey". The employer would have to define, clearly, (i) scope and specifications of the project (ii) quality parameters (iii) project duration, and (iv) cost.

4.1.1 EPC system as adopted by Government of Andhra Pradesh

The EPC model as adopted by GoAP for the projects taken up under Jalayagnam programme is detailed below:

Responsibilities of the contractor	Responsibilities of Government
Engineering: • carry out the related surveys of project site for construction of the head works, canals and distributory system etc. • identify the localized area to be irrigated • carry out exploration of sub-soil for designing of various structures, prepare hydraulic particulars of canals and designs for all structures • prepare land plan schedules for acquisition of requisite land and submit to the Department for further processing and making the land available for construction.	• approve designs and drawings submitted by the contractor • arrange land to the contractor
Procurement: • work out the requirement of machinery, material, manpower etc., and procure them.	• provide mobilization advance as per eligibility, where requested

Responsibilities of the contractor	Responsibilities of Government
Construction: ♦ construction should be taken up and completed as per the milestones agreed to and as per the approved hydraulic particulars, designs and drawings for various components of the project ♦ establish quality control lab, conduct various tests and maintain all the required records of the materials, test results, mark out, placement, consolidation and any other registers that are required for satisfying the Department as well as the third party quality assurance teams. ♦ record the measurement of work done and produce to the Department for checking and arranging payments. ♦ operate and maintain the project for a period of two years after its completion.	♦ monitor the quality of work and pace of progress, payments etc to ensure completion of project within the scheduled time

i. In its foreword on the general conditions of contract for EPC, FIDIC stated that the contractual conditions recommended by it for EPC turnkey projects are not suitable under some circumstances, as detailed below:

- ***If there is insufficient time or information for tenderers to scrutinize and check the employer's requirements or to carry out their designs, risk assessment studies and estimating, EPC turnkey system is not suitable***: The time required for bidding would depend on the size and complexity of the project. It is necessary to give adequate time for bidding, since the contractors have to carry out preliminary survey and investigation before offering their bids in the EPC system. Audit scrutiny revealed that the time limit prescribed for bidding ranged from 8 days (Telugu Ganga) to 300 days (Galeru Nagari). Out of the 180 packages test checked, in 37 packages, the bidding time was less than 30 days. When the time given for tender was less than 30 days, on an average, less than 2 bids were received. When the time given was between 30-60 days, the average number of bids received was 5. Thus, EPC system is suitable, only if the Government standardizes the bidding time, having regard to the size and complexity of the projects.

- ***If the construction involves substantial work underground or work in other areas which the tenderers cannot inspect:*** Some of the Jalayagnam works like SLBC Tunnel (51 km tunnel), Veligonda (18 km tunnel) and other spillway dam and head works like Polavaram involved substantial underground work.

ii. As per FIDIC contractual conditions, the employer should give the contractor access to the site within the time stated in the contract or with effect from the date of commencement. However, the Government could not provide clear land upfront to the contractors for execution of the projects in several cases.

iii. ***FIDIC model provides for contractual clauses to provide for variation to scope and specification of work:*** The contracts entered in to by the Government in the Jalayagnam projects did not provide for variation clauses.

iv. ***In order to value variations to contracts, FIDIC model suggests that tenders should be accompanied by detailed price breakdowns, including quantities, unit rates and other pricing information:*** The test checked projects did not contain the detailed price break-up with unit prices and quantities involved. Later, vide Government Order (GO) No. 50 dated March 2009, Government formally dispensed with the system of quoting for quantities.

4.2 Empanelment of contractor firms

In order to ensure that projects are completed within the envisaged timeframe, and eliminate the delays involved in going in for an elaborate tendering process for every work contract, the State Government decided to empanel the contractor firms which fulfilled the pre-qualification criteria.

4.2.1 Pre-qualification criteria

The following criteria were prescribed for empanelment of contractor firms for participation in prioritized projects.

	Category-I	Category-II
	For Major packages of prioritized projects (where the value of contract was above ₹100 crore)	**For Medium sized packages of prioritized projects** (where the value of contract was between ₹50 - 100 crore)
(i)	Firm/Company registered with GoAP with valid registration under special class with specialization in (i) earth work and canal lining (ii) construction of bridges and other structures or special class civil works	Same as for major irrigation projects
(ii)	Annual turnover of not less than ₹400 crore in at least two years in a block period of five financial years	Annual turnover of not less than ₹50 crore in at least two years in a block period of five financial years
(iii)	Satisfactory completion of not less than 90% of contract value as a prime contractor of at least **one** similar work* of magnitude not less than ₹100 crore in the block period of preceding five financial years	Satisfactory completion of not less than 90% of contract value as a prime contractor of at least **one** similar work* of magnitude not less than ₹20 crore in the block period of preceding five financial years
(iv)	Net worth of ₹100 crore	Net worth of ₹5 crore
(v)	Net profit before tax for last three years	Net profit before tax for last three years
(vi)	In case of a Joint Venture, the number of partners should not be more than three	In case of a Joint Venture, the number of partners should not be more than two

**Similar works means works of dams / barrages / canal system including CM & CD works and hydraulic tunnels / lift irrigation canal schemes / hydro electric projects.*

Government empanelled 19 firms under Category – I and 65 firms under Category – II. Audit observations in this regard are given below.

i. Experience criteria: EPC contracts under Jalayagnam required the contacting firm to carry out survey, soil investigation and design of the project, apart from execution of works of diverse nature like construction of reservoirs, dams, pump

houses, pumps and motors for lifts, excavation of canals, laying pipelines etc. Considering that the contractor firm was awarded works for all or many of these components along with the associated survey, investigation and design aspects, it is imperative that the contractor firms had the requisite minimum experience in all the components of the packages. However, the Government prescribed satisfactory completion of any "**one**" similar work. This was a significant deviation from its earlier orders[1]. Further, the qualification criteria did not prescribe previous experience in execution of EPC turnkey contracts, by all or any of the joint venture firms.

The Department replied (July 2012) that completion of similar works criteria made sure that completion was of paramount importance rather than mere execution of minimum quantities. The reply is not acceptable, since mere completion without technical competence in the concerned domain will not ensure a quality product.

ii. ***Equipment & personnel*****:** As per the standard contracting procedure of GoAP, the bidders should ensure availability of (i) key and critical equipment (ii) key personnel with adequate experience. However, Government ignored these aspects while prescribing the qualification criteria for empanelment.

The Department replied (July 2012) that the bidders were required to furnish these particulars and were **expected** to meet these criteria by virtue of their earlier work experience. The reply is not acceptable, as these aspects should be specified and considered while awarding huge projects, instead of **expecting** the contractor firms to comply with automatically.

iii. ***Bid capacity***: Prior to empanelment of firms for Jalayagnam, GoAP had followed a standardized procedure for assessing the available bid capacity of the contractors through a formula of "2AN-B"[2].

However, Government neither applied the already existing procedure at the time of empanelment nor specified any other alternative procedure for assessing the available bid capacity while evaluating tenders in Jalayagnam.

In its reply (July 2012), the Department stated that Government decided to empanel agencies with rich experience and financial capability to execute the works within time, and therefore, did not consider it necessary to carry out a technical evaluation of each bid every time. The reply is not acceptable, since none of the works were completed on time, albeit, for various reasons. It is also not true that tendering procedures were completed in a short span of time due to non-evaluation of technical bids every time, since the amount of time taken for evaluation ranged up to 303 days (Devadula).

[1] GO Ms. No. 23, dated 5 March 1999 and G.O.Ms.No.94, dated 1 July 2003 which state that the contractors should have executed minimum quantities of (i) cement concrete (ii) earthwork (iii) relevant principle items usually @ 50% of expected peak quantities.

[2] 'A' stood for maximum value of civil engineering works executed in any one year during the last five years, 'B' indicated the value of existing commitments and ongoing works, while 'N' is the number of years prescribed for completion of works. Under this procedure, the bidders had to demonstrate that their bid capacity was more than the estimated value of the work for which tenders were called for

The Department further stated that, it had issued instructions to award a maximum of only three packages to the empanelled firms, and that, it had awarded all the subsequent packages under open category only so as to assess the financial capability of the participating firms, in line with GO No.94.

The reply of the Department is not correct, as can be seen from the details given in ***Appendix- 4.1***, which shows that 8 empanelled contractor firms under Category I and 15 firms under Category II have been entrusted with more than 3 packages.

iv. Foreign firms: The experience certificates furnished by the foreign agencies pertain to their respective countries or elsewhere and not in India. As such, the experience certificates were not susceptible for verification by GoAP. Further, foreign partners of two Joint Venture firms[3] executing Spill way and ECRF packages of Polavaram project were not actually involved in execution of work. This clearly indicates that the foreign firms were roped in only to qualify the experience criteria for empanelment.

During the Exit Conference (July 2012), the Department accepted that this issue was yet to be addressed.

v. Time limit for validity of empanelment: During the seven years since the last empanelment was done (January 2005), Government has neither reviewed the list of empanelled firms nor made any attempt to empanel more number of firms which might have gained eligibility during this intervening period.

During the Exit Conference (July 2012), the Department accepted that this issue was yet to be addressed.

4.2.2 Award of works

Out of 649 packages[4] worth ₹1,23,636 crore, only 227 packages[5] (35 *per cent*) valuing ₹23,771 crore (19.27 *per cent*), were entrusted to the empanelled firms, while the remaining 422 packages worth ₹99,866 crore were awarded to firms under **'open category'** as can be seen from the charts below.

Chart-4.1

No. of packages awarded

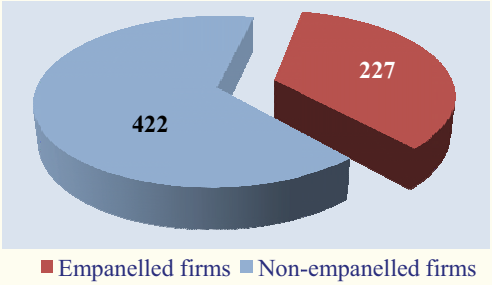
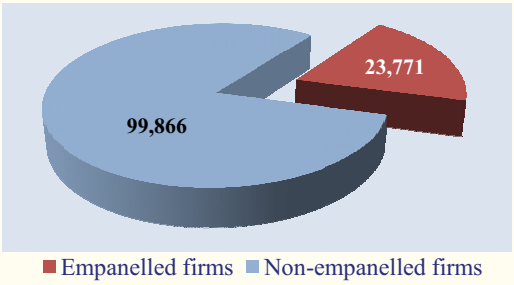


Chart-4.2

Contract value (₹ in crore)



Source: Compiled from information furnished by I&CAD Department

[3] *CR18G* of CR18G-BSCPL, Hyderabad and *Sino-hydro* of Madhucon-Sino-Hydro, Hyderabad (JV)
[4] Including modernization and flood banks
[5] Category I (Major packages) 69 packages worth ₹ 14549.24 crore and Category II (Medium packages) 158 packages worth ₹ 9221.38 crore

In fact, immediately after empanelment (January 2005), in March 2005, works pertaining to Kalwakurthy, Bheema and Polavaram projects amounting to ₹1903.70 crore were awarded under open category. 84 firms empanelled under Categories – I & II on the strength of their JVs obtained contracts worth ₹23,771 crore, and the partners in these firms bagged contracts worth ₹7,296 crore on their own under 'open category' (23 cases).

The Department replied (July 2012) that at the time of empanelment, only 26 projects were envisaged for completion within 2-5 years, and that, the number was later increased to 46, then to 64, 74 and finally to 86. It was further stated that since the number of packages increased and a majority of the empanelled agencies were already awarded 3 packages, it was felt prudent to award all the subsequent packages under **open category**, so as to assess the financial capability of such participating firms.

Audit agrees that tendering under open category is a more transparent method of awarding contracts for huge projects. However, Government needs to review and update the empanelled list, since it is over seven years since it was prepared, and many new firms could have qualified during the intervening period.

4.2.3 Joint Ventures

The empanelled joint venture (JV) firms changed their partners several times during 2004-12 to form new JV firms to bag works in 'open category'. For instance, in **Pranahita Chevella project**, four firms were involved in 15 contracts worth **₹21,843 crore** by forming JVs in 15 different combinations as shown below.

Table-4.1

Pranahita Chevella

MEIL

Package No.	Contractor Firm	Contract amount (₹ in crore)
3	HCC – SEW – **MEIL**	639.57
5	**MEIL** – MAYTAS – ABB – ANDRITZ	3626.11
7	MAYTAS – **MEIL** – ABB – AAG	2118.59
8	**MEIL** – SEW- MAYTAS – BHEL	3271.09
10	HCC – **MEIL** – BHEL	1928.00
11	SEW – **MEIL** - BHEL	2500.53
12	**MEIL** – SEW – ABB – AAG	1954.59
28	**MEIL** – ZVS – PVSRSN – ITT	486.68
	Total	**16525.16**

Maytas

Package No.	Contractor Firm	Contract amount (₹ in crore)
2	**MAYTAS** – NCC HYD JV	215.47
4	SUSHEE HITECH – PRASAD–NCC– **MAYTAS**	1675.25
5	MEIL – **MAYTAS** – ABB – ANDRITZ	3626.11
7	MEIL – **MAYTAS** – ABB – AAG JV	2118.59
8	MEIL – SEW – **MAYTAS** – BHEL	3271.09
14	AMR – **MAYTAS** – KBL – WEG	659.27
17	ITD CEMENTATION (INDIA) LTD., - **MAYTAS**	663.24
	Total	**12229.02**

SEW

Package No.	Contractor Agency	Contract amount (₹ in crore)
3	HCC – **SEW** – MEIL	639.57
8	MEIL – **SEW** – MAYTAS – BHEL	3271.09
11	**SEW** – MEIL – BHEL	2500.53
12	MEIL – **SEW** – ABB – AAG	1954.59
15	SPML – **SEW** – AMR	585.98
16	PLR – GVPR – **SEW**	1082.98
19	GAMMON – **SEW**	435.89
	Total	**10470.63**

NCC

Package No.	Contractor Agency	Contract amount (₹ in crore)
2	MAYTAS – **NCC** HYD JV	215.47
4	SUSHEE HITECH – PRASAD – **NCC** – MAYTAS	1675.25
	Total	**1890.72**

Source : Compiled from records of I & CAD Department

Similar is the case with other projects like Dummugudem NS Tail Pond, where three firms viz. MEIL, Maytas and AAG together bagged contracts worth ₹11630.89 crore, by forming JVs, while these firms had other JV partners in other projects. The details of firms which were involved in contracts worth more than ₹10,000 crore, either under empanelled category or under open category, and by entering in to several JVs, are listed below:

Table-4.2

Sl. No.	Name of the Agency	Number of packages	Value of contracts in which the firm is involved (₹ in crore)	Number of firms with which JVs were formed
1	MEIL	28	36,916	23
2	SEW	51	25,369	20
3	MAYTAS	28	23,186	17
4	ZVS	11	13,989	17
5	AAG	8	12,981	8
6	BHEL	5	12,619	8
7	ABB	7	11,335	8
8	IVRCL	30	10,725	11

Source: Compiled from records of I & CAD Department

Firms mentioned at serial numbers 1, 5, 6 and 7 were not in the original empanelled list but have teamed up with partners of several empanelled firms to obtain contracts under open category.

The Department stated (July 2012) that the amounts mentioned against each of the above firms were total value of works and not their individual stakes in those packages. It was further stated that there was no restriction in forming JVs as long as they fulfilled the conditions of the bid, and that, every JV has its own legal entity and identity and is different from its original mother company, as far as performance in that JV is concerned.

While Audit agrees that the amounts were total value of works and not individual stakes, the stake of individual firms could not be analyzed, since the Department did not provide the details relating to their incorporation as JVs and the extent (percentage) of their interest in the particular contract in question, despite a specific request to this effect.

4.3 Estimation of costs

Before taking up Jalayagnam, the GoAP has been following the 'Unit Price Contract' system in all the works relating to irrigation projects. Under this conventional system, payments are made to contractors with reference to the quantities of work actually executed by them duly considering the tender percentage quoted by them. This system is still being followed by all other departments and also by the Irrigation Department in respect of minor irrigation projects and maintenance works.

The EPC agreements under Jalayagnam were composite contracts, under which, the contractors are required to conduct detailed survey and investigation, design the project and execute the works on turnkey basis. The contractors are required to quote a fixed lumpsum price at the time of tendering. For the purpose of cost estimation, the Department prepared internal bench mark (IBM) estimates, to compare with the price bids of the contractors. While evaluating the bids, the Department continued to follow the existing procedure of rejecting the bids in excess of 105 *per cent* of the IBM estimate values.

Government did not frame any guidelines for preparing the estimates with regard to EPC contracts. The task of preparing the estimates was initially left to the concerned project Chief Engineers/Engineers-in-chief. In May 2006, a committee was constituted for finalizing the IBM estimates. However, there was no uniformity in preparation of estimates for various projects. In the test checked projects, IBM estimates were worked out at increased amounts on five fronts viz., (i) higher estimation of quantities / quantum of work (₹368.88 crore) (ii) higher estimation of costs of components (₹1649.98 crore) (iii) inclusion of duties / taxes which do not cover irrigation projects like Service tax (₹684.15 crore) or already exempt for irrigation projects through various notifications of Government of India, like Central Excise duty (₹265.23 crore) (iv) inclusion of un-authorized amounts towards price variations (₹108.42 crore) and (v) inclusion of higher amounts towards insurance (₹52.85 crore). The total impact of these components in increasing the IBM values in the test checked cases was ₹3,129.51 crore.

These issues are discussed in brief in the succeeding paragraphs.

4.3.1 Abnormal increase in project cost

i. In May 2007, administrative approval for Dummugudem NS Tail Pond was accorded for ₹8,930 crore. Within less than two years, this was revised upwards to ₹19,521 crore (February 2009). The items on which there was an increase and the stated reasons for the increase are tabulated below.

Table-4.3

(₹ in crore)

Sl. No	Description	Initial cost	As Revised	Increase	Reason stated by Department
1	Tunnel	990	3776	2786	Increase in tunnel length by 3.20 Km and adoption of twin tunnel instead of a single tunnel
2	Earthwork & Lining	1128	3906	2778	(i) Change in alignment (ii) Change in soil classification (iii) Increase in number of feeder channels (iv) Increase of lining from 125mm to 150mm

Sl. No	Description	Initial cost	As Revised	Increase	Reason stated by Department
3	Electro Mechanical works	3819	5846	2027	Increase in the number of pump houses from 4 to 6 and change in rates.
4	Cross Drainage works	730	2016	1286	Provision made based on detailed investigation
5	Taxes and other provisions	78	2200	2122	As per Government orders
Cost increase				**10999**	

Source: Project records

The reasons stated by the Department are not acceptable due to the following.

- The escalation in the cost of the project due to change in the scope and design of works, indicates inadequate scoping of work *ab initio*;
- The reasons stated for revision in cost upwards could have been factored in initially itself, if the works were tendered after approval of DPR. Even if the initial cost estimates were not based on project scope as per DPR, at least the cost/scope revision could have been done after the approval of DPR. It is pertinent to note that while the revision in cost was approved in February 2009, the DPR was finalized almost a year later in October 2010. This would have brought about clarity in scope, design and specifications of the project.

4.3.2 Over-estimation of quantities/quantum of work

Cases of over-estimation of items/quantities pertaining to three projects test checked, involving an amount of ₹84.12 crore are summarized below:

Table-4.4

Sl. No.	Project	Package	Item	Quantity provided for in estimates	Actual quantity executed/ approved	Cost Difference (₹ in crore)
1	Nettempadu	108	Storage capacity of two reservoirs	2.6 TMC	2.0 TMC	17.17
2	Handri Neeva	Phase I Package 2	Pumps and Motors	42 MW	39.12 MW	6.62
3	Polavaram	67	Earthwork	16.62 lakh cum	6.47 lakh cum	3.84
4	-do-	-do-	Banking	6.59 lakh cum	1.62 lakh cum	2.67
5	-do-	-do-	Concrete	3.13 lakh cum	0.78 lakh cum	53.82
					Total	**84.12**

Source: Project records

Further, there have been cases where the items specified in the contracts were not actually required or executed. The cost impact of such items with reference to the originally estimated cost was ₹284.76 crore as detailed below.

Table-4.5

Initial proposal	Actual execution	Amount involved (₹ in crore)	Government's reply	Audit remarks
Polavaram (Canal packages)				
CNS soil backing to lining	Not being executed	277.58	Original alignment was through black cotton soil. Hence CNS soil treatment below lining was provided to reduce effect of swelling and shrinkage of soils. After entrustment and detailed survey the contractor fixed a different alignment to safeguard the canal system.	The reply did not justify the circumstances under which the Department itself could not consider alternative alignment in view of safety of the canal in the initial stages instead of proposing canal to pass through black cotton soils and provide for CNS soil backing to the lining.
Polavaram (63 & 64)				
900 mm thickness cement concrete lining	800 mm thickness CC lining in view of the hard rock strata	7.18	Recovery proposals for reduction of lining thickness have been submitted to Government as of July 2012.	Recovery yet to be effected.
Total		**284.76**		

Source: Project records

4.3.3 Adoption of varying rates for distributory network

Creation of distributory network in an irrigation project involves excavation of distributaries/majors, minors, sub-minors and field channels.

Audit analyzed the rates provided for distributory network in the estimates relating to 94 packages in the test checked projects, where excavation of distributory network was involved. The aggregate amount provided in these 94 packages for a distributory network of 40.02 lakh acres was ₹5,005.49 crore. In these estimates, the Department provided the cost of the distributory network at a lump-sum price per acre instead of assessing the costs based on the quantities of work to be executed. The rates across the projects ranged from ₹4,500 to ₹16,500 per acre as shown below.

Table-4.6

Year	Minimum rate per acre (in ₹)	Project	Maximum rate per acre (in ₹)	Project
2004-05	4,856	Vamsadhara Stage II Phase II, Venkatanagaram Pumping Scheme & Bhupathipalem Reservoir Project	12,000	Veligonda (Pkg.IV)
2005-06	4,700	Handri Neeva Phase-II	9,500	Rajiv Dummugudem LIS
2006-07	4,500 4,700	Galeru Nagari (Pkg.13) Handri Neeva Phase-II	12,000	Gandikota-CBR Lift Scheme
2007-08	10,500	SLBC Tunnel Scheme	16,500	Pranahita Chevella
2008-09	4,700	Handri Neeva Phase-II	16,500	Yellampally
2009-10	8,600	Thotapalli Barrage	16,500	Devadula (Phase-III)

Source: Project records

i. In Indira Sagar Dummugudem, rates adopted for distributory network varied from one package to the other. While a lump-sum rate of ₹ 7500 per acre was adopted in packages 21 and 22, a higher rate of ₹ 9500 per acre was provided in packages 50 and 51 resulting in increase in the estimates by ₹36.20 crore in these two packages. Both these packages (50 and 51) were awarded to single bidders.

ii. In Telugu Ganga project, Government accorded administrative approval in April 2007 for Siddapuram LIS for irrigating an ayacut of 21,300 acres. In the administrative approval, the cost of distributary network was provided at ₹7,000 per acre. However, in the IBM estimates approved just one month later in May 2007, the Department adopted a higher rate of ₹8,000 per acre. Further, the estimates provided for the cost of development of distributory network for the entire ayacut of 21,300 acres, even though the ayacut contemplated under the scheme included the already existing ayacut of 1,000 acres. The cost of the distributory network for the new ayacut of 20,300 acres at the rate of ₹7,000 per acre approved by Government works out to ₹14.21 crore. As against this, the Department provided an aggregate amount of ₹17.04 crore (@ ₹8,000 per acre for 21,300 acres). Thus, the estimates were inflated by ₹2.83 crore.

iii. The rate provided in the above mentioned administrative approval accorded in April 2007 was ₹7,000 per acre. In the estimates for packages II and III of the same project (Telugu Ganga) in 2004-05, a higher rate of ₹9,300 per acre was provided. Thus, the cost of development of a total ayacut of 1,61,903 acres in the estimates of these two packages was higher by at least ₹37.24 crore.

The Department replied (July 2012) that the cost of the distributary network would depend on the quantities involved in it, apart from the topography of the area, nature of the basin, soil strata met with, CM&CD[6] works involved, whether the canals are lined or not etc., which would vary from project to project, and, therefore, it would not be possible to adopt a uniform rate.

The reply of the Department is not acceptable due to the following reasons:

- In all the estimates test checked by audit, the costs for distributary network were not based on the project and package specific issues like topography, soil classification of the area etc.
- A uniform rate of ₹16,500 per acre was adopted (2007-08) in all the packages of Pranahita Chevella where the proposed ayacut spanned across six districts *viz*. Adilabad, Karimnagar, Medak, Nalgonda, Nizamabad and Ranga Reddy. The same rate was adopted in Yellampally (2008-09) and Devadula Ph III (2009-10), although the ayacut is located in Karimnagar and Warangal districts.
- The rate adopted in Handri Neeva Ph II (packages 29, 30, 64 and 65) for the ayacut located in Chittoor district was ₹4,700 per acre. However, a higher rate of ₹9,000 was adopted in Galeru Nagari (packages 12 and 14) for ayacut in the same district, in the estimates prepared in the same year (2009-10).

[6] Cross masonry and cross drainage

- IBM committees were suggesting adoption of rates of other projects as in the case of Devadula Phase III works, wherein it was instructed to adopt the costs as per Pranahita Chevella scheme, and also in the case of Siddapuram lift irrigation scheme, which was based on Gandikota lift irrigation scheme.

4.3.4 Higher estimation of cost of items

In the following cases, the IBM estimates of cost of items were not worked out correctly. The effect of such incorrect estimation with reference to the rates provided for the other projects, was ₹1573.71 crore.

Table-4.7

Sl. No.	Project	Package	Item	Cost provided for	Estimated cost in other projects	Reference	Cost Difference (₹ in crore)
1	Dummugudem Tail pond	Packages 1, 4, 5 & 6	Electro-Mechanical equipment for 1135.50MW	₹2.46 crore per MW	₹2.40 crore per MW	Pranahita-Chevella estimates	68.13
2		Packages 1, 4, 5 & 6	Auxiliary equipment to EM equipment to six lifts	₹136 crore per lift*	₹4.25 crore per lift	-do-	790.50
3		Packages 1, 4, 5 & 6	Surge protection equipment for 8 pumps per lift for 4 lifts (1, 2, 3 & 6)	₹16 crore[7] per pump*	₹2.50 crore per pump	-do-	432.00
4		5/2008	M15 grade lining for 21.25 lakh sqm	₹709 per sqm	₹612 per sqm	Standard data	20.61
5		1	85 M wide Head regulator	₹21 crore (2007-08 rates)	₹12.19crore (2009-10 rates)	DPR	8.81
6		All packages	Approach roads & avenue plantation	₹146.52 crore#	₹19.9 crore (2009-10 rates)	DPR	126.62
7	Handri Neeva	Phase I works	Distributary network for 1.98 lakh acres	₹9000 per acre	₹4700 per acre	Phase II	85.14
8		6, 15 & 16	Excavation of tunnels (5.572 lakh cubic meters)	₹1833 per cum	₹1081per cum	Base rate of SLBC increased by 10 *per cent* per year	41.90[8]
Total							**1573.71**

Source: Project records

*Lumpsum amounts were provided in the estimates without break-up
#Percentage provision was made without assessing quantum of work

In IBM of Nettempadu project, there were errors in carrying forward figures from one page to another in the estimates of Stage-I package and in totaling in Stage-II

[7] ₹128 crore / 8 pumps per each lift
[8] Package-6: ₹ 12.12 crore; Package-15: ₹ 11.58 crore; Package-16: ₹ 18.20 crore

package, which pushed up the estimates by ₹13.60 crore and ₹10.20 crore respectively. The impact of such errors is that the bids will be compared with higher costs and contracts would be awarded for a higher amount than is necessary.

4.3.5 Inclusion of exempted taxes/duties in estimates

Audit scrutiny of estimates revealed that provision was made for service tax, central excise duty and turnover tax in the estimates, which do not apply to irrigation projects. Details are given below.

4.3.5.1 Service Tax

As per Chapter – V of Finance Act, 1994 and the rules made there under, service tax is not applicable to irrigation projects and construction services not meant for furtherance of commerce and industry. However, huge amounts were included in the IBM estimates towards this component in the following test checked packages:

Table-4.8

Sl. No.	Project	Package	Cost included in estimates (₹ in crore)
1	Pranahita Chevella	3	0.36
2		4	59.61
3		5	50.13
4		6	93.26
5		7	29.15
6		8	92.10
7		9	17.94
8		10	51.30
9		11	67.31
10		12	51.39
11		13	18.80
12		20	15.47
13		21	30.00
14		22	45.28
15	Yellampally	Spillway gates	6.81
16	Devadula	Phase III Package I	37.26
17		Phase III Package II	2.49
18		Phase III Packge III	15.49
		Total	**684.15**

Source: Project records

4.3.5.2 Provision of Turnover tax despite providing for Sales tax

Apart from providing for sales tax @ 4 *per cent* in the IBM estimates, in Nettempadu project, ₹11.80 crore was provided in the IBM estimates towards Turnover tax, which was not applicable in cases where sales tax is applicable.

4.3.5.3 Central Excise

Government of India, in January 2004, issued a notification fully exempting all items of machinery, equipment, pipes, etc., required for setting up water supply schemes intended for agricultural or industrial use, from payment of Central Excise Duty (CED). Estimates in respect of the following works were loaded with ₹149.70 crore towards CED.

Table-4.9

Sl. No.	Project	Package	Amount of CED included (₹ in crore)
1	Nettempadu	Lift I	31.98
2		Lift II	24.85
3	Devadula	Phase I Stage I	54.27
4		Phase II Package	38.60
		Total	**149.70**

Source: Project records

- Package 5 of Veligonda project involved procurement of equipment like TBM, electro mechanical items etc., which are exempted (January 2004) from CED, when procured for water supply purposes. However, CED component of ₹115.53 crore was included (February 2007) in the IBM estimate (₹715.95 crore).

The Department stated that its officers were not aware that customs and central excise exemptions were available. The reply is not acceptable due to the following reasons.

- It is over three years since this exemption was given by the GoI, and the Department should keep itself abreast of all the relevant provisions/orders with regard to preparation of estimates;
- The contractor was aware of the exemption, as is evident from the affidavit filed by him before the Hon'ble High Court of Andhra Pradesh, stating that his bid had taken in to account the available exemptions.
- Inclusion of exempted duties in the IBM value results in improper evaluation of bids. Notwithstanding Government's instructions to reject tenders exceeding 5 *per cent* ceiling, such inclusion of exempted duties would hike the IBM, resulting in accepting bids not falling within the criteria.

This provision is applicable to all the other projects under Jalayagnam and Government needs to look in to all the cases in this regard.

4.3.6 Insurance

Rates in IBM were inflated in several projects due to provision of higher amounts towards insurance premium on the works as a percentage of the value of the work. The notice inviting tenders as well as the conditions of the contracts stipulate that the contractor has to provide insurance cover for all the envisaged risks for the total work for the entire period of contract.

Audit observations in this regard are as follows:

i. The Department did not obtain quotations from various reputed firms before including insurance component in the IBM estimates resulting in a huge mismatch between what was provided in the IBMs and the value or premium which the contractor firms paid towards insurance. In some projects, the percentage provided for insurance was worked out on the cost of the work on annual basis (based on the period of insurance), while in other cases, percentages were adopted irrespective of the insurance period. Test check revealed the following.

Table-4.10

(₹ in crore)

Sl. No.	Project	Package	GoAP estimate	Actual premium paid by contractors	Cost Difference
1	Dummugudem NS Tail Pond	10 packages	72.86	36.49	36.37
2	Indirasagar Dummugudem	6 packages	8.54	1.99	6.55
3	Yellampally	7 packages	8.13	1.34	6.79
4	Rajiv Dummugudem	1/1	3.12	0.82	2.30
5	Komaram Bheem	Single package	1.74	0.90	0.84
				Total	**52.85**

Source: Project records

ii. There was no uniformity in computing and providing insurance cost component in the estimates across different projects/works. In the tunnel package of SLBC Tunnel, a provision was made at the rate of 0.028 *per cent* of the value of the work for a total insurance period of seven[9] years (i.e., an average rate of 0.004 *per cent* per annum), whereas in the two lift packages of Nettempadu, 2.4 *per cent* was provided for a total insurance period of six years (i.e. an average rate of 0.4 *per cent* per annum). In the same scheme, for packages 99 to 109, insurance coverage was provided at 0.345 *per cent* for the construction period of two years and maintenance period of another two years.

iii. In Pranahita Chevella, insurance was provided in the IBMs at the rate of 0.525 *per cent* in 26 packages and at 0.37 *per cent* in two packages. However, the payment schedules agreed to with the contractors have varying percentages of insurance ranging from 0.08 to 0.5 *per cent*. The overall cost difference between the IBMs and payment schedules was ₹93.40 crore.

iv. Government could not take advantage of insurance cover in the case of Yellampally project, where a scour has occurred in one of the works in September 2010 due to heavy flood. The portion of work, in which the scour has occurred, was withdrawn (19 January 2011) from the contractor due to stoppage of work from July 2010, and entrusted to another contractor. With the expiry of insurance cover on 31 January 2011, the Department could not claim the cost of damages estimated at ₹2.67 crore. As of July 2012, neither the scour was filled up nor was the insurance claim received.

The Department stated (July 2012) that it had lodged claim with the insurance company, and that, the work relating to filling of scour was in progress.

4.3.7 Inclusion of amounts towards price variation/escalation

IBM estimates included amounts towards 'price escalation' in the following test-checked packages.

[9]Agreement period of five years and maintenance period of two years

Table-4.11

Project	Package No.	Amount included in estimates towards price escalation (₹ in crore)
Galeru Nagari	1	14.83
	2	13.78
	GKL-1	33.79
	47	10.30
	48	5.34
	49	5.15
Pulivendula Branch Canal	92	1.99
	93	3.57
Telugu Ganga Project	Pkg II	7.62
	Pkg III	8.78
	50	3.27
	Total	108.42

Source: Project records

No reasons were recorded for making a provision in the IBMs for 'price escalation'. Audit could not find any specific instructions from Government allowing such loading of additional amounts in the estimates. Further, no such provision was made in the estimates in the other test checked projects. Therefore, the reason for making such a provision in these projects in Rayalaseema region is inexplicable.

4.3.8 Delays in finalizing IBMs

i. There were enormous delays in finalizing the IBM estimates. This was especially so in respect of Veligonda, Package-6 (Eastern main canal). Tenders for this package were invited on 4 November 2008 and the scheduled date for price bid opening was 22 December 2008. However, the scheduled dates were postponed nearly six times up to 3 February 2009 due to non-finalization of IBM value by the committee. The IBM value was also changed several times by the committees.

The Department replied (July 2012) that package 6 is a very complex work where both Stage I and Stage II works are to be synchronized and hence the committee took time to finalize the IBM values. The reply only reinforces the Audit contention that it is important to finalise the IBM values carefully before calling for tenders.

ii. So was the case with Telugu Ganga project. Here, while according administrative approval for lining packages of left and right canals pertaining to Sri Potuluri Veera Brahmendraswamy Reservoir (SPVBR), the Government had specifically stated (April 2008 and February 2009) that the IBMs shall have to be got vetted by the IBM committee before inviting tenders. However, tenders were invited (8 September 2009) for both the works without approval of the IBM Committee on the instructions of the Secretary, Projects, I&CAD Department (Rayalaseema Region) on 21 August 2009. The IBM values for these works were approved on 6 November 2009. Price bids were opened on 30 November 2009 and work was awarded to the contractor on 7 April 2010. Revised administrative approval was accorded on 30 March 2010 and the estimates were technically sanctioned on 7 April 2010.

The Department replied that in the EPC mode of procurement, finalization of the IBM is a critical activity and that the IBM was finalized during tender process. It was further stated that giving technical sanction after calling for tenders occurred because of huge number of works and the urgency pressed to complete the works.

The reply confirms Audit contention that, finalization of IBM should precede call of tenders.

4.4 Tendering process

4.4.1 Tendering without technical sanction

Government instructed[10] in February 2006 that *"where tenders were called for without technical sanction, Government ratifies the action in calling for tenders before according technical sanction for the proposals received"*. This indicates that technical sanction should be obtained prior to calling for tenders and Government ratification is required where there are exceptions / violations.

i. Tenders were called before according technical sanction or finalizing the value of the work in 143 packages (out of 180 packages test checked) pertaining to 21 projects.

ii. In 66 packages pertaining to 14 projects, technical sanction was accorded after opening the bids.

The Department replied that technical sanction is a pre-requisite for taking up the work on ground, i.e., before signing the agreement, and that, technical sanction was accorded before the date of agreement and commencement of work in respect of all the packages cited in audit. The reply is not borne out by facts, as in 18 packages pertaining to SLBC Tunnel (1), Handri Neeva (12), Devadula (3) and Yellampally (2), **technical sanctions were accorded after the conclusion of agreements.**

The Department further stated that technical sanction is a mere departmental formality in EPC system and is not significant, and that fixation of IBM value is important. The reply is not acceptable as the possibility of variations to quantities is huge, in the absence of approved estimates for each component of work. Further, even IBM estimates were not finalized on time, as brought out earlier.

4.4.2 Delays in opening/acceptance of bids

One of the stated objectives of the Government in following the EPC mode of contracting was to cut down the time taken in approvals. Audit review of the tendering process in the test checked projects revealed the following:

i. In 63 packages pertaining to 16 projects[11], the Department took more than 90 days for finalizing the bids from the last date of their submission.

[10] 5217/Reforms/06 dated 23.02.2006

[11] Nettempadu (11), Handri Neeva (10), Dummugudem Tail pond (6), Rajiv Dummugudem (5), Indirasagar Dummugudem (4), Devadula (4), Pulivendula (4), Yellampally (4), Telugu Ganga (4), SLBC tunnel (2), Galeru Nagari (2), Polavaram (2), Veligonda (2) and one package each in Bhupathipalem, Pranahita Chevella and Somasila

ii. In 14 packages of 3 projects[12] the time taken for opening the bid was more than the time given for bidding. In Nettempadu, **52 days** were taken for opening the bids. On the other hand, the time given for bidding was only 35 days in 12 out of 14 packages.

iii. In 66 packages of 12 projects[13], the time taken for accepting the bid after opening was more than the time given for bidding.

iv. There were delays of more than 6 months in acceptance of bids in the following cases:

Table-4.12

Project Name	Package No.	Last date for submission of bids	Date of acceptance of bid	Time taken from submission of bids to their acceptance (in days)
Galeru Nagari	31	29/09/2006	19/04/2007	202
Polavaram	ECRF	12/01/2006	14/07/2006	183
	OC-8	19/04/2005	31/12/2005	256
Devadula	Ashwaraopally tank	14/03/2006	11/01/2007	303
	II of Phase III	08/08/2008	13/02/2009	189
	RS Ghanpur tank	14/03/2006	11/01/2007	303
	Tapsapally tank	14/03/2006	11/01/2007	303
Nettempadu	99	15/02/2005	21/10/2005	248
	100	15/02/2005	21/10/2005	248
	101	15/02/2005	19/08/2005	185
	102	15/02/2005	19/08/2005	185
	103	15/02/2005	19/08/2005	185
	104	15/02/2005	21/10/2005	248
	106	15/02/2005	21/10/2005	248
	107	15/02/2005	21/10/2005	248
	108	15/02/2005	19/08/2005	185
	109	15/02/2005	19/08/2005	185
Pulivendula	92	15/02/2005	24/10/2005	251
Rajiv Dummugudem	1/1	25/01/2007	28/03/2008	428
Somasila	11	05/05/2008	23/12/2008	232
Yellampally	Canal Network package 1	28/08/2008	02/03/2009	186

Source: Project records

The Department justified (July 2012) the delay on administrative grounds and stated that in respect of Polavaram project, the bid evaluation report was first submitted to the State level Standing Committee and then to the High Powered Committee, which caused the delay in accepting the single bid. In respect of other projects, it was stated that technical aspects and physical experience of bidders need to be examined thoroughly by various committees and as such, time frame cannot be fixed for accepting the bids.

[12] Nettempadu (12), one each in Devadula and Yellampally

[13] Handri Neeva (12), Nettempadu (11), Pulivendula (7), Raijiv Dummugudem (7), Dummugudem tail pond (6), Yellampally (5), Veligonda, Telugu Ganga, Galeru Nagari, Devadula (four each), SLBC Tunnel and Somasila (one each)

The reply is not acceptable due to the following reasons.

- Government gave shorter time for bidding, and took much longer time for evaluating and accepting the bids, which could give scope to post bidding manipulations.
- Jalayagnam was taken up to complete the projects within a time span of two to five years. If the bid evaluation and acceptance takes more than 6 months to a year, the objective of taking up the programme gets defeated.

4.4.3 Award of contracts to single bidders

i. In 36 packages of 15 test checked projects, works were awarded to single bidders (***Appendix-4.2***). The value of such contracts was ₹7856.11 crore.

ii. There have been 31 cases in 12 projects, where only one bidder was found to have quoted below the prescribed ceiling of five *per cent* above the IBM value. The value of such deemed single bids, which were accepted, was ₹10,009.14 crore.

iii. In 52 packages pertaining to 15 projects, the competition was very low with just two bidders. The value of contracts entrusted amidst such low competition was ₹34,169.49 crore.

The Department put forth several reasons for accepting single tenders viz., (i) single tenders were being accepted in view of poor response to earlier tender calls (ii) if the single tenders with discount are not accepted then Government might have to pay excess amounts during the next calls with revised rates, (iii) location of the work and topography of the area may not be conducive to the agencies.

4.4.4 Post-tender changes

Audit scrutiny revealed that IBM values were adjusted after opening the bids in the following cases.

i. In LMC-8 package of Polavaram, the single qualified bidder reduced (27 August 2005) his bid amount by ₹4.88 crore (from ₹118.26 crore to ₹113.38 crore) after opening the bid (25 April 2005), which brought down the tender premium from 9.49 *per cent* to 4.97 *per cent* i.e., below five *per cent* to avoid rejection as per tender conditions. The bid evaluation report prepared on 30 August 2005 indicated that the Department waited for four months for receipt of rebate by the single bidder.

ii. In the Mechanical Package under Phase.I of Handri Neeva, NIT was issued on 29 June 2005 and the last date for receipt of tenders was 11 November 2005. Three bidders participated in the bid. One bidder was disqualified in the technical evaluation and the financial bids of the remaining two bidders were opened. It was found that both the bidders quoted more than the prescribed limit of 5 *per cent* over the IBM, and were supposed to be rejected. However, Audit noticed that one bidder i.e, M/s.IVRCL Ltd offered two successive rebates of 2.25 *per cent* on 27 December 2005 and 3.93 *per cent* on 28 December 2005 in order to bring down the tender premium within the 5 *per cent* limit and finally got the contract at a premium of 4.94 *per cent* over IBM.

The Department replied (July 2012) that lowest bidder offering a rebate as a good gesture voluntarily is a common practice in Government departments and that, Government has only benefited on account of consideration of such voluntary rebate.

The reply is not justified, as the bid amounts in these cases were initially higher than the prescribed limit of five *per cent*, which was later brought down to within the ceiling by virtue of voluntary rebate, which otherwise should have been rejected, particularly when such an opportunity to revise the bid amounts after opening was not given to all the bidders, though all the bidders including the lowest one had quoted higher than the prescribed limit.

4.5 Variations to specifications/designs/agreements

With regard to the projects taken up under Jalayagnam, Government provided the broad scope of work and the districts to be covered while creating an ayacut of 97.46 lakh acres and provision of drinking water to 6310 villages. Consequently, there were several instances of variations to technical specifications/ designs/agreements after award of works/ during execution in the test checked packages, as detailed below.

i. In Nettempadu, tenders (January 2005), as well as the agreements in packages 104 and 105, specified the canal bed level (CBL) to be + 380M. After entrustment of works, the CBL was changed (March 2006) to +385M due to non-availability of contemplated ayacut with CBL of +380M. The proportionate cost due to decrease in the length of the canal as a result of change in the CBL was **₹4.43 crore,** which was not adjusted from the dues of the contractor.

The Department stated (July 2012) that technical experts examined the issue and opined that the raising of bed level from +380M to +385M to achieve targeted ayacut is technically feasible and there was no additional financial commitment to Government. The reply is not acceptable, as under similar conditions where the CBL of +250M was changed to +253M in Handri Neeva package No.1, the Department adjusted the cost of ₹4.31 crore after obtaining approval from the State Level Standing Committee and IBM committee.

ii. In Handri Neeva (Phase I package I), approach channel from intake in Siddeswaram to Machumurry was designed with a discharge of 165 cumecs. The discharge capacity was increased to 206 cumecs after awarding the work, which was treated as an additional item and **₹9.19 crore** was paid. While the total quantity of earth work as per the IBM estimate with design discharge of 165 cumecs was 44.26 lakh cum, it was only 44 lakh cum as per the revised discharge of 206 cumecs.

The Department has not furnished reply to this observation.

iii. In Veligonda (Teegaleru canal), the ayacut envisaged was 62000 acres, while the design provided was adequate only for 33,892 acres. Government had to pay an extra amount of **₹13.76 crore** on this additional item.

The Department admitted the fact and stated that the original bed width and FSD of the canal were proposed with **lined** section, which was shown as **unlined** in technical specification, by oversight.

iv. In Handri Neeva, the NIT specified the lengths of the canals/pressure main pipes clearly and the bidders quoted for these works based on the length specified. During execution, there was a significant reduction in the lengths of these items of work, which involved a saving of **₹48.98 crore** to the contractors, since they had quoted for higher lengths. However, in the absence of appropriate clause in the agreement to take care of such variations, Government could not derive the benefit due to such reductions.

v. In Veligonda project, estimates for package-4 specified the quantity of earth work involved in 'Excavation of Link canal for KM 0.000 to KM 9.800' as 32.39 lakh cum and the cost was included in the estimate. Subsequent to the award of work, the Government decided to increase the scope of the entire project and accordingly, the capacity of the link canal was also increased by concluding a supplemental agreement with the contractor. While working out the cost of the additional work, the quantities to be executed for the total discharge of the canal was taken at 50.12 lakh cum and the value of 26.57 lakh cum of earthwork was deducted, as against the original quantity of 32.39 lakh cum provided in the initial estimate. As a result, the value of supplemental agreement increased by **₹5 crore** being the value of the 5.82 lakh cum excess provided in the revised estimate.

vi. In Galeru Nagari, there were several changes to the specifications as detailed below:

- In package 28/06, the length of the canal specified in NIT was 29.00 kms, while the length executed was only 26.47 kms, with the impact of reduction in length being **₹15.11 crore**. This was a saving to the contractor.
- This was the case with packages 6/06 and 7/06 also, where the canals are being executed with shorter length by 3.23 and 5.17 km respectively, compared to the original specification, resulting in saving of **₹4.61 crore** and **₹13.13 crore** to the contractors of these packages.
- In package 24/06, the width of BT inspection path was reduced from 4.25 M to 3.75 M, involving a reduction in the cost by **₹0.42 crore** to the contractor.
- In package 31, the original design was single tunnel with RCC lining, which was changed to twin tunnel with SFRS lining, with a financial impact of **₹17.33 crore**.
- Due to increase in discharge capacity from 10000 to 20000 cusecs in packages 48 and 49, canals had to be widened and the initial trimming of slopes (specified in IBM) was no longer required. However, ₹7.06 crore was paid to the contractors on this account. The Department contended that no separate provision was made for trimming and it was shown only to ensure that the contractor does his job. The reply is not acceptable, because, this item was not required to be executed at all, in view of the widening of canal and fresh provision made for that.

vii. In Rajiv Dummugudem (package 32), the length of pressure main pipes executed was 24.50 KM, as against 38.18 KM specified in the agreement. The consequent saving that accrued to the contractor was **₹106.65 crore**.

viii. In Bhupathipalem reservoir, as against the contemplated ayacut of 23086 acres, only 14028 acres ayacut is being developed. Government stated that the difference in cost of **₹4.81 crore** would be deducted from the contractor.

ix. In Polavaram (packages 63 & 64), against the original design specification of M20 with steel reinforcement, actual execution was PCC M20 without steel, which involved saving of **₹45.53 crore** to the contractor.

x. In SLBC, the IBM contemplated excavation of an adit for the tunnel. Accordingly, a quantity of one lakh cum of excavation in hard rock (@ ₹964 per cum) and a quantity of 0.80 lakh running meters (RMT) of rock bolts (@ ₹315 per RMT) was provided in the estimate. However, the adit was not executed. Thus, there has been a reduction in the cost of execution by ₹12.16 crore, which did not accrue to the Government.

The Department replied that adit tunnels are generally provided for ventilation and to decrease leads for materials and that the requirement of adit tunnel or otherwise would be known only after detailed engineering. It was stated that the scope of work may vary since the estimates were prepared in the absence of detailed engineering.

xi. The IBM of the tunnel work in SLBC was inclusive of lining of second tunnel (T2) with a thickness of 500 mm. However, during the execution the agency proposed the lining with thickness of only 425 mm. The extra provision of 75 mm thickness for lining inflated the IBM value by ₹8.07 crore being the cost of the differential quantity of cement concrete involved.

The Department replied that the thickness of 500mm was provided in the estimate as per IS codes and that the approved lining thickness was 425mm. The reply is not acceptable since the agreement also provides for execution of work as per the same IS codes.

xii. In Nettempadu, the agreement for Stage II stated that price variation would be applicable for copper, aluminum, steel and cement according to IEEMA[14] formula and will be payable on production of documentary evidence of rates prevailing on the date of bidding and as on the date of claim as per RBI indices. It also stipulated that the bidders shall clearly indicate the rates considered for these items in their offer so that the variation, if any, would be compensated.

Audit scrutiny revealed that though the Government had paid ₹15.53 crore and had also approved payment of another ₹2.51 crore for copper and aluminum although the contractor did not produce the documentary evidence in support of the prevailing rates on the date of bidding and as on the date of claim.

Further, while the Government orders allowed price adjustment after the variation crosses five *per cent*, the Department allowed compensation within the limit of five

[14] Indian Electrical and Electronics Manufacturers Association

per cent also. The excess payment on this account was ₹49.67 lakh. The Department replied that RBI indices would be followed in future bills for cement and steel also.

xiii. The contract (January 2004) relating to Phase-I stage-I package of Devadula project stated that no price escalation would be applicable on account of changes in laws or variation in the cost of materials, labour or other inputs during the contract period. During the pre-bid meeting (August 2003) itself, the bidders' specific request for price adjustment on steel was rejected by Government. However, Government subsequently permitted (March 2009) price escalation on steel, cement and fuel used in this work and an amount of ₹196.96 crore was paid (August 2009) to the contractor. Out of this amount, ₹125.60 crore was towards increase in the prices of steel plates used in manufacture of pipes. Computation of the price escalation amount was incorrect, as brought out below.

As per the procedure stipulated (April 2008) by the Government, for computation of price adjustment, the rates of the materials provided in the departmental estimates have to be taken as base rates and the current prevailing rates would be decided by the Board of Chief Engineers every month by collecting quotations from various manufacturers. However, while computing the price escalation, the department neither ascertained the current steel rates from various steel manufacturers nor did it insist on production of the original invoices from the contractor towards purchase of steel plates. Instead, it relied on a letter obtained by the contractor from Steel Authority of India Limited showing the general trend of market rates.

Even if the current prices furnished by the contractor are considered, there was an excess payment of ₹35.86 crore due to incorrect computation of price escalation amount as discussed below:

- Before tendering (August 2003), the cost of the work was estimated at ₹737.49 crore and the rate adopted for steel plates was ₹20,514 per MT. After opening the price bids, the estimate was revised (November 2003) to ₹781.60 crore on account of increase in the cost of steel plates, and the cost adopted for this item was ₹22,318 per MT. However, for computing the price escalation in March 2009, the Department incorrectly adopted the rate provided in the initial estimate, instead of the rate provided in the revised estimate, which was used for comparing the bids. This resulted in excess payment of ₹20.99 crore to the agency.
- Further, the steel rate provided in the estimate was inclusive of the prevailing central excise duty (CED). The total amount of CED loaded in the estimate was ₹54.27 crore (out of which ₹34.35 crore was towards CED on steel plates). Subsequently, the GoI exempted (January 2004) pipes etc. used in water supply schemes from CED. Here, the Government lost on two counts – (a) CED exemption (₹34.35 crore) did not accrue to it due to absence of any clause to this effect in the agreement, and (b) incorrect computation of price escalation of steel (₹14.87 crore) inclusive of CED, instead of comparing the prices excluding CED.

The Department stated that in an EPC contract, completion of work is what matters and not quantities, like in the traditional lump sum mode of contracting, and that, the

contractor was free to design the alignment of the canal in keeping with the basic parameters, so long as the start and end points don't change. It was further stated that, the contractor will bear the risk and also the benefit, and that, there were several cases where the contractors had to bear losses in view of the absence of variation clause in the agreements.

The reply is not acceptable on account of the following.

- Higher specifications should not have been indicated in the agreement when execution with lower specification would suffice. Alternatively, if higher specifications were required as per the standards of the Department, execution with lower specifications should not have been permitted. Further, if the contractors were to be given freedom to adopt various alternatives, there was no reason why these were mentioned specifically in the tenders and agreements in the first place, since the bids were received with reference to these specifications.
- In an EPC contract, it is extremely important to determine the exact scope of work, before tendering and award of contracts. The performance criteria under EPC system should clearly articulate the scope, design aspects, quality parameters, schedule and other requirements of a project, like villages to which irrigation facilities are to be provided, placement and number of balancing reservoirs enroute a canal etc.
- Audit has in the past recommended inclusion of variation clause in the agreements, so that each case is examined with reference to the specific issue rather than the Government or the contractor bearing the loss by default. FIDIC model of EPC contracts contains such a clause and Government had provided for such a variation clause in EPC contracts relating to water supply schemes and projects being executed under JNNURM[15].

In the absence of a clearly spelt out mechanism for dealing with variations, objectivity in dealing with each case of deviation was lacking as detailed below.

- One of the important components of the SLBC Tunnel scheme was formation of Dindi Balancing Reservoir. The work was entrusted (February 2009) to a firm for ₹157.74 crore including investigation, design and execution. The agreement stipulated: "A spillway with radial gates shall be designed for a maximum flood discharge (MFD). However it should not be less than 8580 cumecs. Spillway should be designed as per I.S. codes, CWC manual, APDSS[16] and Chief Engineer, CDO norms and Guidelines issued from time to time".

  The contractor, after investigation, adopted a MFD of 8936 cumecs. However, the Chief Engineer, Hydrology, after conducting a study, estimated that the flood is of the order of 18625 cumecs (November 2009). The contractor assessed (December 2009) the cost increase due to change in MFD at ₹64 crore in view of the increase in the (i)number of vents from 17 to 33 and (ii) length between abutments from 244 meters to 476 meters and requested for additional payment. When the matter

[15] Jawaharlal Nehru National Urban Renewal Mission
[16] AP Detailed Standard Specifications

was referred to State Level Standing Committee (SLSC) by Government, the SLSC opined that the spillway was to be constructed for 8580 cumecs only as indicated in the basic project parameters.

- Under contrasting conditions, in Pulichintala project, despite reduction in (i) number of vents from 33 to 24 and (ii) length of the dam from 534 meters to 355 meters, Government did not adjust the cost of the contract on the ground that the quantities were not relevant in EPC contracts and that the contracting system followed does not envisage reduction in payments for reduction in quantities.

The Department contended (July 2012) that the mechanism to deal with changes in the basic parameters is to refer the changes to State level standing committee (SLSC) and the decision of Government based on the recommendations of the SLSC is final and binding on the contractor firm.

The reply is not acceptable as there should be a prescribed procedure for dealing with the variations under EPC agreements itself rather than referring all the variations to SLSC each time.

Government defined the basic parameters only in May 2008[17], by which time, a majority of the agreements under Jalayagnam were concluded and some of the projects had already run into disputes, hampering the progress of the projects.

Further, while the Department made payments for additional items based on current SSRs, with regard to the deleted items, it adopted the payment schedule. The benefit of variation to specifications/designs/scope/agreements etc, thus, invariably went in favour of the contractor in all the cases. Lack of uniformity in assessing variations further benefited the contractors to the extent of ₹2.81 crore in Galeru Nagari. With regard to non-EPC contracts in Jalayagnam, reduction in tender discount resulted in a benefit of ₹2.60 crore in Sriramsagar Stage-II and ₹9.62 crore in Bhupathipalem reservoir.

In addition to giving benefit to the contractors where variations occurred during execution, it was observed in Audit that Government took it upon itself, execution of certain items, which were the responsibility of the contractors as per the agreements. This was so in respect of 8[18] of the 26 test checked projects, which resulted in extra financial burden of **₹439.78 crore** to Government. Details are given in ***Appendix-4.3.***

4.5.1 Payment schedules

The work specified in the contract is divided into several components to facilitate payments and the cost of each component has to be specified as a percentage of the total bid price. This is illustrated below with an example from Polavaram project (package 64).

[17] Circular Memo.No.34843/Reforms/2006, dated 7th May 2008
[18] (i) Yellampally (ii) Polavaaram (iii) Handri Neeva (iv) Galeru Nagari (v) CBR-Lingala (vi) Nettempadu (vii) Devadula and (viii) Thotapally projects

Table-4.13

Description of work	Payment schedule as per contract (Amount in ₹)	Revised payment schedule during execution of work (Amount in ₹)
Investigation	1.62 lakh (0.022%)	1.62 lakh (0.022%)
Construction of entry channel	24.63 crore (33.33%)	3.22 crore (4.36%)
Construction of twin tunnels	24.63 crore (33.33%)	60.85 crore (82.34%)
Construction of exit channel	24.63 crore (33.33%)	9.81 crore (13.28%)

Source: Records of Polavaram project

As can be seen above, equal percentage was given for three items while drawing up the agreement. Based on the extent of completion of work, the percentage weightage accorded to the construction of twin tunnel was increased to 82.34 *per cent*, while that of the exit channel was reduced to 13.28 *per cent*. In Polavaram project alone, the impact of such **'front end payments'** amounted to ₹228.19 crore.

The other test checked projects where premature payments were made to contractors were Galeru Nagari **(₹94.35 crore),** Nettempadu **(₹1.45 crore),** Dummugudem NS Tail pond **(₹346.78 crore),** Pranahita-Chevella **(₹1052.59 crore),** Telugu Ganga **(₹4.45 crore)** and Gandikota-CBR lift scheme. The total amount of such premature payments was **₹1499.62 crore**. In fact, in Galeru Nagari (package 48), due to increase in the discharge from 10000 cusecs to 20000 cusecs, the width of canal had to be increased and the original contract was foreclosed due to the refusal of the contractor to continue the work. In this case, payment was made for actual quantities executed, instead of at IBM rates minus tender discount, which was an excess of **₹15.30 crore** over the IBM value. The Department stated that payments were made as per payment schedules only.

The Department stated that it retains 7.5 *per cent* of money from every bill which would become its property including all the property at site and there would be no loss to Government in case the contractor firm leaves the work midway.

The reply is not acceptable, since the contractors allocate higher percentage/weightage to the work that can be completed early and get their claims accordingly. Although these amounts would be adjusted eventually, the payments made to contractors would be blocked for prolonged periods, in case of delays or foreclosures. A case in point is Dummugudem NS Tail Pond, where ₹346.78 crore stands blocked for the past year and a half, since the work is yet to start (September 2012).

4.6 Mobilization Advances – Blocking of Government funds

As per the procedure prescribed by the State Government (September 2006), an amount equivalent to 10 *per cent* of the contract value could be paid to the contractors as mobilization advance (MA) at 5 *per cent* each for labour and machinery. One *per cent* of the contract value could be paid as MA towards labour component on entering into an agreement, and the balance four *per cent* at the time of commencement of work (after completion of survey, investigation and designs). The amount so advanced was recoverable only after the completion of at least 10 *per cent* of the value of work.

Considering that a number of packages have not moved off the ground for various reasons, a substantial chunk of public money is blocked with the contractors on account of MA. The status of MA granted to the contractors since taking up the Jalayagnam programme and the amount yet to be recovered, is given below.

Table-4.14

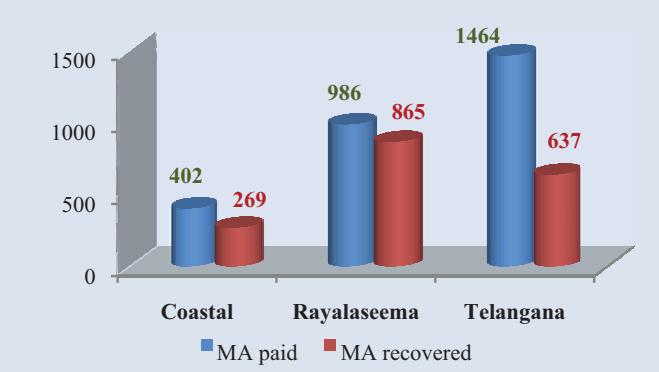
(₹ in crore)

Region	No. of projects	No. of packages	Value of contracts	No. of packages for which MA was given	Amount of MA given	Amount yet to be adjusted with interest
Coastal	21	63	9513	49	514.34	150.03
Rayalaseema	23	179	22612	152	1099.39	122.70
Telangana	30	166	81060	148	2013.67	866.13
Total	**74**	**408**	**113185**	**349**	**3627.40**	**1138.87**

Source: Compiled from information furnished by I&CAD Department

The status of MA paid and recovered with regard to the test checked projects is given below region-wise.

Chart-4.3 (₹ in crore)



Source: Compiled from information furnished by I&CAD Department

The whopping gap between the MA given and recovered in Telangana region is essentially on account of Pranahita Chevella project, where, in 26 out of 28 packages, an amount of ₹354.56 crore was paid as MA, being one *per cent* of the contract value, after concluding agreement with the contractor firms.

The recovery/adjustment of this MA has not commenced (July 2012) resulting in blocking of public funds for more than two years, as the survey and investigation works have not been completed yet. The other projects where huge amounts are blocked with contractors due to non-commencement of works are detailed below.

i. In Package No.4 of Galeru Nagari, execution of work for the reach from KM 119.000 to KM 141.350 has not commenced so far, although work was awarded in June 2007, due to not obtaining forest clearance. The mobilization advance amounting to ₹5.60 crore paid during September 2007 - July 2008 to the contractor remained blocked.

ii. In Galeru Nagari itself, mobilization advance of ₹4.47 crore at **4** *per cent* was included and paid for (July 2008) even before completion of investigation, survey and designs. The Department replied (December 2011) that though the work of survey and investigation was certified in measurement books in February 2010, it was, in fact, completed before July 2008. However, it did not furnish any reasons for the delay in recording in measurement books.

iii. In Indira Sagar Dummugudem LIS, ₹3.16 crore was paid to the contractors at **5** *per cent* of the contract value (June 2007) as mobilization advance in respect of package 49 (to EPIL) in contravention of Government orders (September 2006). This amount was not adjusted as of July 2012 resulting in blocking of funds outside Government account for more than five years.

iv. In Yellampally project, in the package "Implementation of R & R package to displaced families in Yellampally and Murmur villages" the Department did not adjust ₹50.91 lakh out of the mobilization advance of ₹1.40 crore paid (July 2009) from the contractor firm, despite withdrawing the work from it and entrusting it to different firms at different times, due to slow progress of work by the original agency.

v. In package 66 of Polavaram, the recovery of MA of ₹6 crore has not yet commenced even after five years, due to slow progress of work.

vi. In packages 1 and 3 of Polavaram LMC, interest on MA of ₹6.94 crore and ₹8.11 crore was not recovered during the extended period of agreement from August 2008 to August 2010 due to delay in land acquisition and other clearances.

vii. In **Dummugudem NS Tail pond**, out of the ₹126 crore paid as MA, only ₹3.5 crore was recovered, leaving a balance ₹122.50 crore. In fact, in this scheme, more than one *per cent* was paid as mobilization advance even before completion of survey and investigation, in violation of Government orders, as detailed below.

Table-4.15

(₹ in crore)

Package No	Contract value	Admissible MA (at 1%)	MA paid		Excess MA paid
			Percentage	Amount	Amount
8	1360.26	13.60	3	40.81	27.21
9	771.36	7.71	3	23.14	15.43
10	464.42	4.64	2.50	11.58	6.94
Total	**2596.04**	**25.95**		**75.53**	**49.58**

Source: Project records

viii. The contractors of Packages 99, 100 and 107 in Nettempadu left the site of work by withdrawing their men and machinery. An amount of ₹3.26 crore was pending recovery from the contractors on account of MA. As there were no men and machinery at the time of site visit by audit and the progress in respect of these works was very poor, the purpose for which the advance was granted was defeated.

ix. In Nettempadu again, the actual date of payment of MA and copies of invoices in proof of machinery purchased were not made available to audit. Hence payment without requirement could not be assessed.

x. In package 33 of Handri Neeva, MA of ₹1.48 crore was paid without invoices.

During the Exit Conference, the Department stated that orders have been issued to ensure such instances do not take place. However, it had not intimated the action proposed against the officials who had violated the prescribed rules in this regard.

Project Execution

Jalayagnam was taken up to fast track the irrigation projects languishing for a long time and to complete them in a timebound manner, so as to bring succour to the parched and drought prone areas, especially in Telangana and Rayalaseema regions of the State. Audit review of the extent of achievement of this objective and the status of the test checked projects is given in this chapter.

5.1 Creation of Irrigation potential

5.1.1 Target vs. Achievement

Initially, the Government identified 26 projects as 'prioritized' and subsequently, this number increased to 86 projects, including 4 Flood Banks and 8 Modernization works. Government sanction for these projects has been accorded over a period of time as indicated below:

Table-5.1

Financial year	No. of projects sanctioned	Original administrative sanction (₹ in crore)
Prior to 2003-04	8	785.15
2003-04	4	1353.89
2004-05	36	71727.14
2005-06	6	2397.16
2006-07	3	4643.68
2007-08	10	11313.17
2008-09	19	93389.17
Total	**86**	**1,85,609.36**

Source: PMU of I&CAD Department

The 26 projects prioritized by Government were to be completed within a span of two (8 projects) to five years (18 projects). As of September 2012, while four (out of 86) projects[1] (sanctioned in 2008-09) were yet to be initiated, 13[2] out of the remaining 82 projects have been completed at a cost of ₹1,538 crore, as against the approved cost of ₹1,441 crore and have achieved the envisaged objectives. Out of these, nine are medium irrigation projects, which involved creation of 1.14 lakh acres of ayacut and stabilization of 23,921 acres. The remaining four are major irrigation projects, which involved creation of 22,846 acres of ayacut and stabilization of 1.65 lakh acres.

Apart from the 13 projects that have been operationalized, as and when a project is partially completed, Government has been releasing water to the ayacut. As of September 2012, Government released water to a new ayacut of 12.74 lakh acres besides stabilizing existing ayacut of 2.07 lakh acres. Audit noted that:

[1] (i) Kanthanapally (ii)Uttarandhra Sujala Sravanti (iii) Modernisation of Nagavali System (iv) Modernisation of Yeleru Delta System

[2] **Major:** Chagalnadu, Ramatheertham balancing reservoir, Alisagar, Guthpa
Medium: Peddagadda reservoir, Madduvalasa Stage I, Pedderu reservoir, Surampalem, Kovvada kalva, Swarnamukhi barrage, Veligallu, Ralivagu and Gaddena Suddhavagu

- Out of the total 413 packages awarded under Jalayagnam (excluding modernization and flood banks), 369 packages were scheduled to be completed by September 2012.
- 51 packages (14 %) have been completed as of September 2012 and 318 (86 %) were in progress.
- Eight (16 %) packages were completed within the stipulated time and there was a delay of 2 to 72 months in completion of the remaining 43 packages.

The ayacut contemplated in the initially prioritized 26 projects and the status of achievement as of September 2012 are given below.

Table-5.2

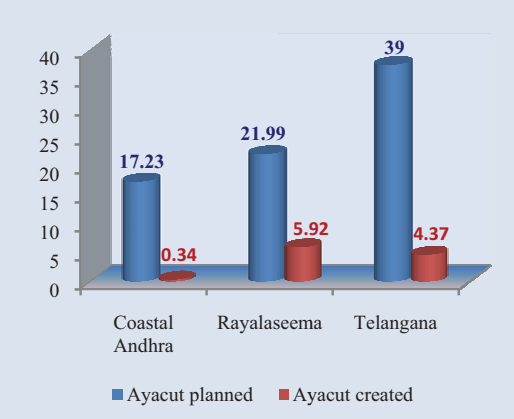
(in acres)

Sl. No.	Details	Contemplated Ayacut	IP created in completed projects[3]	Stabilization
1	Eight projects were to be completed in 2 years	1108866	0	92584
2	Eighteen projects were to be completed in 5 years	5017134	0	72874
	Total	**6126000**	**----**	**179679**

Source: Jalayagnam book and records of I & CAD Department (PPMU)

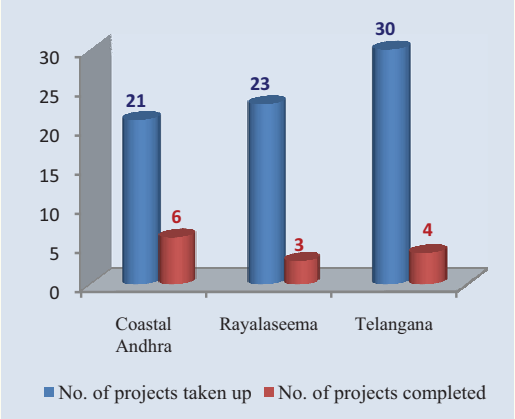
The region wise ayacut created vis-à-vis target in the test checked projects (Chart-5.1) and the overall status of projects taken up and completed (Chart-5.2), as of September 2012 are given below:

Chart-5.1 (Ayacut in lakh acres)



Source: Records of I & CAD Department

Chart-5.2



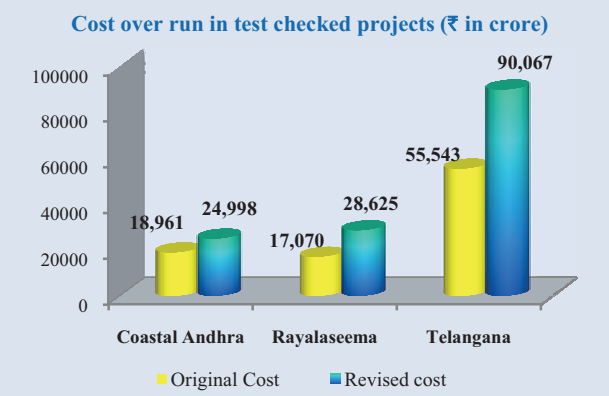
Source: Records of I & CAD Department

Delay in completion of the projects, along with changes to the specifications and scope of work pursuant to detailed survey and investigation and designs, pushed up the cost of the projects by a whopping ₹52,116 crore (as of September 2012) with reference to the original sanction. The region wise break up of cost over run in the 26 test checked projects, as per the records of I&CAD Department, is given below.

[3] The 26 prioritized projects include only 3 projects in the 13 completed. These 3 involve stabilization of ayacut

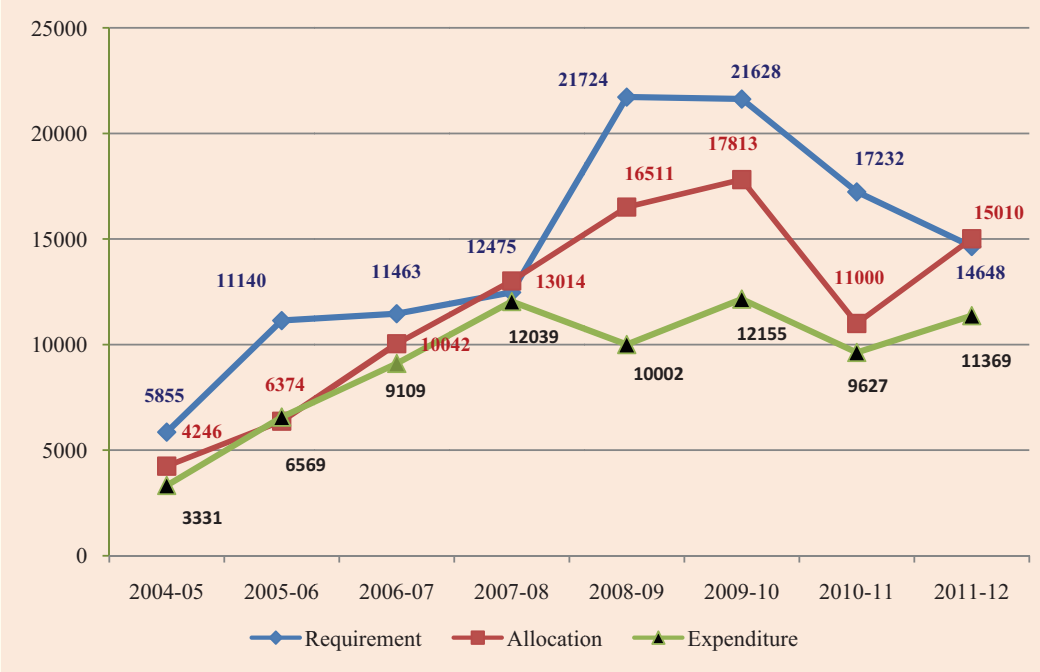
Since execution of several projects was taken up simultaneously, it was imperative to assess the availability of funds, prioritize the projects based on their importance to the needs of the targeted area, and ensure allocation of adequate resources for their completion.

Chart-5.3



As of March 2012, ₹61,498 crore was expended on the programme. However, adequate funds were not provided for the programme commensurate with the requirement in any of the years during the period 2004-12. Expenditure kept pace with budget allocation during 2004-08, but fell short of the outlay during 2008-11, before picking up again in 2011-12 as can be seen below.

Chart-5.4 **(₹ in crore)**



Note:

(i) Requirement is as per the approved administrative sanctions spread over the agreement period

(ii) Budget allocation and expenditure figures are for Major and Medium irrigation projects as furnished by I&CAD Department

(iii) Expenditure includes ₹12,703 crore in respect of non-Jalayagnam Major and Medium irrigation projects

The Department replied (July 2012) that there was some uncertainty during 2008-09 and 2009-10 due to general decline in the State economy, and that, it has been prioritizing projects since 2009. It was further pointed out that despite constraints, the allocations have not come down. The reply is not borne out by facts, since there was a dip in budgetary allocation after 2009-10, and fluctuation in spending.

5.2 Reasons for non-completion of projects

The main reasons for non-completion of projects were as follows.

- Delay in acquisition of land;
- Delay in obtaining clearances;
- Non-finalization of R&R activities.

The Department confirmed these factors as the reason for the delays and stated that it expects to complete most of the projects by 2017-18. While the delay due to not obtaining clearances was discussed in Chapter 3, the other reasons are discussed below.

5.2.1 Land Acquisition

The overall status of land acquisition as of March 2012 is given below region-wise.

Table-5.3

(in acres)

Region	Required	Requisitioned	Acquired	Balance
Coastal	253089	204528	142677	110412
Rayalaseema	295891	294591	255465	40426
Telangana	370431	276603	198960	171471
Total	**919411**	**775722**	**597102**	**322309**

Source: Records of I & CAD Department

Government could not acquire adequate land required for any of the projects on time although the original agreement periods in respect of several of these projects expired. The Department replied (July 2012) that for speedy completion of land acquisition in various projects, 5 posts of Special Collector, and 44 posts of Special Deputy Collector were created, and that, it had acquired about 6 lakh acres (as of March 2012) despite shortage of staff. It was further stated that, there were litigations relating to land, and due to taking up too many projects simultaneously, the sequential activities in land acquisition process like survey, Draft Notification and Draft Declaration could not be taken up simultaneouly in respect of all the projects with the available revenue staff.

As these factors were forseeable and critical, these should have been addressed appropriately by the Government.

5.2.2 Rehabilitation and Resettlement (R&R)

The status of R&R in Jalayagnam projects as of March 2012 is as follows:

Table-5.4

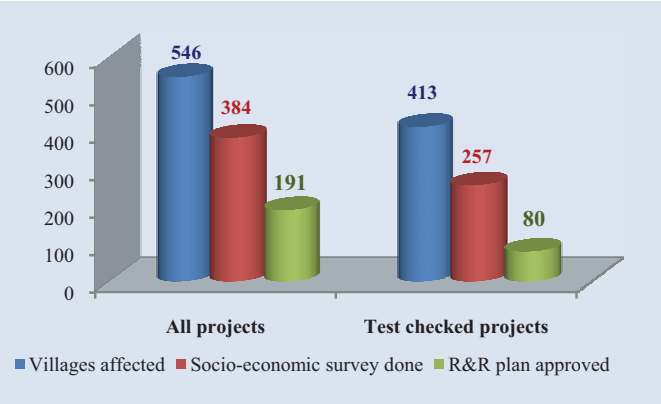
	No. of Districts	No. of projects	Villages affected	R & R centers	PAFs[4]	PDFs[5]	BPL[6] Households
Overall	17	37	546	500	132135	129739	121004
Test checked projects	14	14	413	365	87608	86047	80893

Source: Commissionerate of R&R

[4] Project affected families
[5] Project displaced families
[6] Below poverty line

i. As against the 546 villages estimated by the Government to be affected during the implementation of the projects, draft plan is yet to be approved for more than 50 *per cent* villages, as can be seen from the charts given below. Out of the 281 villages for which the draft R&R plan is yet to be submitted, 206 villages pertain to Polavaram project.

Chart -5.5

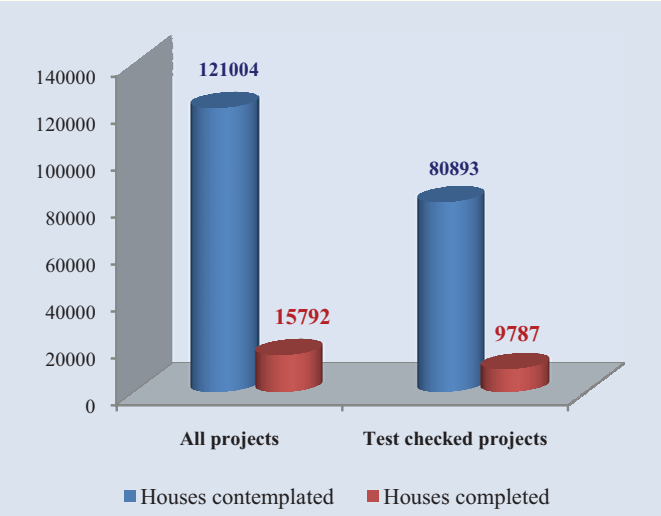


Source: Commissionerate of R&R

The Commissioner (R&R) stated (July 2012) that the Government had prioritized 191 villages in different irrigation projects as of March 2012, and all the activities in this regard have to be completed within the next two to three years. It was further stated that R&R plan was already approved in respect of 189 villages.

The reply confirms that Government is unable to complete even the planning process, despite expiry of the original agreement periods, for a majority of the projects.

Chart-5.6



Source: Commissionerate of R&R

ii. Provision of houses for the project affected families was particularly slow, as can be seen from the Chart given alongside. With just about 13 *per cent* progress in constructing houses for the families, clearly, the Government has not displayed the required urgency in ensuring R&R activities of a majority of the project affected families.

iii. In respect of nine[7] projects, as against 23,166 houses contemplated, not a single house was completed as of March 2012.

iv. In two projects, involving five districts, the progress of completion of houses was only marginal, as illustrated below.

[7] Pulichintala (11580), Veligonda (4013), Bheema (3587), Nettempadu (2471), Tarakarama Thirtha sagar (616), Neelwai (371), Kalwakurthy (242), Handri Neeva (204), and Devadula (82)

Table-5.5

Sl. No.	Project	District	Houses contemplated	Houses completed
1	Polavaram	Khammam	31552	Nil
2		East Godavari	4421	**483**
3		West Godavari	4139	**352**
4	Yellampally	Karimnagar	6816	**788**
5		Adilabad	4413	Nil

Source: Commissionerate of R&R

The Commissioner stated (July 2012) that prioritization is being done with reference to the stage of the project, and that, the overall progress of construction of houses in respect of priority projects was 32 *per cent*.

v. Apart from the construction of houses, progress in providing infrastructure facilities in the contemplated R&R centers is still in the early stages, as detailed in the table below.

Table-5.6

	Total R&R centers contemplated	Land acquired for (No. of centres)	Road facilities provided for (No. of centres)	Water facilities provided for (No. of centres)	Electricity facilities provided for (No. of centres)
Over all	500	222	147	150	142
Test checked projects	**365**	**104**	**63**	**64**	**57**

Source: Commissionerate of R&R

vi. Delay in R&R activity is visible above all in Polavaram project, which involved submergence of 277 villages, affecting 42,712 PAFs with 1,31,045 persons in 3 districts[8] of Andhra Pradesh, apart from 4 villages, affecting 2335 PAFs with 11,766 persons in Chattisgarh, and 8 villages, affecting 1002 PAFs with 6316 persons in Odisha. The GoAP accorded administrative approval (May 2005) towards R&R package for ₹2051 crore and the GoI granted clearances for the R&R plan in April 2007.

- At the time of awarding the Spillway (March 2005) and ECRF Dam works (August 2006) of Polavaram project, socio-economic survey of the submergence area was not conducted and the PAFs were not identified.
- The first phase of R&R activity, which was due for completion by June 2008, was not completed even as of March 2012.
- Shifting of 6 out of 7 villages in West Godavari district and 3 out of 4 villages in East Godavari district situated in the vicinity of the dam was also not completed yet.
- Only 277 families comprising 1136 persons were rehabilitated so far despite spending ₹108 crore. The progress in this aspect was a mere five *per cent* during the last seven years.

[8] Khammam, East Godavari and West Godavari

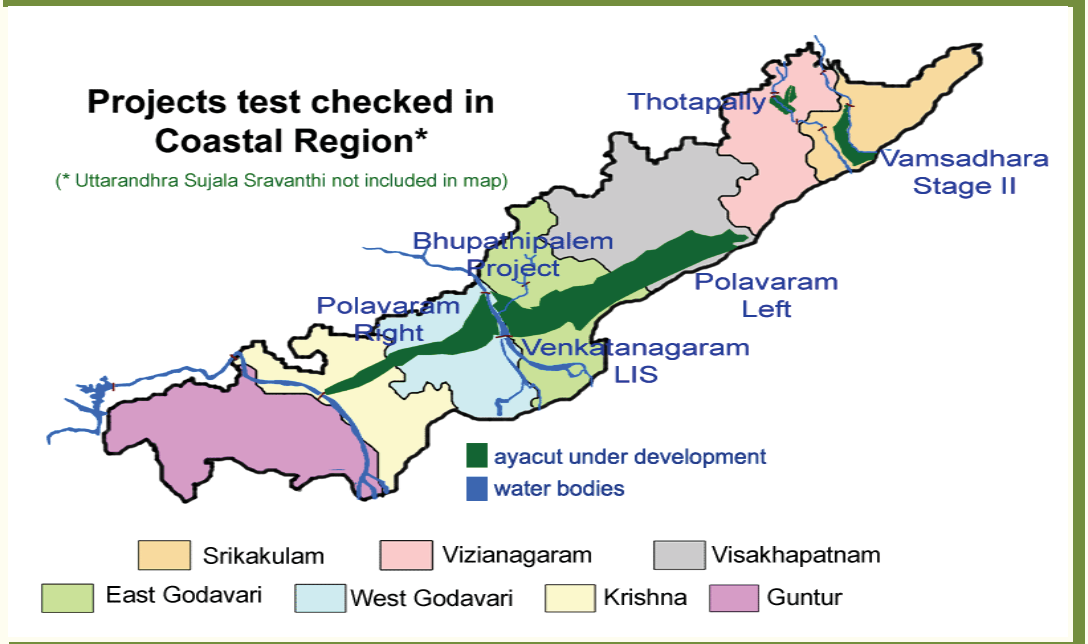
- Further, non-sorting out submergence issue with Chattisgarh and Odisha led to prolonged litigations with these two States.

The Commissioner, R&R replied (July 2012) that R&R activity is planned in a phased manner with reference to the progress of the project and that, all the villages in Khammam have been categorized under phase 3 and 4, and therefore, R&R in these villages would be completed one year before the actual submersion takes place. Further, the I&CAD Department cited (July 2012) the inter-state Agreement of 1980 and GWDT[9] Award to support its contention that there was no submergence issue with Chattisgarh and Odisha. However, the fact remained that, while according clearance for Polavaram project, the MoTA observed (17 April 2007) that there has been a consistent opposition to the project from the Governments of Chattisgarh and Odisha and there has also been no consultation with the affected Gram sabhas in those States. The clearance of MoTA was subject to fulfillment of the conditions that (i) there would be no submergence and displacement in the territories of these two states and (ii) the people of these two states are not adversely affected in any manner.

5.3 Project execution

The status of execution of the test checked projects and the key issues involved therein, are given below region-wise. Package wise time over-run of these projects is given in ***Appendix-5.1.***

Coastal Andhra



The ayacut created in the six test checked projects in the Coastal region as of September 2012 was **0.34** lakh acres as against **17.23** lakh acres contemplated. All these projects are at various stages of execution, except for Uttarandhra Sujala Sravanthi, where the works are yet to be awarded.

[9] Godavari Water Disputes Tribunal

Table-5.7

Sl No.	Project	Ayacut contemplated (in lakh acres)	Ayacut created	Due date of completion	Delay
1	Polavaram	7.21	Nil	October 2006 - July 2010	26-71 months
2	Vamsadhara Stage II ph II	0.45	20000 acres.	March 2007 - March 2008	54-60 months
3	Thotapally Barrage	New: 1.20 Stab: 0.64	New: Nil 64000 acres stabilized	September 2005 - December 2012	0-59 months
4	Venkatanagaram Pumping Scheme	New: 0.23 Stab: 0.10	New: Nil 4250 acres stabilised	September 2006	72 months
5	Bhupathipalem Reservoir	0.14	14028 acres	August 2006 - September 2007	10-61 months
6	Uttarandhra Sujala Sravanthi	8.00	Yet to award works		

Source: Records of I & CAD Department

The key issues relating to each of the test checked projects in the Coastal region are given below.

5.3.1 Indirasagar Polavaram Project (Polavaram)

5.3.1.1 Project profile

Irrigation potential envisaged	*7.21 lakh acres[10] in East Godavari, West Godavari, Krishna and Visakhapatnam districts*
Other purposes	• *Stabilize 10.13 lakh acres of Godavari and 13 lakh acres of Krishna delta* • *Interlinking river project proposing to divert 80 TMC to River Krishna* • *23.44 TMC to industries in Visakhapatnam* • *Domestic water to 28.50 lakh population in 540 villages* • *Generation of 960 MW hydel power*
Source of water	*307.96 TMC from Godavari*
Other information	• *A multipurpose terminal reservoir project, earlier known as Ramapadasagar project, under contemplation since 1943 on river Godavari near Ramaiahpet village of Polavaram mandal* • *Sharing of 5 TMC and 1.5 TMC water with Orissa and Chattisgarh states respectively*
Components	*(i) 2454 meters of earth cum rock fill dam, (ii)1128 meters spill way, (iii) 181.50 KM of left main canal to serve 4 lakh acres,(iv)174 KM of right main canal to serve 3.2 lakh acres*
Project Cost	*Original Cost: ₹10151 crore (December 2007);* *Revised : ₹16010.45 crore (October 2010)*
Expenditure	*₹4354.95 crore*
Land	*Required:166672.21 acres, Acquired:69589.13 acres*
R & R Houses	*Contemplated:42705, Completed:899[11]*

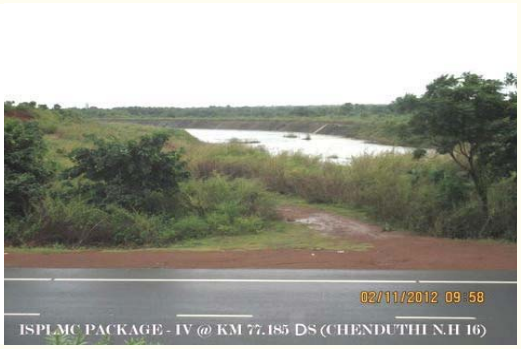
[10] Visakhapatnam (1.5 lakh acres), East Godavari (2.5 lakh acres), West Godavari (2.58 lakh acres) and Krishna (0.62 lakh acres)

[11] Figures here differ from those in Table 5.5 as these are updated to September 2012

5.3.1.2 Key Issues

i. ***Status of works:*** Polavaram project was divided in to 23 packages and the works were awarded during October 2004 to July 2007. All the 23 packages were reviewed in audit. The delay in completion of packages ranged from two years to more than five years.

- Progress in 21 package works (Head works connectivities - 6, LMC - 8 and RMC – 7) was limited mainly to earth work excavation only, as structures were not completed in the connectivities even after seven years since the entrustment of works (March 2005). The physical status of two of the canal packages as of 2nd November 2012 is given below.



NH 16 Crossing @77.185 KM of ISLMC (Package 4)

Untackled portion of ISRMC due to HPCL-GAIL crossing (Package 2)

- Sri Sathyasai Drinking water pipelines were to be shifted before taking up Saddle dam "KL" in Package 66 and package 67. Since this was not done, there was a delay in completing the saddle dam, and consequently, the related works in these packages.
- Completion of right and left main canals was also held up due to land acquisition problems, delay in R & R, shifting of various utility pipelines, delay in obtaining permissions for crossing railway and national highway lines etc.
- As per the GWDT Award, the design parameters of Polavaram dam and its operation schedule should be decided by CWC. However, GoAP awarded (March 2005 and August 2006), spillway and earth cum rock fill dam works with a flood discharge of 36 lakh cusecs without the approval of CWC. The CWC, after review of the DPR and further hydrological studies, later recommended (September 2006) a design discharge of 50 lakh cusecs at spillway. Ultimately, both the contracts had to be closed prematurely in August 2009, on the request of the contractor, *inter-alia,* due to the change in the discharge from 36 lakh cusecs to 50 lakh cusecs and were yet to be re-entrusted (September 2012).
- Government took three years to pre-close (August 2009) the contracts from the date of decision of increasing the discharge capacity by CWC (September 2006). The impact of delay in this regard was about ₹1049 crore, being the cost difference between SSRs of 2007-08 to 2010-11.

The Department stated that pre-closure of the contract was not solely on account of change in the design and there were other reasons, some of which were attributable to the contractor. The fact remains that the State had lost about six working seasons from September 2006 due to this pre-closure, and failed to reap any benefits from this prioritized project till date (September 2012). Further, it had to admit the contractors' claims of ₹19.39 crore[12] on this account.

The Department replied that most of the claims pertain to infrastructure works like approach roads, procurement of dumping areas, amounts deposited with AP Transco and hence can be made use by the new contracting agencies. The reply is not acceptable as (i) formation of the approach roads was contingent to the scope of work and paid as an integral part through payment schedules and (ii) the claims did not include amounts towards dumping areas and amounts deposited with AP Transco, but included an amount of ₹6.39 crore towards insurance, whereas, no work was executed under the agreements and only survey, investigation, designing and earth work excavation was carried out, which did not have any risk factor to be covered under insurance.

ii. ***Approval of designs***: Designs were yet to be approved in respect of **303** out of the total **717** structures as of July 2012. The Department replied that out of the 303 structures, 129 were returned at different stages with major remarks for want of further field data and were pending with the contractor for re-submission, and that, for 159 structures, the designs were yet to be submitted by the contractor. The Department did not specify whether any action was taken against the contractor.

5.3.2 Boddepalli Rajagopala Rao Vamsadhara Project - Stage II (Vamsadhara Project Stage II)

5.3.2.1 Project profile

Irrigation potential envisaged:	*45000 acres in Srikakulam district*
Source of water	*9.417 TMC from River Vamsadhara*
Phase I	
Components	*Head regulator 750M upstream of Gotta barrage on right flank, Right main canal for 59 KM* ***(before Jalayagnam)***
Administrative Sanction	*Original Cost: ₹123.94 crore* *Revised : ₹209 crore*
Expenditure	*₹132.8 crore (September 2012)*
Lifts	*8*
Land	*Required:1458 acres, Acquired : 1399.77 acres*
Phase II	
Components	*Side weir of 300M at 2 KM upstream of Neradi barrage* *Gravity flood flow canal for 34 KM* ***(under Jalayagnam)***
Administrative Sanction	*₹933.9 crore (February 2005)*
Total expenditure	*₹671.89 crore*
Land	*Required:12257.96 acres, Acquired : 11732.43 acres*
R & R Houses	*Contemplated:7104, Completed:968*

[12] ECRF ₹12.43 crore and Spillway ₹6.96 crore

5.3.2.2 Key Issues

i. ***Inter-State issues***: Stage-II of Vamsadhara project involved construction of a barrage across the river at Neradi (on the AP-Odisha border) to irrigate an ayacut of 82,280 acres. However, Government of Odisha (GoO) objected to the construction of Neradi Barrage and since 1979, the Stage-II of the project was not cleared by CWC. In view of the delay in sorting out the issue with the GoO, the GoAP modified the Stage-II of the project and took it up in two phases. Phase-I was cleared by CWC and construction, taken up in 2002, is nearing completion.

Phase-II, taken up under Jalayagnam, envisaged creation of an ayacut of 45,000 acres and involved construction of a side weir near Katragada village in AP, two kilometres upstream of the Neradi barrage. The GoAP accorded administrative approval to the project in February 2005 and awarded the works in March 2005 without either consulting the GoO or obtaining clearance from CWC. Subsequently, (February 2006), based on a writ petition from the GoO, the Supreme Court ordered (February 2009) maintenance of 'status quo' in respect of construction of the side channel weir and the flood flow canal.

The contractors of two packages[13] suspended (June/July 2008) the works midway and as of September 2012, these works, on which an expenditure of ₹47.43 crore was incurred, remain incomplete. Suspension of work led to locking up of substantial investment of ₹671.89 crore, with the structures remaining in semi-finished stage and exposed to the vagaries of nature for more than three years, as depicted in the photographs given below (July 2012).

Incomplete bridge at Km 13.062 of FFC (Package-87)

Incomplete bridge at Km 24.284 of FFC (Package-88)

The Department justified taking up the Phase-II of Stage-II of the project stating that it proposes to utilize the equitable and judicious share of AP, and that, the project neither involves any submergence nor affects any territory of Odisha and as such, its concurrence was not necessary. The reply is not acceptable, as this project is on inter-State river and on common border, and the Government should have kept in mind the experience earlier with suspension of work relating to Neradi barrage.

[13]Packages 87 (progress : 39%) and Package 88 (progress : 31.13%)

ii. ***Delay in approvals:*** There was a delay of over two years in approval of hydraulic particulars and commencement of civil works. The Department stated that the proposals submitted by the contractors will be scrutinized and approved based on survey & investigation work.

5.3.3 Thotapally Barrage Project

5.3.3.1 Project profile

Irrigation potential envisaged:	♦ *New ayacut of 1.2 lakh acres on right side of river Nagavali* ♦ *Stabilization of existing ayacut of 64000 acres*
Source of water	*15.895 TMC from river Nagavali*
Components	*(i) construction of spillway, (ii) formation of earthdam, (iii) formation bank connections, (iv) construction of left and right head sluices, (v) right main canal for 107 KM*
Administrative Sanction	*Thotapally: ₹450.23crore* *Gajapathinagaram: ₹76.99crore*
Expenditure	*Thotapally: ₹485.67 crore* *Gajapathinagaram: ₹7.08 crore*
Land	*Thotapally:Required:11680.52 acres and acquired : 10370.47 acres* *Gajapathinagaram:Required:590 acres and acquired : 66.35 acres*
R & R Houses	*Contemplated:5915, Completed: 2134*

5.3.3.2 Key Issues

i. ***Delay in execution*****:** The works relating to spillway and formation of earth dam were awarded in March/June 2004 before Jalayagnam and the remaining works were awarded (October 2004) under Jalayagnam. While the three non-EPC works were completed, the two EPC packages were yet to be completed even after 8 years of award of works. The Department replied that progress has been hampered severely due to land acquisition and R&R problems.

ii. ***Additional ayacut***: In July 2008, GoAP decided to create an additional ayacut of 15,000 acres by excavating the Gajapathinagaram Branch Canal (GBC) for about 25 KMs starting at km 97.00 of the right main canal (RMC) of Thotapally Barrage. However, the revised project proposals were not submitted to the CWC.

The Department replied that the GBC is only an extension of the right main canal of Thotapalli Barrage project, which was already cleared by CWC and thus fresh approval of CWC might not be required for GBC. The reply is not acceptable since the CWC guidelines[14] stipulate that even in case of the projects already approved by the Planning Commission, the revised project reports with updated cost estimates have to be submitted to CWC for examination, if there is change in the ayacut.

iii. ***Undue favour to contractor***: In package II, the IBM value of ₹178.56 crore, which was used to evaluate the bids, included ₹1.78 crore towards cost of executing railway crossing structures. However, the Department took on the responsibility of making payment of an amount of ₹2 crore to the railway authorities, which should have been borne by the contractor, by modifying the relevant contractual clause.

[14] Guidelines on 'Submission, Appraisal and Clearance of Irrigation and Multipurpose Projects issued by CWC in 1989, 2002 and 2010)

When the issue of undue benefit to the contractor was pointed out in Audit, the Department replied that the addendum issued at the time of concluding the agreement (October 2004) was appropriate in view of the Government Memo (February 2006), which authorized the competent authority to regularize any inconsistencies by concluding necessary supplementary agreements.

The reply is not acceptable because, (i) the Department, while issuing the addendum, ignored the fact that the IBM value, with which tenders were compared, and the scope of work also include the cost towards railway bridges (ii) the Government memo quoted by the Department authorizes it to remove inconsistencies in the agreement already concluded, and, is not a blanket permission to support irregular modifications from tender to agreement. Moreover, the memo cannot be applied to the present case, as the event of modification / addendum (October 2004) precedes the memo (February 2006).

5.3.4 Venkatanagaram Pumping Scheme

5.3.4.1 Project profile

Irrigation potential envisaged:	*36000[15] acres in 5 mandals* *Drinking water facilities to 1.2 lakh population in 31 villages*
Source of water	*3.6 TMC of water.from river Godavari*
Components	*(i) construction of three pump houses* *(ii) four delivery cisterns* *(iii) excavation of main canal, distributaries and filed channels*
Administrative Sanction	*Original: ₹58.43 crore (August 2004)* *Revised: ₹124.18 crore (March 2008)*
Expenditure	*₹84.02crore*
Power required	*10.45 MW*
Land	*Required:621.02 acres and Acquired:341.57 acres*

5.3.4.2 Key Issues

i. ***Clearance by CWC***: The Venkatanagaram Pumping Scheme (VPS) is an existing minor irrigation scheme, serving an ayacut of 4,250 acres. Under Jalayagnam, improvements to this scheme were taken up to increase the ayacut to 36,000 acres (creation of new ayacut of 31,750 acres and stabilization of the already existing ayacut of 4,250 acres). Consequently, the scheme became a major irrigation project and required clearance from the CWC. The project proposals were not sent to CWC at any stage.

The Department replied that the ayacut under VPS was covered in Polavaram project, for which, the CWC has already given hydrological clearance and hence no separate clearance for this scheme was required.The **reply is incorrect, since the CWC cleared the Polavaram project in January 2009 whereas the expansion of VPS was taken up nearly four years earlier in March 2005**. Further, there was no mention in the DPR of Polavaram that the ayacut and the project cost of VPS was included in it.

[15] This differs from the figure in Table 5.7 due to changes as of September 2012

ii. ***Administrative approvals***: Initially, administrative approval for the project was accorded in August 2004 for an amount of ₹58.43 crore to irrigate an ayacut of 30,000 acres. Later (March 2008), a revised administrative approval was accorded for ₹124.18 crore by increasing the proposed ayacut to 36,000 acres. However, tenders were invited and the works were awarded in March 2005 for an agreed value of ₹85.57 crore, i.e., three years before according the revised administrative approval.

iii. ***Status of works:*** All the works relating to this project were awarded through one package. Stage I and Stage II pump houses, pressure mains and civil works of Stage III pump house were completed. However, due to non-completion of distributory network, these could not be commissioned. The length of the main canal was reduced from 7.885 KMs to 6.60 KM and two distributories (1 R and 3 R) could not be taken up due to objections from farmers.

Thus, only the old ayacut (4250 acres) could be served despite spending nearly ₹84 crore on the Venkatanagaram pumping scheme during the last seven years due to lack of proper planning. The Department accepted the above facts, and attributed these to court cases, objections of ayacutdars and dispute relating to land compensation.

5.3.5 Bhupathipalem Reservoir Project

5.3.5.1 Project profile

Irrigation potential envisaged:	*23086 acres (revised to 14028 acres) and drinking water for 45 tribal villages of East Godavari*
Source of water	*1.151 TMC from Sithapalli vagu, a tributary of Godavari river*
Components	*(i) formation of an earth dam* *(ii) construction of spillway* *(iii) head sluice* *(iv) formation of diversion road* *(v) excavation of main canal and distributory system*
Administrative Sanction	*Original : ₹76.77 crore* *Revised : ₹187.91 crore*
Expenditure	*₹160.07 crore*
R & R Houses	*Contemplated:149, Completed:149*

5.3.5.2 Key Issues

i. ***Status of works***: This is a medium irrigation project with an original target of creating an ayacut of 12,100 acres. The CWC approved (December 2000) an ayacut of 13,370 acres at an estimated cost of ₹47 crore. Subsequently, the proposed ayacut was increased to 23,086 acres and administrative approval was accorded (October 2003) for ₹76.77 crore.

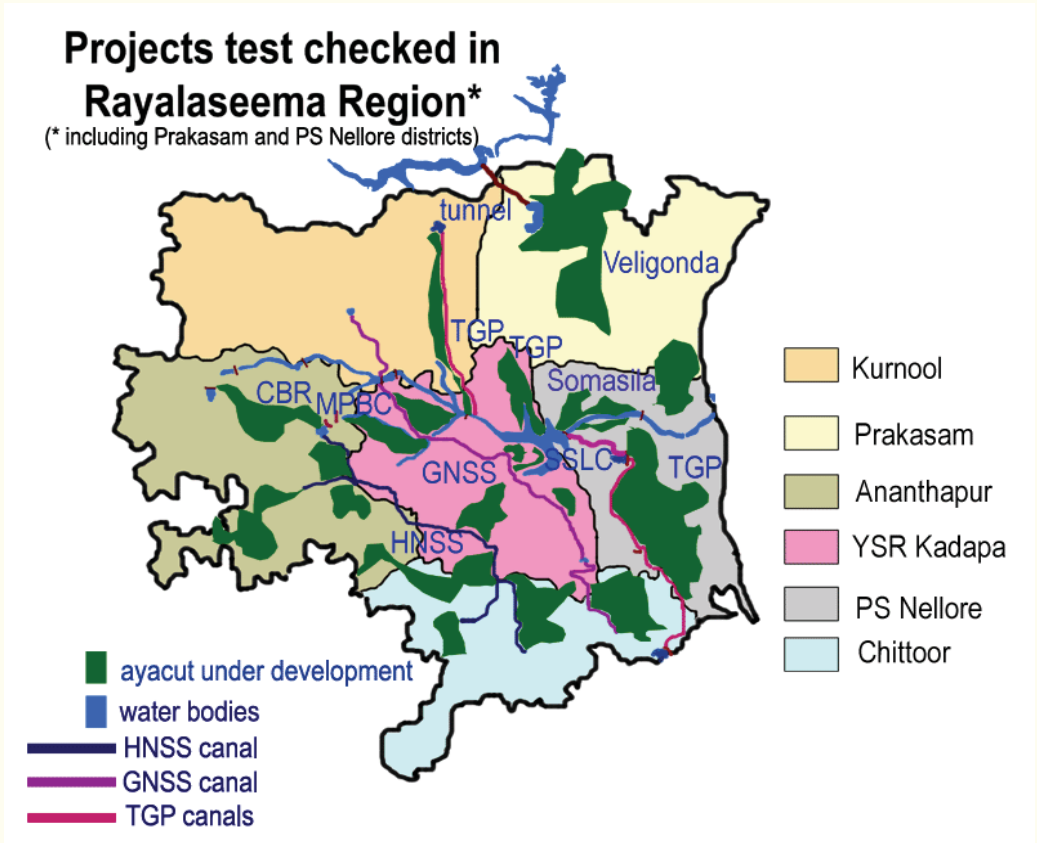
By the time Jalayagnam was taken up, the reservoir work was already in progress. Under Jalayagnam, the works relating to the main canal and distributary network were entrusted (September 2005) under EPC turnkey system. All the works were completed by 2011 and water was released in Kharif 2011. However, the Government has not yet (September 2012) declared this project as complete.

ii. ***Ayacut creation***: During execution of the project, ayacut to an extent of only 14,028 acres was developed and it was found that the balance ayacut of 9,058 acres was not available for this project as it was covered under another medium irrigation project (Musurumilli) adjacent to this.

iii. The Bhupathipalem reservoir and the main canal were designed to serve the full ayacut of 23,086 acres, though the ayacut finally developed was only 14,028 acres. Thus, the project on which an expenditure of ₹160.07 crore was incurred, has finally achieved only partial benefits, indicating poor planning while taking up two proximate projects. Incidentally, the same contractor has executed the canal and distributory works of both the projects.

The Department replied that the scope of the project was increased to 23,086 acres based on the demands from local ryots, but after the field investigations, the final ayacut was found to be only 14,028 acres.

Rayalaseema



The ayacut created in the nine test checked projects in this region as of September 2012 was **5.92** lakh acres as against **21.99** lakh acres contemplated. All nine test checked projects were at various stages of execution as of September 2012. The detailed status of ayacut created in this region vis-à-vis that envisaged, is given below.

Table-5.8

Sl. No	Project	Ayacut contemplated (in lakh acres)	Ayacut created	Due date of completion	Delay
1	Galeru Nagari	Original:3.25 Revised:2.60	Nil	Ph I February 2007-October 2009 Ph II June 2011 - November 2011	35-67 months 10-15 months
2	Handri Neeva	6.02	Nil	Ph I February 2007 – December 2009 Ph II November 2009-September 2011	33-67 months 12-34 months
3	Veligonda	4.47	Nil	August 2007 – August 2013	0-61 months
4	Telugu Ganga	5.23	4.36 lakh acres	February 2007 - April 2012	5-66 months
5	CBR-Lingala	0.59	Nil	August 2007 – May 2009	40-61 months
6	Gandikota-CBR Lift	0.57	Nil	May 2009 - October 2009	35-40 months
7	Modernization of PBC	New: 0.37 Stab: 0.60	New: Nil 45000 acres stabilised	July 2007 - December 2009	33-62 months
8	Somasila	New: 1.79 Stab: 3.34	New:1.56 lakh acres 2.75 lakh acres stabilised	March 2007 - June 2011	15-66 months
9	Somasila-Swarnamukhi Link canal	New: 0.35 Stab: 0.88	Nil	May 2010 - January 2011	20-28 months

Source: Records of I & CAD Department

The key issues relating to these projects are given below.

5.3.6 Sri Krishnadevaraya Galeru Nagari Sujala Sravanthi (Galeru Nagari)

5.3.6.1 Project profile

Irrigation potential envisaged:	*3.25 (later revised to 2.6) lakh acres in Chittoor, Kadapa and Nellore districts*
Drinking water facilities	*Villages enroute*
Source of water	*42 (revised to 38) TMC of flood water of river Krishna from foreshore of Srisailam reservoir*
Phase I: ***Administrative Sanction :*** ***Expenditure :*** ***Villages affected:*** ***Houses contemplated:*** ***Houses completed:***	 *₹4690.24 crore (June 2004 to March 2008)* *₹3630.30 crore* *25* *5665* *2252*
Phase II: ***Administrative Sanction :*** ***Expenditure:***	 *₹2525.91 crore* *₹306.69 crore*
Land	*Required: 55764.77 acres, Acquired:44708.59 acres*

5.3.6.2 Key Issues

i. Source of water: In December 1995 an Expert Committee was constituted to examine various alternatives relating to availability of water for this project, as mentioned in Chapter - 3. The Committee felt that the flood days on river Krishna

was only **30** and that the flow would be available in only 40 *per cent* of the years. Government, however, disregarded this observation and awarded the project works to draw 38 TMC of flood waters in **45** days. Later, the canal system was redesigned (November 2006) to discharge 20,000 cusecs instead of the originally envisaged 10,000 cusecs from Gorakallu Balancing Reservoir to Owk Reservoir, to facilitate drawal of 38 TMC in 30 days. Further, water required for Galeru Nagari can be drawn from Srisailam reservoir only if the discharge capacities of Pothireddipadu Head Regulator, Right Main Canal and the Right Branch Canal of Srisailam Project are increased. However, these works were not included in the Galeru Nagari project works awarded initially, indicating lack of planning in taking up this project.

ii. ***Reduction in Ayacut***: Government initially contemplated creation of an ayacut of 3.25 lakh acres, which was reduced to 2.6 lakh acres (October 2005) through the conventional canal irrigation system, besides providing drinking water to villages enroute. Several changes were made in the allocation of water under the project as shown below:

Table-5.9

Sl. No.	Allocation (in TMC)	DPR 1990	DPR 1994	Initial allocation (2006-07)	Revised allocation (2010-11)
1	Irrigation and drinking water supply	28.00	30	26.45	17.33
2	Evaporation, seepage and transmission losses	13.76	8	7.55	3.67
3	Supplementation of PBC ayacut by 88,500 acres through GKLI	---	---	4.00	6.00
4	Pilot Micro irrigation system through lift from Gandikota reservoir to CBR for 1,26,000 acres (1,06,000 + 20,000)	---	---	---	8.83
5	M/s Brahmani Steel Ltd. at Jammalamadugu	---	---	---	2.00
6	M/s SJK Steel Plant at Tadipatri	---	---	---	0.30
7	M/s Raghuram Cement Industries	---	---	---	0.09
8	Drinking water to Tadipatri town in Anantapur district	---	---	---	0.60
	Total	**42**	**38**	**38**	**38.820**

Source: Records of I & CAD Department

- After commencement of works, 14.83 TMC of water was allocated to Chitravathi Balancing Reservoir (CBR) and Pulivendula Branch Canal (PBC) alone and 2.39 TMC was allocated to three private industries. These allocations were not contemplated at the time of commencement of the project.
- There is no uniformity in computing evaporation, transmission and seepage losses. The Department had earlier assessed (2006-07) these losses at 7.55 TMC, whereas, in November 2010, these were projected at only 3.67 TMC. If the losses which were assessed earlier are also considered, the water available for irrigation would be only 13.45 TMC, which will be sufficient to meet only part of the 2.6 lakh acres of ayacut proposed under the project.

The Department replied that the crop water requirement under Galeru Nagari project was reduced by adopting micro irrigation system and that the saved water was allocated to the CBR and PBC projects. It was also stated that the allocations to private industries was as per Government's policy to allocate 10 *per cent* storage in reservoirs to promote industrialization. The reply is not acceptable, since micro irrigation was neither contemplated in the original project proposals nor has been taken up so far. Besides, adoption of micro irrigation for 2.6 lakh acres under the project requires huge additional investments of atleast ₹880 crore[16] and drastically increases the project cost.

As regards downward revision of evaporation, transmission and seepage losses in the revised allocation, Department replied that these losses depend on the design of the canal system and soil conditions etc. and therefore may vary. The reply did not address the issue of reduction in losses by more than half between 2006-07 and 2010-11 when obviously the soil conditions would not have changed. In fact, the discharge capacity of the canal system was subsequently increased, which, in fact, would lead to increase in the evaporation and seepage losses.

The Department stated that the reduction in ayacut was due to overlap of 90,000 acres of ayacut under Somasila Swarnamukhi Link Canal (SSLC) scheme in Chittoor and Nellore districts, and that, an additional ayacut of 25,000 acres was identified in Kadapa district. **The reply is not correct, since the SSLC was taken up in May 2006 while the ayacut of Galeru Nagari was reduced in October 2005 itself**. Further, Audit observed that, under SSLC, only 34,818 acres of new ayacut is being developed and 88,182 acres of existing ayacut is being stabilized. This indicates that the ayacut originally included under Galeru Nagari and stated to be transferred to SSLC later, is, in fact, not entirely new, but is a part of the existing ayacut.

iii. Status of works: Out of the 28 Packages in Galeru Nagari, not even one package was completed as of September 2012. In as many as 17[17] packages, the slow progress of work was due to non-acquisition of land, including land to be obtained from the forest department. In view of this, the contractors executing packages 4, 7 and 28 requested to close their contracts. The progress in respect of the remaining packages was negligible.

- Package 12/06 was stopped due to agitation from the land owners who lost their lands due to the project works.
- Work on package 14 was suspended from March 2011 to October 2011 due to several reasons including non-payment of bills. The Department stated that the agreement period was over and extension of time was granted, and that, it is pursuing with the contractor to complete the balance work.

[16] As per the contracts entered into (February 2009) by the irrigation department under Gandikota LIS, Pulivendula Branch Canal and CBR-Lingala Canal, the cost of providing micro-irrigation was ₹3.385 crore per 1000 acres. At this rate, it would cost atleast ₹880 crore to provide micro-irrigation to the total ayacut of 2.6 lakh acres under Galeru Nagari

[17] Packages Nos 26 to 29 and 2 to 14

- In package 30, the initial proposal of a single tunnel with 16 meter dia at Owk was changed (November 2008) after entrustment of work, to twin tunnels with 11 meters dia. While approving the alternative design criteria, Government stipulated (December 2009) the bed lining thickness as 600mm based on the advice of the technical committee, as against the initial proposal of 500 mm. The work was suspended (December 2010), since the contractor found it difficult to execute the revised specification.
- Gandikota reservoir (package 1) was nearing completion. However, unless the works in the head reaches are completed, the reservoir would remain idle. None of the packages taken up during 2005-2007 was completed, even after granting extension of time for 3 years.

The Department confirmed that the slow progress in completion was due to non-acquisition of the required land and lack of forest clearance. It however, expressed confidence that there would be inflows into Gandikota dam and from catchment of Pennar during the monsoon period, which can be utilized for irrigation, as previous records indicated considerable inflows into Pennar River.

5.3.7 Anantha Venkata Ramireddy Handri Neeva Sujala Sravanthi (Handri Neeva)

5.3.7.1 Project profile

Irrigation potential envisaged:	*6.03 lakh acres in Ananthapur (3.45 lakh acres), Chittoor (1.40 lakh acres), Kadapa (0.38 lakh acres) and Kurnool (0.80 lakh acres) districts*
Drinking water facilities	*To 33 lakh population in four districts*
Source of water	*40 TMC of Krishna water; (14 TMC for phase I and 26 TMC for Phase II)*
Phase I:	
Administrative Sanction :	*₹2774 crore (January 2007)*
Expenditure:	*₹2708.61 crore (September 2012)*
Power required :	*453.19 MW*
Phase II:	
Administrative Sanction :	*₹4076 crore (January 2007)*
Expenditure:	*₹3244.94 crore (September 2012)*
Power required :	*199.68 MW*
Land	*Required: 46190 acres, Acquired: 40955 acres*
R & R houses	*Contemplated:204, Completed: Nil*

5.3.7.2 Key Issues

i. ***Changes to scope***: As per the DPR, the water required for the project was to be drawn from river Krishna (at Malyal village near Nandikotkur) by excavating a 3.4 km long approach channel with a carrying capacity of 109.02 cumecs up to Stage-I pump house. The off take point of the approach channel was fixed considering the levels of Srisailam reservoir (above which the flood waters of Krishna was proposed to be drawn). Subsequently, additional arrangements[18] for

[18] (i) an approach channel of 6.20 km from Siddeswaram, (ii) a new pump house near Mutchumarri and (iii) a 21.75 km long link channel from the new pump house which again joins the Malyal approach channel

drawal of water from a lower location viz., Siddeswaram in the foreshore of Srisailam reservoir were specified and agreements were concluded (December 2007 and June 2008) for an aggregate value of ₹250.66 crore.

The Department justified these additional works citing the design of Malyal channel to draw water at +250m level, and stated that, the additional intake arrangements at Siddeswaram have been planned to draw water at +240m, when the water level of Srisailam dam falls below +250m, for supplying drinking water during summer.

The reply is not acceptable, as the crest level of the spillway of Srisailam reservoir is +252.98 m. The fact that the original intake at Malyal was kept at +250 m indicates that the Government initially contemplated drawing flood waters from below the crest level of Srisailam dam whereas, the alternate intake arrangements are now being made at a far lower level of +240m near Siddeswaram, which leads to the conclusion that water is now proposed to be drawn from the carryover storage of Srisailam reservoir, which was meant to serve the already existing projects during the deficit years.

ii. Entrustment of works: As per the NIT, the contractors who were involved in fraudulent practices should not be awarded any contract. There were however, two firms, *viz*. Backbone Projects Ltd and LASA-VAS[19], which indulged in fraudulent practices[20] and as such should have been black-listed. However, both the firms were awarded further contracts worth **₹152.84 crore** (3 packages) and **₹8.10 crore** (one package) respectively.

iii. Status of works: Out of the 70 packages in Handri Neeva project, only one package (Jeedipalli reservoir) was completed as of September 2012. All the remaining packages were delayed by 2-3 years.

The Department attributed the delay in completion to (i) objections from local farmers to canal excavation, (ii) issue of exgratia to C category lands to be solved by Revenue authorities, (iii) implementation of control blasting at certain places, and (iv) insistence of crop, land and house damage compensation by farmers.

- The Phase I works, taken up in 2004-05, were not completed before taking up the Phase II works in 2007. Even the Phase II works, stipulated to be completed by 2011, were not completed as of September 2012.

The Department replied that the Phase-I works were awarded in 2004-05, duly keeping the completion time as 2 years, and after 2 years only, the Phase-II works were called for.

- Due to non-completion of lifts at all the stretches, the canals already excavated are getting silted up/ filled up with bushes/mud slides/rockslides etc. as can be seen from the photographs relating to packages 33 and 30 of Phase I given below (July 2012).

[19] Third Party Quality Control Agency

[20] (i) Not following agreement clauses and claiming excess payments ₹5.88 crore (ii) Claiming payments for work not executed ₹2.28 crore


5.3.8 Poola Subbiah Veligonda Project (Veligonda)

5.3.8.1 Project profile

Irrigation potential envisaged	*4.47 lakh acres and drinking water to 15.25 lakh population in Prakasam, Kadapa and Nellore districts*
Source of water	*43.5 TMC Krishna flood waters from Srisailam reservoir during monsoon (July to October)*
Administrative sanction	*₹4785.82 crore (March 2008)*
Expenditure	*₹3127.82 crore*
Land	*Required: 29645 acres; Acquired:21363 acres*
Villages affected	*11*
Number of Housing units	*Contemplated 4148; completed : Nil*
Power required	*14.70 MW*

5.3.8.2 Key Issues

i. ***Administrative approvals***: The DPR was prepared in 1994 and the GOAP accorded 8 administrative approvals and 11 technical sanctions in a piecemeal manner for 7 works. For instance, administrative approval for Tunnel-I was given for ₹400 crore whereas the technical sanction was accorded for ₹699.93 crore and the agreement was concluded for ₹624.60 crore.

ii. ***Changes to scope of project***: As per the DPR, the project was designed to draw 43.50 TMC of Krishna water from Srisailam reservoir in 45 days during the flood season through a tunnel of 11.34m diameter to irrigate 4.38 lakh acres in Prakasam, Kadapa and Nellore districts. However, when the project was taken up under Jalayagnam, the scope of the project was reduced and under stage-1, it was proposed to draw only 10.7 TMC of water in 45 days using a tunnel with a lesser diameter of 7.0m and irrigate 1.19 lakh acres. Tenders were invited and the works relating to tunnel, reservoirs, canals, etc., were awarded (November 2004 – August 2005). However, subsequently, stage-2 works were also awarded through supplemental agreements (June 2007 – August 2009) and some portions of work already executed had to be redone, resulting in an extra expenditure of ₹2.88 crore.

It was further noted:

- While deciding to take up the project in two stages, the Department did not devise any action plan for phasing the stage-1 and stage-2 works.

- Tunnel-1, feeder canal, three non-overflow dams and link canal were designed with a reduced capacity to draw only 10.7 TMC of water as against the requirement of 43.5 TMC and works were awarded.
- The Committee of Experts constituted for finalizing the designs relating to tunnel-II of this project suggested (December 2005) that the exact number of flood days have to be scientifically arrived at, duly considering all inflows and drawls of existing, ongoing and proposed projects from Srisailam reservoir. However, no such studies have been conducted and water availability for the project is not yet established (September 2012).
- As per the DPR, 43.5 TMC of water was to be drawn **in 45 days** through a single tunnel with a discharge capacity of 328 cumecs. This was later revised to be drawn **in 30 days** using twin tunnels, as shown below:

Table-5.10

	Tunnel description	Total discharge of the tunnel(s)	No. of days of drawl of water	Quantum of water proposed to be drawn	Ayacut proposed
As per the DPR	One tunnel of 11.34m dia	328 cumecs	45 days	43.5 TMC	4.38 lakh acres
As per the works initially awarded	One tunnel of 7m dia	85 cumecs	45 days	10.7 TMC	1.19 lakh acres
As being executed now	Two tunnels T 1 : 7m dia T 2 : 9.2m dia	483.31 cumecs	30 days	43.5 TMC	4.47 lakh acres

Source: Records of I & CAD Department

The total area of the tunnel proposed in the DPR (with 11.34m dia) and the twin tunnels now being executed (with 7m dia and 9.2m dia) works out approximately the same. Thus, the quantum of water these tunnels can draw in a specific duration should also be the same. However, as per the designs approved now, it is proposed to draw 43.5 TMC of water in just 30 days as against 45 days contemplated in the DPR.

The Department replied that a plan was prepared to take up the works in two stages but later it was decided to start Stage-II works based on various representations from the people and public representatives. It was also stated that though the 7 meter dia tunnel taken up originally could have been increased to 11.34 meters to draw the ultimate discharge, since the flood days are limited at that level, it was decided to have two tunnels, so that water can be drawn in more than 30 days.

iii. IBM estimates vs. execution: The Department estimated the IBM value of the tunnel-1 package as ₹693 crore (SSR 2004-05) based on certain assumptions. However, during execution, there were changes to the specifications, which involved an amount of ₹172.06 crore, as can be seen below.

Table-5.11

Sl. No	Assumptions made while preparing the estimate	Amount provided in IBM (₹ in crore)	As per execution	Cost of the actual requirement (₹ in crore)	Excess provision loaded in IBM (₹ in crore)
1	Two tunnel boring machines (TBMs) were proposed to be used for in tunnel excavation	210.00	Only one TBM is being used	105.00	105.00
2	An adit was proposed for the tunnel	22.00	No adit is executed as only one TBM was used	-	22.00
3	Scrap value not contemplated in the estimate	-	If 10% of the value of the TBM is taken as scrap value.	10.50	10.50
4	Lining of 500 MM thick with M20 grade concrete	90.14	Lining of 300mm thick with M 35 grade concrete	55.58	34.56
				Total	**172.06**

Source: Records of I & CAD Department

The Department stated that while preparing the estimates, some assumptions were made in the absence of practical data and that the IBM value was uploaded in the e-procurement platform only after the closing date of bid submission and no bidder had taken advantage of these assumptions. The basis of computing IBM not being firm, using it to compare the price quoted by the bidder led to awarding the contract at ₹172.06 crore in excess of the actual requirement.

iv. Status of works: The project is divided in to seven packages and all seven were reviewed in Audit.

- Boring activity of tunnel was held up due to encountering loose soil with gush of water in December 2009. The Department confirmed (July 2012) that for 16 months, the boring activity was held up due to encountering loose soil and that, the work is now progressing briskly.
- There was slow progress in tunnel excavation and the feeder canal was not completed as per the scheduled time line. The status of some of the works is given below (July 2012).

Non completion of CM &CD[21] works (Aqueduct)

Eastern Main Canal at Km 6.00 to 10.00 delayed due to non acquisition of Forest Land

[21] Cross masonry and cross drainage works

5.3.9 Chitravathi Balancing Reservoir (CBR) Right Canal (Lingala Canal) and Lift Irrigation Scheme

5.3.9.1 Project profile

Irrigation potential envisaged:	*59400 acres (25000 acres in Phase I; 34400 acres in Phase II)*
Source of water	*3.6 TMC of water from Chitravathi Balancing Reservoir*
Other benefits	*Drinking water facilities to 50000 population*
Components	*Canal for a length of 53 KM*
Administrative Sanction	*Original: ₹32 crore (June 2004)* *Revised: ₹626.82 crore (October 2006-November 2008)*
Expenditure	*₹300.57 crore*
Power requirement	*14.21 MW*
Land	*Required:2856 acres, Acquired:1923 acres*

5.3.9.2 Key Issues

i. Assessment of availability of dependable water resources: When the CBR was not able to provide water to even 25 *per cent* of the ayacut already existing under it, proposing another project on this reservoir was not appropriate. The chances of success of Lingala canal system, being constructed at a cost of ₹626.82 crore, are thus dependent on providing an alternative source.

ii. Changes to scope of project: The Chitravathi Balancing Reservoir (CBR) was constructed as part of the Tungabhadra Project High Level Canal scheme, with a storage capacity of 10 TMC to stabilize an ayacut of 59,500 acres under the Pulivendula Branch Canal (PBC) system. The total water requirement for PBC system was 6.40 TMC.

Government decided to take up excavation of a 64 KM long right canal (called Lingala Canal) from the CBR to provide irrigation facilities to 25,000 acres and drinking water to the population of Lingala and the adjoining mandals of Pulivendula constituency by utilizing the 3.60 TMC of balance water of CBR and accorded (June 2004) administrative approval for ₹32 crore. Tender notice for the work was issued on 18 August 2004. Immediately thereafter, in the same month, the CE sanctioned (August 2004) a revised estimate for ₹150.43 crore with an increased scope of project by proposing (i) increase in the carrying capacity of the canal from 28.30 cumecs to 34.00 cumecs, (ii) excavation of a new link canal, (iii) improvements to 4 No. of tanks, (iv) provision of four lifts to feed these tanks and (v) increase the capacity and the number of structures. However, there was no increase in the ayacut. The length of the canal was reduced in the revised scope of work to 53 KM as against the originally contemplated length of 64 KM. Further, even this revised scope of work was not adhered to.There were frequent changes in the project including adoption of micro-irrigation system and increase in the contemplated ayacut to 59,400 acres. In all, five administrative approvals were accorded for the project. After concluding the initial agreement, four supplemental agreements were concluded with the same agency for the additional scope of work. The total value of works entrusted was ₹336.20 crore as against the original agreement value of ₹148.05 crore. Clearly, the scope of the project was not determined before award of works. Further, although the entire ayacut of 59,400 acres was to be developed through micro-irrigation as per the revised proposals, agreements were concluded only for 5000 acres.

The Department replied that the frequent changes made in the project have to be seen in the context of the need to provide irrigation and drinking water to upland areas which could never hope to get these facilities.

5.3.10 Modernization and Micro Irrigation of Pulivendula Branch Canal (PBC)

5.3.10.1 Project profile

Irrigation potential envisaged:	*Additional ayacut of 36900 acres; Stabilization of 60000 acres in Pulivendula constituency*
Source of water	*6.4 TMC (4.4 TMC from Tungabhadra dam and 2 TMC from catchment through Chitravathi river)*
Administrative Sanction	*₹657.43 crore*
Expenditure	*₹200.17 crore*
Power requirement	*5.06 MW*
Land	*Required : 2385.41 acres Acquired : 1491.07 acres*

5.3.10.2 Key Issues

i. Changes to scope of project: The Pulivendula Branch Canal (PBC) was an existing canal scheme taken up (1973) under the Tungabhadra Project High Level Canal Scheme. Modernization of the PBC system was initially taken up in 2005 to stabilize the existing ayacut at a cost of ₹118.23 crore. Later, the GoAP decided (December 2006) to create a new ayacut of 36,900 acres through micro irrigation at a cost of ₹156 crore. Subsequently, it was decided (November 2008) to implement micro irrigation system at a cost of ₹360 crore to the entire ayacut under PBC.

During the execution of works, the GoAP decided (May 2008) to increase the carrying capacity of the system by 400 cusecs to supplement Mylavaram reservoir, but due to the refusal of the contractor, the portion relating to excavation of Tumpera deep cut and bypass channel were deleted from the scope of the original contractor and entrusted to another agency in November 2007. Taking up modernization works initially with lower discharge and subsequently increasing the carrying capacity of the system indicates lack of planning in formulation of the project.

The Department replied that the changes made to the scope of the project during execution were the result of representations from people and public representatives. The reply is not acceptable, as projects of this magnitude, while addressing the needs of the people, should also have sound engineering/technical basis.

ii. Status of works: All the eight packages are at various stages of completion and not one of them has been completed as of September 2012. The Department had procured electro-mechanical components required for lift irrigation at a cost of ₹31.87 crore between September 2008 to August 2009, which have not yet been put to use.

The Department replied that due to delay in land acquisition, non availability of water and power for testing & commissioning of electro-mechanical equipment etc., the project could not be completed on time.

5.3.11 Somasila Swarnamukhi Link Canal (SSLC)

5.3.11.1 Project profile

Irrigation potential envisaged:	*Create a new ayacut of 34818 acres* *Stabilize 88182 acres of 316 tanks in Nellore and Chittoor districts*
Source of water	*Proposes to utilize 4.45 TMC of Pennar flood water*
Other benefits	*Provides for drinking water facilities to 2.5 lakh population with 0.2 TMC*
Components	*Takes off at KM 12.52 of Somasila-Kandaleru Flood flow canal and runs for a length of 100.06 KM*
Administrative Sanction	*₹437.42crore*
Expenditure	*₹97.66 crore*
Land	*Required : 5870 acres Acquired : 2668 acres*

5.3.11.2 Key Issues

i. ***Technical sanction***: Tenders for the works relating to SSLC were invited before according the technical sanction to the estimates. In fact the estimates were approved after more than seven months from the date of issue of tender notices. The Department in its reply, accepted the audit observation and stated that tenders being called before getting technical sanction was a procedural lapse due to heavy rush of work under Jalayagnam.

ii. ***Delay in approval of designs***: In all the three packages, which were entrusted from May to September 2007, there was a delay in approval of designs. Out of the total 145 designs to be got approved, the contractor submitted designs for 23 structures, out of which, only 14 designs were approved by the Department. The Department has taken more than four and half years for approval of 14 designs, which led to time over run in the project. The Department replied that works in package 17 are under progress and that, work in package 15 is held up because forest land was yet to be handed over. Work in package 16 was stated to be held up because of delay in handing over of forest land & Wild Life Sanctuary clearance.

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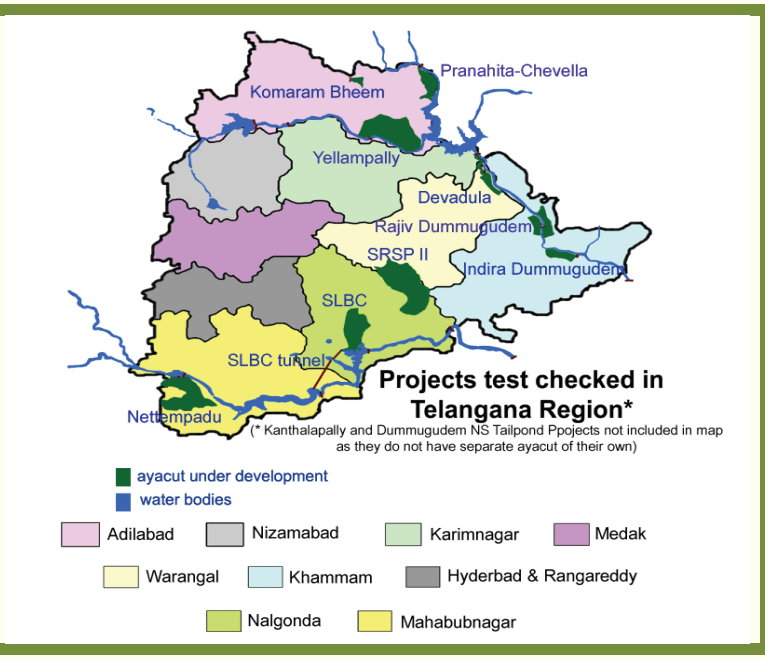


The ayacut created in the eleven test checked projects in the Telangana region as of September 2012 was **4.37** lakh acres against **39** lakh acres contemplated. All the test checked projects were at various stages of execution as of September 2012. The details of ayacut created vis-à-vis envisaged, in respect of these projects is given below.

Table-5.12

Sl. No	Project	Ayacut contemplated (in lakh acres)	Ayacut created	Due date of completion	Delay
1	Devadula	6.21	45000 acres	July 2005 - August 2014	0-60 months
2	Nettempadu	2.00	Nil.	August 2007 - July 2009	38-61 months
3	Indira Dummugudem	2.00	Nil	Jan 2012 - March 2012	6-8 months
4	Rajiv Dummugudem	2.00	Nil	February 2012 - February 2013	0-7 months
5	Dummugudem NS Tail pond	Stab: 14.13	----	Nov 2011 - April 2014	0-10 months
6	SLBC tunnel	3.70	2.13 lakh acres.	March 2008 - February 2012	7-54 months
7	Yellampally	New: 2.20 Stab: 0.30	Nil	Oct 2006 - Nov 2011	10-71 months
8	Pranahita – Chevella	New:16.40	Nil.	Nov 2010 – April 2013	0-22 months
9	Komaram Bheem	0.45	14000 acres	March 2007	66 months
10	SRSP Stage II	4.04	1.65 lakh acres.	March 2007 – May 2010	28-66 months
11	Kanthanapally	Stab: 7.5	Not awarded works as yet		

Source: Records of I & CAD Department

The key issues relating to these projects are given below.

5.3.12 J. Chokka Rao Godavari Lift Irrigation Scheme (Devadula)

5.3.12.1 Project profile

Irrigation potential envisaged:	*6.47 lakh acres (later revised to 6.21 lakh acres) in Warangal, Nalgonda and Karimnagar districts*
Source of water	*38.182 TMC from river Godavari and 8.2 TMC from self catchment area*
Components	*Construction of pumping stations, laying of pipelines, inter-conneting 12 irrigation system tanks, excavation of canals and distributaries*
Administrative Sanction	*₹9178.78 crore (Phase I : June 2003, Phase II: April 2005, Phase III: October 2007)*
Expenditure	*₹6351.77 crore*
Lifts	*Number : 3, Height : 1246 meters*
Power requirement	*484 MW*
Land	*Required : 20089 acres and Acquired : 13840 acres*
R & R Houses	*Contemplated : 83, Completed : Nil*

5.3.12.2 Key Issues

i. ***Scope variation***: The task of preparation of DPR for the project was entrusted to a consultant in February 2002 at a cost of ₹4.15 crore, for completion in nine months. The DPR was however, submitted in October 2003 and was cleared by the CWC in March 2007. However, administrative approvals of phase-I and phase-II were awarded in June 2003 and April 2005 respectively, and works were also entrusted in January 2004 and April 2005 respectively, *i.e.,* prior to approval of DPR.

The Department replied that the works were awarded on EPC basis on the instructions from the Government. The decision to award the works without obtaining clearance from CWC and even before submission of DPR by the consultant proved costly, since the scope of works and demarcation of ayacut underwent several changes, as detailed below.

- The Department adopted (April 2008) an FRL of + 202.97 M for Ramappa Tank based on the levels furnished by the EE of the Mulugu Division, as against the FRL of + 209.38M stated in the DPR. The discrepancy in the levels later led to confusion and it took more than seven months for the Department to finally confirm the actual levels (which were correctly stipulated in the DPR) after physical verification of the site. This ultimately contributed to delays in execution of works.

The Department, while confirming the error, stated that only fixation of minimum water level of the surgepool was delayed and not the entire execution.

ii. Overlap of ayacut: As per the DPR, Devadula initially proposed to irrigate 6.47 lakh acres of ayacut which included 0.77 lakh acres under the already existing tanks in four districts[22] of Telangana region. However, during execution, the contemplated ayacut was changed as indicated below.

Table-5.13

(in acres)

	Warangal	Karimnagar	Nalgonda	Medak	Total
Ayacut as per DPR	4,44,081	14,833	1,49,459	38,197	**6,46,570**
Ayacut as per execution	5,61,229	14,100	45,671	Nil	**6,21,000**

Source: Records of I & CAD Department

The Department, while accepting that there was an overlap of ayacut, stated that owing to technical considerations and public representations, these adjustments were made, and that, the overall quantum of ayacut contemplated under Devadula remained in tact. The reply does not explain the reasons for the overall reduction of ayacut by 25,570 acres. Considering that the works are awarded on a fixed price based on several parameters like topography of the area, length of canals etc., changing the contours of the ayacut mid-way, would have financial implications.

iii. Impractical Agreement period: In most of the EPC agreements under this project, the completion period fixed ranged from 18 to 36 months[23]. Within this period, a host of activities, including detailed survey and investigation and submission of alignment proposals (by the contractor), their approval (by the Department), identification of forest lands (jointly), processing the proposals and obtaining approvals, clearances and execution of the works were to be completed. While on one hand, the Department has attributed these aspects as causes of delay, in this background, the agreement periods drawn up are not realistic.

[22] Warangal, Karimnagar, Nalgonda and Medak. The CA in Medak district was later deleted during execution

[23] Except in packages-V, VI, VII and VIII of phase-III where the contract period stipulated was 57, 42, 48 and 48 months respectively

iv. ***Design of canals****:* Some of the canals in Devadula were not designed properly, as detailed below.

- In the DPR, the south main canal (SMC) of Dharmasagar tank was designed with a discharge of 220 acres/cusec[24]. However, after commencement of the project works, the GoAP ordered to adopt a duty of 150 acres per cusec. Thus, there is a mismatch between the design of the main canal and its distributary.

The Department, while accepting the change in design, contended that the discharge capacity of the SMC would be sufficient. The reply is not acceptable, since the total ayacut fed by SMC has been reduced by 57,575 acres of ayacut to accommodate this change in design.

- The Right Main Canal of Ashwaraopally Tank was being executed to provide irrigation to 0.93 lakh acres while the distributary network was being excavated to create an ayacut of only 0.43 lakh acres in Phase-II. The remaining ayacut of 0.5 lakh acres was transferred to another project viz., Pranahita Chevella.
- Similarly, while the Right Flank Main Canal of R.S.Ghanpur Reservoir was designed and being executed for providing irrigation to 1.51 lakh acres, the distributary canals were being executed for 1.33 lakh acres only. The remaining ayacut of 0.18 lakh acres was transferred to Pranahita Chevella Sujala Sravanthi Project.

The Department replied that the higher design can be used to supply water during peak demand. The reply is not justified since the canals under irrigation projects are invariably designed keeping in view the peak water demand only (i.e. the maximum of the fortnightly water demand during the crop period)

v. ***Status of works***: Devadula project comprises three phases. Execution of Phase I with three packages commenced in January 2004. Work on Phase II with five packages commenced in April 2005 and Phase III with eight packages was taken up in December 2008.The project was divided in to 16 packages and 15 packages have been reviewed in audit.

- Out of the three packages in the first phase, the canal and distributory system under packages 45 and 46 was yet to be completed and execution of field channel system which was separately awarded to non EPC contractors in July 2010, was also not completed.
- The progress of the works in the remaining packages was very slow due to non-acquisition of land to the extent required.
- Due to slow progress of work and delay in land acquisition in D8 of package 46, ayacut of 47119 acres could not be brought to irrigation.
- The work of seventeen minors and sub minors under D9 has not started despite handing over site.

[24] to irrigate 220 acres of ayacut, the canals have to be designed with a discharge capacity of one cusec

- Only 12054 acres could be irrigated under South Main Canal during Kharif 2011.
- In Phase I, package 46, construction of field channels for an ayacut of 19643 acres was not completed on the ground of standing crops.

5.3.13 Jawahar Nettempadu Lift Irrigation Scheme (Nettempadu)

5.3.13.1 Project profile

Irrigation potential envisaged	*2 lakh acres in 148 villages of Mahabubnagar*
Source of water	*21.425 TMC of water from foreshore of Jurala reservoir on river Krishna*
Components	*Two lifts with two balancing reservoirs supported by eight online balancing reservoirs*
Lift	*Height :139 meters*
Power	*119 MW*
Project Cost	*₹1428 crore (June 2005)*
Expenditure	*₹1429.74 crore*
Land	*Required:25412 acres Acquired:20503 acres*
R & R Housing units	*Contemplated:2575, completed: nil*

5.3.13.2 Key Issues

i. Deviations from DPR: The DPR for the project was first prepared in July 2004. It was revised later (November 2005) and the project works commenced with two major deviations *viz*., (i) increase in power requirement of the pumps and motors from 62 MW to 119 MW; and (ii) increase in storage capacity of reservoirs from 3.35 TMC to 5.19 TMC. As the extent of targeted ayacut has not increased with these revisions, initial planning of the scheme was, thus, not in order. In the original DPR, the storage capacities of the two balancing reservoirs viz., Gudemdoddi Balancing Reservoir and Relampadu Balancing Reservoir were worked out as 1.04 TMC and 2.31 TMC respectively, and were later increased to 1.19 TMC and 4.0 TMC respectively, to serve only the contemplated ayacut. In addition to the above two balancing reservoirs, the project also contemplated formation of eight online reservoirs with a total storage capacity of 6.73 TMC for additional storage. However, even after the lapse of more than six years since award (August 2005 – March 2006) of works, the feeder channels through which these reservoirs are to be linked with the main canals has not been finalized. The Department has also not firmed up the location of these online reservoirs.

The Department replied that the number and capacity of the pumps was modified after consultation with the APGENCO and that the capacity of the online reservoirs was increased after detailed investigations by the EPC agencies. As regards the feeder channels linking the online reservoirs, it was stated that tenders had now been invited to take up these works.

ii. Identification of targeted ayacut: The project contemplates providing irrigation to two lakh acres in 148 villages. While preparing the DPR, although the 148 villages were identified, the names of only 29 villages were indicated in the six agreements involving development of distributary network. The Department stated that these would be finalized only after completion of detailed investigations by

the contracting agencies. It was further stated that, the villages falling in the alignment of the main canals only were mentioned in the agreements, and that, the distributory network will cover the adjacent villages enroute and that the contemplated ayacut of two lakh acres is achievable.

iii. ***Status of works***: Review of all 14 packages of Nettempadu LIS revealed time over run in project execution ranging from 38 to 61 months.

- Progress of works was very slow in all the packages, except package No. 102, where the work was completed.
- In package 98, the need for construction of Head Regulator and Cross Regulator was identified after entrustment of works. The Department stated that they were entrusted to the same agency as additional work.
- In package 99 the hydraulic particulars of ending reach of Right Main Canal were not approved.
- Only **726** designs were approved out of the total **3658** designs required to be approved. The contractors were yet to submit **2847** designs.

iv. ***Synchronization of activities***: In any lift irrigation project, the balancing reservoirs would become functional only when the lift works are completed. Similarly, canals would be useful when the reservoirs can release water in to them. However, in Nettempadu, works were entrusted to firms stipulating the completion of canals and balancing reservoirs by October 2007 whereas lift works were given time for completion up to July 2009 resulting in blocking of funds on canal works.

The Department replied that the working period given for **canal works was 24 months on par with commissioning of first pump of the lift works, which had to be commissioned in 24 months**. The reply is not tenable since operation of one pump will not be able to cater to the needs of even Stage-I and unless more than two pumps are commissioned in Stage-I lift, water cannot reach Stage-II after meeting the water requirements of Stage-I ayacut.

5.3.14 Indirasagar Dummugudem Lift Irrigation Scheme

5.3.14.1 Project profile

Irrigation potential envisaged:	*2 lakh acres in Khammam, Krishna and West Godavari districts*
Source of water	*16.5 TMC from river Godavari at the foreshore of Indirasagar Polavaram Project*
Administrative Sanction	*₹1824 crore (December 2005)*
Expenditure	*₹933.14 crore*
Lift Information	*Number : 3*
Power requirement	*229 MW*
Land	*Required : 3815 acres; Acquired : 1033 acres*

5.3.14.2 Key Issues

i. ***Changes to scope of work***: This project proposes to lift 16.50 TMC of water from river Godavari during monsoon period (flood season from July to September) from the foreshore of Polavaram Project.

- During the actual execution of project works, there have been a number of changes in the location of pump houses and scope of works which resulted in delay in execution of works. Further, non-identification of the contemplated ayacut before award of works has also contributed to non-commencement of works in packages 50 & 51 despite the agreement period nearing completion.

The Department replied that the changes to the scope of works during execution was on account of technical considerations, and that, the work was delayed due to land acquisition and finalization of initial reaches of parent canal of the distributary network.

- During execution of works, the contractors reported that it was not possible to create an ayacut beyond 1.43 lakh acres due to non-availability of ayacut under packages 50 and 51. Thus, there is a shortfall of 0.57 lakh acres of ayacut.

The Department replied that the Mandal wise and Village wise aycut was identified by the consultant which was made available to the EPC agencies. It was also stated that as per departmental data the ayacut was available and the agencies of packages 50 and 51 had been asked to resurvey in detail and submit revised proposals for the total ayacut of 1.81 lakh acres. The reply does not explain as to why the EPC agencies were unable to find the ayacut when it was already established in the DPR and was made available to them.

ii. ***Status of work***: Major portion of laying pipelines was completed except pump houses and distributory network.

- Progress of all three pump houses was poor despite completion of agreement period. Government replied that pump houses 1 and 2 are in progress (July 2012) and pump house 3 would be started soon, as it received clearance from MoEF
- Contractors of packages 50 and 51 could only complete survey and investigation for formation of distributory network during the agreement period of 56 months without any real execution in physical terms.
- Even in packages (Nos 21, 22 and 31) where manufacturing and laying of pipelines has progressed well, other items like earth work excavation for approach channel, formation of tanks, outfall regulators etc., were either not commenced or were still in the initial stages. The Department stated that the land acquisition is now complete and forest clearance was obtained.
- In package 49, excavation of Left Main Canal was completed only in 7.88 km, as against 90 KM, as of July 2012.

5.3.15 Rajiv Dummugudem Lift Irrigation Scheme

5.3.15.1 Project profile

Irrigation potential envisaged:	*2 lakh acres in Khammam & Warangal districts*
Source of water	*Proposes to lift 16.5 TMC from river Godavari in monsoon at Pamulapally of Aswapuram mandal in Khammam district*
Components	*seven stage lifting apart from six balancing tanks*
Administrative sanction	*₹1681 crore (December 2005)*
Expenditure	*₹699.82 crore*
Land	*Required:4042 acres Acquired:737 acres*
Power	*Required:120MW*

5.3.15.2 Key Issues

i. ***Status of works***: The project, proposed to be completed within three years with seven packages, was not on course as indicated below.

- One contractor firm (package 67) has not completed survey and investigation work till date (September 2012) and the instructions (August 2009) of the Secretary to Government for deletion of the work, in view of non-commencement of survey and investigation to create an irrigation potential (IP) of 90000 acres, have not been implemented.
- Acquisition of forest land for about 1503 acres was one of the main hindrances for completion of the scheme and the works were in intial stages.

5.3.16 Jyothirao Phule Dummugudem Nagarjunasagar Sujala Sravanthi (Dummugudem Nagarjunasagar Tail Pond)

5.3.16.1 Project Profile

Irrigation potential envisaged:	*No original ayacut of its own; Purely interlinking of rivers; Intends to stabilize 14.13 lakh acres of Nagarjunasagar*
Source of water	*165 TMC of river Godavari water to river Krishna through river Halia*
Components	*Main canal of 244 KM including twin tunnel 38.325KM*
Administrative Sanction	*Original ₹8930 crore (May 2007); Revised : ₹19521 crore (February 2009)*
Expenditure	*₹547.21 crore (September 2012) No expenditure during the last one and half a year*
Lifts	*Number : 6*
Power requirement	*1136 MW*
Land	*Required : 10225 acres, Acquired : Nil*

5.3.16.2 Key Issues

i. ***Feasibility of the project***: This project involves inter-linking of rivers and does not envisage creation of new ayacut. The objective is to supplement the Nagarjunasagar Project (NSP) with 165 TMC of water, by diverting water from river Godavari to Nagarjunasagar tail pond and stabilize the already existing ayacut of 14.13 lakh acres under NSP during the Kharif season.

The task of preparation of feasibility report and DPR was entrusted to M/s WAPCOS in July 2006 with a stipulation to submit the report within six months. The agency submitted the DPR in October 2010, i.e. after a delay of nearly four years.

- A Committee constituted by the Government to examine the DPR of this project felt (December 2008) that the Nagarjunasagar Tail Pond would not be able to absorb the inflows diverted from Godavari and suggested diverting/lift the water directly into the Nagarjunasagar reservoir instead of into the tail pond. However, this recommendation has not been taken into account in the latest DPR prepared for the project and the works are continuing as per the original proposals.
- More importantly, in July 2009, the CWC questioned the viability of this project, raising a fundamental issue that the project proposes to divert Godavari water into Nagarjunasagar during monsoon when it would already be receiving a lot of water. The CWC had returned the proposals in February 2012. The State Government has not responded to the CWC's comment till date (September 2012).

ii. ***Financial viability of the project:*** In May 2007, when the project proposals were submitted for approval, the Finance Department expressed concern over the cost of the project in view of a number of ongoing projects worth ₹60,000 crore and outlay on already committed projects and schemes. Despite this, the Government accorded administrative sanction for this project for ₹8,930 crore (May 2007) and in February 2009, further enhanced it to ₹19,521.42 crore, as against which, the expenditure up to September 2012 was only ₹547.21 crore.

iii. ***Inadequate competition***: Works relating to this project were awarded before preparation of the DPR. With regard to bidding and award of works, there was inadequate competition in this project. Two (Packages 1 and 4) out of the ten packages were entrusted to single bidders. In seven packages, the competition was low with only two bids in each. Five bids were received in respect of the remaining Package (2). The Department accepted that competition among the bidders was poor and attributed it to the condition of 15 years of operation and maintenance incorporated in the tenders for the first time in India.

- Out of the three bids received for package 3, the lowest bid was for ₹124.65 crore, against the IBM of ₹140 crore. The bids were valid up to 28 January 2008 but due to delay in acceptance of bid up to March 2008, the lowest bidder expressed his inability to extend bid validity. The tender was, therefore, cancelled. When bids were re-invited in July 2008, the response was poor. Non-acceptance of the bid in the first call within the validity period resulted in extra burden on the Government due to revision of estimate from ₹140 crore to ₹252.72 crore including new items. The work was finally awarded in May 2009 for ₹265.30 crore. The extra burden on account of revision of SSRs, excluding new items was ₹ 43.02 crore.
- Execution of the project has not started as of September 2012. Investigation was completed in respect of seven out of ten packages and approvals of designs for these packages are at various stages.

5.3.17 Alimineti Madhava Reddy Project (Srisailam Left Bank Canal Tunnel Scheme or SLBC)

5.3.17.1 Project profile

Irrigation potential envisaged	*3.7 lakh acres in Nalgonda district*
Source of water	*30 TMC from river Krishna*
Components	*43.70 KM gravity tunnel to carry 4000 cusecs from Srisailam reservoir to Dindi balancing reservoir* *Formation of Dindi balancing reservoir* *7.25 KM second tunnel to SLBC main canal and open canal for 25 KM to feed existing AMRP canal*
Administrative sanction	*₹2813 crore (August 2005)*
Expenditure	*₹1479.99 crore*
Land	*Requisitioned :5566 acres, Acquired : 1566 acres*
Villages affected	*9*
Number of Housing units	*Contemplated : 2154 and Completed:995*

5.3.17.2 Key Issues

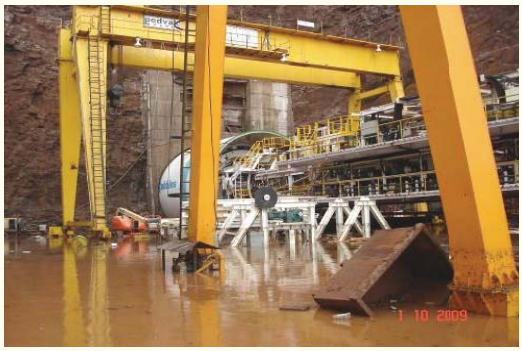
i. ***Detailed Project Report***: Government commissioned (1979) a study to ascertain the feasibility of a High Level Canal and Lift canal from the foreshore of Nagarjuna Sagar reservoir for providing irrigation facilities in Nalgonda, not coming under the purview of the Nagarjunasagar (NSP) left canal. Accordingly a report was submitted (1980) with two feasible alternatives - i) Lift canal from Nagarjunasagar reservoir; and ii) Gravity canal from Srisailam reservoir. Government ordered (1981) a detailed investigation on the second alternative. In 1983 it decided to expedite the investigation of a tunnel from Srisailam reservoir. Since the 39 KM long tunnel scheme involved application of advanced technology, besides obtaining forest clearance, to derive early benefits, GoAP decided to take up the lift canal scheme from NSP, which involved relatively low capital investment of ₹801 crore (1994-95). However, even while the lift scheme from NSP was still under execution, in 2005 the GoAP took up the second alternative i.e. tunnel scheme under Jalayagnam at an estimated cost of ₹2813 crore. The DPR for Tunnel scheme was submitted to CWC for approval earlier in the year 1985. The CWC returned the DPR stating that unless the availability of 30 TMC water is firmly and clearly established, the examination of the project cannot be taken up. The DPR for the other alternative – Lift scheme from NSP was not considered by the CWC for the same reason. Though the project cost has increased substantially, revised DPR has not been prepared by Government with the updated cost. CWC has not approved either alternatives of the SLBC, *viz*., gravity tunnel scheme from Srisailam reservoir and lift irrigation scheme from Nagarjunasagar reservoir due to lack of firm and clear availability of 30 TMC of water.

ii. ***Status of works***: SLBC tunnel scheme involved four packages, out of which, two packages relating to Tunnel I - Tunnel II and Formation of Dindi Balancing Reservoir were reviewed in Audit and it was noted that:

- There was a delay of seven months in indenting for the Tunnel Boring Machines (TBMs) (May 2006) after payment of TBM advance (November

2005). The TBMs were received from March to November 2007. Thus 2 out of the targeted 5 years elapsed in importing TBMs itself. The Department replied that the TBMs were ordered after detailed investigation and collecting geological information.

- Assembling of Tunnel Boring Machine (TBM) at the outlet face of Tunnel-1 was commenced in December 2007 and boring started from May 2008.
- There was a delay in assembling the second TBM at inlet face of Tunnel-1, which commenced only in June 2009 i.e. after 18 months of receipt of the TBM (November 2007). The Department replied that the delay in assembling second machine was due to clearance from the Forest department, and that, the site for intake was changed due to geological conditions.
- The process of procurement and assembling, to be completed in 16 months by the contractor took more than 3 years.
- Within three months, the second TBM was inundated by floods (October 2009) as can be seen from the photographs given below. The entire TBM was refurbished after 18 months and commenced operation in June 2011. Thus, the boring did not commence at the inlet face during the agreement period.



A length of 14.10 KM including lining was completed as of September 2012 out of 43.93 KM in Tunnel - I. The average boring rate targeted for both the TBMs put together was more than 1KM per month, while the achieved rate was only 210.45 meters due to power grid failure, non-availability of spares and frequent change of cutters of TBM.

The Department replied that the geological conditions could not be assessed in depth due to the restrictions of survey work in the Wild Life sanctuary area, and in the event of any problem in the machine, it has to be got repaired there itself. It was further stated that the second machine is progressing well with about 400m per month which is likely to touch 500 meters.

- The civil works of Dindi balancing reservoir have not commenced even after completion of 30 months of the contract period. Works pertaining to open canal for 25 KM were yet to be entrusted as of July 2012. The Department attributed the delay to problems in land acquisition and added that the estimates for open canal are under preparation.

5.3.18 Sripadasagar Yellampally Project (Yellampally)

5.3.18.1 Project profile

Irrigation potential envisaged:	*Original: 4.5 lakh acres of Karimnagar, Adilabad and Medak districts. Revised: New: 2.20 lakh acres, Stab: 0.30 lakh acres under Kaddem project*
Source of water	*Diversion of 40 TMC of Godavari*
Other purposes	*Supply of 6.5 TMC water to NTPC* *Lift of 3 TMC of water to supplement tail end ayacut of Kaddem Narayan Reddy Project*
Components	*Multistage lifting by constructing a barrage across Godavari near Yellampally village (Ramagundam mandal, Karimnagar district) with gross storage capacity of 20.16 TMC* *Erection of 62 radial gates of barrage*
Administrative Sanction	*₹3177.74 crore (July 2004 to July 2008 under various Government orders)*
Expenditure	*₹3347.27 crore*
Land	*Required: 27387 acres, Acquired: 18778 acres*
Power requirement	*116.80 MW*
R & R Houses	*Contemplated:13296, Completed:1448*

5.3.18.2 Key Issues

i. ***Identification of ayacut: (a)*** For excavation of distributory network for the ayacut of 2 lakh acres, a separate administrative approval was accorded (June 2008) for ₹376.25 crore. However, the technical sanction was accorded for the distributory network covering only 1.66 lakh acres under three separate packages as detailed below:

Table-5.14

Canal Network package-I	49,500 acres	under Gangadhara tank
Canal Network package-II	57,400 acres	under Rudrangi and Nagaram tanks
Canal Network package-III	58,800 acres	under Kodimial, Potharam, Surampet, New tank 450 and Lachupet tanks
Total	**1,65,700 acres**	

Source: Records of I & CAD department

Thus, abinitio there was a shortfall of 34,300 acres of ayacut. The distributary network package-II has not been taken up so far. Further, the department furnished the village wise ayacut particulars only in respect of Karimnagar district. In respect of Adilabad district, only mandal wise ayacut was furnished and village wise details were not furnished to Audit.

The Department replied that the balance ayacut would be taken up after making field studies. The reply is not tenable, as it is over 5 years since the DPR was completed at a cost of ₹1.5 crore.

(b) Two lakh acres of ayacut was proposed under stage-II, phase-I to be developed under different tanks. Mulavagu was one of the tanks proposed and work for the canal system under this tank was awarded in April 2005. T**he ayacut of 13,500 acres under this tank was later included under one of the packages of Pranahitha Chevella** for which tenders were called for and agreement was also concluded in November 2008. Due to the overlap of ayacut, the excavation of gravity canal beyond Mulavagu

would not be necessary and the Department is proposing to delete this item from the scope of contract of Yellampally.

A comparison of the ayacut proposed under Yellampally and Pranahita Chevella projects where both the mandal wise and village wise particulars of contemplated ayacut were available, revealed that there was an overlap of 30 villages under four mandals in these two projects.

The Department replied that the ayacut under this project was finalized after detailed investigations before even contemplation of Pranahita Chevella project. If this was so, there was no reason to have included the ayacut pertaining to this project in another project.

5.3.19 Dr. B.R. Ambedkar Pranahita Chevella Sujala Sravanthi (Pranahita-Chevella)

5.3.19.1 Project profile

Irrigation potential envisaged:	*16.4 lakh acres in seven districts[25] of Telangana*
Source of water	*160 TMC from Pranahita, 20 TMC from Godavari at Yellampally*
Purpose	*124 TMC for irrigation, 10 TMC for drinking water in villages enroute, 30 TMC for drinking water in twin cities of Hyderabad and Secunderabad and 16 TMC for industrial purpose*
Components	*7 links and 7 balancing reservoirs apart from utilization of 5 balancing reservoirs of other projects* *849 KM Gravity canal and 209 KM tunnel works*
Administrative Sanction	*Original : ₹17875 crore (May 2007)* *Revised : ₹38500 crore (December 2008)*
Expenditure	*₹2205 crore*
Lifts	*Number : 19, Height : 493*
Power requirement	*3466MW*
Land	*Required: 85000 acres, Acquired: 2685 acres*

5.3.19.2 Key Issues

i. ***Changes to project scope***: Originally the project envisaged irrigation to 12.20 lakh acres in 6 districts by utilizing 160 TMC of water from Pranahita river at a cost of ₹17,875 crore and administrative approval was given (May 2007) accordingly. Subsequently, the scope of the project was increased with the following deviations/additions:

- Provision of irrigation facilities to an ayacut of about one lakh acres in Mudhol and Nirmal constituencies of Adilabad district and shifting of the ayacut of 67,500 acres of Nalgonda district from Phase-III of Devadula to this project.
- Provision of irrigation facilities to about 1.5 lakh acres in Tanduru, Parigi and Vikarabad Mandals of Rangareddy district under this project.
- It was also proposed to feed an ayacut of 1.24 lakh acres through Pranahita Chevella, which was originally contemplated under Yellampally Project Stage-II, Phase-II.

[25] Adilabad, Karimnagar, Warangal, Nizamabad, Medak, Nalgonda and Rangareddy

- It was further decided to utilize 20 TMC of Godavari water from Yellampally Project for this project.
- The carrying capacity of water conveyor system from Pranahita to Yellampally Project was increased from 462 cumecs to 583 cumecs considering 90 days of diversion and 160 TMC of water requirement.

Consequent to the above major changes in the scope of the project, the administrative approval was revised in December 2008 to ₹38,500 crore. The DPR was submitted in April 2010 while the project works were awarded during May 2008 to May 2009. While most of the agreements stipulated completion period as four years, the DPR, which was prepared later, stipulated the completion period of the project as eight years.

ii. ***Inter-State issues***: In inter-state agreements entered into (6th October 1975 & 7th August 1978) on utilization of waters of river Godavari and its tributaries, the States of Andhra Pradesh and Maharashtra agreed to have barrage(s) across the Pranahita river at suitable sites so as to provide irrigation facilities in their areas. The joint Project(s) for such barrages are to be taken up after reaching separate Agreement(s) between the two States for this purpose. It was also agreed therein that in using the waters permitted to each State, no State can construct projects other than those already specifically agreed to, submerging the territory of another State(s), without the prior consent of that State for such submergence.

As per the DPR of Pranahita Chevella, a total extent of 6140 acres will be submerged due to this project, out of which, 5247 acres (85.45 *per cent*) falls within Maharashtra. However, the GoAP went ahead with awarding works (May 2008 – May 2009) without sorting out the inter-state issues and entering into any formal agreement with GoM in this regard.

The GoM had requested the GoAP in October 2010 to conclude an agreement for formation of an Inter State Board (ISB) and draft protocol to sort out the issues relating to submergence. In May 2012 both the States signed an agreement to form an ISB to oversee the investigation, preparation of DPR and other issues relating to this project.

iii. ***Financial viability of the project:*** When the project proposals were submitted for approval in May 2007, the Finance Department expressed concern over the estimated cost of this project in view of a number of ongoing projects worth ₹60,000 crore and outlay on already committed projects and schemes. However, the Government went ahead and accorded administrative sanction for Pranahita Chevella for ₹17,875 crore (May 2007) stating that these issues would be addressed before uploading IBMs for tenders for the project. However, a year and a half later (December 2008), this was further enhanced by more than 115 *per cent* to ₹38,500 crore with an increase in ayacut by 34 *per cent*.

iv. ***Status of works:*** All the packages relating to this project were tendered in 'open' category.

- Out of the 28 packages, packages No. 1 and 2 should have been completed by the end of 2010 and the remaining packages are scheduled to be completed by the end of April 2013. At present, work in all the packages is in the initial stages.

The Department stated that field investigation for main canal and tunnels was completed in most of the packages and design works are in progress.

- Government permitted (June 2011) the Chief Engineer to revise the milestones of all the packages in such a manner so as to complete the entire project in next eight years. It was further ordered to initiate necessary action to revise the date of completion of different packages through supplementary agreement, ensuring that the benefits of the project start accruing in a time bound and continuous manner from 2014-15 onwards.

- The land required for the project was 85,000 acres but in the test checked seven packages (17, 18, 19, 23, 24, 25 and 26), no land was acquired.Formation of both the reservoirs was held up for want of land acquisition and R & R. The Department replied that the process of land acquisition was in full swing and about 22,889 acres of land was requisitioned and about 1578 acres was acquired.

v. ***Changes to payment Schedules:*** In this project, the percentage of survey components were specified as 0.43 to 0.50 *per cent* in the original payment schedules in all the packages. These were later revised upwards to 2 to 3.50 *per cent*. While cost contemplated as per the original payment schedule in all the packages was only **₹172.12 crore**, the cost agreed to be paid towards survey component as per the revised payment schedules was abnormally high at **₹1211.23** crore.

The Department replied that the decision of the Government to freeze investigation of the scheme before taking up actual execution made it very difficult to take up the investigation and designs of all components of packages and the scheme at one time, and the provision made in the original payment schedule were found to be insufficient without supplementation from the components of execution of these items.

5.3.20 Sri Komaram Bheem Project

5.3.20.1 Project profile

Irrigation potential envisaged:	*39500 acres under left canal and 6000 acres under right canal – Total 45500 acres* *Formerly known as Peddavagu Project, a medium irrigation project*
Source of water	*8 TMC of water Peddavagu river*
Components	*(i) formation of earthdam, (ii) construction of spillway, (iii) two head regulators, (iv) two main canals – left (65 KM) and right (9KM)*
Administrative Sanction	*Revised ₹450.14 crore (February 2009)*
Expenditure	*₹399.48 crore*
Land	*Required :7288 acres Acquired:6057 acres*
R & R Houses	*Contemplated:2091, Completed:1995*

5.3.20.2 Key Issues

i. ***Forest Clearance***: This project required clearance from the MoEF for diversion of 246.80 hectares of forest lands. Proposals for forest clearance were sent in a piecemeal manner and the final clearance from MoEF was received only for 181.66 hectares. The project was cleared by CWC in May 2000 and the works were awarded in March 2005.

The Department stated that the process of obtaining forest clearance in respect of head works was initiated in 1999 itself i.e., well before taking up the works, and that, the clearance was received in 2006. It was contended that had the project been postponed for want of forest clearance for main canal beyond Km 34, the ryots would have been denied early irrigation benefits to an extent of 14,000 acres.

The Department had not followed the same approach for the main canal, where, work was entrusted simultaneously with the head works in March 2005 when the process of forest clearance was not even initiated. Further, while the agreement period stipulated was just two years, the proposals for forest clearance for main canal were sent to MoEF only in February 2011, i.e. nearly six years after concluding the agreement and four years after completion of the original agreement period. In fact, even Stage-I clearance had not been received as of September 2012. The main canal was completed upto Km 34 as no forest lands were involved in that reach. The reach beyond Km 34 can be completed only after receipt of forest clearance.

ii. ***Administrative approval & Technical sanction***: NIT for the project works was issued on 10 January 2005 whereas the administrative approval was accorded later on 22 January 2005. Technical sanction for the estimates was accorded in March 2006, i.e. more than one year after award of works.

The Department stated that tenders for all the projects under Jalayagnam were invited in tune with the Government policy and that administrative approval was accorded in the same month in which the tenders were invited. The reply is not acceptable since the administrative approval was accorded after the date of issue of tender notice.

5.3.21 Sriramsagar Project – Stage II

5.3.21.1 Project profile

Irrigation potential envisaged:	*4.04 lakh acres in chronically drought affected areas of Warangal, Khammam and Nalgonda districts.* *Stage II is an extension of Stage I beyond KM 284 of Kakatiya Canal up to KM 346*
Source of water	*24.41 TMC from river Godavari in conjuction with 4.703 TMC of ground water*
Components	*Excavation of three branch canals with distributaries, Mylavarm and Bayyanna vagu balancing reservoirs and an aqueduct at Akeru*
Administrative Sanction	*Original : ₹830.75 crore* *Revised : ₹1043.14 crore*
Expenditure	*₹824.6 crore*
Land	*Required : 30000 acres and acquired 19869 acres*

5.3.21.2 Key Issues

i. ***Overlap of ayacut***: The works relating to extension of Kakatiya canal upto KM 346 and excavation of some of the distributaries, majors and minors commenced before Jalayagnam. Under Jalayagnam, the works relating to providing CC lining to Kakatiya canal and excavation of the remaining distributaries and field channels were taken up in seven packages.

During execution, the contractor executing package-58 noticed that an extent of 18,790 acres was already covered under the Nagarjuna Sagar left canal system. Therefore, ayacut to the extent of only 32,077 acres was being developed as against the ayacut of 50,867 acres contemplated under this package.

The Department replied that the fact of overlap of ayacut came to light after detailed investigation by the EPC agency and that a proportionate amount of ₹16.85 crore was reduced from the agreement value towards the above reduction in ayacut. Here the main issue is not about reduction in the agreement value. The fundamental question is the manner in which the Department entrusted the works without clearly identifying the proposed ayacut. In the instant case, the proposed ayacut lies at the tail end (Km 40 to Km 72) of the distributary No.DBM-71, which itself is located at the tail end (at Km 345.93) of Kakatiya Main Canal. The total ayacut proposed under this distributary was 1.63 lakh acres. The excavation work of DBM-71 was entrusted to different agencies and the distributary is largely completed upto Km 56. The works relating to the distributary network (i.e. majors, minors, sub-minors and field channels) on DBM-71 were taken up separately and entrusted to three agencies under EPC system. Deletion of an ayacut of 18,790 acres in the extreme tail end of DBM-71 means that, while the distributary was designed and constructed with a higher design to serve more ayacut, the actual ayacut itself would be less.

ii. ***Status of project:*** The works of this project were awarded during March 2005.

- All the distributaries are in progress.
- Distributory No.68 and tail end distributory are under investigation.
- Due to non-acquisition of land, Distributaries 61 and 65 could not be completed.
- Tenders for distributory 71 beyond KM 56 were cancelled for want of land acquisition.

The Department stated that land acquisition for package 54 could not be completed, as the ryots were vehemently opposing the canal execution.

- Sriramsagar Stage II suffered most when it comes to withdrawal of funds already allocated. Government withdrew 76, 87 and 87 *per cent* respectively out of ₹270 crore, ₹560 crore and ₹250 crore allocated during the last three years.

5.3.22 P.V.Narasimha Rao Kanthanapally Sujala Sravanthi Project (Kanthanapally)

5.3.22.1 Project profile

Irrigation potential envisaged:	*Stabilization of ayacut of SRSP (3.1 lakh acres) and SRSP stage II (4.4 lakh acres) – Total 7.5 lakh acres*
Source of water	*Lifting of 50 TMC of water from Godavari river and dropping it in Kakatiya canal for stabilization of ayacut*
Components	*(i) construction of Barrage at Kanthanapally on river Godavari (ii) Spillway (iii) Hydropower block (iv) Tunnels, lifts and canals*
Administrative Sanction	*₹10409 crore (February 2009)*
Expenditure	*Nil*
Lifts	*Number :3 Height : 249 meters*
Power	*878 MW*
Power generation	*Contemplated: 450 MW (now revised to 280MW)*

5.3.22.2 Key Issues

i. ***Sequencing***: This project contemplates stabilization of ayacut under SRSP (stage I and II) but was taken up even before the stage II of SRSP was commissoned. In fact, SRSP stage-II is currently under execution. If stage-I of SRSP was facing water deficit and requires supplementation of water from Kanthanapalli project, the rationale behind executing stage-II is not clear.

The Department replied that there is a short fall of about 60 TMC of water in the SRSP system and the ayacut of SRSP stages I and II beyond Km 224 had been experiencing regular shortage of water due to the following factors:

- Even while SRSP stage-II project was under execution, water was released to the fields as and when parts of the canal work got completed and due to availability of plenty of water the farmers are habituated to paddy crops whereas the project was designed for irrigating dry (ID) crops and that this change in cropping pattern led to shortage of water in SRSP Stage-II. The Department contended that it takes time to educate the farmers and change their mindset to go for ID crops.
- The capacity of the SRSP reservoir is also drastically reduced due to deposition of silt.

ii. ***Project Approvals:*** Tenders were invited for this project (May 2009) before obtaining clearances. However, there was no response from the bidders.

Ultimately, the project remained a non-starter even after three years of according administrative approval (February 2009).

Conclusion

Jalayagnam is the most ambitious programme taken up by the State Government for benefiting an ayacut of over 97 lakh acres and drinking water to over 2 crore population, with enormous financial implications. The programme is commendable for the socio-economic reach envisaged and the priority accorded by the Government for providing irrigation and drinking water in the arid uplands in the most backward areas of the State. However, the programme is marred by poor planning and hindrances in execution of the projects due to delays in acquisition of the requisite land, clearances from CWC/MoEF/MoTA/Planning commission, rehabilitation and resettlement activities etc.

Projects were taken up without feasibility study on basic aspects such as availability of adequate water (for the projects on Krishna and Pennar rivers), adequate power (for the Lift Irrigation Schemes), and inadequate delineation of the targeted ayacut in some cases. Specific concerns of CWC on ensuring availability of adequate water sources were ignored.

The EPC mode of contracting, as adopted by the State Government, did not ensure commensurate benefits to the State. Several contracts were awarded on single tender basis, and sufficient time was not given for ensuring adequate competition. Technical sanctions were obtained after the receipt and opening of bids in several cases and there were instances of delays in finalization of IBMs and post tender changes to IBMs. With fixed price contracting involving detailed survey and investigation, design and execution, absence of appropriate clauses in the agreements to deal with variation to specifications led to a situation where the benefits (in terms of reduced project scope, quantities etc.) accrued to the contractors in several cases.

Instead of taking up 74 irrigation projects simultaneously without establishing the feasibility of some of these and tendering without preparing the DPRs and necessary clearances for several of these, the Government should have prioritized projects over a medium to a long term time frame, and concentrated its attention on few projects at a time, ensuring that adequate resources are allocated, land

acquired for their timely completion to ensure reaping of the envisaged benefits by farmers and public. The Government is now saddled with a huge number of projects whose completion will take long with sustainability of many projects becoming doubtful on account of inadequate availability of water and power. The financial burden of these incomplete projects (and associated contracts) on the State Exchequer will be felt for a long time to come.

(VANI SRIRAM)
Principal Accountant General (G&SSA)
Andhra Pradesh

Hyderabad
The 24 Jan 2013

Countersigned

(VINOD RAI)
Comptroller and Auditor General of India

New Delhi
The 1 Feb 2013

Appendices

Appendix-2.1
(Reference to paragraph 2.1, page 3)

(a) Details of projects audited earlier and significant findings

Audit Report 2006-07	***Para 3.2 – Godavari Water Utilization Authority***
Projects Involved	*Devadula, Yellampally, Alisagar LIS, Guthpa LIS, Lendi, Indirasagar Dummugudem, Rajiv Dummugudem*
Major Findings	• The projects prioritized for completion by March 2007 were not completed and consequently, the objectives of utilizing allocated water of river Godavari and creating irrigation potential to 2.16 lakh acres in the Telangana region were not achieved • Unintended benefit of ₹359 crore was given to the contractor due to incorrect estimates and absence of suitable clauses in the EPC agreements to safeguard the Government interest • Post tender reduction in the length of pipeline and the thickness of pipes resulted in undue benefit of ₹108.86 crore to contractors • Irregular advance payments of ₹65.11 crore to contractor contrary to agreement conditions resulted in loss of interest of ₹9.22 crore
Audit Report 2008-09	***Para 1.4 – Accelerated Irrigation Benefit Programme***
Projects Involved	*Alisagar LIS, Gundlakamma Reservoir, Pushkara LIS, Somasila, Sriram Sagar Stage-I, Komaram Bheem, Ralivagu, Thotapalli Barrage, Veligallu Reservoir and Yerrakaluva Project.*
Major Findings	• Projects were awarded without prior acquisition of land resulting in a majority of the projects getting stalled mid-way and non-creation of envisaged irrigation potential • Awarding of projects on a fixed price basis without defining the scope of work precisely and firming up quantity of works to be executed and not having payments linked to quantity of works executed resulted in undue benefits to the contractors.
Audit Report 2008-09	***Para 1.3 – Third Party Quality Control/Assurance in execution of irrigation projects***
Major Findings	• Faulty empanelment of TPQC firms which did not have experience in quality control of irrigation projects, inadequacies in agreements, modification of tender conditions and passing undue benefit to firms, non-enforcement of the agreement conditions and improper payments • Over reliance on the TPQC firms and lack of control by the department in quality assurance and lack of coordination between the department, EPC agencies and the TPQC firms • EPC firms did not take prompt corrective action on the deficiencies pointed out by the TPQC firms
Audit Report 2009-10	***Para 2.2 – Mahatma Gandhi (Kalwakurthy) Lift Irrigation Scheme***
Major Findings	• The estimates were exaggerated by ₹119 crore due to adopting a higher rate of ₹15,000 per acre as compared to ₹11,500 per acre adopted in two other projects viz., Koilsagar Lift Irrigation Scheme and Jawahar Nettempadu Lift Irrigation Scheme located in the same district having the same topography, taken up in the same year (2005). • Incorrect acceptance of bids despite exceeding the stipulated ceiling of 105 *per cent* by ₹58.47 crore defeated the cost control objective of the Government.

- Payments were made without reference to quantities executed resulting in undue benefit of ₹242 crore (₹130.19 crore + ₹112.23 crore) to the contractors.
- No reduction in payments to contractors despite reduction in pipeline quantities resulting in excess payment to contractors by ₹74.76 crore.
- In respect of tunnel works under Lift-II and Lift-III packages the amounts scheduled for payment to contractors was in excess of the amounts payable by ₹122.32 crore.

Para 3.4.3 – K.L.Rao Sagar (Pulichintala) Project

- Absence of vital cost control in execution of project works resulted in Government not getting the benefit of post tender reduction in quantities and undue benefit of ₹56.52 crore to the contractor.
- Award of works without firming up designs led to prolonged litigation over the number of vents to be constructed in the spillway hampering the progress of works besides resulting in avoidable payment of ₹1.76 crore towards contractor's claims.
- Commencement of the project works without environmental clearance in violation of Environment (Protection) Act led to stoppage of works on the order of the High Court and consequent payment of ₹3.24 crore to the contractor on account of idle labour and machinery.

Para 3.4.4 – Flood Flow Canal from Sriram Sagar Project

- Incorrect sequencing/synchronization of various activities/works under the Flood Flow Canal (FFC) project led to incurring of huge expenditure of ₹1,476.30 crore on project works earlier than required, only to be blocked in an incomplete asset without any benefit till reservoir is completed.

Para 3.4.5 – Rajiv Bheema Lift Irrrigation Scheme

- The contractor got undue benefit of ₹21.25 crore due to post tender reduction in quantities.
- Though exemption of Central Excise Duty was available on the Electro/Hydro mechanical equipment used in water supply schemes, the department loaded the CE Duty in the estimates, resulting in incorrect acceptance of a bid higher by ₹20.46 crore.
- There were cases of defective formulation and implementation of agreement clauses like altering the payment methodology in respect of electro/hydro mechanical components after award of works, post tender reduction of rate of interest on mobilization advances to the advantage of the contractor.

Para 3.4.6 – Kandula Obula Reddy Gundlakamma Project

- Undue benefit of ₹22.43 crore was given to contractor due to lack of safeguards in the agreements to ensure that the payments to contractors are linked to the quantities of work actually executed by them resulting in release of higher payments to the contractors.

Para 3.4.7 – Mobilisation Advances paid to contractor

- Audit scrutiny of Mobilisation Advances paid to contractors in eight projects revealed many deficiencies including incorrect payment of advances of ₹111.84 crore; and loss of revenue of ₹33.07 crore due to incorrect stipulation of interest rate.
- Starting of civil works without addressing the issues of i) Statutory clearances like Forest and Environmental clearances, ii) Land acquisition and iii) Rehabilitation & Resettlement led to slow progress of works resulted in blocking up mobilization advances amounting to ₹702.70 crore with the contractors beyond their scheduled dates of recovery in the eight test checked projects.

(b) Recommendations in earlier Audit Reports

Audit Report 2006-07	***Para 3.2 – Godavari Water Utilization Authority*** • Delay should be avoided in acquisition of land, implementation of R&R packages, approval of designs and getting clearances to complete the ongoing schemes/projects expeditiously so that the allocated waters of river Godavari can be utilized to provide irrigation and drinking water to the backward areas of the State • For the successful operation of LI schemes, arrangements for assured power supply should be quickly finalized • It is essential that future IBM estimates are prepared as accurately as possible regarding basic parameters of the project, designs and drawings etc., to avoid unintended benefits to the contractors • All conditions/clauses in tender schedules and agreements should be examined in consultation with Law Department and suitable changes/ provisions may be made to safeguard the Government interest in EPC system of contract • Amount to the extent of liquidated damages due from contractor should not be released to him
Audit Report 2009-10	***Para 2.2 – Mahatma Gandhi (Kalwakurthy) Lift Irrigation Scheme*** • For effective cash flow management, proper planning and sequencing/ synchronization of various activities/works should be followed in execution of projects so that precious funds are not spent earlier than required and get blocked up in incomplete assets for prolonged periods without deriving benefits • Government may consider bringing about suitable changes in the EPC system of contracts to make the preparation of estimates as realistic as possible both in terms of quantities to be executed as well as financial commitments in order to protect Government interests and achieve closure. • Where the quantities of work to be executed have not been firmed up, it would be in the interest of the Government to link payments to quantities executed rather than awarding works on fixed price basis, by making suitable changes in the EPC system of contract. • Specific time frames should be fixed and stipulated in the agreements for the obligations to be fulfilled by the department in addition to the obligations of the contractors, for effective operation of liquidated damages clause.

Appendix-2.2
(Reference to paragraph 2.5.1, page 5)

Details of projects and packages selected for detailed audit scrutiny

Sl. No.	Name of the project	Admn. Sanction (₹ in crore)	Total no. of packages	Packages test checked
1.	Polavaram	16010.45	23	23
2	Nettempadu	1428.00	14	14
3.	Galeru Nagari	7216.15	27	15
4.	Handri Neeva - Phase-I	2774.00	21	24
	Handri Neeva - Phase-II	4076.00	49	
5.	Devadula	9178.78	16	15
6	Yellampally	3177.74	8	8
7.	SLBC Tunnel	2813.00	4	2
8.	Veligonda	4785.82	7	5
9.	Rajiv Dummugudem	1681.00	7	7
10	Indirasagar Dummugudem	1824.00	7	7
11.	Dummugudem NS Tail Pond	19521.42	10	10
12	Pranahita - Chevella	38500.00	28	7
13.	Telugu Ganga	4432.00	12	7
14	Somasila	1196.00	5	3
15	Somasila - Swarnamukhi Link Canal	437.42	4	1
16	a)Chitravathi Balancing Reservoir Right (Lingala) Canal	405.82	1	1
	b)Micro Irrigation Under Lingala Canal	221.00	2	2
17.	Gandikota Reservoir – CBR Lift	2059.00	6	6
18.	a) Modernization of Pulivendula Branch Canal	297.43	5	5
	b) Micro Irrigation under Pulivendula Branch Canal	360.00	3	3
19	Vamsadhara Stage-II Ph-II	933.90	3	3
20.	Thotapally (includes thotapally barrage and	450.23	4	2
	Gajapathinagaram branch canal)	76.99	1	1
21	Bhupathipalem	187.91	2	2
22	Venkatanagaram	124.18	1	1
23	Sriram Sagar Project Stage II	1043.14	7	5
24	Komaram Bheem	450.14	1	1
25	Kanthanapally	10409.00	0	0
26	Uttarandhra Sujala Sravanthi	7214.10	0	0
	Total	**143284.62**	**278**	**180**

Appendix-3.1
(Paragraph 3.2, Page 16)

Status of approvals/clearances for the test checked projects as of July 2012

S. no.	Name of the Project	Feasibility study	In principle consent of CWC	Preparation of DPR	Environmental clearance	Forest clearance	R&R clearance	Investment clearance
1	Polavaram	✓	NA[1]	✓	✓	✓	✓	✓
2	Venkatanagaram	✓	X	✓	X	✓	NA	X
3	Uttarandhra	✓	X	X	X	X	X	X
4	Bhupathipalem [2]	✓	NA	✓	NA	✓	✓	✓
5	SLBC Tunnel Scheme	✓		✓	✓	✓	X	X
6	Galeru Nagari	✓		✓	✓	X	X	X
7	Nettempadu	✓	X	✓	✓	NA	X	X
8	Somasila Swaramukhi Link Canal	✓	X	✓	X	X	NA	X
9	Somasila Project[3]	✓	NA	✓	✓	X	✓	✓
10	Rajiv Dummugudem	✓	✓	✓	✓	X	NA	X
11	Indirasagar Dummugudem	✓	✓	✓	✓	✓	NA	X
12	Gandikota - CBR Lift	✓	X	X	X	✓	NA	X
13	CBR Lingala canal	X	X	X	X	✓	NA	X
14	Modernization of PBC	X	X	X	X	NA	NA	X
15	Pranahita Chevella	✓	✓	✓	X	X	X	X
16	Vamsadhara Stage II Phase II	✓	X	✓	✓	✓	X	X
17	Thotapalli Barrage[4]	✓	✓	✓	✓	NA	✓	✓
18	Dummugudem NS Tail pond	✓	X	✓	X	X	NA	X
19	Telugu Ganga	✓	NA	✓	✓	X[5]	✓	X
20	Handri Neeva	✓	X	✓	✓	X	✓	X
21	Veligonda	✓	X	✓	✓	X	✓	X
22	Komaram Bheem	✓	✓	✓	NA	X[5]	✓	✓
23	Kanthanapally	✓	✓	✓	X	X	NA	X
24	Devadula	✓	✓	✓	✓	X[5]	NA	✓
25	SRSP Stage-II	✓	✓	✓	✓	NA	✓	✓
26	Yellampally	✓	✓	✓	✓	X	✓	X

✓ : Received; X : Not received; **NA** : Not applicable

[1] At the time of formulation of this project, the procedure of granting of In-principle consent by the CWC was not in vogue.

[2] Bhupathipalem Reservoir Project was an ongoing project already cleared by the CWC in 2000 for irrigating 13,391 acres. The scope of the project was later increased to 23,086 acres. However, the Department did not send the revised proposals to the CWC for clearance.

[3] All the necessary clearances except Forest Clearance were obtained for the Somasila Project. However, the in principle consent of the CWC, Environmental Clearance from MoEF and the Investment Clearance from the Planning Commission were not obtained for the extension of the GKN Canal under Somasila Project taken up under Jalayagnam.

[4] Thotapally Barrage Project was cleared by the Planning Commission in March 2006. Later, the scope of the project was increased under Jalayagnam. However, this extension of the project did not have investment clearance from the Planning Commission as the revised proposals were not sent to the CWC.

[5] Forest clearance obtained partially

Appendix-3.2
(Reference to paragraph 3.3, page 20)

Power requirements of the lift irrigation schemes

Sl. No.	Name of the Lift Irrigation Scheme	Power Requirement		
		In MW	Daily requirement (in MUs)	Total for the crop period (in MUs)
	Andhra Region			
1	Pushkara LIS	32.35	0.78	93.17
2	Tadipudi LIS	28.00	0.67	80.64
3	Venkatanagaram LIS	10.37	0.25	29.87
4	Janjhavathi Project	1.46	0.04	4.20
5	Chagalnadu LIS	12.00	0.29	34.56
6	Chintalapudi LIS	111.80	2.68	321.98
7	Uttara Andhra Sujala Sravanthi	329.95	7.92	950.26
	Sub Total	**525.93**	**12.63**	**1514.68**
	Rayalaseema, Nellore & Prakasam Region			
8 (a)	Handri Neeva (Ph I)	453.19	10.88	1305.19
8 (b)	Handri Neeva (Ph II)	199.68	4.79	575.08
9	Guru Raghavendra LIS	28.69	0.69	82.63
10	Pulikanuma LIS	13.50	0.32	38.88
11	Gandikota - CBR LIS	103.08	2.47	296.87
12	Gandikota LIS	36.30	0.87	104.54
13	K.C. Canal Lift	10.00	0.24	28.80
14	Siddhapuram LIS	6.56	0.16	18.89
15	Korisapadu LIS	2.01	0.05	5.79
	Sub Total	**853.01**	**20.47**	**2456.67**
	Telangana Region			
16	Alisagar	25.42	0.61	73.21
17	Guthpa	18.00	0.43	51.84
18	Choutapally Hanumantha Reddy LIS	5.14	0.12	14.80
19	Bhima	96.00	2.30	276.48
20	Nettempadu	119.00	2.86	342.72
21	Kalwakurthy	450.00	10.80	1296.00
22	Koilsagar	30.00	0.72	86.40
23 (a)	SLBC - HLC	72.00	1.73	207.36
23 (b)	SLBC - LLC	12.00	0.29	34.56
23 (c)	Udayasamudram LIS	32.00	0.77	92.16
24 (a)	Devadula	56.00	1.34	161.28
24 (b)	Devadula	123.60	2.97	355.97
24 (c)	Devadula	304.40	7.31	876.67
25	Yellampally	166.80	4.00	480.38
26	Rajiv Dummugudem	119.75	2.87	344.88
27	Indirasagar Dummugudem	229.10	5.50	659.81
28	Dummugudem - NS Tail Pond	1135.87	27.26	2180.87
29	Pranahita - Chevella	3466.00	83.18	7486.56
30	Kaleshwaram	28.35	0.68	81.65
31	Kanthanapally	878.00	21.07	2528.64
	Sub Total	**7367.43**	**176.81**	**17632.24**
	Grand Total	**8746.37**	**209.91**	**21603.59**

Appendix 4.1
(Reference to paragraph 4.2.1, page 26)

Empanelled contractor firms entrusted more than three packages under category I and II

Category I firms

(₹ in crore)

Name of the Contractor	Number of Packages					Total value of contracts
	2004-05	2005-06	2006-07	2007-08	Total	
IVRCL – Sew – Prasad (JV), Hyd	6	1	2	4	13	2516.29
Maytas – NCC, Hyd JV	6	-	2	1	9	2118.82
Jayaprakash – Gayatri JV	3	-	-	2	5	1228.95
Madhucon-Sino-Hydro, Hyd JV	3	-	-	1	4	1077.50
Progressive Constructions Ltd., Hyd	3	-	-	3	6	1068.55
Sabir Dam and Water Works Construction Co., Hyd	2	-	1	3	6	914.95
KCL – JCCG Hyd JV	3	-	-	2	5	786.08
Total	**26**	**1**	**5**	**16**	**48**	**9711.14**

Category II firms

(₹ in crore)

Name of the Contractor	Number of Packages						Total value of contracts
	2004-05	2005-06	2006-07	2007-08	2008-09	Total	
ECCI-MRKR, Hyderabad	1	2	1	5	-	9	581.42
RMN – GVR Engineer, Hyderabad	3	-	3	3	-	9	548.66
Hindustan – Ratna, Hyderabad	1	-	3	2	-	6	459.89
Engineering Projects (India) Ltd.	2	-	-	5	-	7	446.48
Ramky Infrastructure Ltd., - Mr. V. Satyamurthy (JV)	1	-	1	3	-	5	354.89
AKR-Coastal, JV, Hyderabad	2	1	1	1	-	5	333.02
P. Lakshmu Reddy & Kranti Construction, Hyderabad	-	2	-	4	-	6	316.92
Sadbhav Engineers Ltd., Ahmedabad – Individual	-	-	3	2	-	5	306.84
Back Bone Projects Ltd., Ahmedabad – Individual	2	-	3	-	-	5	276.88
Avantika Sai Venkata, Nellore	3	-	3	-	-	6	263.16
GH Reddy & Associates & KK Reddy & Co. (JV)	1	-	1	2	-	4	241.02
RNS-GSR, Hyderabad	2	-	2	-	-	4	194.50
Ratna Infrastructure Projects Pvt. Ltd.	-	-	-	3	1	4	192.77
A. Prabhakar Reddy & Co., Hyderabad	-	1	1	2	-	4	184.95
Pioneer Builders, Hyderabad	1	-	-	3	-	4	177.78
Total	**19**	**6**	**22**	**35**	**1**	**83**	**4879.18**

Appendix 4.2
(Reference to paragraph 4.4.3, page 40)

Details of Packages where single bids were accepted

Sl. No.	Project Name	Package No.	Agt. value (₹ in crore)
1	Handri Neeva	P 2 Mech Ph I	162.37
2	Bhupathipalem	OC	28.45
3	Dummugudem NS Tail pond	1	1198.12
		3	265.30
		4	883.84
4	Polavaram	OC-8	113.38
5	Nettempadu	Stage I	338.53
6	Pulivendula Branch Canal	92A	55.77
		93A	38.81
		MIPBC-2	10.15
		MIPBC-3	13.54
7	Rajiv Dummugudem	67	82.07
		68	67.28
		1/1	338.92
		1/2007	62.83
8	Somasila	11	34.23
		96	78.92
9	Yellampally	Kaddem	125.45
		Canal Network package 3	99.31
10	Telugu Ganga	50	72.45
11	Veligonda	1	624.60
		4	206.80
12	Chitravathi Balancing Reservoir - Lingala canal	MI 01	8.46
		MI 02	8.45
13	Gandikota - Chitravathi Balancing Reservoir lift	LI 01	275.00
		LI 02	276.00
		LI 03	129.50
		LI 04	332.00
		LI 05	326.40
		LI 06	118.28
14	Indirasagar Dummugudem	31	156.20
		50	73.95
		51	69.70
		1/2	344.00
		21	136.30
15	Pranahita Chevella	18	700.75
		Grand Total	**7856.11**

Appendix 4.3
(Reference to paragraph 4.5, page 46)

Owning of contractor firms' responsibilities by Government

Sl. No	Project	Phase / package	Issue	Amount (₹ in crore)	Payment made to / payable to
1	Yellampally	Stage II Phase I	Extension of 220 KV and 132 KV power supply scheme including transformers despite an MoU between the JV firms of the contracting agencies for providing substations and power transformers	155.06	APTRANSCO
2	Chitravathi Balancing Reservoir – Right Main Canal (Lingala Canal)	Lingala Canal pacakge	Formation of new tanks and improvements to existing tanks, Enhancement of capacity of pumps and easing of slopes to irrigate originally specified ayacut without any change	46.07	Contractor
3	Devadula	Phase-II Distributory network packages (3 packages)	Change in duty from 130 acres per cusec to 110 acres per cusec, which was already agreed upon by the contractors without extra cost	37.06	Contractor
4	Handri Neeva	28 (Phase I)	Finding the ayacut of 29200 acres required in the surroundings	24.63	Contractor
5	-do-	23 (Phase I)	Technical requirement of carrying capacity of approach channel	11.37	Contractor
6	-do-	32	Bridge across NH	6.14	NHAI
	-do-	25	NH road crossing	3.03	NHAI
	-do-	24, 25, 27 and 28	Stoppage of work by original contractor and re-entrustment to others	70.66	New Contractor
7	Polavaram	67	Construction of flood gates structures on the downstream, essential to avoid flood waters from entering into village	11.84	Contractor
8	-do-	62	Depletion sluices for saddle dams, that are essential for emptying the reservoir for maintenance	6.27	Contractor
9	Galeru Nagari	27/06	Four lane bridge	9.21	NHAI
10	-do-	1	Formation of Water Bound Macadam road with black top for 1.150 KM	1.63	Contractor
11	Thotapally	II	Construction of a canal crossing on National Highway	3.50	NHAI
	-do-	I	Stoppage of work by original contractor and re-entrustment to others	35.64	New Contractor
12	Nettempadu	98	Technical requirement of carrying capacity of approach channel	3.42	Contractor
13	Devadula	Phase I	O & M costs	2.00	Other agencies
14	-do-	Aswaraopally Distributory system Ghanapur Distributory system	Costs of the Bridges	12.25	R&B authorities and Railways
			Total	**439.78**	

Appendix 5.1
(Reference to paragraph 5.3, Page 57)

Time over run in test checked packages as of September 2012

Polavaram

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Head works/ OC/ Spill way/ Madhucon – Sino hydro (JV), Hyd / 633.60	22.03.08	Preclosed-Delay 54 months
2	Head works/ OC/ ECRF / M/s CR-18G-BSCPL (JV), Hyderabad / 884.00	06.07.10	Preclosed-Delay 26 months
3	Left Main canal / Cat-I/ C1-1 / Progressive Const. Limited, Hyderabad / 254.88	19.03.07	66
4	Right Main canal/ Cat-I/ C1-1/ M/s Patel & Soma (JV) / 241.50	20.10.06	71
5	Left Main canal / Cat-I/ C1-2/ M/s Patel & Soma (JV) / 242.54	16.03.07	66
6	Right Main canal/ Cat-I/ C1-2/ M/s Progressive Constructions Ltd., / 236.25	19.10.06	71
7	Left Main canal/ Cat-I/ C1-3/ M/s. Maytas - NCC (JV), Hyd / 212.94	18.03.07	66
8	Right Main canal/ Cat-I/ C1-3/ M/s Hindustan Construction Co. Ltd / 321.30	22.10.06	71
9	Left Main canal/ Cat-I/ C1-4/ M/s Sabir Dam & Water Works Construction Co., Hyd / 206.80	22.03.07	66
10	Right Main canal /Cat-I/ C1-4/ M/s Jai Prakash-Gayatri (JV) / 301.30	22.10.06	71
11	Left Main canal/ Cat-I/ C1-5/ M/s Sabir Dam & Water Works Construction Co., Hyd / 181.60	22.03.07	66
12	Right Main canal/ Cat-I/C1-5/ M/s IVRCL-SEW Prasad JV / 295.92	22.10.06	71
13	Left Main canal/ Cat-I / C1-6/ M/s. Madhucon - Synohydro (JV), Hyd / 196.20	22.03.07	66
14	Right Main canal/ Cat-I / C1-6/ M/s Progressive Constructions Ltd., / 196.74	19.10.06	71
15	Left Main canal/ Cat-I/ C1-7/ M/s.KCL - JCCG (JV), Ahmedabad / 175.00	13.03.07	66
16	Right Main canal/ Cat-I/ C1-7/ M/s Larsen & Toubro Ltd., / 180.70	24.10.06	71
17	Left Main canal/ Cat-I/ C1-8/ M/s.IVRCL - SEW & PRASAD (JV), Hyd. / 113.38	08.03.08	54
18	Head works/ Cat-II/ C2-62/ M/s Hindusthan - Ratna (JV) Hyd / 79.00	04.03.07	66
19	Head works/ Cat-II/ C2-63/ M/s SMSL-UANRCL (JV),Visakhapatnam / 72.81	08.03.07	66
20	Head works/ Cat-II/ C2-64/ M/s.G. Venkata Reddy & Co., Hyd / 73.90	10.03.07	66
21	Head works/ Cat-II / C2-65/ Unity Infra Projects Ltd., Mumbai. / 103.91	15.03.07	66
22	Head works/ Cat-II/ C2-66/ Sri Avanthika & Sai Venkata (JV) / 77.08	13.03.07	66
23	Head works/ Cat-II/ C2-67/ Sree Jaya – K Siva Rao (JV), Hyderabad. / 77.00	04.03.07	66

Vamsadhara Stage II

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Stage II Phase II - Construction of Side weir, Head regulator, FFC for 13 KM / CatII /87/ 72/64 / M/s Harvins Constructions Pvt. Ltd.,	23.03.2007	66
2	Stage II Phase II - FFC for 17 KM and reservoir at Parapuram / Cat II / 88 / 66.68 / M/s Srinivasa Constructions Pvt Ltd., Hyderabad	16.09.2007	60
3	Stage II Phase II / OC / 3-SE / 353.50 / M/s. Soma - Patel ASI (JV), Hyderabad	30.03.2008	54

Thotapally Barrage Project and Gajapathinagaram Branch Canal

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Leftside earthdam and excavation of right main canal from KM 0 to 52.45 / Cat I / I / 119.88 / M/s ITD Cementation India Ltd. Mumbai	24.10.2007	59
2	Right Main Canal from KM 52.45 to 107.00 / Cat I / II /170.02 / M/s Maytas-NCC(JV), Hyderabad	24.10.2007	59
3	Taking off from 97.70 km of Right Main Canal of Thotapalli Barrage Project @ Chipuripalli – 25 km length; M/s UANMAX Infra Ltd.,Hyd; 59.38	29.12.2012	--

Venkatanagaram

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	PkgNo.59/Cat-II, Construction of Venkatanagaram Pumping Scheme; 143.05/ M/s Koya & Co Construction(p) Ltd., Hyd	13.9.06	72

Bhupathipalem Reservoir Project

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Head works / OC / Head Works / 84.35 / M/s. Maytas Infra Pvt Ltd., Hyderabad	24.08.2006	Completed with a delay of 5 years
2	Canal including distributaries / Cat II / CII – 4 canals / 28.45 / M/s.MCL - RSR (JV), Rajahmundry	22.09.2007	Completed with a delay of 10 months

Galeru Nagari

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time overrun in months
1	I/ 1 / M/s MAYTAS - NCC(JV), Hyderabad / ₹341.51	30.06.2008	61
2	I/ 47 / M/s. G.Venkata reddy & Co, Hyderabad/ ₹147.21	28.02.2007	67
3	I/ 48(A) / M/s. Hindustan-Ratna (J.V), Hyderabad/ ₹73.60	18.01.2009	44
4	I/ 49(A) / M/s Ramky Infrastructure Ltd.,-Mr. V.Satyamurthy (J.V), Hyderabad / ₹90.45	10.12.2008	45
5	I/ 24 / M/s. IVRCL - SEW - Prasad (JV) / ₹201.35	26.11.2008	46
6	I/ 27 / M/s. CR 18 G - BSCPL (JV) / ₹254.00	18.02.2009	43
7	I/ 30 / M/s. Maytas-NCC (JV) / ₹401.12	15.02.2010	31
8	I/ 31 / M/s. IVRCL-CR-18 G (J.V), Hyderabad/ ₹376.14	27.10.2009	35
9	II/ 1 / M/s KCL-JCCG (J.V), Hyd/ ₹129.94	06.06.2011	15

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time overrun in months
10	II/ 4/ M/S Jaya Prakash - Gayatri (JV) / ₹111.96	24.06.2011	15
11	II/ 6 / M/s Sabir Dam & Water Works Construction Co., Hyd/ ₹95.83	15.11.2011	10
12	II/ 7 / M/s Progressive Constructions Ltd / ₹117.99	19.08.2011	13
13	II/ 12 / M/s. IVRCL - SEW - Prasad (JV) / ₹189.00	24.07.2011	14
14	II/ 14 / M/s. IVRCL - SEW - Prasad (JV) / ₹129.20	24.07.2011	14
15	GKLI/ Cat-OC / M/s KBL-MCCL (JV) / ₹712.29	30.09.2007	60

Handri Neeva

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Excavation of HNSS main canal from Ph-I/Cat-II-23: Km (-) 3.420 to Km 20.000/58.37/ M/s Backbone Projects Ltd	24.02.2007	67
2	Cat-II-24: Km 20.00 to Km 42.000. Ph-I/24/57.78/ M/s Sushee Hitech Constructions Pvt Ltd	24.02.2007	67
3	Cat-II-25: Km 42.000 to Km 64.000. Ph-I/25/56.50/ M/s Sri Avantika – Sai Venkata (JV)	25.02.2007	67
4	Cat-II-27: Km 77.000 to Km 100.000. Ph-I/27/55.35/ M/s Sushee Hitech Constructions Pvt Ltd	24.02.2007	67
5	Cat-II-28: Km 100.000 to Km 114.000. Ph-I/28/82.89/ M/s G.Venkata Reddy & Co	27.02.2007	67
6	Cat-II-31: Km 134.000 to Km 155.000. Ph-I/31/65.62/ M/s RMN-GVR(JV)	26.02.2007	67
7	Cat-II-32: Km 155.000 to Km 176.000. Ph-I/32/ 77.04/ M/s BackBone Projects Ltd	24.02.2007	67
8	Cat-II-33: Km 176.000 to Km 192.000. Ph-I/33/ 58.32/ M/s Engineering Projects	22.02.2007	67
9	Cat-II-36: Excavation of Perur Branch Canal from Km 0.000 to Km 6.000. Ph-I/36/93.29/ M/s OM-RAY (JV)	09.05.2007	64
10	Excavation of approach channel from siddeswaram to pump House near Mutchmarri and excavation of Link channel from Pump house near Mutchmarri to PS1Ph-I /Pkg 1 Civil/70.37/ M/s Engineering Project (India) Ltd	19.06.2009	39
11	Construction of Additional pump House Near Mutchumarri (V) including Delivery Mains, Pumps, Motor Auxiliaries and connected EM components Etc., including connected civil works Etc.Ph-I /Pkg 2 Mech/162.37/M/s IVRCL-KBL & MEIL (JV)	22.12.2009	33
12	Cat-OC:Stage-II Pumps & Motors/Mech(MBC) Ph-II/357.80/ M/s IVRCL-SEW-WPIL(JV)	17.06.2011	15
13	Cat-OC:Stage-I Pumps & Motors/Ele Mech Ph-II/933.76/ M/s MEIL-MAYTAS-KBL(JV)	06.12.2010	21
14	Cat-II-2:Km.230.00 to Km.245.00 /Ph-II/2/42.05/ M/s Sadbhavana Engineering Ltd.	03.12.2009	33
15	Cat-II-64: Chintaparti Distributory from 0.00 Km to 44.02 Km./Ph-II/64/79.69/ M/s ECCI-MRKR(JV)	19.7.2010	26
16	Cat-II-18: Investigation and Execution of HNSS Main canal from Km.463.00 to Km.490.00 /Ph-II/18/53.89/ M/s Backbone Projects Ltd	23.01.2010	32
17	Cat-II-58: Excavation of Amarapuram minor from Km 0.000 to Km 25.100 and Agali minor from Km 0.000 to Km 35.340 and taking off from Km 171.015 of Manadakasira Branch Canal Ph-II/58/61.66/ M/S RMN-Infrastructure Ltd	14.09.2011	12

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
18	Cat-II-9: Km.340.00 to Km.360.00 (Excluding Tunnel from Km.358.500 to Km.360.00) /Ph-II/9/75.49/ M/SHindustan-Ratna (JV)	04.02.2010	31
19	Cat-II-25: Investigation and Execution of Punganuru Branch canal from Km. 20.00 to Km. 30.00 ayacut of 5500 Acres. /Ph-II/25/74.70/ M/s Ramky Infrastructure Ltd/	22.04.2010	29
20	Cat-II-6: Investigation and Execution of Tunnel in complete shape from Km.285.10 to Km.287.10. /Ph-II/6/32.40/ M/s Sri Avantika-Sai Venkata/	30.11.2009	34
21	Cat-II-57: Excavation Madakasira Branch Canal from 143.00 Km to 171.015 Km. /Ph-II/5749.86/ M/s RMN-GVR(JV)	24.06.2010	27
22	Cat-II-16: Tunnel from Km.421.00 to Km.426.00. /Ph-II/16/43.47/ M/s G.Venkata Reddy & Co	30.11.2009	34
23	Cat-II-29: from Km. 0.00 to Km. 32.00 ayacut of 20000 Acres. Ph-II29/78.88/ M/s RMN-GVR (JV)	28.02.2010	31
24	Cat-II-30: from Km. 32.00 to Km. 74.00 ayacut of 20000 Acres. Ph-II/30/67.68/ M/s RMN-GVR (JV)	28.02.2010	31

Veligonda

Sl. No.	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Tunnel I / OC / 627.99 / M/s SABIR, SEW & PRASAD (JV), Hyd.	10.08.2008	49
2	Sunkesula Gap / Cat-I / 348.58 / M/s Jai Prakash Gayatri (JV), Hyderabad	20.08.2007	61
3	Kakarla Dam, Link Canal & Eastern main canal / OC / 459.19 / M/s SCL - BSCPL (JV), Hyderabad	10.08.2008	49
4	Tunnel II / OC / 735.21 / M/s HCC – CPPL (JV), Hyderabad	20.06.2012	3
5	Western Main Canal, Turimella, Racharla, Seetharamsagar reservoirs / OC / 753.14 / M/s Pioneer-Avantika-ZVS-KBL (JV)	12.08.2013	—

Telugu Ganga

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	TGP-Kadapa / Cat I / 2 / 210.42 / M/s IVRCL,SEW & PRASAD (JV),Hyd.	15.02.2007	67
2	TGP-Kadapa / Cat I / 3 / 222.30 / M/s IVRCL,SEW & PRASAD (JV),Hyd.	15.02.2007	67
3	TGP-Kadapa-Lining / OC / II / 107.00 / M/s SEW Infrastructure Ltd, Hyd.	06.04.2012	5
4	TGP-Kadapa-Lining / OC / III / 122.34 / M/s SEW Infrastructure Ltd, Hyd.	06.04.2012	5
5	TGP-Nandyal / Cat II / 50 / 72.45 / M/s ECCI - MRKR (JV)	24.07.2007	Closed contract. 62 months delay
6	TGP-Nandyal / 51 / Cat II / 67.39 / M/s SVEC Constructions, Hyd.	28.07.2007	Completed with delay of 5 years
7	Siddapuram LIS/OC/72.63/ M/s Engineering projects India limited	05.12.2009	33

Chitravathi Balancing Reservoir (CBR) Right Canal (Lingala Canal) and Lift Irrigation Scheme

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Canal & Distributory Work / 1/ 336.20 M/s Maytas - NCC (JV), Hyd / 25.10.2004	30.08.2007	61
2	MI / Lingala I / 8.46 M/s Jain Irrigation Systems	10.05.2009	40
3	MI / Lingala II / 8.46 M/s Jain Irrigation Systems	10.05.2009	40

Gandikota - CBR Lift Irrigation Scheme

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Lifting of water from the foreshore of Gandikota Reservoir to storage reservoir - 1 near Thimmapuram village / L1-1 / 279/ M/s **IVRCL**-KBL (JV)	17.05.2009	40
2	Lifting of water from the foreshore of storage reservoir - 1 near Thimmapuram village to Storage reservoir - 2 near Yellanur village / L1-2 / 276/ M/s **IVRCL**-KBL (JV)	17.05.2009	40
3	Lifting of water from foreshore of storage reservoir -2 near Yellanur village to Storage Reservoir -3 near Goddamvari Palli / L1-3 / 129.50 / M/s **MAYTAS**-KBL (JV)	17.08.2009	37
4	Lift from the foreshore of storage reservoir -3 near Goddamvari Palli to Goddumarri Anicut / L1-4 / 332 / M/s **L&T** - KBL (JV)	17.08.2009	37
5	Lift from the foreshore of Goddumarri Anicut to Chitravathi Balancing Reservoir / L1-5 / 326.40 / M/s KBL-**MEE**-KCCPL (JV)	22.05.2009	40
6	Lift systems with electrical & Mechanical components, from foreshore of Gandikota Reservoir to Chitravati River Left Bank Lift Irrigation System / L1-6 / 118.27 / M/s KBL-PLR (JV)	17.10.2009	35

Modernization & Micro-Irrigation Pulivendula Branch Canal

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Canal excavation and lining from KM 0 to 33.74 / Cat II / 93 / 74.75 / M/s SRK - Bhailal Bhai (JV)	22.07.2007	62
2	Canal excavation and lining from 33.66 to 47.00 / Cat II / 92 / 44.04 / M/s SRK - Bhailal Bhai (JV)	13.12.2007	57
3	Providing lift & irrigation under micro irrigation on both sides of PBC and modification of existing PBC system from Km 35.025 to Km 68.00 / Cat II / 92 (A) / 55.77 / M/s Ratna Infrastructure Projects Ltd.	02.12.2009	33
4	Providing lift & irrigation under micro irrigation on both sides of PBC and modification of existing PBC system from Km 0.02 to Km 35.025 / Cat II / 93 (A) / 38.81 / M/s Ratna Infrastructure Projects Ltd	02.12.2009	33
5	EWE., CC Lining KM 0.000 to KM. 5.000 and Tunpera deep cut from km 6.00 to km 6.20 / Cat II / 93 (b) / 73.83 / M/s Ratna Infrastructure Projects Ltd.	20.11.2009	34
6	MIPBC Pkg-1/ 3000 Ac ; M/s Jain Irrigation Systems Ltd./ 10.15	10.05.2009	40
7	MIPBC Pkg 2 / 3000 Ac ; M/s Jain Irrigation Systems Ltd./10.15	10.05.2009	40
8	MIPBC Pkg 3/ 4000 Ac ; M/s Jain Irrigation Systems Ltd./13.54	10.05.2009	40

Somasila

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Construction of distributory network system / Cat II / 95 / 28.81 / M/s MSK. Suryakon (JV) Nellore	24.03.2007	66
2	Easening of slopes from 13 to 72 KM of GK Canal / Cat II / 96 / 104.72 / M/s MSK. Suryakon (JV) Nellore	24.03.2007	66
3	Widening and easening of slopes from 0 to 13 KM / Cat II / 11 / 34.23 / M/S SCL INFRA TECH Limited)	04.06.2011	15

Somasila Swarnamukhi Link Canal

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Canal from km. 9.50 to 39.90 including formation of Gonupalli& Rapur Reservoirs / 16 / 97.00 / M/s. Sabir Dam & Water works construction Co.	12.09.2010	24

Devadula

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Lift of Water from Gangaram to RS Ghanapur / OC/843.97/M/s. HCC-KBL (JV)	07.07.2005	Completed with a delay of five years
2	Excavation of North main Canal / Cat II / 45 /48.90 /M/s. K Sudarshan Reddy & K. Venkateshwarlu & Co. Hanamkonda	15.09.2007	60
3	Excavation of South main canal / Cat II / 46 / 71.20/ M/s. K Sudarshan Reddy & K. Venkateshwarlu & Co. Hanamkonda	16.09.2007	60
4	Lifting of water in Janagam, RS Ghanpur, and Cheriyal / OC / Ph. II / 1887.00/ M/s. HCC-NCC (JV)	31.10.2007	59
5	Distributory system under RS Ghanpur / Cat II / RS Ghanpur / 82.53 / Sri. V.Satya Murthy and M/s. K. Venkateshwarlu & Co.(JV)	19.07.2008	50
6	Distributory system under Tapaspally Cat II / Tapaspally / 64.44 / M/s. G.H.Reddy & K. K. Reddy (JV).	16.08.2008	49
7	Distributory system under Ashwaraopally/ Cat II / Aswaraopally / 74.43 / M/s. Rani Constructions Pvt. Ltd	21.08.2008	49
8	Lift from Gangaram to Bheemghanpur / OC / Phase III Package I / 1398.50 / M/s. HCC-MEIL-CBE (JV)	28.12.2011	9
9	Lift from Bheemghanpur to Ramappa Tank / OC / Pack.II / 531.70 / M/s. Coastal Projects Pvt. Ltd. & Patel Engg. Ltd., Jyothi ITD and CBE (JV)	27.02.2012	7
10	Lift from Ramappa Tank to Dharmasagar / OC /III / 1410.00 / M/s. HCC-MEIL-AAG (JV)	07.12.2011	9
11	Lift from Dharmasagar to RS Ghanpur / OC / IV / 855.86 /M/s. NCC-MEIL-ZVS-Sigma (JV)	23.02.2012	7
12	Phase III / OC / V / 305.696/ M/s MEIL-Prasad-KBL,Hyd.,	19.08.2014	--
13	Phase III / OC / VI /325.207 /M/s SEW&Kranthi JV	20.11.2014	--
14	Phase III / OC / VII / 260.269 / M/s SSS/IPL, SSLCC & RMMCC, Hanumakonda	27.10.2013	--
15	Phase III / OC / VIII / M/s VPR-RK-MRKR JV 323.458 /	27.10.2013	--

Nettempadu

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time overrun in months
1	Formation of approach channel & Gudemdoddi Balancing Reservoir / Cat II / 98 / M/s Manisha and Mulay (J.V.) AURANGABAD/ 65.45	01.09.2007	60
2	Left Main Canal (8KM) and Right Main Canal (36KM) / Cat II / 99/ M/s AKR-Coastal (JV), Hyderabad / 48.07	24.10.2007	59
3	Right Main Canal (36 to 76 KM) / Cat II / 100/ M/ Srinivasa Civil works (P) Ltd., Hyderabad / 57.00	23.10.2007	59
4	Formation of balancing reservoirs under RMC of Gudemdoddi balancing reservoir / Cat II / 101/ M/s P.Lakshmareddy & M/s Kranthi Constructions (JV)/\ / 62.91	23.08.2007	61
5	Formation of Gravity Canal from lift-I to lift-II / Cat II / 102 / M/s S.V. Engineering Constructions B.Kumara Swamy Reddy (J.V.) / 51.48	25.09.2007	Completed with a delay of 7 months
6	Formation of Relampadu Balancing Reservoir / Cat II / 103 / M/s S.V. Engg Constructions B.Kumara Swamy Reddy (J.V.) / 70.00	08.03.2008	54
7	Left Main Canal under RBR (43KM) / Cat II / 104 / M/s.APR Constructions Ltd., Hyderabad /40.74	23.10.2007	59
8	Right Main Canal under RBR (11.25 KM) / Cat II / 105 / M/ Srinivasa Civil works (P) Ltd., Hyderabad / 36.27	23.10.2007	59
9	Right Main Canal under RBR (11.25 to 26 KM) / Cat II / 106 / M/s Prathiba Constructions & Ch.Marthanda Rao (JV) /67.34	23.10.2007	59
10	Right Main Canal under RBR (26 to 51 KM) / Cat II / 107 / M/s Prathiba Constructions & Ch.Marthanda Rao (JV) / 54.85	23.10.2007	59
11	Formation of 5 balancing reservoirs under reach I and reach II of RBR / Cat II / 108 / M/s P.Lakshmu reddy & M/s Kranthi Constructions (JV) / 55.29	23.10.2007	59
12	Formation of 5 balancing reservoirs under reach III of RBR Cat II / 109 / M/s Reddy Veeranna Constructions Ltd., Banglore /38.25	26.10.2007	59
13	Stage I Lift / OC / M/s Patel Engineering Ltd., / 338.53	07.02.2009	43
14	Stage II Lift / OC M/s Patel Engineering Ltd., / 314.84	12.07.2009	38

Indirasagar Dummugudem

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Construction of Pumping Stations at Vasanthavada, Peddavagu project and Bandarugudem Tank/ OC / 344.00 / M/s Kirloskar Brothers, Pune	16.01.2012	8
2	Laying of Pressure mains from Koyamadaram to Pedavagu project. Construction of Distributaory system / Cat I / 21 / 136.30 / M/s ZVSTROY GDCL JV, Hyd	17.01.2012	8
3	Laying of Pressure mains from Pedavagu Project to Bandarugudem Tank and Construction of Distibutory system / Cat I / 22 / 298.56 / M/s ZVSTROY GDCL JV, Hyd	22.01.2012	8
4	Laying of pressure main from Bandarugudem Tank to Arlapenta Cistern and approach channel / Cat I / 31 / 156.20 / M/s IVRCL-SEW - Prasad (JV)	05.03.2012	6
5	Construction of cistern and outfall structure of Arlapenta, construction of left and right main gravity canal & Mukkamamidi main canal from Arlapenta cistern / Cat II /49 / 66.64 / M/s Engineering Projects (India) Ltd., Hyderabad	08.01.2012	8

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
6	Construction of distributory net work for irrigating the ayacut 93000 acres / Cat II / 50 / 73.95 / M/s Engineering Projects (India) Ltd., Hyderabad	08.01.2012	8
7	Construction of Distributory network for irrigating the ayacut 88000 acres / Cat II / 51 / 69.70 / M/s Engineering Projects (India) Ltd., Hyderabad	08.01.2012	8

Rajiv Dummugudem

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Construction of Pumping station at intake @ pamulapally and intermediate pumping stations @ Gollagudem, Karakavagu, Singabhupalem, Bethampudi, Lalithapuram / OC / 1/1 / 338.92 / M/s Kirloskar Brothers, Pune	02.02.2013	--
2	Laying of pressure mains including surge protection against transient for presure mains / Cat I / 32 / 328.49 / M/s Hindusthan Construction Company, Mumbai	17.02.2012	7
3	Laying of pressure mains including surge protection against trasient from PH 3 to Bethampudi Reservoir, from PH 4 to cistern at Km.6.2, from PH 6 to Sudimalla Pedacheruvu / Cat I / 33/ 281.61 / M/s Jaiprakash - Gayatri (JV), Hyderabad	26.02.2012	7
4	Construction of left Flank and Right Flank canals system at Vinobhanagar cistern and Singabhupalem reservoir / Cat II / 66 / 86.36 / Rao Construction - PJR Project Construction (JV), Bangalore	13.04.2012	5
5	Construction of left flank and Right Flank canals system at Lalithapuram tank / Cat II / 67 / 82.08 / M/s AKR Coastal (JV) Hyderabad	13.04.2012	5
6	Construction of approach channel from intake to PH 1 and Gravity Canal from PH 1 to PH 2 and gravity canal from proposed Marellapadu tank to proposed Karakavagu tank and construction of cistern at Gollagudem etc., / Cat II / 68 /67.28 / Rao Construction - PJR Project Construction (JV), Bangalore	13.04.2012	5
7	Construction of infall regulator at Karakavagu tank and formation of new reservoir at Karakavagu / OC / 1/2007 / 62.84 / M/s Kranthi Constructions Ltd., Hyderabad	20.05.2012	4

Dummugudem– Nagarjunasagar Tail Pond

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Approach channel, Intake structure, Pump house I / OC / 1 / 1198.11 / M/s MEIL-MAYTAS-ABB-AAG (JV), Hyderabad	09.11.2011	10
2	Gravity Canal Maddulagudem to Krishnasagar / OC /2 / 172.49 / M/s Engineering Projects (India) Ltd., Hyderabad	09.12.2012	Delayed due to land acquisition problem
3	Gravity Canal Krishnasagar to Manuguru / OC / 3 / 265.30 / M/s HES-ZVS(JV)	18.11.2013	Investigation completed. Land yet to be acquired.
4	Construction of Pump house II / OC / 4 / 883.84 / M/s MAYTAS-MEIL-ABB-AAG (JV), Hyderabad	09.11.2011	10
5	Gravity Canal from KM 46.375 to 78 / OC / 5 / 3862.51 / M/s MEIL - MAYTAS - AAG (JV), HYDERABAD	26.08.2013	Investigation completed. Land yet to be acquired.

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
6	Gravity Canal from KM 78 to 115 / OC / 6 / 5686.43 / M/s SEW - MEIL - ZVST - AAG (JV)	26.08.2013	Investigation in progress
7	Gravity Canal from KM 115 to 182 / OC / 7 / 2536.32 / M/s Ramky - ZVS - Progressive (JV), Hyd.	26.08.2013	Investigation in progress
8	Gravity Canal KM 182 to 206 / OC /8 / 1360.26 / M/s Gayatri - Ratna (JV), Hyd.	18.08.2013	Investigation completed. Land yet to be acquired.
9	Gravity canal KM 206 to 244 / OC / 9 / 771.36 / M/s Gayatri - Ratna (JV), Hyd.	18.08.2013	Investigation completed. Land yet to be acquired.
10	Construction of pump house II and erection of EM equipment at Kalyanapuram / OC / 10 / 464.42 / M/s Raghava- Prasad Consortium,Hyderabad	22.04.2014	Investigation completed. Land yet to be acquired.

SLBC Tunnel Scheme

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Tunnel I and Tunnel II including head regulator / 1925.00 / M/s. Jaiprakash Associates, New Delhi	24.08.2010	25
2	Dindi Balancing Reservoir of Tunnel Scheme of AMR Project including O & M for 2 years / 157.74 / M/s G.V.V- V.S.M – G.V.R (JV), Hyderabad	01.02.2012	8

Yellampally

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Construction of Sripada Sagar Project across Godavari river at Yellampally (V) / Cat I / Barrage / 408.85 / M/s. ITD Cementation India Ltd.	6.11.2007	58
2	Excavation of approach channel Construction of pump house, Supply and commissioning of pumping machinery to lift 8.5 TMC / OC / NTPC / 98.92 / M/s. Subhash Projects & Marketing Ltd., New Delhi	6.10.2006	71
3	Stage-II, Phase-I of Sripada Sagar Project- supply, installation and commissioning of pumping machinery / OC /Stage II Phase I / 1737.00 / M/s IVRCL-NAVAYUGA-SEW(JV)	3.10.2007	59
4	Design, fabrication, erection of 62 sets of radial gates of size of 15.6Mx 10.2 M / OC / Gates / 191.03 / M/s SEW - OM METALS	24.05.2010	28
5	Lifting of 2.00 TMC of water from cistern near NTPC reservoir to fee an ayacut of 20,000 acres in Kamanpur and Mutharam / OC / Manthani LIS / 102.07 / M/s MEIL - KCCPL - FLOWMORE (JV)	17.11.2011	10
6	Distributory canal net work system under Kodimial, potharam, Surampet , lachupet / OC / Canal network PK-III / 99.31 / M/s SEL - GKC (JV)	18.02.2011	19
7	Lifting of 3 TMC of water from Sripada Yelampally Project to supplement tail end ayacut of 30000 acres under Kaddem Narayanreddy Project / OC / Kaddem LIS / 125.45 / M/s MEIL - KBL - WEG (JV)	19.11.2010	22
8	Canal net work system / OC / Canal network PK-I / 76.49 / M/S Harvins Constructions Pvt. Ltd.-JSR (JV)	15.07.2011	14

Pranahita-Chevella

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Status	Bottleneck / Remarks
1	Tipparam reservoir to Chevella reservoir (reach I) / 17 / 663.24 / M/s. ITD CEMENTATION (INDIA) LTD. - MAYTAS (JV),	18.02.2013	Alignment investigation in progress	Only field investigation works for main canal and tunnels completed in most of the packages
2	Tipparam reservoir to Chevella reservoir (reach II) / 18 / 700.75 M/s. Madhucon	24.02.2013		
3	Tipparam reservoir to Chevella reservoir (reach III) / 19 / 435.89 M/s. Gammon – SEW(JV)	27.02.2013		
4	Tipparam reservoir to Chevella reservoir main canal (reach 4)/ 23 / 1059.98 / M/s. PATEL-BHEL-SRIAVANTIKA-DEEPIKA(JV)	30.04.2013		
5	Tipparam reservoir to Chevella reservoir main canal (reach 5) /24 / 937.33 / M/s. HES-ZVS-PRASAD-ITT(JV)	30.04.2013	Investigation & designs in progress	
6	Parigi Canal and Tandur Canal / 25 / 1144.13 / M/s. TRANSSTROY	23.02.2013	Alignment investigation completed	
7	Raikodu Canal/ 26 / 1042.21 / M/s. SEW-Kranthi - AKR(JV)	24.04.2013		

Komaram Bheem

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	C1-18, Investigation, Design, estimation, execution of head works and canals of Sri Komarambheem project: M/s Navayuga- Transtroy (JV); 269.04	20.3.2007	66

Sriramsagar Project Stage II

Sl. No	Pkg No. / Category / Agreement value (₹ in crore)/ Agency	Original date of completion	Time over run in months
1	Lining of Kakatiya Main canal from KM 284 to 346 / Cat II / 52 / 58.37 / M/s. Sudarshan Reddy & K Venkateshwarlu & Co (JV)	10.03.2007	66
2	Majors, Minors, Sub-Minors & Field Channels of DBM-69 Distributory / Cat II/ 55 / 88.22 / M/s. A.K.R. Coastal (JV)	10.09.2007	60
3	Majors, Minors, Sub-Minors & Field Channels of DBM-71 Distributory from km.0.00 to km.32.00 / Cat II / 56 / 72.00 / M/s. Ramky Infrastructure & Co.	05.09.2007	60
4	Majors, Minors, Sub-Minors & Field Channels of DBM-71 Distributory from km.32.00 to km.40.00 / Cat II / 57 / 55.35 / M/s. Ramky Infrastructure & Mr.V. Satyamurthy	05.09.2007	60
5	Majors, Minors, Sub-Minors & Field Channels of DBM-71 Distributory from km.40.00 to km.72.00 / Cat-II / 58 / 45.61 / M/s. Rani Constructions Pvt. Ltd	08.05.2010	28

Glossary

AIBP	:	Accelerated Irrigation Benefit Programme
AMRP	:	Alimineti Madhava Reddy Project
AP	:	Andhra Pradesh
APDSS	:	Andhra Pradesh Detailed Standard specifications
APERC	:	Andhra Pradesh Electricity Regulatory Commission
APGENCO	:	Andhra Pradesh Power Generation Corporation Limited
APPWD code	:	Andhra Pradesh Public Works Department Code
APTRANSCO	:	Transmission Corporation of Andhra Pradesh Limited
BCR / BC Ratio	:	Benefit Cost Ratio
BPL	:	Below poverty line
CA	:	Command Area
CBL	:	Canal Bed Level
CBR	:	Chitravathi Balancing Reservoir
CC	:	Cement Concrete
CDO	:	Central Designs Organization
CE	:	Chief Engineer
CED / CE duty	:	Central excise duty
CECDO	:	Chief Engineer, Central Designs Organization
CGS	:	Central Generating Stations
CM & CD works	:	Cross Masonry and Cross Drainage works
CNS soils	:	Cohesive Non Swelling soils
cusec	:	Cubic feet per second
CWC	:	Central Water Commission
DPR	:	Detailed Project Report
ECRF dam	:	Earth cum Rock fill dam
EE	:	Executive Engineer
EL	:	Elevated Level
EoT	:	Extension of Time
EPC	:	Engineering, Procurement and Construction
FFC	:	Flood flow canal
FIDIC	:	Federation Internationale des Ingenieurs Conseils (International Federation of Consulting Engineers)
FRL	:	Full Reservoir Level
FSD	:	Full supply Depth
GAIL	:	Gas Authority of India Limited
GBC	:	Gajapathinagaram Branch Canal
GKLI	:	Gandikota Lift Irrigation

GKN canal	:	Gottipati Kondapa Naidu Canal
GNSS	:	Sri Krishnadevaraya Galeru Nagari Sujala Sravanthi
GO	:	Government Order
GoAP	:	Government of Andhra Pradesh
GoI	:	Government of India
GoM	:	Government of Maharashtra
GoO	:	Government of Odisha
GWDT	:	Godavari Water Disputes Tribunal
GWUA	:	Godavari Water Utilization Authority
Ha	:	Hectare
HPCL	:	Hindusthan Petroleum Corporation Limited
I & CAD	:	Irrigation and Command Area Development
IBM	:	Internal Bench Mark
ID	:	Irrigation Dry
IEEMA	:	Indian Electical and Electronics Manufacturers Association
IP	:	Irrigation Potential
IS codes	:	Indian Standard Codes for Engineering
ISB	:	Inter State Board
ISLMC	:	Indirasagar Left Main Canal (Polavaram)
JNLIS	:	Jawahar Nettempadu Lift Irrigation Scheme
JNNURM		Jawaharlal Nehru National Urban Renewable Mission
JV	:	Joint Venture
KM	:	Kilometer
KWDT	:	Krishna Water Disputes Tribunal
LA	:	Land Acquisition
LIS	:	Lift Irrigation Scheme
LMC	:	Left Main Canal
MA	:	Mobilization Advance
MFD	:	Maximum Flood Discharge
MoEF	:	Ministry of Environment and Forest
MoTA	:	Ministry of Tribal Affairs
MoWR	:	Ministry of Water Resources
MT	:	Metric tonne
MU	:	Million units
MW	:	Mega Watts
NHAI	:	National Highways Authority of India
NIT	:	Notice Inviting Tender
NS	:	Nagarjuna Sagar

NSP	:	Nagarjuna Sagar Project
NTPC	:	National Thermal Power Corporation
O&M	:	Operation and Maintenance
OS	:	Original Suite
PAF	:	Project Affected Families
PBC	:	Pulivendula Branch Canal
PCC	:	Plain Cement Concrete
PDF	:	Project Displaced Families
R & R	:	Rehabilitation and Resettlement
RBI	:	Reserve Bank of India
RMC	:	Right Main Canal
RMT	:	Running meters
SFC	:	South Feeder Channel
SFRS	:	Steel Fibre Reinforced Shortcrete
SKFFC	:	Somasila Kandaleru Flood Flow canal
SLBC	:	Srisailam Left Bank Canal
SLSC	:	State level standing committee
SMC	:	South Main Canal
SPVBR	:	Sri Pothuluri Veerabrahmendra Swamy Balancing Reservoir
SRSP	:	Sri Ram Sagar Project
SSLC	:	Somasila Swarnamukhi Link Canal
SSR	:	Standard Schedule of Rates
T & D Losses	:	Transmission and Distribution losses
TAC	:	Technical Advisory Committee on Irrigation of MoWR, GoI
TBM	:	Tunnel Boring Machine
TBPHLC	:	Tunga Bhadra Project High Level Canal
TGP	:	Telugu Ganga Project
TMC	:	Thousand Million Cubic Feet
TPQC	:	Third Party Quality Control
UMPP	:	Ultra Mega Power Project
VPS	:	Venkatanagaram Pumping Scheme