Audit Report of the
Comptroller and Auditor General of India
Performance Audit on Surface Irrigation
for the year ended March 2020

लोकहितार्थ सत्यनिष्ठा

Dedicated to Truth in Public Interest

Government of Odisha

Report No. 1 of the year 2022

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Preface

Utilisation of irrigation plays a significant role in economic growth and poverty reduction of the farmers of any state. Odisha has a cultivable land of around 61.80 lakh hectare and 49.90 lakh hectare can be brought under irrigation coverage through major, medium and minor irrigation projects.

The average annual availability of surface water for irrigation is estimated to be 95.54 billion cubic meters in Odisha. In order to manage the water resources of the state, 7 Major, 40 Medium and 2,340 Minor irrigation projects are operational. Budget provision for the surface irrigation during the period 2014-15 to 2019-20 was ₹30,366.51 crore, out of which ₹25,153.35 crore was utilised.

This report contains results of a Performance Audit of the Surface Irrigation in Odisha which was conducted with the objectives to assess the adequacy of financial management of projects; planning and execution of the project deliverables; and whether coordination with all stakeholders was ensured and monitored for sustainable extension of benefits to the targeted population during the period 2014-19.

The Performance Audit covered 24 Major/Minor irrigation and Mega Lift Projects which were completed/partly completed during January 2011 and March 2017.

This Report of the Comptroller and Auditor General of India has been prepared for submission to the Governer of Odisha under Article 151 of the Constitution of India and under CAG's DPC Act 1971.

Audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Executive summary

Audit Approach

- A Performance Audit on Surface Irrigation was conducted during June to September 2019 covering the period from April 2014 to March 2019, and by conducting test check of one completed and four partly completed major projects, nine completed Mega Lift Projects and 10 completed Minor Irrigation Projects. The Performance Audit revealed several deficiencies in the planning, implementation and monitoring of the Projects.

Financial Management

- Audit found that though the spending efficiency of the authorities of test checked projects ranged from 74 *per cent* to 99 *per cent*, a sum of ₹842.98 crore was surrendered during 2014-20 without its immediate utilisation. The surrender of funds was mainly due to delay in handing over of clear site for execution by the Department, delay in obtaining mandatory clearances, etc., as well as poor monitoring by the Department.
- There was increase in cost of the major irrigation projects between 182 and 4,596 *per cent*. Despite escalation, only one major project *i.e.* UIIP (extension) had been completed and other four major projects were in different stages of progress for which further cost escalation could not be ruled out.
- Audit noticed other irregularities in financial management such as non-receipt of central assistance, parking of funds in various banks without utilisation for which it was drawn, non-deposit and non-realisation of government revenue, non-adjustment of advances and inadmissible payment of tax to the extent of ₹2,203.84 crore.

Planning and execution of Projects

- In spite of incurring expenditure of ₹12,742.11crore in all of the test checked projects, the IP achieved was 1,22,418 ha against IP proposed of 5,02,842 ha which constituted only 24 *per cent.*
- Implementation of projects was tardy, with delays in completion of projects ranging from 13 (Minor Irrigation Projects) to 43 (Rengali Right Bank Canal /Rengali Left Bank Canal) years. The delays were attributed to shortfall in land acquisition, inability to obtain statutory clearances of forest land in advance, changes in design and scope of work, *etc*. The delays in implementation of projects together with inefficient works management led to cost overrun of projects.
- Deficiencies in preparation and processing of Detailed Project Reports (DPRs) such as inadequate surveys, modifications in design and scope of work, command area, incorrect calculation of Benefit Cost Ratio of the projects, inaccurate assessment of water availability, and lack of

monitoring of execution, *etc.*, led to revision in cost estimates after commencement of work.

- Against requirement of 66,219.25 acre of private land, the LAOs could acquire 31,554.57 acre (48 *per cent*) of land despite availability of funds for the said purpose. Similarly, the LAOs of selected projects failed to alienate 7,338.60 acre of Government land against the requirement of 8,387.05 acre.
- Deficiencies in works management such as duplication of work, non-levy of penalty for delay in completion of work, irregularities in tenders, extra cost incurred due to provision of excess lead, extra cost incurred due to non-adoption of Schedule of Rates/Analysis of Rates and deviations from BIS Code etc. were noticed. The extra financial implications seen in audit were to the extent of ₹554.87 crore towards irregular/ unfruitful/ wasteful/ avoidable/ extra expenditure to the contractors.
- While mega lift projects were executed without ensuring availability of water at source, the ayacuts of minor irrigation projects were found to be overlapped by major irrigation projects due to lack of coordination between executing officers of the same department.
- In test checked projects there was significant shortfall in ayacut achieved. It was revealed that in the ayacut of all test-checked projects, only paddy was being cultivated without adoption of a multi-cropping pattern. Consequently, all major projects ran the risk of becoming economically unviable.

Efficacy of Stakeholders handholding for the sustainability of the project

- Deficiencies in participatory management as well as handholding of the other stakeholders of project works were noticed. An amount of ₹282.93 crore was deposited with Forest Department for catchment treatment plant, canal bank plantation, wild life management, compensatory afforestation etc. Utilisation Certificates for only ₹70.93 crore were received.
- In two test checked-projects non-clearance of forest land led to non-completion of works and consequent deprival of farmers of irrigation facility.
- Intensity of irrigation to be achieved through the cropping pattern assessed and proposed in DPRs by Department of Agriculture & Farmers' Empowerment was actually not implemented and only paddy was cultivated in the ayacuts.

Monitoring of the Projects

- For construction of 19 lift irrigation projects the Executive Engineer, Lift Irrigation Division, Dhenkanal was provided with ₹26.35 crore during 2004-12. Only ₹15.67 crore was utilised and 17 projects were constructed. Remaining two projects remained incomplete till September 2019. Out of the 17 projects only five were functional and

remaining twelve remained defunct due to the thefts of spares. Non-monitoring of execution and maintenance of lift irrigations deprived irrigation to 2,200 hectare of ayacut.

- Due to sub-standard execution of construction of an aqueduct and not taking any remedial action, the acqueduct could not be utilised upto its designed capacity.
- Inadequate monitoring of functioning of Mega Lift Projects, Non-levy of penalty for delay in completion of work have also been pointed out in the Report.

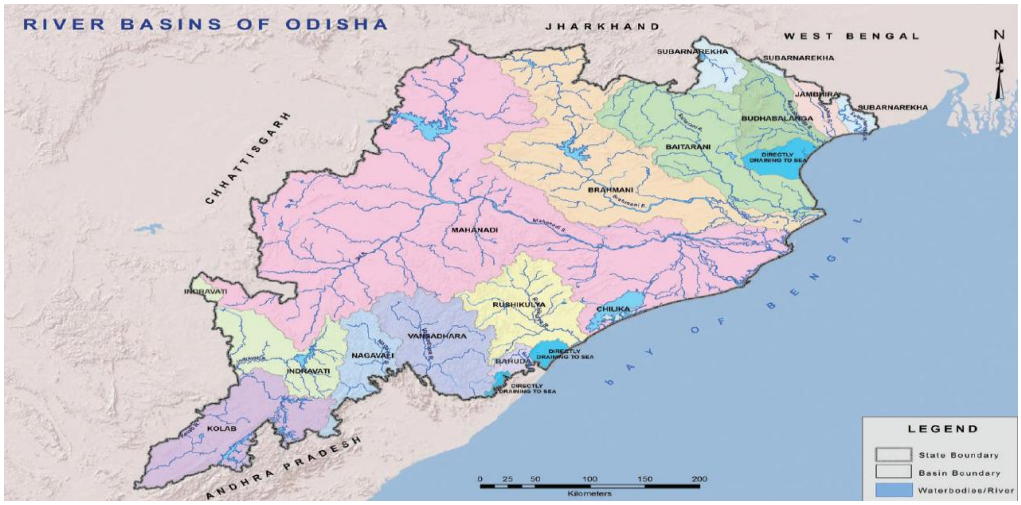
CHAPTER - I
AUDIT APPROACH

Chapter I

Audit Approach

1.1 Introduction

The Department of Water Resources (DoWR), Government of Odisha (GoO), is the nodal department with regard to all matters concerning to state's water resources. The mandate of the department in this sector primarily focuses on administration of various navigation embankment, water for irrigation and navigation canals, drainage embankments and water storage. The irrigation requirements of the state are met through various modes of irrigation including Major and Medium Irrigation (MMI) projects and Minor Irrigation (MI) schemes. The State of Odisha is endowed with an extensive network of rivers



Map 1.1: Map indicating the river basins of Odisha

and streams. There are 11 river basins[1] covering the entire State of Odisha.

1.2 Irrigation Potential of the State

Utilisation of Irrigation plays a significant role in poverty reduction and economic growth. The state has a cultivable land of 61.80 lakh hectares. It has been assessed[2] that 49.90 lakh hectares can be brought under irrigation coverage through major, medium and minor (flow & lift) irrigation projects. Irrigation development has not made much headway in the state in the pre-independence era. Hardly 1.83 lakh hectares of irrigation facilities were created. After introduction of Five Year Plan by Govt. of India in 1951, attempts were made for rapid harnessing of water resources and much emphasis was laid to accelerate the irrigation development. Numbers of major, medium and minor irrigation projects have been constructed in the state during last six decades, thereby increasing irrigation facilities from 1.83 lakh hectares in 1951 to 43.07 lakh hectares in 2020.

[1] Bahuda, Baitarani, Brahmani, Budhabalanga, Indravati, Kolab, Mahanadi, Nagavali, Rushikulya, Subernrekha, and Vansadhara

[2] As per Annual Report 2019-20 of Department of Water Resources, Government of Odisha

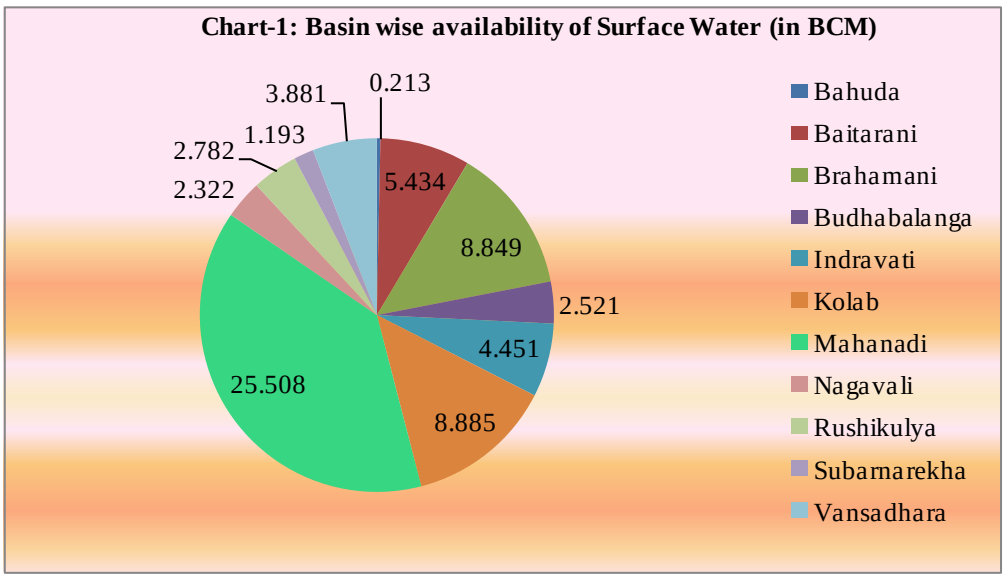
1.3 Statistics on irrigation in the State of Odisha

Odisha depends largely upon monsoon for its water resources. South west monsoon triggers rainfall in the state. About 78 *per cent* of total annual rainfall occurs during the period from June to September and the balance 22 *per cent* during the remaining period from October to May. In addition to seasonal availability of rain, the rain fall in the state also shows spatial variation *i.e.* from about 1,200 mm in southern coastal plain to about 1,700 mm in northern plateau. The long-term average annual rainfall in the state is of the order of 1,452 mm, which corresponds to an annual precipitation of about 230.76 billion cubic meters (BCM) of water. Out of the total precipitation, a portion of it is lost by evaporation & transpiration, a part goes towards increasing ground water storage and the remaining as surface run-off. The ground water reserve and surface run-off constitute the water resources of the State.

As per an assessment made in the Annual Report 2017-18, the average annual availability of surface water from State's own drainage boundary is estimated at 82.84 BCM. Considering the topography and geological limitations, 65.68 BCM of water can be utilised for irrigation purposes. Besides, there was an estimated inflow of surface water of 37.56 BCM annually from neighbouring states through interstate rivers, of which, the utilisable resources was assessed as 29.86 BCM and the remaining 7.70 BCM of water would flow into the sea. Due to increasing demands of water for various uses, DoWR had made an attempt to assess the availability of surface water by the year 2051.The assessment revealed that the surface water availability from its own drainage boundary remains more or less fixed but the inflow of surface water from neighbouring states would be reduced from 37.56 BCM to 25.27 BCM[3].

The Basin-wise availability of utilisable water is given in the Pie Chart below:

Chart-1: Basin wise availability of Surface Water (in BCM)



For utilising 95.54 BCM (65.68 BCM from own water resources and 29.86 BCM from water flowing from other states), the state of Odisha has taken up 15 major irrigation projects (seven completed, eight ongoing); 50 medium

[3] Annual Report 2017-18 of DoWR

irrigation projects (40 completed, 10 ongoing); 197 mega lift projects (nine completed, 188 ongoing) and 2,498 minor irrigation projects (2,340 completed, 158 ongoing) to create irrigation potential of 52.37 lakh ha against which the state has claimed to have achieved irrigation potential of 38.15 lakh ha.

Chart 1.1 : Water inflow, cultivable area, Irrigation Projects in Odisha

Annual availability of Surface water from State's own sources (82.84 BCM) (Utilised/not utilised)

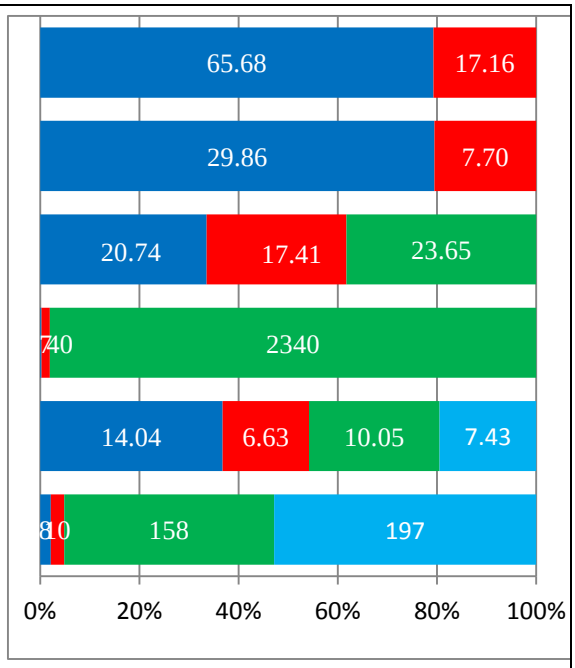
Annual inflow from neighbouring States (37.56 BCM (Utilised/Not utilised)

Cultivable land (61.80 lakh ha (Surface water/Ground water/Not irrigated)

Irrigation Projects completed (Seven Major/40 Medium/2340 Minor)

Irrigation facilities created through (Major & Medium, Minor flow, Minor lift & Mega lift and Other sources in lakh ha)

Number of Projects taken up for providing additional irrigation to 6.99 lakh ha (Major/Medium/Minor flow/Mega lift)

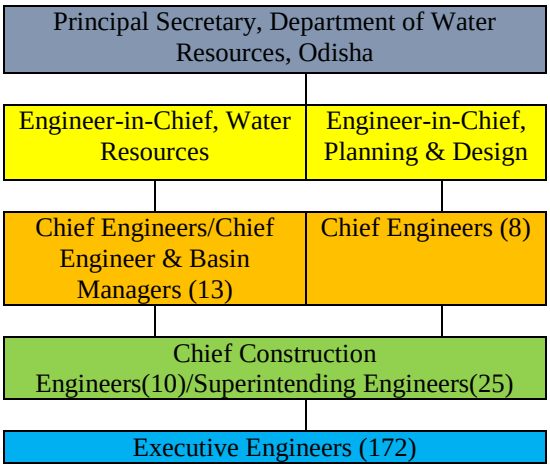


Source: Annual Report of DoWR for 2017-18

1.4 Organisational Structure

DoWR is headed by a Principal Secretary to Government of Odisha who is responsible for implementation of various schemes for construction, maintenance, improvement and creation of additional surface irrigation projects in the State. The above activities for surface irrigation are assisted by two Engineer-in-Chiefs (E-i-C), 21 Chief Engineers (CE)/Chief Engineer & Basin Managers (CE &BM), 10 Chief Construction Engineers (CCE)/25 Superintending Engineers (SEs). The creation, maintenance and improvement of surface irrigation undertaken through a number of schemes were implemented by 172 Executive Engineers (EEs).

Organisational structure chart



1.5 Audit Objectives

The performance audit was conducted to assess whether:

- Financial management of projects was adequate,
- Project deliverables were planned and executed in accordance with the intended objectives, and
- Coordination with all stakeholders was ensured and monitored for sustainable extension of benefits to the targeted population.

1.6 Audit Criteria

Audit Criteria is sourced from the following:

- State Irrigation Manual,
- State Public Works Department Code,
- Land Acquisition Act 1894 and subsequent amendments and orders,
- Government resolutions and instructions/orders relating to the works, rehabilitation *etc.*,
- General Financial Rules(GFR),
- Odisha Treasury Code (OTC),
- Annual Plan, Perspective Plan, Regulations and guidelines issued by GoO, and
- Detailed Project Reports (DPRs), standard specifications, Schedule of Rates (SoR), Analysis of Rates (AoR), contract conditions and agreements.

1.7 Scope of Audit

Performance Audit was conducted during June to September 2019 covering the period from April 2014 to March 2019. Audit test checked the records of DoWR, Project authorities, Special Land Acquisition Officers (SLAOs) of the sampled projects. The records of the implementing Units[4] of the Department of Agriculture and Farmers' Empowerment (DA&FE) within the ambit of sampled projects were also test checked. Out of one completed major project, 17 partly completed major/medium projects, nine completed Mega Lift Projects (MLPs) and 23 completed/partly completed Minor Irrigation Projects (MIPs)(completed/implemented between January 2011 and March 2017), following projects were selected for detailed scrutiny:

Completed projects:

(1) Upper Indravati Irrigation Project (UIIP) (extension),
(2) Ten MIPs[5]
(3) Nine MLP[6]

Partly completed projects:

(1) Rengali Left Bank Canal (RLBC),
(2) Rengali Right Bank Canal (RRBC),
(3) Subarnarekha Irrigation Project (SIP) and
(4) Lower Indra Irrigation Project (LIIP)

[4] Chief District Agriculture Officers (CDAOs) of Bhawanipatna, Cuttack, Jajpur and Mayurbhanj

[5] (a)Ankamara, (b) Barhanalla, (c) Brahamanijore, (d) Chitalparha, (e) Damkipali, (f) Jatakhalia, (g) Nagapara, (h) Nuapali, (i) Talijore and (j) Tiljodi

[6] (a) Agalpur, (b) Amath, (c) Belgam, (d) Bharsuga, (e) Gudvella, (f) Kapsila, (g)Kusmal, (h)Laitara and (i) Utkela

1.8 Audit methodology

The Audit methodology adopted for performance audit of surface irrigation is as follows:

- An Entry Conference was held on 3 July 2019 with the Principal Secretary to GoO, DoWR to explain the Audit objectives, criteria as well as scope and methodology,
- Field Audit of offices selected by Audit team,
- Joint surveys (June – September 2019) of projects and beneficiaries with an objective to assess the veracity of the recorded data given by the audited entities,
- Physical inspections (June – September 2019) conducted jointly with the officials of DoWR for the assets created,
- Draft Performance Audit Report was issued on 27 July 2021 to Government. Replies to draft note was received on 30 July 2021 from Government. Audit findings were discussed in an Exit conference held on 10 August 2021 and deliberations of Exit conference and replies of Government were considered while finalising the Report,
- Present status of the test-checked projects has been updated based on the records subsequently furnished to Audit (September 2021).

CHAPTER - II
FINANCIAL MANAGEMENT

Chapter II

Financial Management

2.1 Budget provision and expenditure

The details of budget provision *vis-à-vis* expenditure incurred by DoWR during the period from 2014-15 to 2019-20 are given below:

Table 2.1: Statement showing the budget provision and utilization of funds by DoWR during 2014-2020

(₹ in crore)

Year	Budget provision of DoWR	Expenditure of DoWR	Expenditure as percentage of budget provision
2014-15	4,566.88	4,278.70	94
2015-16	6,236.36	6,043.53	97
2016-17	7,986.20	7,749.65	97
2017-18	9,224.88	8,814.73	96
2018-19	10,221.33	9,305.46	91
2019-20	9,738.42	6,112.26	63
Total	**47,974.07**	**42,304.33**	**88**

(Source: Odisha Budget)

Table-2.2: Statement showing the budget provision and utilization of funds by DoWR in respect of Surface irrigation during 2014-2020

(₹ in crore)

Year	Budget provision for Surface Irrigation	Expenditure on Surface Irrigation	Expenditure as percentage of budget provision
2014-15	2,557.81	2,423.67	95
2015-16	3,695.68	3,541.84	96
2016-17	5,025.20	4,842.14	96
2017-18	6,617.71	5,884.58	89
2018-19	7,470.63	4,682.27	63
2019-20	4,999.48	3,778.85	76
Total	**30,366.51**	**25,153.35**	**83**

(Source: Data collected from EIC office)

The details of budget provision and its utilization in respect of five test-checked projects during 2014-2020 are given below**:**

Table 2.3: Statement showing the budget provision and utilization of funds in test checked projects

(₹ in crore)

Year	Budget provision	Re-appropriation	Revised provision	Expenditure incurred (percentage)	Surrendered amount
2014-15	780.09	-47.12	732.97	668.19*(91.16)*	64.78
2015-16	722.01	30.45	752.46	735.57*(97.76)*	16.89
2016-17	1,123.09	-186.95	936.14	929.37*(99.28)*	6.77
2017-18	1,202.91	-132.21	1,070.70	984.46*(91.95)*	86.24
2018-19	1,428.00	-41.35	1,386.65	1,026.39*(74.02)*	360.26
2019-20	1,357.22	-122.69	1,234.53	926.49 (75.05)	308.04
Total	**6,613.32**	**-499.87**	**6,113.45**	**5,270.47**	**842.98**

(Source: Data collected from five CE/(CE&BM)/CCE)

During last six years 2014-20, the DoWR surrendered an amount of ₹842.98 crore which was 14 *per cent* of the revised budget provision. The surrender of funds was mainly due to delay in handing over of clear sites for execution of projects by the Department, delay in obtaining mandatory clearances, non-execution of work taken up under third phase with loan assistance from Japan International Cooperation Agency (JICA) *etc.* The reasons for re-appropriation of ₹499.87 crore was mainly due to the delay in award of work for laying Under Ground Pipe Lines (UGPL) of LIIP (March 2018) though proposed during December 2016. Similarly, the work could not be executed in RRBC/RLBC due to non-acquisition of land.

Accepting the facts, Government stated (July 2021) that shortfall in utilisation of funds were due to delay in Land acquisition (LA) and forest land clearances, as well as pending bills and other issues. Government further assured that all out efforts were being made to utilise the entire budget provision in each financial year.

2.2 Project wise sanctioned cost and expenditure on test checked projects

Project wise sanctioned cost and expenditure on test checked projects as on March 2020 is given in the table below:

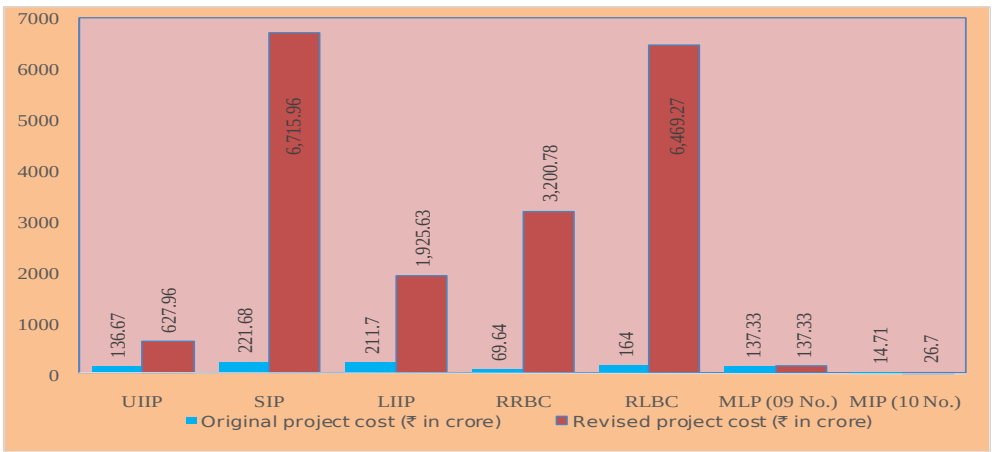
Table 2.4: Statement showing project wise sanctioned cost and expenditure on test-checked projects

(₹in crore)

Name of the Project	Original project cost	Revised project cost (Percentage of excess)	Total expenditure up to March 2020	Year of commencement	Revised date of completion	Remarks
UIIP	136.67	627.96 *(459)*	761.63	2003	March 2016	Completed
SIP	221.68	6,715.96 *(3030)*	4,872.64	1982	March 2019	In progress
LIIP	211.70	1,925.63 *(910)*	1,811.73	1999	March 2021	In progress
RRBC	69.64	3,200.78 *(4596)*	2,267.19	1978	March 2022	In progress
RLBC	164.00	6,469.27 *(3945)*	2,871.25	1978	March 2023	In progress
MLP (09 No.)	137.33	137.33 *(Nil)*	137.33	2013-15	March 2018 March 2019	Completed
MIP (10 No.)	14.71	26.70 *(182)*	20.34	2006-08	2010-2014	Completed
Total	**955.73**	**19,103.63**	**12,742.11**			

(Source: The data provided by CE/CCE)

Chart: 2.1 Project wise original cost and revised cost on test-checked projects



As could be inferred from the table/chart above, the projects which commenced as early as 1978 were still ongoing with revisions of their completion date. This was mainly due to delay in land acquisition, forest clearance for canal alignment, delay in finalisation of design, *etc*. In respect of projects other than MLPs, the increase in cost of the projects ranged from 182 to 4,596 *per cent*. Despite cost escalations, only one major project *i.e.* UIIP (extension) had been completed and other four major projects were still in progress as of March 2021 for which further escalation of cost could not be ruled out. The cost escalation was attributable to various reasons such as delay in execution of works, increase in cost of land, increase in payment of Rehabilitation and Resettlement(R&R) assistance due to revision of R&R policy and revision of SoR, *etc*., which are elucidated in the succeeding paragraphs.

Audit observed significant issues on financial mis-management in the test-checked projects which are given in the Table below.

Table 2.5: Statement showing irregularities noticed in the financial management

Sl. No	Nature of irregularities	Amount (₹ in crore)	Projects involved	Irregularities in brief
1	Non receipt of central assistance(CA)	311.60	SIP, UIIP and LIIP	Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) stipulates that the GoI would provide grants for the first instalment at the beginning of the year and after receipt of Utilisation Certificate (UC) for the 1st instalment, the 2nd instalment would be released. Audit noticed that the DoWR had submitted claim of ₹986.96 crore (2015-19) in respect of three projects (SIP, UIIP and LIIP) for assistance under PMKSY during 2015-19. Against the above claimed amount, the GoI had released CA of ₹675.36 crore due to non-submission of UCs by DoWR on time and the balance amount for ₹311.60 crore was not released by the centre, thus depriving the State of CA.
		592.34	RRBC	GoI stopped funding under AIBP (2010-11) for want of forest clearance for the branch canal construction of RRBC. The project was also not included in PMKSY thereby losing central assistance of ₹592.34 crore. Government stated (July 2021) that UCs were being submitted and proposals were being sent for receipt of CA. However, fact remained that the State lost CA of ₹592.34 crore.
2	Parking of funds in various bank accounts	334.64	SIP, LIIP and RRBC	OTC Rule 242 stipulates that no money shall be drawn from the treasury unless required for immediate disbursement. It is not permissible to draw money from the treasury in anticipation of demands or to prevent the lapse of budget grants. Audit

Sl. No	Nature of irregularities	Amount (₹ in crore)	Projects involved	Irregularities in brief
				scrutiny revealed that: (i)The competent authority of SIP project had drawn an amount of ₹75 crore between December 2011 and June 2015 and kept with the Project Director, R&R, towards payment of R&R assistance. However, the amount was not utilised for the intended purpose and instead was kept in savings bank accounts from December 2011 till Audit during September 2019. This indicates that the amount had been withdrawn without immediate requirement in violation of OTC Rule 242. (ii)Similarly, in violation to circular (September 2012) of Revenue and Disaster Management Department which stipulated for depositing advances in civil deposits, advance drawn on account of compensation for LA and R&R assistance of ₹334.64 crore were kept in various bank accounts (2011 to 2019) instead of depositing under the Head of Account 8443 Civil Deposits by Project Director (PD) (R&R and LAO) of three projects (SIP, LIIP, & RRBC). Government stated (July 2021) that in order to avoid the process of drawing from Civil Deposits for immediate disbursement of R&R assistance, funds were kept in bank accounts. The reply is not acceptable as it happened over eight years and also in violation to the circular instructions**.**
3	Non-remittance of revenue	66.94	SIP, RRBC and LIIP	As per rule 25 of chapter 3 of Odisha GFR, the controlling officer shall remit all sums collected which are due to the Government regularly and promptly into Government account. Audit noticed that the Project authorities (SIP, RRBC and LIIP) failed to deposit the interest earned on funds kept in various bank accounts amounting to ₹66.94 crore in violation to the above rules. Government stated (July 2021) that ₹30.71 crore had been deposited and the balance amount of interest would be deposited on receipt of interest confirmation from banks.
4	Outstanding advance	64.94	SIP and RRBC	As per Resolution No.9133 dated 6 September 2012 of Works Department, GoO, one third of the award amount was to be paid as 1st advance to Odisha Construction Corporation (OCC). After adjustment of 75 *per cent* of the 1st advance, the 2nd advance was to be sanctioned and so on. Audit noticed that the EEs of two projects (SIP and RRBC) paid an amount of ₹381.55 crore to OCC

Sl. No	Nature of irregularities	Amount (₹ in crore)	Projects involved	Irregularities in brief
				(June 2016 to May 2017) in respect of four works[7] without adjustment of 75 *per cent* of the first advance, of which ₹316.61 crore had been subsequently adjusted as of April 2021. The balance advance of ₹64.94 crore remained outstanding and the works remained incomplete beyond stipulated date as of September, 2021. No specific reply was furnished by Government for non-adjustment of advance.
5	Inadmissible payment Of GST	10.23	SIP, LIIP, MLP	GoI introduced Goods and Service Tax (GST) with effect from 1 July 2017 but no GST was paid on work bills up to September 2018. From October 2018, 12 *per cent* GST was paid on work bills. Three works[8]of three projects (SIP, LIIP, MLP) were awarded to agencies for completion between May 2017 and November 2017 but extended beyond October 2018. Agencies could not complete the works within the stipulated period for which unwarranted GST of ₹10.23 crore was paid. Government stated (July 2021) that payment of GST was inevitable for contracts wherein extension of time had been granted. However, it also stated that the audit observation had been noted for future guidance. Had the department monitored and completed the works on time which were executed on Engineering, Procurement and Construction (EPC) mode, payment of GST could have been avoided.
6	Inadmissible payment of service taxes	3.99	UIIP & MLP	As per para 12 (d) of Service Tax Notification No.25/2012 dated 20 June 2012, the Service Tax had been exempted from construction of a structure meant for use as canal, dam or other irrigation works. But it was noticed that in violation to aforesaid authority, the EEs of two test checked projects (UIIP & MLP) had paid (December 2016 to February 2018) Service Tax of ₹3.99 crore to OCC which was inadmissible and needed to be recovered. Government stated (July 2021) that service tax for consultancy service for irrigation was not exempted and if exempted, refund would be claimed. The reply is not acceptable since consultancy service

[7] (i) Construction of spillway of Haldia Dam, (ii) Construction of feeder canal of Baisinga branch canal, (iii) Restoration of Subernarekha Main Canal (SMC) and (iv) Construction of protection wall of RRBC from Reduced Distance (RD) 88.70 km to RD 91.50 km.

[8] (i) Construction of damaged portion of SMC from RD 45.32 km to 45.52 km, and from 45.56 km to 45.64 km, (ii) Construction of balance work of Bagomunda branch canal, and (iii)Goimundi distributaries of LIIP

Sl. No	Nature of irregularities	Amount (₹ in crore)	Projects involved	Irregularities in brief
				charges are part of the project cost and hence exempted.
7	Non-realisation of cost of repair of canal	11.17	RRBC	Bhushan Steel Plant exists on the right side of the RRBC. The DoWR had accorded permission of Right of Way for transportation of raw materials/finished product to Bhushan Steel Plant through construction of double track road adjacent to the left side of canal at RD 39.570 km. Due to plying of heavy vehicles to the Steel Plant in the track, the RRBC at RD 39.275 to 39.959 km had been damaged. For restoration of the canal and other damages, the department assessed and demanded (December 2018) ₹11.67 crore. Against the total demand, Bhushan Steel had deposited in advance (May 2014) ₹50 lakh before assessment and balance ₹11.17 crore remained unrealised (August 2019). No follow up by the Department had been done in the matter. Government accepted (July 2021) that after completion of work the entire expenditure would be recovered from the industry without mentioning loss of revenue by way of interest.
8	Non recovery of cost of compensatory irrigation	159.46	RRBC	GoO vide No.4538 dated 24 February 2016 notified that industries using the irrigation ayacut area were liable to pay the cost of construction of the project per ha and 25 per cent of the above cost towards delay for construction of three years. Audit noticed that seven industries used 5498.49 ha ayacut of RRBC. As such, an amount of ₹159.46 crore at ₹2.32 lakh[9] per ha plus 25 per cent for delay was to be recovered from such industries which had not been recovered (September 2019). On this being pointed out, the Government stated (July 2021) that ₹6.53 crore had been deposited by two industries and the balance amount would be recovered from the industries as per Government guidelines.
9	Inadmissible payment of contingency charges	2.84	SIP	GoO in their Resolution No.9133 dated 6 September 2012 devised the guidelines for award of work to PSUs. As per the guidelines the work was to be awarded to PSUs at the estimated rate plus corporation charges at 10 *per cent*. There was no provision for payment of contingency charges. In violation to the above order, contingency charges of ₹2.84 crore at one *per cent* was paid to OCC in respect of four works of SIP.

[9] Cost per ha = Cost of the project/CCA i.e. 1,96,233 lakh/84,406 = ₹2.32 lakh per ha

Sl. No	Nature of irregularities	Amount (₹ in crore)	Projects involved	Irregularities in brief
				The Government stated (July 2021) that any payment towards contingency charges would be reimbursed by the agency at the time of final payment.
10	Non-recovery of royalty	4.26	LIIP	As per rule pertaining to minor minerals, royalty at prescribed rate was to be recovered from the bills of the contractors for the construction materials *i.e.* soil, sand, stone *etc*., in case the contractor had not deposited the same. Ten works[10] were awarded for ₹88.07 crore for completion between November 2014 and July 2018.The contractors transported 14.31 lakh cum of burrow earth for execution of canal embankment. The royalty on earth at ₹27.44/₹35 per cum amounting to ₹4.26 crore had not been recovered from the bills of the contractors leading to loss of revenue. Government stated (July 2021) that royalty amounting to ₹1.17 crore had been recovered and the balance would be collected.
11	Loss of revenue due to non-certification of ayacut	23.99	SIP, UIIP and RLBC	As per GoO, Finance Department's Report of Expert Committee on Revenue enhancement measures, the EEs were responsible for preparation and certification of irrigated ayacut for the purpose of assessment of revenue. A joint verification is to be conducted by Revenue Department and DoWR. The assessment of revenue is finalised after joint verification. Audit noticed that 83,082 ha irrigation provided during1987 to 2012 were not certified through joint verification. As a result, water rate could not be recovered from farmers resulting in loss of revenue of ₹23.99 crore[11]. Government stated (July 2021) that in SIP projects steps were being taken to get the irrigated ayacuts certified from Tahasildars soon.
12	Unauthorised expenditure for want of revised administrative approval	617.44	UIIP & MIPs	Para 3.2.4 of OPWD code stipulates that if the expenditure on a project exceeds 10 per cent of the administratively approved cost, a revised administrative approval of the competent authority must be obtained for the excess expenditure without delay. Audit noticed that though the expenditure

[10] (i) Construction of Mamiyan distributaries of LIIP, (ii) Diaton Branch canal from RD.0/0 to 6.50 km, (iii) Construction of Chuliphunka Sub-minor, (iv) Construction of Nagaljore Sub-minor, (v) Construction of Alanda distributaries, (vi) Construction of Jampada distributaries, (vii) Construction of balance work of Palaskhanda distributary, (viii) Construction of Diaton branch canal from 6.50 to 9.50 km, (ix) Construction of Manigaon Minor, and (x) Construction of Bangomunda branch canal

[11] Ayacut area irrigated X Number of years X Annual water rate

Sl. No	Nature of irregularities	Amount (₹ in crore)	Projects involved	Irregularities in brief
				of UIIP and seven MI projects exceeded the revised sanctioned cost by more than 10 per cent, the revised Administrative Approval had not yet been obtained as of March 2021.
Total		**2,203.84**		

(Source: Compiled by Audit)

As summarized above**,** the financial management of the test checked projects was marred due to non-incurring of expenditure to complete the projects despite availability of funds. Since the authorities of five test checked projects could not spend the funds for which it was sanctioned due to delay in mandatory clearances, handing over of site *etc.*, a sum of ₹842.98 crore was surrendered during 2014-20. Issues like non receipt of CA, parking of funds in various banks without its utilization for which it was drawn, non-depositing of advances in civil deposit accounts, non-realisation of government revenue, non-adjustment of advances and inadmissible payment of tax aggregating ₹2,203.84 crore *etc*. were noticed.

During Exit Conference (August 2021) the Principal Secretary, DoWR concurred with the financial observations mentioned above and promised to initiate action. Some of the actions already taken have been mentioned in the above table.

Recommendations:

- **Department needs to closely monitor financial management of the irrigation projects and fix responsibility on the executives for financial irregularities.**

CHAPTER - III
PLANNING AND EXECUTION OF PROJECTS

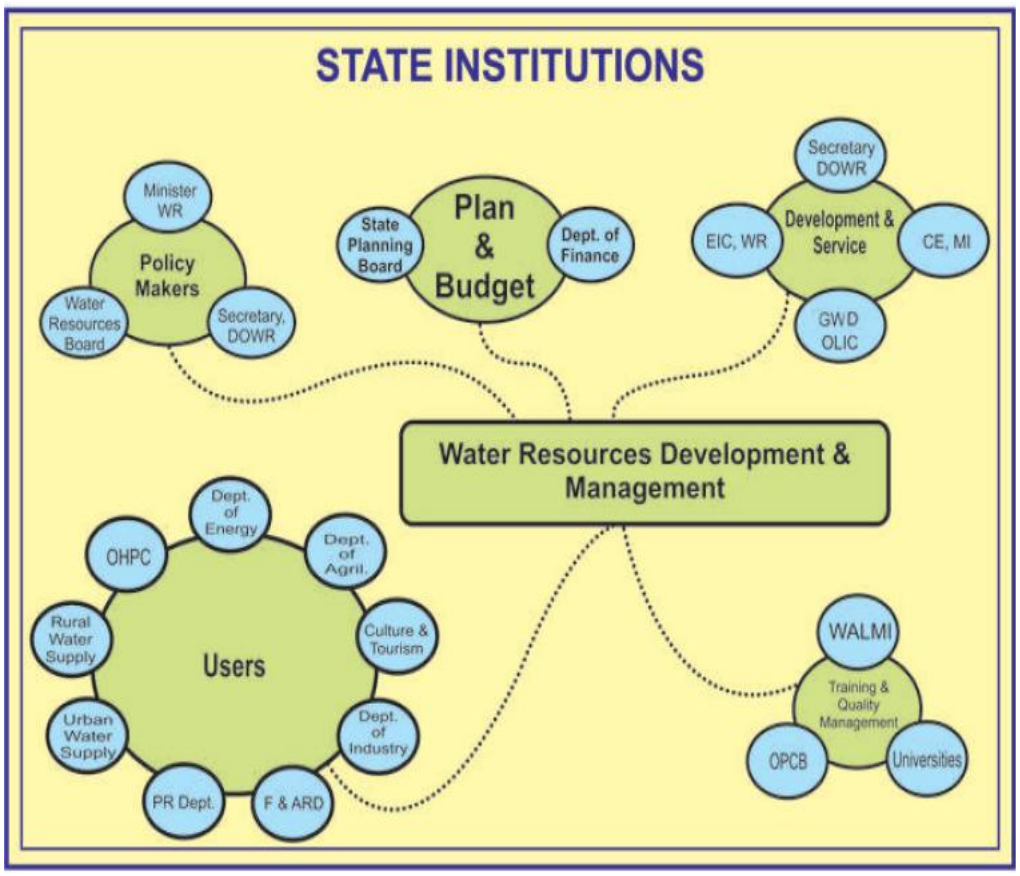
Chapter III

Planning and execution of projects

3.1 Planning, Development & Management of State's Water Resources

Competing demands on water resources from industrial, domestic, environmental and other sectors essentially warrants an integrated water resources development and management approach. The river basin is taken as a logical hydrological unit of management. To achieve this objective, policy initiatives, administrative initiatives and legal provisions have been made at the state and national levels. The State's Institutions responsible for Water Resource Development and Management is given in the chart 3.1 as detailed below:

Chart 3.1: Showing State's institutional framework responsible for Water Resources Development and Management



Despite an elaborate institutional arrangement at the State level, serious Planning and Management shortcomings were noticed in achieving targets of surface irrigation as discussed in subsequent paragraphs.

3.2 Creation and utilisation of Irrigation Potential (IP)

3.2.1 Targets and achievements of creation of IP in the State

The DoWR fixed year-wise targets for creation of Irrigation Potential (IP) during 2014-19. It was seen that out of 1.34 lakh ha of creation of IP, the state could create only 0.63 lakh ha (47 *per cent*) as given in table below:

Table 3.1: Year-wise target and achievement of IP creation in the State

Year	Target fixed for creation of IP in ha	IP created in ha	Percentage of non-achievement
2014-15	27,000	7,917	70
2015-16	10,000	9,229	8
2016-17	17,000	4,000	76
2017-18	34,000	21,747	36
2018-19	45,898	20,125	56
Total	**1,33,898**	**63,018**	**53**

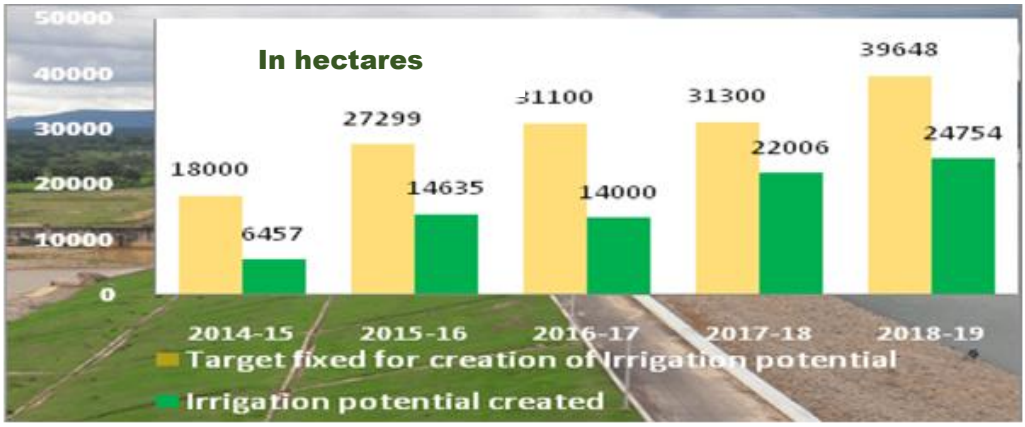
(Source: Data received from E-i-C (Water Resource-WR)

The non-achievement of target for creation of irrigation potential ranged between eight and 76 *per cent* of the target fixed during the said years.

3.2.2 Targets and achievements of creation of IP in selected Projects

The DoWR fixed targets for creation of irrigation potential of 1.47 lakh ha of Culturable Command Area (CCA) for the five test-checked major projects for 2014-19 and the achievement was only 0.82 lakh ha (56 *per cent*) as given in the Chart 3.2 below: -

Chart 3.2: Showing target fixed for IP creation and IP created in test checked projects.



The non-achievement of targets for creation of irrigation potential ranged between 38 and 64 *per cent*. This was due to delay in execution of work by the contractors, delay in land acquisition, delay in forest clearance, inadequate survey and investigation and delay in finalization of design *etc*., as discussed in subsequent paragraphs.

The details of the designed ayacut of the test checked project and the ayacut achieved as of March 2020 is given in the following Table:

Table 3.2: Showing the details of designed ayacut and IP achieved as of March 2020 in respect of test checked projects

Sl.No	Name of the project	Designed ayacut (in ha)	IP Achieved (in ha)	Percentage of achievement
1	SIP	1,00,568	33,899	34
2	UIIP	1,28,012	33,710	26
3	LIIP	29,900	3,860	13
4	RRBC	1,21,200	17,606	15
5	RLBC	1,14,300	28,471	25
6	Nine MLPs	7,250	4,100	57
7	10 MIPs	1,612	772	48
	Total	**5,02,842**	**1,22,418**	**24**

(Source: Compiled by Audit from the records of project authorities)

The achivement of ayacut ranged between 13 to 34 *per cent* in respect of five major test checked projects. Although, UIIP had been completed (March 2016), the achievement of ayacut was only 26 *per cent* of the designed ayacut.

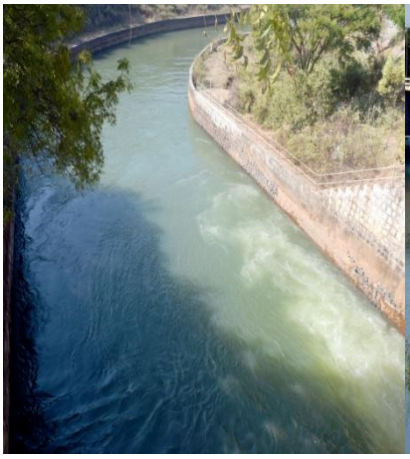
3.3 Need for irrigation and factors influencing the projects

The need for irrigation projects and the project proposals indicating deliverables and status of the test checked projects are given below:

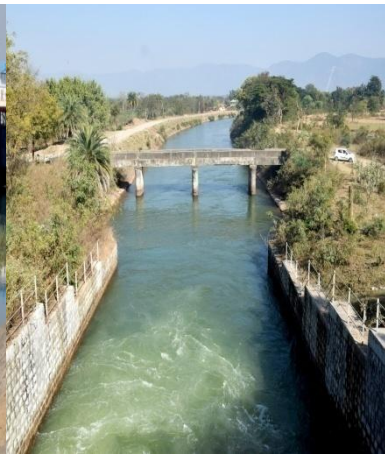
3.3.1 Upper Indravati Irrigation Project (Extension) (UIIP)

Upper Indravati Irrigation Project

In order to solve the problem of water scarcity and to improve the socio-economic conditions of the people in Kalahandi, Bolangir and Koraput (KBK) districts, the GoI proposed (May 1978) UIIP across Indravati River which has a gross storage capacity of 2,300 million cubic meters (MCM) to irrigate 1.28 lakh ha. In the first phase, irrigation to 0.76 lakh ha was provided during 1987-2004. In order to cover the remaining ayacut a proposal was mooted to irrigate through gravity of water flow and one lift project. Ministry of Water Resources, GoI approved (27 January 1999) the proposal for extension of Left and Right Canal system for ₹136.67 crore to irrigate 25,484 ha. Both the extension canals were completed during March 2016 with an expenditure of ₹761.63 crore (March 2020).


Left Main Canal of UIIP


Hati Barrage of UIIP


Right Main Canal of UIIP

The project proposals comprised of the following:

- ✓ The Right Canal system was designed for 50 cumecs discharge at the head, of which 33 cumecs of water had been utilised in first phase for providing irrigation to 27,195ha up to river Sagada and balance 17 cumecs was proposed to provide irrigation to 15,260 ha through extension of canal. No irrigation could be provided through Right extension canal due to defective construction of alignment of Right main canal.

- ✓ The Left Canal system was designed for 69.77 cumecs, of which the existing consumption up to River Tel was 59.56 cumecs for providing irrigation to 49,085 ha and the balance 10.21 cumecs of water was available to provide irrigation to 10,224 ha through extension of canal. Against the above, irrigation to 9,001 ha only could be provided.

- ✓ The Lift project was taken up in March 2015 for completion by March 2020 to provide irrigation to 0.26 lakh ha in upland using 30 cumecs of water. The work was in progress (March 2021).

Though the Left and Right Canal system of UIIP had been extended with an expenditure of ₹761.63 crore (557 *per cent* excess), trial irrigation[12] to only 9,001 ha, against designed ayacut of 10,224 ha could be provided in left extension canal. The right extension canal could not provide any irrigation against proposed area of 15,260 ha due to defective construction of alignment of Right main canal.
Government stated (July, 2021) that as the existing Right Main Canal needs immediate renovation and restoration, no trial irrigation could be provided up to March, 2020.

3.3.1.1 Assessment of Project deliverables with the intended objectives

The DPR of the Project envisaged to provide irrigation only to the designed ayacuts. The details of component-wise IP proposed and achieved in the project and gist of Audit comments are given in the following table:

[12] Irrigation provided on trial basis to check the functioning of canal system

Table 3.3: Component wise up-to-date Target and achievement of IP of UIIP

Project components	Designed length of canal (in km)	Completed canal length (in km)	Cost involved (₹ in crore)	IP proposed (in Ha)	IP Achieved (in Ha)	Gist of Audit comments
Right main canal	84.00	84.00	199.07	27,195	5,306	There was shortfall in IP due to defective construction of canal alignment.
Left Main canal	52.00	52.00	702.04	49,085	19,403	Due to insufficient release of water after power generation by Odisha Hydro Power Corporation (OHPC), and non-verification of ayacut, there was shortfall in ayacut.
Right canal extension	22.18	22.18	332.92	15,260	0	No IP created due to defective construction of alignment of Right Main canal.
Left canal extension	42.84	42.84	369.06	10,224	9,001	Due to insufficient water availability in Hati Barrage, there was shortfall in IP achieved. The utilisation of IP created has not been certified with Revenue Authorities. So actual utilisation could not be ensured in Audit.
Lift Project	45	45	679.59	26,248	0	The distribution system is under progress through UGPL.
Total				**1,28,012**	**33,710**	Pani Panchayats (PP) formed only in Golamunda distributory of left extension canal.

(Source: Compiled by Audit from the records of project authorities)

Audit analysis and the deficiencies observed on the components of the project are detailed in subsequent paragraphs. Audit also observed that due to defective alignment of canals, insufficiency of water in the project and overlapping of ayacut, the IP designed could not be achieved as detailed below:

3.3.1.2 Non execution of work as per DPR

The DPR of UIIP (Extension) envisaged execution of canals/distributaries with lining[13]. The Golamunda distributaries of left extension canal of UIIP were completed without lining in 2012-13. As such, the side slope of the canal had slipped in a number of places and there were rain cuts[14] due to which the siltation had taken place in the canal. In order to restore the slipped portion as well as for silt clearance, the division had incurred expenditure of ₹7.08 crore (between 2013 and 2015). Thus, non-execution of work with proper design as visualised in the DPR, EE, UILC Division No. II, Dharamgarh incurred ₹7.08 crore towards restoration subsequently, which was avoidable.

The State Government accepted (July 2021) that due to shortage of land, steep slope was provided to the outer sloped portion of the canal causing seepage and slippage of earth necessitating construction of the wall. The reply is not acceptable as the reasons for non-adherence to technical requirements as per DPR was not explained.

3.3.1.3 Improper canal alignments led to non-supply of water to the designed ayacut

The extension project of UIIP had been completed with an expenditure of ₹761.63 crore (557 *per cent* excess). The Right Canal system was designed for 50 cumecs discharge at the head, of which 33 cumecs of water had been utilised in first phase for providing irrigation to 24,133 ha and balance 17 cumecs was proposed to provide irrigation to 15,260 ha for which the extension of canal was executed at a cost of ₹332.92 crore.

Audit observed that though the right extension canal had been completed, no irrigation was provided due to defective construction/alignment of right main canal. Audit conducted joint physical inspection of UIIP right extension canal and found that water was not coming to the right extension canal at all due to excavation of right main canal above bed level ranging between 0.31 m and 1.88 m in two patches for 1.20 km (between RD 26.27 km and RD 29.57 km) and in three places for 1.13 km (between RD 61.10 km to RD 65.64 km). As such, the maximum discharge of water in the right main canal

Rock zone in the Canal bed and side at RD 64.5 to 65.5KM of Right Main Canal

[13] Canal lining is an impermeable layer provided for the bed and sides of canal to improve the life and discharge capacity of canal

[14] The erosion of soil in the earthen embankment due to rain is generally called rain cut

was 18 cumecs during 2014-19 against the required discharge of 33 cumecs, as revealed from the discharge data of the division.

Despite knowing the fact that water was not reaching the end point of the right main canal, the CCE without proposing rectification of the canal to its design level chose to propose the extension of canal which rendered expenditure of ₹332.92 crore not only unfruitful, but the farmers also could not derive benefits of crop production (estimated at ₹657.95 crore per annum envisaged in the DPR) from the designed ayacut of 15,260 ha.

Further, due to non- supply of water in the canal system for more than five years, the canals were filled up with earth and damaged in a number of places. There were breaches in embankment in many places, lining was damaged severely and canal bed was filled with mud and trees. Audit conducted Joint physical verification of the Chandapalla distributaries near village Phukujodi in the presence of the representatives of the department and found that it was filled with mud and trees and was in damaged condition.

Breach in embankment near Phukujodi village

Sliding &silting of lining near Phukujodi village

Thus, the extension of right canal of UIIP without restoration work of right main canal rendered expenditure of ₹332.92 crore unfruitful and the farmers were deprived of the benefits of irrigation.

Government admitted (July 2021) the fact and stated that there are incorrect alignments of bed which necessitated restoration and renovation of the existing main canal under Canal Lining and System Rehabilitation Programme (CLSRP). The reply is not acceptable as the department had not taken any action rectifying defects of the main canal since 2004.

3.3.1.4 Assessment of water availability in the project

- **Construction of projects without flow of sufficient water**

The UIIP had two completed canal systems (Left Main Canal including Left extension canal for 69.77 cumecs of water and Right Main Canal including Right extension canal for 50 cumecs of water) to provide irrigation to 1.02 lakh ha by drawing 119.77 cumecs (rounded to 120 cumecs) of water from Hati Barrage charged by release of water after power generation by OHPC. This requirement of water of 120 cumecs was for kharif season i.e for the period from 15 June to 15 November. But, Audit noticed that the release of water to the extent of 120 cumecs was from nine to 59 days during the same period against the requirement of 154 days in a kharif season.

The release of water after generation of power by OHPC was insufficient and therefore, the barrage could not meet the requirement of water for irrigation. This rendered the project unviable and could not meet the water requirements of the targeted beneficiaries.

Further, it was noticed that the Full Supply Depth (FSD) of the Left Extension canal of UIIP Project was 1.48m. The CCE, UIIP made a proposal for extension of the length of left canal to DoWR for approval without proper assessment of water. The DoWR approved (May 2003) the proposal accordingly and the extension work of left canal was completed during 2013-14 with expenditure of ₹369.06 crore.

Audit noticed that against the requirement water level of 1.48 m, water for irrigation was released up to 0.6 m only. Besides, this level of water was also not regular as per the requirement of farmers. As the discharge outlets were above 0.6 m, water could not be discharged to irrigate the fields. Therefore, farmers had to construct temporary cross bunds so that water level could be raised up to required level to get water through outlets. Thus, due to erroneous assessment of water availability by the CCE, UIIP, the expected results could not be attained despite an expenditure of ₹369.06 crore on the extension work of left canal.

Temporary cross bund in the Golamunda Distributaries at RD2.345 km

Government stated (July 2021) that during appraisal of DPR water availability study was conducted and water availability was ensured by the Hydrology Directorate of CWC. It was also confirmed that constructing cross bund in the canal bed was a fact which was on account of erratic power generation by OHPC. Evidently, the water supplied was insufficient for irrigation and expenditure on extension of work of left canal was infructuous (September 2021).

3.3.1.5 Overlapping of ayacut

Twelve Minor Irrigation projects with an ayacut of 1,053 ha had an overlapping area by the ayacut of UIIP. Though the canals of UIIP for this ayacut have already been completed no water could be supplied due to defective construction of alignment of main canals. The EE, incurred an expenditure of ₹2.80 crore on maintenance of nine of the twelve MI projects during 2017-19. Had the water been supplied through this canal, there would not have been any requirement for repair and maintenance of MIPs. Hence the expenditure of ₹2.80 crore incurred by EE of MI Division was avoidable.

Government accepted (July 2021) that the MI projects were constructed by MI wing inside the command area of UIIP and were maintaining these projects. It was also stated that the MI authorities would be requested to transfer these projects to UIIP. The reply is not acceptable since incurring expenditure by MI wing within the command area of UIIP was redundant and avoidable.

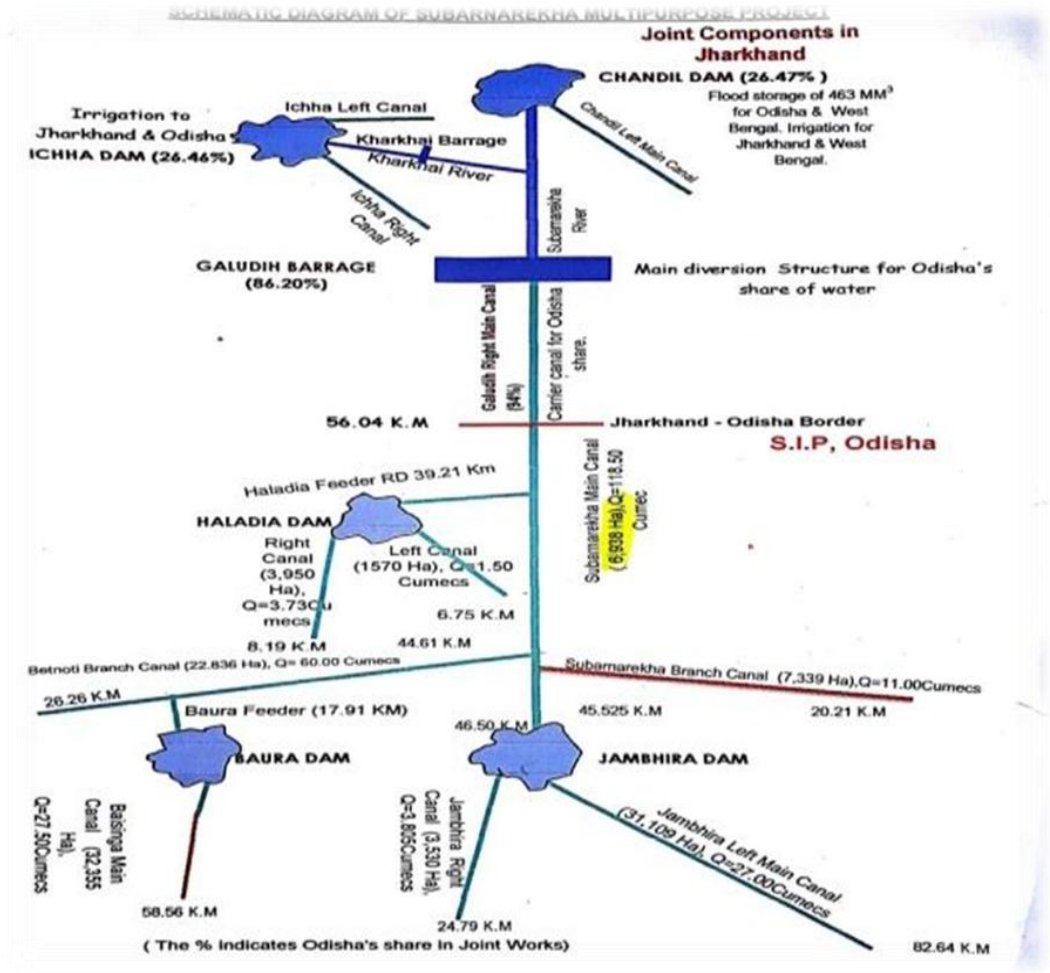
Despite completion of all components of the project, right extension canal could not provide irrigation to the proposed IP of 15,260 ha due to defective execution of alignment of the original right main canal constructed by the EEs, rendering the entire expenditure of ₹332.92 crore incurred on construction of the extension of canal unfruitful. Besides, the farmers were deprived of the irrigation benefit as envisaged in the Project Report for more than six years.

Similarly, the left extension of canal completed at a cost of Rs.369.06 crore could not provide irrigation to its full design ayacut of 10,224 ha due to insufficient water in the source for which the IP created was only 9,001 ha. The actual utilisation of ayacut could not be ensured since the ayacut has not been certified through joint verification with the revenue authorities.

3.3.2 Subarnarekha Irrigation Project (SIP)

In order to harness the water resources potential of Subarnarekha river, the SIP was taken up in the command area of 1.09 lakh ha in Mayurbhanj and Balasore districts. It is an interstate project of three States viz., Jharkhand (*erstwhile* Bihar), Odisha and West Bengal. For attaining the optimum utilization of water resources of Subarnarekha-Kharkhai Basin, a tripartite agreement was executed (August 1978) for allocation of water. A hydrological study of resources available was carried out in Chandili, Galudih, Ichha and Kharkhai complex. The States of Bihar and Odisha agreed to construct a barrage at Galudih and the right bank main canal up to Odisha border jointly. The Chief Engineer (CE), Odisha had prepared (April 1978) the Galudih joint project report in which share of water of Odisha was projected as 118.50 cumecs.

The SIP proposals comprised of the following as shown in schematic diagram below:



The SMC consists of 56 km in Bihar and 46.5 km contour canal in Odisha. The Scheme was originally accepted by Technical Advisory Committee (TAC) in 1982 for ₹221.68 crore. Subsequently, the project cost was revised four times with enhancement of 3,030 per cent to ₹6,715.96 crore till the year 2016 including Government of Jharkhand share of ₹1,208.46 crore. Out of which an amount of ₹1,000.46 crore has already been paid to Jharkhand Government. The project was funded under PMKSY for completion by March 2019. The project remained incomplete with trial irrigation to only 33,899 ha (31*per cent*) as of March 2021.

Restoration work of Subarnarekha Main Canal at RD 7.950 km

The SMC with a discharge capacity of 118.50 cumecs would feed three command storage reservoirs (Haldia, Jambhira and Baura) in addition to its own ayacut of 6,938 ha. Though the project was proposed for 1.09 lakh ha, it

was reduced to 1.01 lakh ha due to abandonment of Baura reservoir wherein the local people were resisting to part with their land. Accordingly, a new component of Baisinga feeder-cum-link canal was proposed with a reduction of 9,059 ha of Baura reservoir. The distribution system would irrigate 93,630 ha as under:

- ✓ Haldia Reservoir (existing) Project comprising of Right main canal of 8.19 km with discharge capacity of 3.73 cumecs would provide irrigation to 3,950 ha and Palbani main canal (left) of 6.75 km with discharge capacity of 1.50 cumecs would provide irrigation to 1,570 ha.
- ✓ Betnoti Branch Canal (BBC) with 26.26 km length would irrigate a net ayacut of 22,836 ha and would feed Baisinga feeder cum link canal. The Subarnarekha Branch Canal (SBC) of 20.21 km length would irrigate 7,339 ha.
- ✓ The Jambhira reservoir has two canals. The Right main canal of 24.78 km with discharge capacity of 3.81cumecs would provide irrigation to 3,530 ha and Left main canal of 82.46 km with discharge capacity of 27 cumecs would provide irrigation to 31,109 ha.
- ✓ Baisinga feeder cum link canal had been taken up during December 2016 with ayacut of 23,296 ha and a canal length of 26 km.

Though the cost of the SIP had been revised four times to ₹6,715.96 crore, by a whopping 3,030 *per cent* and rescheduling the date of completion as March 2019 (from March 2002 scheduled earlier), the project remained incomplete with trial irrigation commencing of 33,899 ha (31 *per cent*) as of March 2021.

3.3.2.1 Assessment of Project deliverables with the intended objectives

The DPR of the Project envisaged to provide irrigation only to the designed ayacuts. The details of component-wise IP proposed and achieved in the project and gist of Audit comments are given in the table below:

Table. 3.4: Component wise up-to-date Target and achievement of IP of SIP

Project components	Designed length of canal (in km)	Completed canal length (in km)	Cost involved (₹ in crore)	IP proposed (in Ha)	IP Achieved (in Ha)	Gist of Audit comments
SMC	46.5	46.5	491.39	6,938	7,260	IP achieved was not certified through joint verification with Revenue authorities. Hence, utilisation of IP could not be ensured by Audit.
BBC	26.26	26.26	240.05	22,836	15,359	Shortfall in IP creation was due to non-completion of distribution system for want of LA.
SBC	20.21	0	0	7,339	0	Canal work could not be started due to non-acquisition of land and not handing over the site to the contractor.

Project components	Designed length of canal (in km)	Completed canal length (in km)	Cost involved (₹ in crore)	IP proposed (in Ha)	IP Achieved (in Ha)	Gist of Audit comments
Haldia reservoir	14.94	14.94	333.02	5,520	3,580	Construction of spillway under progress and the IP achieved is out of the existing reservoir.
Jambira reservoir	107.25	107.25	1,178.67	34,639	7,700	Distribution system work is under progress and hence short achievement of IP.
Baisinga link cum feeder canal	58.56	20.00	189.36	23,296	0	Due to abandonment of Baura reservoir this new project component was taken up in 2016 with a reduction of ayacut of 9,059 ha. As construction of feeder canal is under progress no ayacut has been created.
Total	**273.72**	**214.95**	**2,432.49**	**1,00,568**	**33,899**	The actual utilisation of ayacut could not be ensured since the created ayacut has not been certified through joint verification with the revenue authorities. Only 6 PPs out of 19 PPs were formed. No PPs were involved in maintenance of canals.

(Source: Compiled by Audit from the records of project authorities)

Audit analysis and the deficiencies observed on the components of the project are detailed in subsequent paragraphs. Audit also observed that due to deficiencies in DPR, overlapping of ayacut and short creation of ayacut, delay in land acquisition, delay in finalisation of design and etc. in the project, the IP designed could not be achieved as detailed below:

3.3.2.2 Deficiencies in the DPR

- **Avoidable extra expenditure due to execution of excess length of spillway**

Haldia dam project of SIP was an existing reservoir project with 16 m height, 1.74 km length with live storage capacity of 11.15 mcm that provided irrigation to 2,428 ha. The project was included in SIP to provide irrigation to 5,520 ha by increasing the length of the dam to 3.52 km and height to 23.5 m with a live storage capacity of 46.87 mcm. The reservoir was planned to be filled up with water conveyed through SMC. In order to discharge the excess water from the reservoir due to heavy rainfall, there was a provision in the DPR for construction of un-gated spillway of 17m

on Haladia dam. Against the above provision, the division had constructed a 50 metre long gated spillway at a cost of ₹104.35 crore without any hydraulic assessment. As the Central Water Commission (CWC) had approved the SIP initially, any major technical changes in design by increasing length and switch over to gated spillway required the approval of CWC which had not been obtained. Besides, the WAPCOS[15] report had approved provision of 17m length of un-gated spill way instead of 50 m gated spillway. Thus, construction of 33 meters of excess length of gated spillway by the EE, Subarnarekha Irrigation Division No-I without any hydraulic assessment and without obtaining approval from CWC had rendered an extra expenditure of ₹73.20 crore infructuous. Responsibility may be fixed on the EE for such extra expenditure.

Government stated (July 2021) that the TAC accepted the proposal for construction of 50 m gated spillway but necessary approval of CWC had not been received. The reply is not acceptable since the provision of 17 m length of un-gated spillway had the approval of CWC.

3.3.2.3 Improper survey and investigation and deficiencies in design

- **Avoidable expenditure due to faulty design and drawings**

The canal work of SMC from RD 7.95 km to 8.84 km of SIP completed in 1992 was seen breaching gradually and canal slopes were slipping due to presence of Kaolin soil. As the canal was breached, no water has been supplied for irrigation since 2012-13. TAC could not finalise the design for restoration and referred (November 2012) the matter to CWC for providing the design which was received in August 2015. The CE had taken up (August 2016) restoration work at a cost of ₹67.28 crore for completion by August 2018. The work was in progress (September 2020) with a booked expenditure of ₹70.90 crore. Thus, failure on the part of department in proper survey and investigation and to design the canal as per soil condition delayed the work depriving irrigation to the farmers for more than 28 years. Besides, the department incurred an avoidable expenditure of ₹9.82 crore towards replacement and disposal of entire Kaolin soil from the canal embankment constructed originally.

Accepting the delay in finalisation of design and drawing for technical reasons, Government stated (July 2021) that the unsuitable soil was excavated and dumped at the available Government land. The reply is not acceptable since the department failed to carry out a proper survey and canal design as per the soil condition that led to avoidable expenditure.

3.3.2.4 Overlapping of ayacut

The left main canal and its distributaries, minors and sub-minors of Jambhira Dam of SIP were in progress. The local people of Basta distributaries were not allowing ayacut survey of 4,500 ha in the command area, since their land had already been irrigated through MIP/LIP. This overlapping of ayacut was due to the time lag in proposal mooted for Jambhira Left Main Canal (LMC)

[15] Water and Power Consultancy Services (India) Limited is a government undertaking and consultancy firm wholly owned by Ministry of Jal Shakti, Government of India

during 1982-83 and commencement of work during 2016. This resulted overlapping of ayacut of 4,500 ha of SIP. Despite availability of water, Government had not taken any action to provide alternate ayacut in the project.

3.3.2.5 Land Management

- **Acquisition of private land and alienation of Government land**

The requirement of acquisition of private land and alienation of Government land for the project is given below: -

Table 3.5: Statement showing land requirement and land acquired for construction of the project

(in Acres)

Land Required			Land Acquired/alienated			Balance		
Govt.Land	Private Land	Total	Govt. Land	Private Land	Total	Govt. Land	Private Land	Total
12,328.40	45,204.25	57,532.65	4,989.80	17,383.85	22,373.65	7,338.60	27,820.4	35,159

(Source: compiled by audit)

From the above table it could be noticed that against the requirement of 45,204.25 acres of private land for the project, the Special Land Acquisition Officer (SLAO) could acquire 17,383.85 acres (38 *per cent*), despite availability of funds for the said purpose. The LA processes for 1,305.78 acres of private land are at various stages and the requisition for LA for the balance area of 26,514.62 acres of private land has not yet been submitted by the EEs to SLAO (October 2021). Similarly, the SLAO of the project failed to alienate 7,338.60 acres of Government land against the requirement of 12,328.40 acres.

OPWD code stipulates that no work should be commenced unless land for the purpose was available. As such, before execution of any project/work, land acquisition should have been completed. In the following cases the execution/commencement of works were delayed due to non-acquisition of land on time.

- **Delay in land acquisition led to increase in project cost**

The land acquisition process for Ichcha Reservoir in SIP had been carried out between 1982-83 and 1998-99 as per LA Act, 1894 which was amended in 2007 and again revised in 2013. The delay in acquisition for Ichcha reservoir was on account of delay in finalisation of construction of Ichcha Dam which was entrusted to the contractor only during August 2019 for completion by August 2022. The land compensation for acquisition of land of 2,737.30 acres for the reservoir was increased to ₹123.13 crore as per 2013 amendment as against ₹58.15 crore as per 2007 amendment, resulting in extra cost of ₹64.98 crore.

The Government stated (July 2021) that LA is a lengthy process and changes in LA Act are unavoidable causing extra project cost. The reply is not acceptable as authorities should consider the timelines for land acquisition while proposing the project for approval to avoid delay in providing irrigation facilities.

- **Non-acquisition of land delayed the execution of works**

The Betonati Branch Canal of SIP with a length of 26.26 km, along with minors/sub-minors was taken up for construction at a total cost of ₹ 779.63 crore (December 2016). While the branch canal was completed, the distributaries could not be completed due to non-acquisition of required land (March 2021) for which an expenditure of ₹ 588.30 crore had been incurred. Against the requirement of 2,446.57 acres of land, only 1,401.24 acres could be acquired. As a result, irrigation potential of only 15,359 ha had been created so far (May 2020) against designed ayacut of 22,836 ha despite incurring expenditure of ₹588.30 crore.

Accepting the factual position, Government stated (July 2021) that irrigation to the designed ayacut could not be provided due to LA issues and for want of forest clearance, *etc.*

3.3.2.6 Rehabilitation and Resettlement

R&R measures are governed by the LA Act, 1894 and the LA, R&R Act, 2013 of the Union and relevant State Acts. Timely implementation of R&R measures is necessary for undertaking land acquisition, obviating public opposition to projects and for taking up key components of projects such as dams and reservoirs. The deficiencies noticed in test checked projects is given below:

- The R&R assistance of ₹7.43 crore had been paid to 1,304 displaced persons (DP) of eleven villages of Jambhira reservoir of SIP between 1992 and 1997. DPs were not evacuated from the reservoir area and demanded additional compensation as per new Odisha R&R Policy (ORRP) 2006. The Collector & District Magistrate, Mayurbhanj recommended (April 2017) the demand to DoWR for sanction of additional ex-gratia payment at ₹2 lakh each amounting to ₹26.08 crore. Since, the displaced persons were not evacuated, despite paying an amount of ₹7.43 crore, the reservoir could not be utilised optimally to provide irrigation to its designed ayacut.

  Government stated (July 2021) that budget provision had been made in the current year budget and payment would be released soon on receipt of approval of Government. The reply is silent on the reasons for delay in recommendation for payment of additional ex-gratia after 20 years and payment was still not complete.

  Further, due to non-evacuation of DPs from Haldia earth dam site of SIP, the completion of the Haldia project was delayed for which unwarranted escalation of ₹19.46 crore had been paid to the contractor, besides payment of additional compensation as ex-gratia of ₹84 lakh to the DPs.

Despite increase in project cost from ₹221.68 crore to ₹6,715.96 crore, the achievement of ayacut was only 33,899 ha (34 *per cent*) even after 39 years of commencement of the project which was mainly due to delay in LA, non-evacuation of DPs from the project site even after payment of R&R assistance coupled with irregular execution of spillway and defective survey and investigation. The utilization of the ayacut achieved was also not ensured as the same was not certified by joint verification with revenue authority.

3.3.3 Lower Indra Irrigation Project (LIIP)

Lower Indra Irrigation Project

The Planning Commission approved (February 1999) the LIIP for ₹211.70 crore for completion by three years. The project was constructed at the confluence point of River Indra and River Sundar to provide irrigation to 29,900 ha in Nuapada and Bolangir districts. It envisages construction of an earthen dam on Indra River intercepting a total catchment area of 931 sq.km with a reservoir of 303 MCM gross storage capacity. The reservoir project proposals comprised of the following:

- ✓ The Right Canal system was designed for 4.51 cumecs to provide irrigation to 3,452 ha.
- ✓ The Left Canal System was designed for 35.23 cumecs to provide irrigation to 26,448 ha. Both the main canals and branch canals were completed through open excavation. The distributaries, minors and sub-minors[16] taken up through UGPL and contemplated to be completed by March 2021 were in progress (September 2021).

The Right Canal system and the Left Canal system of LIIP were designed to provide irrigation to 3,452 ha and 26,448 ha respectively. Despite incurring an expenditure of ₹1,811.73 crore (March 2020) by revising cost five times to ₹1,925.63 crore (910 *per cent*) for completion by 2021, the project could not be completed due to delay in land acquisition as DPs could not be evacuated even after payment of R&R assistance, delay in award of work (March 2018) though proposed (December 2016) for distribution system of the project etc., thereby denying the intended benefits to the farmers of Nuapada and Bolangir districts.

3.3.3.1 Assessment of Project deliverables with the intended objectives

The DPR of the Project envisaged to provide irrigation only to the designed ayacuts. The details of component-wise IP proposed and achieved in the project and gist of Audit comments are given in the table below:

[16] Water supply from the main canal or distributaries with a head discharge of less than one cumecs is called "Minor" and water supply from Minor is termed as "Sub-Minor"

Table 3.6: Component wise up-to-date Target and achievement of IP of LIIP

Project components	Designed length of canal (in km)	Completed canal length (in km)	Cost involved (₹ in crore)	IP proposed (in Ha)	IP Achieved (in Ha)	Gist of Audit comments
Right canal	8.22	8.22	1,811.73	3,452	3,860	Trial irrigation for 3,860 ha provided though the ayacut has not been verified. UGPL work is under slow progress due to shortage of manpower though the work was entrusted under EPC contract and scheduled to be completed by February 2019.
Left canal	49.38	49.38		26,448		
Total	**57.6**	**57.6**	**1,811.73**	**29,900**	**3,860**	The actual utilisation of ayacut could not be ensured since the created ayacut has not been certified through joint verification with the revenue authorities. No PPs were formed though trial irrigation has been provided.

(Source: Compiled by Audit from the records of project authorities)

Audit analysis and the deficiencies observed on the components of the project are detailed in subsequent paragraphs. Audit also observed that due to deficiencies in DPR and delay in land acquisition etc. in the project, the IP designed could not be achieved as detailed below:

3.3.3.2 Deficiencies in the DPR

- **Wasteful expenditure on construction of a distributary**

As per DPR, the water of the Duajhar distributaries of LIIP would enter into the Dumerjore MIP to provide irrigation to its ayacut. The work of Duajhar distributaries from RD 8.76 km to 18.54 km with its minors and sub-minors having ayacut of 490.72 ha with the estimated cost of ₹19.17 crore was partly completed (September 2017) with an expenditure of ₹12.55 crore. The balance portion of the work with Command Area Development (CAD) work was included in UGPL for ₹6.62 crore and was under progress (March 2021).

Dumerjore MIP has sufficeint water to irrigate to its own ayacut

Audit noticed from the available records that the ayacut of Duajhar distributary from RD 8.76 km to 18.54 km had already been irrigated through Dumerjore and Rajamunda MIPs. Both the MIPs were renovated during 2014-19 at a cost of ₹1.92 crore and were providing irrigation to their respective designed ayacut. Thus, the construction was unwarranted and led to wasteful expenditure of ₹12.55 crore as well as cost overrun in the project.

Accepting the factual position, the Government stated (July 2021) that after completion of UGPL work, Minor Irrigation authorities would hand over the said ayacut to this project without explaining the reasons for deviation from DPR and incurring avoidable expenditure on constructing minors/sub-minors.

3.3.3.3 Land Management

- **Acquisition of private land and alienation of Government land**

The requirement of acquisition of private land and alienation of Government land for the project is given below:

Table 3.7: Statement showing land requirement and land acquired for construction of the projects

(in Acres)

Land Required			Land Acquired/alienated			Balance		
Govt.Land	Private Land	Total	Govt. Land	Private Land	Total	Govt. Land	Private Land	Total
1,155.57	10,445.27	11,600.84	1,155.57	10,425.16	11,580.73	0	20.11	20.11

(Source: compiled by audit)

From the above table it could be noticed that against the requirement of 10,445.27 acres of private land for the project, the Land Acquisition Officers (LAOs) could acquire 10,425.16 acres (99 *per cent*), despite availability of funds for the said purpose.

OPWD code stipulates that no work should be commenced unless land for the purpose was available. As such, before execution of any project/work, land acquisition should have been completed. In the following cases the execution/commencement of works were delayed due to non-acquisition of land on time.

- **Delay in land acquisition led to increase in project cost**

The LIIP envisaged construction of dam with maximum reservoir level[17] at 265 m for providing irrigation to 29,900 ha, in which case National Highway (NH) No.217 would submerge 9.97 km (from RD123.00 km to RD 132.97 km) at water level of 259.30 m. For construction of a bypass road and a high-level bridge, 3.17 acre of land was to be acquired in the above stretch. An estimate for ₹24.19 crore (December 2007) was sanctioned by the LIIP authorities. The work was taken up by NH Division, Kesinga but could not be executed due to non-acquisition of land by SLAO on account of agitation by the villagers demanding DP status. The evacuees of LIIP Dam site did not accept the amount of compensation and appealed to the Hon'ble Court of Senior Civil Judge, Nuapada who directed payment of ₹5.12 crore including interest of ₹3.04 crore at 15 *per cent.* The estimate for the work was revised for ₹30.63 crore leading to extra cost of ₹6.44 crore. The work is in progress thereby depriving the beneficiaries of rabi irrigation for more than five years.

The Government accepted (July 2021) that the delay in execution of diversion of NH work was mainly due to agitation by the villagers demanding DP status and consequent revision of compensation and project cost. Evidently, the project authorities had delayed handing over of clear site to the contractor which led to escalation of project cost**.**

[17] Water level that is ever likely to be attained during the passage of the designed flood

- **Wasteful expenditure on land acquisition for open excavation of canals**

The LIIP was planned (February 1999) as per DPR to provide irrigation through open excavation of canals. DoWR sanctioned an amount of ₹13.91 crore between 2003 and 2012 for acquisition of 564.48 acres of land for excavation of 33 minors/sub-minors, of which an amount ₹8.50 crore had been paid between 2005 and 2015 and possession for 132.73 acres of land was taken (August 2019). During progress of payment, the department had taken up these minors/sub-minors through UGPL (March 2018) for which no LA was required, rendering the expenditure of ₹8.50 crore on acquiring land for open excavation, wasteful.
The Government accepted (July 2021) that due to implementation of UGPL no land needed to be acquired. Evidently the payment therefore made for acquisition of land was wasteful.

3.3.3.4 Rehabilitation and Resettlement

R&R measures are governed by the LA Act, 1894 and the LA, R&R Act, 2013 of the Union and relevant State Acts. Timely implementation of R&R measures is necessary for undertaking land acquisition, obviating public opposition to projects and for taking up key components of projects such as dams and reservoirs. The deficiency noticed in LIIP is given below:

- In LIIP, the displaced persons were identified prior to 2006 and the R&R assistance were paid in phased manner. After payment of R&R assistance, the displaced persons had not been evacuated from the reservoir area. Due to non-eviction, additional 367 displaced persons, who have attained the age of 18 had become eligible for R&R assistance. The DoWR sanctioned an amount of ₹28.10 crore between December 2017 and July 2019 and the payment was in progress. Thus, failure on the part of Department to evacuate the persons after payment of R&R assistance resulted in avoidable expenditure of ₹28.10 crore.

  Government stated (July 2021) that final notice had been issued during 2017 to evacuate DPs and action had been initiated by the PD (R&R), LIIP on those who were responsible for non-eviction causing extra payment.

3.3.3.5 Deficiencies in execution of project

- **Wasteful expenditure on construction of minor/sub-minor**

The EEs, LIIP constructed (2008 to 2016) 68 minors/sub-minors through open excavation at a cost of ₹110.95 crore. Audit scrutiny revealed that since the irrigation was provided through UGPL by diverting the water from distributaries to UGPL, the minors/sub-minors executed through open excavation were not put to use for carrying water to their downstream. Thus, the expenditure incurred on construction of 68 minors/sub-minors through open excavation was rendered wasteful. Audit conducted (August 2019) joint physical verification of two sub-minors (Darlipada and Thagpali) in presence of the representatives of the department and found that the entire water was

passing through the intake wells and supplied to the field through UGPL directly from Kikribeda distributory bypassing minors/sub-minors.

The Government stated (July 2021) that where minors and sub-minors in open channel system were available, UGPL CAD work could draw water from these, and where these were not available, UGPL distribution network was being provided to feed the UGPL CAD network. The reply is not acceptable as audit observation was based on a joint physical verification.

During exit conference (August 2021) the E-i-C had also agreed to look into the issue.

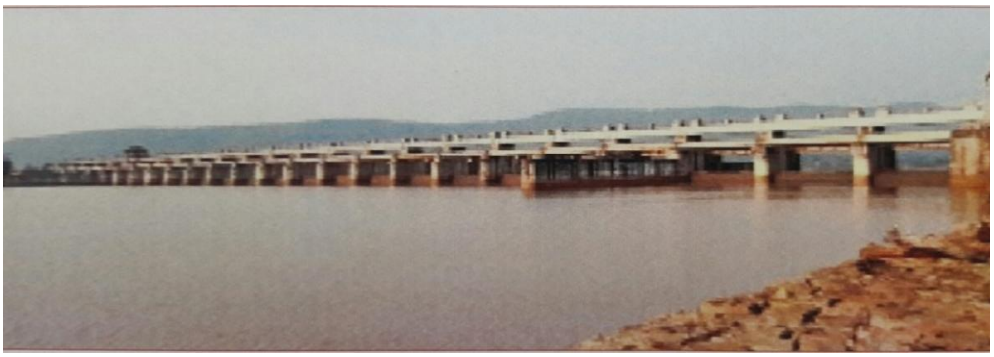
Inspite of incurring expenditure of ₹1,811.73 crore (March 2020) by revising the project cost five times to ₹1,925.63 crore (910 *per cent*) for completion by 2021, the project could not be completed due to delay in land acquisition, non-evacuation of DPs even after payment of R&R assistance, overlapping of ayacut, etc., thereby denying the intended benefits to the farmers of Nuapada and Bolangir districts.

3.3.4 Rengali Multipurpose Project (RRBC & RLBC)

The Planning Commission approved (March 1978) Rengali Multipurpose Project with an estimated cost of ₹233.64 crore. The project was planned to be executed in two stages. Stage-I envisaged construction of a dam across River Brahmani to generate 250 MW hydro-power

Rengali Multipurpose Project

and to provide flood relief to 2,600 sq km in the Brahmani Delta. Stage–II projected construction of Samal Barrage at about 34 km below the dam with a length of 533.40 m with two head regulators. It aimed to provide irrigation to



Samal Barrage

2.35 lakh ha through RRBC and RLBC. The construction of Dam and Barrage were completed in 1985 and 1995 respectively.

The net increase in annual production of food grains was estimated at 1.33 million tons. Besides, after development of irrigation, agro-industries and

allied economic activities were to develop in the area. The details of project proposals comprised of the following:

RRBC was designed to provide irrigation to 1.21 lakh ha in Angul, Dhenkanal, Cuttack and Jajpur districts using 111.30 cumecs of water through 95 km long main canal. The ayacut had been curtailed to 84,406 ha and the original estimate of ₹69.64 crore (March 1978) had been revised to ₹1,962.33 crore (2,818 *per cent*). As of March 2020, only trial irrigation to 17,606 ha had been provided. The balance ayacut would be achieved after completion of the branch canals with its minors and sub-minors. The Department had assessed that the project would be completed in 2021-22 at a cost of ₹3,200.78 crore (4,596 *per cent* increase). However, the Department after incurring an expenditure of ₹2,267.19 crore (71 *per cent*) could create irrigation potential of 17,606 ha (21 *per cent*).

RLBC was approved for ₹164 crore in March 1978 to provide irrigation to 1.14 lakh ha in Angul, Dhenkanal, Jajpur and Keonjhar districts using 151.86 cumecs of water. The construction of canal was taken up in four phases as given in Table below:

Table: 3.8 Phase-wise status of projects

Name of the phase	Chainage[18]	Year of completion	Designed Ayacut	Loan assistance
1st phase	RD 0 to 29.18 km	2003-04	8,483 ha	Water Resources Consolidation Project (WRCP) for ₹173.53 crore
2nd phase	RD 29.18 to 71.31 km	2012-13	26,946 ha	Loan from (JICA) for ₹627.16 crore
3rd phase	RD 71.31 to 123.50 km	In progress	39,416 ha	State plan funds for ₹799.69 crore and JICA loan of ₹1,787.30 crore
4th phase	RD 123.50 to 141.00 km	Not taken up		

(Source: Compiled by Audit from the records of project authorities)

Although the designed ayacut of RLBC up to 71.31 km was of 35,429 ha, the actual ayacut achieved as per the departmental verification report was only 28,471 ha (80 *per cent*). The cost of the project also increased to ₹6,469.27 crore (3,945 *per cent*) from the original cost of ₹164 crore with a reduction of ayacut to 74,845 ha (34 *per cent*) as construction of canal from RD 123.50 km to 141.00 km could not be taken up. The cost escalation was due to improper planning and execution of the project components which are discussed in subsequent paragraphs.

3.3.4.1 Assessment of Project deliverables with the intended objectives

The DPRs of the Projects envisaged to provide irrigation only to the designed ayacuts. The details of component-wise IP proposed and achieved in the projects and gist of Audit comments are given in the table below:

[18] The term chainage is used in surveying to refer to a distance.

Table 3.9: Component wise up-to-date Target and Achievement of IP RRBC and RLBC

Project Name	Project components	Designed length of canal (in km)	Completed canal length (in km)	Cost involved (₹ in crore)	IP proposed (in Ha)	IP Achieved (in Ha)	Gist of Audit comments
RRBC	Main Canal with four completed branch canals in 1st phase	165	165	1353.59	33,700	17,606	Delay in completion of branch canals and industrialisation of ayacut is the cause for short creation of IP.
	Darpani branch canal	97.5	42.18	201.08	50,147	0	Due to delay in LA process, the construction of branch canals was taken up only in patches which were in progress.
	Narasingpur branch canal	46.46	18.37	61.90	11,109	0	
	Athagarah branch canal	24.26	11.31	49.61	5,544	0	
	Lift project	-	-	-	20,700	0	Not yet taken up.
RLBC	RD 0 to 29.18 km with one completed branch canals in 1st phase	58.63	58.63	366.89	8483	28,471	Delay in execution of main and branch canals and also overlapping of ayacut by MI projects, there was shortfall in IP.
	RD 29.18 to71.31 km with one completed branch canals in 2nd phase	76.91	76.91	1,185.41	26,946		
	RD 71.31 to 100.49 km with two completed branch canals in 3rd phase	71.66	43.37	610.52	19,650	0	As the canal works are in progress, no ayacut has been created so far.
	RD 100.49 to 123.50 km	23.01	0	0	19,766	0	Not yet taken up
	RD 123.50 to 141.00 km	17.5	0	0	27,139	0	
	Lift Project	-	19	26.35	12,316	0	Non-functional of lift project due to lack of proper maintenance/ watch and ward.
	Total				**2,35,500**	**46,077**	The actual utilisation of ayacut could not be ensured since the created ayacut has not been certified through joint verification with the revenue authorities. As against 69 PPs, 67 PPs were formed without conducting re-election to 30 PPs.

(Source: - Compiled by audit from the records of project authorities)

Audit analysis and the deficiencies observed on the components of the projects test-checked are detailed in subsequent paragraphs. Audit also observed that due to repeated survey and planning, overlapping of ayacut, short creation of ayacut, delay in land acquisition, and etc. in projects test-checked, the IP designed could not be achieved as detailed below:

3.3.4.2 Deficiencies in the DPR

- **Avoidable extra cost on repeated survey and planning**

The EEs of RRBC awarded the work of survey, planning, design of macro irrigation of Darpani, Narasinghpur and Athagarh Branch Canal to five contractors for ₹1.71crore for completion by March 2011. The contractors provided macro planning data for 62,838 ha which included construction of branch canals and distributaries system. While the branch canals were constructed, distribution system had not been taken up as per the plan.

In order to provide irrigation to all the ayacuts, the concerned EE of Right Canal Division No.I, Khuntuni again awarded (March 2019) macro planning such as distribution system of the branch canals to a contractor that resulted in ₹5.47 crore avoidable and extra cost to the state exchequer.

Government stated (July 2021) that macro planning of UGPL was awarded for ₹5.47 crore which was highly essential for distribution system. The reply is not acceptable since the contractors were paid (March 2011) for conducting macro planning of distributaries and minors/sub-minors after a proper survey had been done. As such award of work again for macro planning was unwarranted. During Exit Conference (August 2021) E-i-C stated that the matter would be examined and a report would be submitted.

3.3.4.3 Assessment of water availability in test-checked projects

- **Non-supply of water through distributaries**

The construction of RRBC from RD 00 to 79 km had been completed with trial irrigation since 2015-16. The distributary off-taking at RD 210 m with an ayacut of 135 ha has also been completed (2016). Audit noticed that no water had been supplied through the distributary since the outlet point was more than two feet above the water level of the canal. Audit conducted the physical verification of the project in presence of the representatives of the department and found that no water had been supplied as per design. Audit also interacted with the farmers whose land was situated adjacent to the canal and confirmed that no water had been discharged through this canal. Due to non-supply of water to its design level by the CCE, water could not be supplied to the distributaries for irrigation.

Government stated (July 2021) that Full Supply Level could not be maintained at the main canal resulting in non-supply of water in the distributary. Evidently, providing irrigation through this distributary for an ayacut of 135 ha looks remote now.

3.3.4.4 Overlapping of ayacut

- Construction of Bhuban Branch Canal off-taking at RD 75.71 km of the RLBC with its distributaries had been taken up for ₹85.25 crore between December 2016 and August 2018 for completion between December 2018 and August 2020 to provide irrigation to 7,216 ha. The branch canal had been completed by widening the existing Damsal MIP canals having ayacut of 1,500 ha. The ayacut of Damsal MIP was not shown in the DPR of Bhuban Branch Canal. The distribution system was in progress. The canal was not completed but the trial irrigation could provide water to 2,000 ha during 2019-20. Out of this, 1,500 ha had already been achieved through the existing Damsal MIP. In effect, so far only an extra 500 ha could be irrigated after an expenditure of ₹43.78 crore.

  Accepting the factual position, Government stated (July 2021) that the available unutilised storage water of Damsal MIP would be utilised for creation of new ayacut in the upper uncommand zone of Bhuban Branch Canal. The reply is not acceptable since the DPR did not show the ayacut pertaining to Damsal MIP while proposing the IP to be created.

3.3.4.5 Short creation of Ayacut

The RLBC was designed from RD 00 m to 141.00 km to provide irrigation to 1,14,300 ha including 12,316 ha through lift irrigation. The designed ayacut of the canal up to RD 123.50 km was 74,845 ha. The canal had been completed with an ayacut of 35,429 ha up to RD 71.31 km. The canal from RD 71.31 km to 123.50 km with an ayacut of 39,416 ha was in progress and the balance canal from RD 123.50 to 141.00 km with an ayacut of 19,033 ha had not yet been taken up. Thus, the total ayacut would have to be 93,878 ha. On verification of ayacut by the Department it was found that the actual ayacut was only 78,859 ha[19] with a shortfall of 35,441 ha (1,14,300 ha – 78,859 ha). The reduction in ayacut was mainly due to defective construction of works and overlapping of MI projects. There was also uncertainty in providing up-land irrigation of 12,316 ha through lift projects since no irrigation could be provided despite deposit of ₹26.35 crore with EE, Lift Irrigation Division, Dhenkanal since 2004-05.

The Government stated (July 2021) that the total ayacut of RLBC on completion may be around the design ayacut. The reply is silent regarding achievement of only 28,471 ha ayacut against the design ayacut of 35,429 ha (80 *per cent*) in respect of completed portion of the canal from RD.00 km to 71.31 km. Hence achievement of designed ayacut after completion is remote.

3.3.4.6 Land Management

- **Acquisition of private land and alienation of Government land**

[19] Verified ayacut of canal up to 71.33 km was 21,910 ha (17 MI ayacut for 1,484 ha excluded) + ayacut from 71.33 to 123 km was 37,916 (1,500 ha of one MIP is overlapped) +19,033 ha thereafter

The requirement of acquisition of private land and alienation of Government land for all the test checked projects is given below:

Table 3.10 Statement showing land requirement and land acquired for construction of the projects

(in Acres)

Name of the project	Land Required			Land Acquired/alienated			Balance		
	Govt.Land	Private Land	Total	Govt. Land	Private Land	Total	Govt. Land	Private Land	Total
RRBC	375.43	7,637.34	8,012.77	375.43	1,768.69	2,144.12	0	5,868.65	5,868.65
RLBC	1,866.25	2,932.39	4,798.64	1,866.25	1,976.87	3,843.12	0	955.52	955.52
Total	**2,241.68**	**10,569.73**	**12,811.41**	**2,241.68**	**3,745.56**	**5,987.24**	**0**	**6,824.17**	**6,824.17**

(Source: compiled by audit)

From the above table it could be noticed that against the requirement of 10,569.73 acres of private land for the two test checked projects, the Land Acquisition Officers (LAOs) could acquire 3,745.56 acres (35 *per cent*), despite availability of funds for the said purpose and the balance area of 6,824.17 acres had not been acquired. Besides, land acquisition for distribution system has not yet been taken up.

OPWD code stipulates that no work should be commenced unless land for the purpose was available. As such, before execution of any project/work, land acquisition should have been completed. In the following cases the execution/commencement of works were delayed due to non-acquisition of land on time.

- **Delay in land acquisition led to increase in project cost**

The GoI issued (during 1978) investment clearance for construction of RRBC. The required land for branch canals, minors and sub-minors of RRBC were not acquired till 2013 due to non-finalisation of alignment of canals. During 2014-19, ₹306.20 crore had been paid for acquisition of 2,798 acres of land for construction of three branch canals and five distributaries. Audit observed that the revision of compensation of LA increased by 35 *per cent*. Hence, delayed acquisition of land led to extra expenditure of ₹107.17crore[20].

The Government stated (July 2021) that LA is a lengthy process and changes in LA Act are unavoidable causing extra project cost. The reply is not acceptable as authorities should consider the timelines for land acquisition while proposing the project for approval to avoid delay in providing irrigation facilities.

3.3.4.7 Deficiencies in execution of project

- **Adoption of faulty design of canal**

Parjang Branch Canal (PBC) of RLBC including its distribution system had been completed under World Bank supported Water Resources Consolidation Project (WRCP) during 2004 to irrigate 5,580.30 ha but the water could not be supplied through the canal as the design depth was not achieved during execution of the canal in three locations which were above 0.6 m to 1.0 m of the bed level[21]of the canal. Thus, failure of the EE to adhere to the design bed

[20] 35 *per cent* of ₹306.20
[21] Bottom surface level of canal

level led to faulty construction of the canal for which water could not be supplied for irrigation.

To achieve the design depth of the canal, the department had taken up the work under CLSRP for ₹70.51crore during 2016-17. The works were in progress and the contractors had been paid ₹67.76 crore (September 2021). Hence, defective construction of canals deprived the targeted beneficiaries of irrigation during the period from 2004-18. Responsibility may be fixed on the EE and other officers for such lapses.

Government replied (July 2021) that since PBC ran through clayey and expansive soil with black cotton soil, the canals were silted in the bed level from 0.30m to 0.60m. The reply is not acceptable as the canal bed level was constructed above 0.60m to 1m, which necessitated further work and expenditure.

Though the Department had incurred an expenditure of ₹2,267.19 crore (71 *per cent*) as of March 2020 in RRBC project, it could create irrigation potential of 17,606 ha (21 *per cent*). Completion of the project has been delayed due to delay in LA, Forest clearance and finalisation of design of canals and improper survey and investigation.
Though RLBC was to provide irrigation to 1.14 lakh ha through 141 km long main canal, it was reduced due to short creation and overlapping of the ayacut. Due to defective construction, Parjang Branch canal could not provide irrigation to its ayacut for more than 14 years during 2004 to 2018.

3.3.5 Mega Lift Projects

Pump House of Amath Mega Lift Project

Mega Lift Projects (MLPs) aim at providing irrigation to the farmers in the upland area by lifting water from rivers and reservoirs which could not be irrigated by normal means of irrigation. The benefit of the MLP *inter alia* provides less land acquisition since irrigation is provided by lifting water by pumps from sources through pressurised networking distribution system. MLPs had been spread in 174 feasible sites in 15 clusters covering 23 districts with command area of 500 to 2,000 ha to provide irrigation to 2.14 lakh ha. Among those, nine sampled projects were completed with an ayacut of 7,250 ha, of which four projects[22] completed at a cost of ₹60.59 crore with an ayacut of 3,150 ha could not provide irrigation to its designed ayacut due to inadequate availability of water at source. In other three projects[23] water supply could not be made due to frequent power fluctuations and in respect of remaining two MLPs[24], trial irrigation had been provided but ayacut had not been verified by the department. The Department had constructed the MLPs with assessment of availability of water above

[22] Agalpur, Gudvella, Kapsila and Laitara
[23] Amath, Belgaon, and Utkela
[24] Bharsuga and Kusmal

threshold level. But the water level remained below the threshold level which indicate that the Department had not conducted hydrological study properly.

3.3.5.1 Assessment of Project deliverables with the intended objectives

The DPRs of the nine MLPs envisaged to provide irrigation only to the designed ayacuts. The details of component-wise IP proposed and achieved in projects and gist of Audit comments are given in the table below:

Table 3.11: Component wise up-to-date Target and achievement of IP in the project

Name of the project	Project components	IP proposed (in Ha)	IP Achieved (in Ha)	Gist of Audit comments
MLPs (Nine)	UGPL	7,250	4,100	Department constructed MLPs with assessment of water availability above the threshold level. But water level remained below the threshold level. Hence the shortage in IP created. The actual utilisation of ayacut could not be ensured since the created ayacut has not been certified through joint verification with the revenue authorities.

(Source: - Compiled by audit from the records of project authorities)

Audit analysis and the deficiencies observed on the projects are detailed in subsequent paragraphs.

3.3.5.2 Deficiencies in the DPR

- **Projects initiated without ensuring feasibility**

The DPR for construction of 26 MLPs in Tel Basin of Kalahandi district envisaged (November 2012) that the water would be supplemented by Hati Barrage under UIIP through the flowing water to be received in the river Tel. Accordingly, the EEs executed 26 MLPs at a cost of ₹ 587.78 crore in August 2013 for completion by February 2016 in Tel Basin to provide irrigation to 34,200 ha during Kharif season i.e. from June to November every year.
Out of 26 MLPs, five projects with ayacut of 4,500 ha were completed during 2017 with an expenditure of ₹82.37 crore. Of these completed MLPs, one MLP with ayacut of 900 ha could not provide irrigation due to inadequate water at source. The works of other projects were in progress with total expenditure of ₹591.16 crore.

Audit further noticed that the Tel river had no barrages and could provide water only when there was sufficient rainfall. In case of scanty rainfall or drought situation, the system would not provide any irrigation. Besides, the Hati Barrage under UIIP had insufficient water to meet the ayacut of UIIP as discussed in the **paragraph 3.3.1.4.** As such, Hati Barrage also could not supplement water to Tel river in normal condition except in case of heavy rains or flood.

While confirming Audit findings, the Government stated (July 2021) that construction of temporary cross bund would allow water to enter sump well

through intake system to meet the demand. However, to improve its efficiency, construction of an in-stream structure had been suggested.

3.3.5.3 Assessment of water availability in test-checked projects

- **Construction of Mega Lift Projects with dry source**

Out of nine completed sampled MLPs; four[25] projects with designed ayacut of 3,150 ha were constructed at a cost of ₹60.59 crore. These projects could not provide irrigation due to non-availability of sufficient water in the source as the water source was dry in one project (Kapsila project) and in the remaining three projects the water level remained below the trash back bottom level [26]. To make the projects functional, the Project Director-cum-Chief Engineer, MLP approved (October 2019) construction of low height in-stream storage structures which have not yet been taken up (September 2021).

As the lift projects were not made functional due to non-construction of in-stream storage structures, the designed ayacut of 3,150 ha could not be irrigated rendering expenditure of ₹60.59 crore infructuous.

Government while accepting the findings stated (July 2021) that if the dry spell within rainy season persisted for a longer period, then water depth in river might deplete below the designed depth causing inconvenience in providing irrigation as the inlet of the system was kept at 0.6 m above average bed level of river to restrict free intrusion of sand into the system. However, to improve its efficiency, construction of an in-stream structure had been suggested. The reply is not acceptable since this aspect should have been addressed during execution of the projects.

Audit noticed that since the Tel river had no barrages and could provide water only when there was sufficient rainfall, construction of MLPs taken up without ensuring feasibility and sufficiency of water at source was unfruitful.

3.3.6 Minor Irrigation Projects

The MIPs provide irrigation from the availability of water of perennial sources through Nullahs or through existing canal system. MIPs are popular due to its low gestation period, adaptability to all regions, speedy creation of irrigation potential, rare or no R&R issues, low cost and easy

Head works of Talijore MIP

[25] Agalpur, Gudvela, Kapsila and Laitera

[26] Refers to the bed level of water to be maintained for Lift Irrigation projects.

operation and maintenance. Government approved 10 MIPs under Accelerated Irrigation Benefit Program (AIBP) during 2007-08 in KBK districts[27] to provide irrigation to 1,612 ha at a cost of ₹14.70 crore. The projects were completed at a cost of ₹20.34 crore (38 *per cent* increase) with achievement of Ayacut as 772 ha (48 *per cent*). The escalation of project cost varied from Nil (Damkipalli) to 242 *per cent* (Ankamara).

Although the Department had shown that 10 MIPs were completed, in two projects[28] only head works had been completed and distribution system had not been taken up. In other six projects[29] the distribution system was partly completed for which irrigation could be provided to the ayacut of respective MIPs to the extent of 26 to 75 *per cent*. In other two projects[30], although the projects were completed in all respects, water could not be supplied due to protest by the land losers as compensation towards LA had not been paid.

During Exit Conference the Principal Secretary stated (August 2021) that the Department was in the process of introducing Enterprise Resources Planning, Project Management Information System, and Irrigation Management System etc., for intensively monitoring the progress of the irrigation projects under progress which were encountering issues of LA, Forest clearance, R&R problems and delay in execution of projects.

3.3.6.1 Assessment of Project deliverables with the intended objectives

The DPRs of all the test checked MI Projects envisaged to provide irrigation only to the designed ayacuts. The details of component-wise IP proposed and achieved in test checked projects and gist of Audit comments are given in the table below:

Table 3.12: Component wise up-to-date Target and achievement of IP in the selected projects

Name of the project	Project components	IP proposed (in Ha)	IP Achieved (in Ha)	Gist of Audit comments
MIPs (10 No.)		1,612	772	Shortage of IP created was mainly due to non-completion of distribution network, delay in LA and non-payment of compensation to land losers. No PPs have been formed yet. The actual utilisation of ayacut could not be ensured since the created ayacut has not been certified through joint verification with the revenue authorities.
Grand Total		**1,612**	**772**	

(Source: - Compiled by audit from the records of project authorities)

Audit analysis and the deficiencies observed on the projects are detailed below.

[27] The erstwhile districts of Koraput, Balangir and Kalahandi (popularly known as KBK districts) have since 1992-93 been divided into eight districts: Koraput, Malkangiri, Nabarangpur, Rayagada, Balangir, Subarnapur, Kalahandi and Nuapada

[28] Barahanalla, and Damnipalli

[29] Ankamara, Brahamanijore, Jatakhalia, Nagapara, Nuapali and Tiljodi

[30] Chitalparha, and Talijore

3.3.6.2 Non-acquisition of land delayed the execution of works

The CE, MI sanctioned (2010-11) ₹2.15 crore for construction of Barahanalla MIP in Kalahandi district to provide irrigation to 250 ha for completion by 2011-12. The EE, Kalahandi MI Division executed the head works of the project which was completed during 2011-12 with an expenditure of ₹1.14 crore. The distribution system with a length of 7.58 km had not yet been taken up due to non- acquisition of 27.89 acre of land situated in the scheduled area (August 2019). Thus, the farmers were deprived of irrigation for more than nine years with blockade of funds of ₹1.14 crore.

The Government accepted and stated (July 2021) that to avoid LA, the construction of distribution system has been proposed to be taken up under UGPL scheme in May 2021. Evidently, the project remained idle for more than 9 years.

10 MIPs were taken up at a cost of ₹14.71 crore to provide irrigation to 1,612 ha between 2006-08 were completed (2010-14) at a cost of ₹20.34 crore but could provide irrigation to only 772 ha (48 *per cent*) due to non construction of distribution system.

3.4 Benefit Cost Ratio (BCR)

BCR is the ratio of annual additional benefit on account of irrigation to the annual cost of providing those benefits. The calculations of BCR are incorporated in the DPRs, as it is an essential requirement for determining the economic feasibility of an irrigation project. It plays a vital role for execution of any project which depends upon the cost of project *vis-à-vis* benefit derived from various sources *viz*; irrigation, industrial water supply, drinking water supply *etc*. As per guidelines for preparation of DPRs of irrigation and multipurpose projects, the minimum BCR for approval of such projects in Drought Prone Areas was one and in other areas it was 1.5.

During test check of sampled projects, it was noticed that the BCR of the projects as envisaged in the DPRs were prone to changes because of the reasons as detailed below:

- In order to calculate the BCR, the department projected in the DPR that various crops like paddy and other cash crops like vegetables, pulses, oilseeds *etc.* were to be grown. Audit observed that in all of the test checked projects, though a multi-cropping pattern was envisaged in the DPRs, paddy was the only crop produced by the farmers, which had a negative impact on the BCR. Audit conducted joint physical verification in the presence of representatives of the department and found that the farmers produced only paddy in the irrigated areas. This was also confirmed by the CCE and by the farmers during interaction with them during field visit by the Audit.

  Due to non-creation of awareness programme and proper monitoring they adopted the traditional pattern of farming without following any muti-cropping pattern.

- Besides, the ayacut of three projects (SIP/RRBC/RLBC) were reduced to a large extent.
- Cost of the project was enhanced by more than five times the original cost (UIIP and LIIP).

The BCRs given in the DPR and BCR calculated basing upon the cropping pattern adopted, revised ayacut and higher project cost are given below:

Table 3.13: Project-wise BCR projected and calculated based on reduced ayacut

Name of the Project	Year of commencement	BCR of the project as per DPR	BCR calculated as per revised ayacut and cropping pattern	Designed ayacut in lakh ha	Reduced ayacut in lakh ha
SIP	1982	1.62	0.70	1.09	0.92
UIIP (Extension)	2003	2.44	0.79	0.25	0.25
LIIP	1999	1.27	0.71	0.30	0.30
RRBC	1978	2.27	0.79	1.21	0.67
RLBC	2016	Not calculated	0.84	1.14	0.79
MLP	2013-15	More than one	Less than one	0.59	0.59
MIP	2006-08	More than one	Less than one	0.01	0.01

(Source: compiled by Audit)

From the table above, it could be seen that BCR calculated by Audit, in respect of all the test checked projects ranged from 0.70 to 0.84 only. BCRs of all the projects were actually less than one rendering the projects economically unviable.

It was observed that BCR calculated while approving the projects/schemes was not sacrosanct as the actual BCR had reduced significantly due to increase in cost as outlined in earlier paragraphs and decrease in benefits in cases where the utilized IP was below the IP envisaged.

Government stated (July 2021) that crop diversification and farmers' awareness could not be achieved in a short period, as various departments were involved in this context and this was a State level problem and it was proposing capacity building for improvement of farmers' awareness.

3.5 Command Area Development

The GOI launched CAD Programme in 1974, in which assistance is provided to the States on matching basis for on-farm development works such as land levelling and shaping, field channels, field drains, farm roads, agricultural & irrigation extension services *etc.* The command area development works *inter alia* included agricultural extension services, major drainage channels, lateral drains *etc*. The required length and execution of CAD works on test checked projects are given below:

Table 3.14: Showing length of CAD works required and executed in test checked projects

Sl. No	Name of the Project	Required length of channel of CAD works (in km)	Channel length of CAD works executed (in km)
1	SIP	1,016.97	118.83
2	UIIP (extension)	764.52	627.31
3	LIIP	Taken up under UGPL	Taken up under UGPL
4	RRBC	507.68	Not yet taken up.
5	RLBC	701.82	Not yet taken up
6	MLPs	Being Lift projects, not required	Being Lift projects, not required
7	MIP	23.16	Not yet taken up
Total		**3,014.15**	**746.14**

(Source: - compiled by Audit from the records of project authorities)

❖ In SIP project, although the project was providing irrigation to 33,899 ha, CAD works for only 6,587 ha had been executed (2013-14). Further as per CAD guidelines 30 m of water course/field channel should have been executed for one ha. As such 197.61 km should have been executed for required length of 6,587 ha against which 118.83 km had been executed. This indicated that the CAD works were executed in some patches in deviation to the guidelines. Fewer execution of CAD work was due to failure of the Department to acquire land for the continuous stretch of distribution system. Further, it was noticed that against the cost norm [31]of ₹9.55 crore for construction of 118.83 km of CAD work, the department had incurred an expenditure of ₹26.31 crore leading to extra expenditure of ₹16.76 crore.

Government stated (July 2021) that steps were being taken to complete the CAD works by the end of December 2021 without explaining the delay and shortfall in length.

❖ The extension of canal of UIIP had been completed in 2015-16. The CAD work for 627.31 km (82 *per cent*) had been executed in the entire ayacut covering 25,484 ha against the requirement of 764.52 km as required under guidelines (30 m per ha) resulting in short execution of 137.21 km. The short execution of CAD work was due to improper assessement of the actual ayacut to be covered as per norm by the EEs. Audit also noticed that the construction of water course/field channel were executed with 150 mm thickness side wall and bed against the requirement of 75 mm as stipulated in BIS code. Against the cost norm of ₹36.12 crore, the EEs incurred an expenditure of ₹85.68 crore leading to extra cost of ₹49.56 crore.

Government stated (July 2021) that as per actual execution 627.31 km length of field channel had been constructed for 25,484 ha. The reply is not acceptable as there was short execution of 137.21 km and the reasons for shortfall was not furnished to audit.

❖ The EE, Rengali Right Canal Division-II had deposited ₹25 crore during 2016-20 with CAD Division No-10, Dhenkanal under DoWR for development of command area. Out of ₹25 crore, UC for ₹2.72 crore only

[31] As per norm of BIS code the actual cost per metre was calculated as ₹575.83 by Audit.

had been provided. Despite lapse of four years, the CAD, Dhenkanal division could execute the work of ₹2.72 crore. As a result the payment of ₹22.28 crore remained idle without rendering benefit of the irrigation through CAD to the farmers.

The Government stated (July 2021) that an expenditure of ₹9.76 crore towards execution of CAD works had already been spent and the balance work was under progress for completion, after which irrigation would be provided. The reply is not acceptable since funds had been released as early as in 2016 and the works were still in progress.

The CAD works were to be executed for equitable supply of water to the tail end of the ayacut. Due to non-completion of the work, the equitable distribution of water to the tail end users could not be ensured.

During Exit Conference (August 2021) the Principal Secretary to Government stated that the works would be taken up through MGNREGS *etc*.

Recommendations:

- **The State Government may evaluate performance of the components of individual projects to identify specific areas for focussed attention and direct all executants to intensify efforts for their expeditious completion.**
- **Government may ensure commencement of project works after acquisition of land as stipulated in OPWD code**.
- **Government may adopt suitable mechanism for timely acquisition of land and evacuation of the displaced persons immediately after payment of R&R assistance and fix accountability on officers responsible for delay in land acquisition and evacuation of the displaced persons resulting in extra payments.**
- **Responsibility needs to be fixed on executives for improper survey and adoption of defective design causing slippage of embankment necessitating avoidable restoration works.**
- **Accountability on executives needs to be fixed by the Department for defective execution of works.**

CHAPTER - IV
EFFICACY OF STAKEHOLDERS HANDHOLDING FOR SUSTAINABILITY OF THE PROJECT

Chapter IV

Efficacy of stakeholders handholding for sustainability of the project

4.1 Laxity in compensatory afforestation

It was seen in audit (July 2019) that SIP/LIIP/RRBC/RLBC authorities had deposited an amount of ₹282.93 crore with the Forest Department for catchment treatment plant, canal bank plantation, wild life management, compensatory afforestation and Net Present Value for 3,504.43 ha of non-forest land. This was muted against the equivalent forest land utilized for construction of these projects as detailed below:

Table 4.1: Showing details of forest land utilized, compensatory afforestation proposed and amount deposited

Name of the project	Forest land required (in ha)	Forest land acquired (in ha)	Compensatory afforestation proposed (in ha)	Amount Deposited (₹in crore)
SIP	1,166.07	1,166.07	1,166.07	1.16
LIIP	1,042.97	1,042.97	1,042.97	97.21
RRBC/RLBC	1,295.39	812.02	1,295.39	184.56
Total	**3,504.43**	**3,021.06**	**3,504.43**	**282.93**

(Source: compiled by Audit)

Even after 10 years, UC for only ₹70.93 crore has been received. Since no expenditure was incurred, no UC for the balance amount could be submitted by Forest Department resulting in blockage of government fund for ₹212 crore.

Government stated (July 2021) that necessary action was being taken to receive UC for balance amount.

4.2 Non-clearance of forest land

In two test checked-projects non-clearance of forest land led to non-completion of works and consequent deprival of farmers of irrigation facility as described below:

(i) Planning Commission approved the Rengali Multipurpose Project in 1978. The construction of the project involved clearance of forest land of 2,107.40 ha. The Department deposited an amount of ₹171.89 crore towards forest clearance and also obtained the Stage-I and stage-II clearance for 812.02 ha. Clearance for the balance 1,295.38 ha was yet to be obtained. Due to want of clearance of Forest land in the changed canal alignment, the completion of three Branch Canals of the RRBC was delayed for more than 16 years (May 2003-August 2019).

Accepting the factual position Government stated (July 2021) that Stage I & II Forest Clearance were obtained for 812 ha & 874.59 ha respectively and for the remaining 429.91 ha, forest clearance efforts were in progress.

(ii) Construction of Sukinda Branch canal off-taking at RD 96.65 km of LBC under RLBC was taken up in October 2018. The length of the canal was 28.29 km with designed ayacut of 6,458 ha. Canal works costing ₹134.70 crore was taken up between October 2018 and July 2019 for completion

between April 2020 and January 2021.The execution of canal work was taken up in patches where no clearance for the forest land was required. Although, sufficient funds was available including the loan assistance from JICA since 2015-16, yet the canal work could not be completed for want of forest clearance due to change in canal alignment which delayed the irrigation facility with denying the intended benefits to the farmers.

Accepting the factual position Government stated (July 2021) that the land acquisition of private land and forest land was a long process which involved various Departments. However, the land acquisition process of this Canal had reached 95 *per cent* and trial irrigation was expected to be provided during 2021-22.

4.3 Involvement of Agriculture executives

Intensity of irrigation[32]assessed and proposed in DPRs by DA & FE is given in the Table below:

Table 4.2: Showing details of intensity of irrigation proposed in DPRs of the projects

Name of the Project	Irrigation intensity (in *per cent*)	Cropping pattern
SIP	171	**Kharif**-paddy, oilseeds, pulses and vegetables **Rabi**-wheat, pulses, vegetables, potato *etc*
UIIP ***(Extension)***	164	**Kharif**-paddy **Rabi**- paddy, vegetables and pulses and **Annual cropping**-vegetable and sugarcane
LIIP	130	**Kharif**–paddy, ragi, maize **Rabi**-wheat, pulses, groundnut, vegetables, potato, til and mustard
RRBC/ RLBC	170	**Kharif**– paddy, sugarcane, vegetables etc **Rabi**- wheat, pulses, vegetables, oil seeds *etc*
MLP	100	**Kharif**–paddy, oilseeds, vegetables *etc*
MIP	Assessment of irrigation intensity of the test-checked 10 projects were not on record.	

(Source: Compiled by Audit)

Audit test checked the records of CDAOs and consequent visit of ayacut jointly with the departmental officers (August 2019) revealed that only paddy was cultivated in the ayacut of the projects against various crops to be cultivated as envisaged in the DPR of the Projects.

4.4 Power generation by industries in test-checked project

CE & BM, Brahmani Left Basin, Samal entered (May 2006) into an agreement with Odisha Power Consortium Limited (OPCL), a private limited company for establishment, operation and maintenance of 20 MW Small Hydro Electric Power Project at the right side of RLBC of Samal Barrage, Angul. Audit observed that the IP utilised was only 34 *per cent* of IP created due to

[32] Intensity of irrigation is defined as the percentage of CCA proposed to be irrigated during the year.

defective execution of canal work. There was nothing on record assuring sufficiency of water for both power generation and irrigation project in the DPR of RLBC. However, the flow of water was diverted and optimally utilised by the industry for power generation.

4.5 Water supply for industrial use in projects

Water supply for industrial use was not envisaged in the DPR of Rengali Multipurpose Project. Due to delay in construction of canals, the irrigation to the designed ayacut could not be provided. This irrigation water was diverted for industrial use and even the legitimate dues to Government were not paid by those industries leading to non/short recovery of ₹1,441.83 crore as detailed in **Appendix-I.**

Recommendation:

- **Government needs to take initiatives by interacting with farmers for adopting a multi-cropping pattern as envisaged in project proposals.**
- **Responsibility needs to be fixed on the authorities for non-levy/non-recovery of legitimate water charges from industries drawing water from irrigation projects.**

CHAPTER – V
MONITORING OF PROJECTS

Chapter – V

Monitoring of projects

5.1 Non-functional/ non-completion of LI project

The Project Report of RLBC envisaged providing lift irrigation to 12,316 ha in highland areas. The Project Authority, RLBC deposited (during 2004 to 2012) ₹26.35 crore with EE, Lift Irrigation Division, Dhenkanal for construction of 19 Lift Irrigation (LI) Projects to provide irrigation to 2,780 ha. The Division had constructed 17 lift projects during 2013-16 to provide irrigation to 2,220 ha incurring an expenditure of ₹15.67 crore. Execution of balance two projects with an ayacut of 560 ha was under progress (September 2019) due to delay in want of clearance from NHAI and Railway authorities. Audit scrutiny revealed that of the 17 completed LI projects, five projects[33] with an ayacut of 680 ha (24 *per cent*) were functional and balance 12 projects[34] remained defunct due to continuous theft of spares. Audit conducted Joint Physical Inspection of LI project -Chandapur-III with an ayacut of 100 ha completed in 2013 and stated to be operative and found that the project was defunct since 2017. The Department had not taken any initiatives for completion of balance two projects and upkeep of the projects through PPs. Thus, poor monitoring by the Department led to denial of irrigation to 2,200 ha (76 *per cent*) despite incurring expenditure of ₹15.67 crore. Besides, balance funds of ₹10.67 crore were lying idle with EE, Lift Irrigation Division, Dhenkanal.

Government accepted (July 2021) that due to lack of proper maintenance, watch & ward *etc*., by the respective PPs, some projects such as Chandpur-III were not functional as these projects had no provision for maintenance. The reply is not acceptable since 13 out of 17 LI Projects were found defunct and no action had been taken to make them functional, indicating laxity in monitoring.

5.2 Sub-standard execution of work due to lack of monitoring

The project authority of SIP, constructed an aqueduct at RD. 00 km of SMC which got completed in 2006. In order to provide trial irrigation in the project, 20 cumecs of water was released in 2013-14 through the aqueduct. When water was discharged through the aqueduct, it leaked profusely. The E-i-C inspected (May 2014) the aqueduct and advised to take remedial measures to prevent the leakage so as to protect the structure from further deterioration and emphasised structural strengthening and water proofing of the aqueduct. Audit noticed that no remedial measures had been taken (July 2019) by CE&BM/SE of SIP. As such, in the event of release of water to its designed capacity of 118.50 cumecs, possibility of collapse of the structure could not be ruled out. In the event of collapse of the aqueduct the supply of irrigation water to the entire SIP would be stopped. This indicated laxity in monitoring by the authorities of works executed.

[33] (i)Badajhara, (ii)Chandapur-III, (iii)Jantanibol, (iv)Kantoor-II and (v)Kantoor-III

[34] (i)Baghua, (ii)Bangura, (iii)Birasal, (iv)Brahmania, (v)Chandapur-I, (vi)Chandapur-II, (vii)Kanpura,(viii)Kantoor-I, (ix)Kapasira, (x)Muktaposi, (xi)Rahani and (xii)Sibulaposi

5.3 Lack of measures in quality control

Slipped portion of canal siphon at RD 59.730 km of RBC

The Agreement condition stipulated that the samples of materials should be furnished to the Departmental laboratory for testing. After satisfactory test results confirming to technical specifications, the materials were to be utilized. In test checked projects, Audit noticed that the department did not conduct any test of the materials so as to ensure the comprehensive strength of the structures constructed. On test check, Audit noticed that a siphon was constructed at a cost of ₹16.40 crore during 2006 in NH crossing of RRBC at RD 59.73 km. During trial irrigation in 2016, there was severe leakage from the canal. The E-i-C visited (8 September 2016) the site and observed that the leakage was due to settlement of approach slab and subsoil erosion by piping and suggested for remedial measures by dismantling and removing the entire settled portion. Accordingly, the work was completed (August 2017) through the existing contract with an extra expenditure of ₹7.32 crore. Thus, due to lack of monitoring and quality control of the materials utilized, the department incurred extra expenditure of ₹7.32 crore.

Government stated (July 2021) that leakage might have been caused due to small cavity formation as water was supplied after a decade. It was also stated that the cost of restoration was only ₹95 lakh without providing details of expenditure incurred.

Similarly, during joint physical verification of the distribution system of Amath MLP, Audit noticed that the pipes utilised in the work were leaking and water was not flowing in the outlet. The reason attributable to such lapse was non-utilisation of pipes in correct specifications. Laxity on the part of executives in monitoring the materials utilised by the contractors led to leakage of pipes.

The State Government replied (July 2021) that the public were knowingly damaging the pipes of the outlets for irrigation. Evidently, there is lack of vigilance and monitoring mechanism in the infrastructure created by Government.

5.4 Inadequate monitoring of MLPs

Audit conducted the joint physical verification and found that in the four completed projects costing ₹56.85 crore under cluster-XIV for an ayacut of 3,100 ha water was not reaching the tail-end of the pipeline due to various reasons such as leakages in the pipeline, less pressure in the pipeline due to insufficient water in the source, operation of less number of pumps on account of low voltage and non-operation of pumps due to high voltage and frequent fluctuations in power supply. Thus, inadequate monitoring of the MLPs, despite an expenditure of ₹56.85 crore has not ensured sufficient irrigation to the designed ayacut of 3,100 ha.

Government stated (July 2021) that the OPTCL authorities were on the job to optimize their power system so that voltage problems could be reduced to a great extent.

5.5 Non-levy of penalty for delay in completion of work

Time is the essence of the contract. Further, contract condition stipulates that failure of the contractor to complete the work in time, the contractor is liable to pay compensation at 0.5 *per cent* per day subject to maximum of 10 *per cent* of the estimated cost. Test check of records revealed that despite non-completion of the work in time the department had not levied penalty of ₹167.79 crore as detailed in the table below:

Table 5.1: Showing non levy of penalty due to delay in execution of works

Sl.No.	Projects involved	Penalty (₹ in crore)	Impact
1	SIP	27.34	Three works[35]with estimated cost of ₹273.43 crore were awarded (between June 2016 and December 2016) to OCC on signing of Memorandum of Understanding (MoU) for ₹315.32 crore with stipulation to complete the said works between August 2018 and December 2018. Audit noticed that OCC could complete the work valuing ₹302.61crore (96 *per cent*) as of September, 2020. As there was no provision for levy of penalty for delay in execution of work in MoU, penalty of ₹27.34 crore, being 10 *per cent* of the estimated cost, could not be levied and recovered.
2	LIIP And MLP	140.44	Four contractors were awarded works between August 2013 and March 2018 for completion between February 2016 and February 2019 for ₹1,404.44 crore. The works could not be completed despite repeated instructions from the EEs as the delay was attributable to the contractors. As such liquidated compensation for ₹140.44 crore should have been recovered from the contractors.

(Source: Compiled by Audit)

The State Government stated (July 2021) that the delay in execution of canal works was on account of release of surplus water of reservoir through spill channel, delay in receipt of permission for blasting, general election, LA, forest clearance, *etc*. The reply is not acceptable as the reasons furnished are too general and were known to the contractors while accepting the contracts.

In addition to aforesaid deficiencies, the Audit also found several irregularities on tendering, extra cost due to adoption of excess lead, preparation of estimates without adhering the SoR/AoR which led to excess payment to the contractors, execution of works in violation to BIS code which are given in the **Appendix-II** enclosed:

[35] (i) Construction of spillway of Haldia earth dam, (ii) Baisinga feeder cum link canal and Restoration of SMC

5.6 Non maintenance of Registers of check measurement

Appendix-II of OPWD Code stipulates that Register of check measurement should be maintained and that measurement of work shall be done by Superior Officers. Divisional Officers should check measure 10 *per cent* of the works costing more than ₹2 lakh to check the accuracy of the measurements recorded by the subordinate officers. The objective of check measurement is to detect errors in measurement and to prevent fraudulent entries and also to see that the specifications have been faithfully maintained. Divisional Officer should particularly check measure extra items in respect of which the executed quantity had exceeded the original quantity by more than 10 *per cent*. However, it was noticed that none of the divisions test-checked had maintained the Registers of check measurement for which Audit could not ensure that the superior officers had conducted the required check and certified the accuracy of the measurements recorded by the subordinates.

Government stated (July 2021) that the observation of audit had been noted for guidance and assured to maintain check measurement register in each division.

5.7 Systemic issues observed in test checked projects

Despite audit recommendations to avoid delays in land acquisition, forest clearance and ayacut planning reported in Paragraph 2.3 of Audit Report (March 2009) under Accelerated Irrigation Benefit Programme, the following systemic issues as detailed below persisted.

- Out of five test checked major projects, four projects (except UIIP) which commenced between 1978 and 1999 were still under progress with time and cost overruns on account of delay in land acquisition, forest clearance, delay in finalization of design, inadequate survey and investigation, *etc*. In some projects the costs had gone up by 9 to 46 times.
- Due to delay in execution of UIIP, SIP and RLBC projects, the designed ayacut has been overlapped by MI projects, thereby increasing costs and bringing redundancies.
- In two test-checked projects (SIP and LIIP), non-evacuation of DPs despite payment of R&R assistance caused further payment of enhanced assistance.
- Non-adherence to the design and drawings as per DPR for lined canals, slippages of canal embankments was seen in UIIP and SIP projects.
- Lack of co-ordinated efforts on the part of different departments has led to single-cropping in irrigated ayacuts, instead of multi-cropping, envisaged in the DPRs. This has also contributed to reduction in benefit-cost ratio, making the projects economically unviable.

CHAPTER - VI
CONCLUSION AND RECOMMENDATIONS

Chapter – VI

Conclusion and Recommendations

6.1 Conclusion

Odisha Government had initiated various irrigation projects (Major, Minor, Mega Lift *etc*.) at considerable cost with the objective of providing adequate and assured water supply for farming. However, as noticed in audit, lack of adequate and assured supply of water through completion of irrigation projects has deprived the farmers of irrigation facilities.

During the period covered by this Performance Audit *i.e.* 2014-19, audit test checked five major Irrigation projects, nine MLPs and 10 MIPs for which a sum of ₹12,742.11 crore had been incurred up to March 2020. Other than nine MLPs, increase in cost of the projects ranged between 182 and 4,596 *per cent*. Despite escalation, only one major project *i.e.* UIIP had been completed and other four major projects were in different stages of execution.

Performance Audit of Surface Irrigation revealed several deficiencies in the planning, implementation and monitoring of the projects. The financial management of the test -checked projects was marred due to surrendering of funds resulting non-completion of projects despite availability. There were also instances of loss of central assistance, parking of funds without utilization, non-realisation of government revenue, non-adjustment of advances and inadmissible payment of tax.

Projects were found deficient in preparation and execution of DPRs and incorrect calculation of BCR of the projects. These led to modifications in design and scope of work and revision in cost estimates affecting the schedule of implementation of the projects. Similarly, in spite of incurring expenditure of ₹12,742.11 crore in all of the test-checked projects, the IP achieved was 1,22,418 ha against IP proposed of 5,02,842 ha which constituted only 24 *per cent* of the envisaged potential. The reasons for non-completion and non-achievement of IP in test checked projects are non-acquisition of land, deficient DPRs, defective survey and investigation, deficient design in execution of the projects, inadequate availability of water in the canals *etc*. Implementation of major projects are facing delays ranging from 13 to 43 years.

The delays and cost overrun were due to factors such as delayed land acquisition, delayed R&R measures and deficiencies in works management etc.

As only paddy is cultivated without adoption of a multi-cropping pattern by the farmers in the project ayacuts, all the projects run the risk of economic unviability. There were also deficiencies in participatory management as well

as handholding the stakeholders and laxity in monitoring of project implementation.

Though the extension of irrigation facility is of critical importance for the growth of the agricultural and farming sector and despite release of substantial funds for completion of the projects, the projected irrigation potential (IP) could not be created to the benefit of farmers.

6.2 Recommendations

1. Department needs to closely monitor financial management of the irrigation projects and fix responsibility on the executives for financial irregularities**.**

2. The State Government may evaluate performance of the components of individual projects to identify specific areas for focussed attention and direct all executants to intensify efforts for their expeditious completion**.**

3. Government may ensure commencement of project works after acquisition of land as stipulated in OPWD code.

4. Government may adopt suitable mechanism for timely evacuation of the displaced persons immediately after payment of R&R assistance and fix accountability on officers responsible for delay in evacuation resulting in extra payments.

5. Responsibility needs to be fixed on executives for improper survey and adoption of defective design causing slippage of embankment necessitating avoidable restoration works.

6. Accountability on executives needs to be fixed by the Department for defective execution of works.

7. Government needs to take initiatives by interacting with farmers for adopting a multi-cropping pattern as envisaged in project proposals.

8. Responsibility needs to be fixed on the authorities for non-levy/non-recovery of legitimate water charges from industries drawing water from irrigation projects.

Bhubaneswar
The: 04 MAR 2022

(Bibhudutta Basantia)
Principal Accountant General (Audit-II)

Countersigned

New Delhi
The: - 8 MAR 2022

(Girish Chandra Murmu)
Comptroller and Auditor General of India

APPENDICES

Appendix-I

(Refer paragraph 4.5 at page 51)

Statement showing issues on industries utilizing water from irrigation source

Sl. No	Name of the Project	Nature of discrepancies	Impact on discrepancies
1	RLBC	Odisha Irrigation Rule stipulates that if payment of water tax was delayed, interest at two *per cent* per month was to be levied for the delayed payment. CE & BM, Brahmani Left Basin, Samal entered in to an agreement (May 2006) with Odisha Power Consortium Limited (OPCL) for drawal of 260 cumecs of water at 110 m downstream of the left head regulator of Samal Barrage for a period of 30 years with payment of water rate at ₹60 per one lakh gallon.	The agency had drawn 49.38 lakh gallon of water from October 2009 to September 2010 but water rate and interest thereon at two *per cent* per month amounting to ₹246.14 crore was not recovered from the agency (August 2019). Government stated that proposal of OPCL to waive out of water cess/ charges for the period from October 2009 to September 2010 has not been finalised yet. Demand notices are served as per Odisha Irrigation Amendment Rules, 2010.
2	RLBC	As per Rule 23-A of Orissa Irrigation (Amendment) Rules 2010 water tax at ₹5.60 per unit was to be collected for drawal of water from Irrigation source. The water rate shall be enhanced at 10 *per cent* per annum from 1 April each year with effect from April 2016. Three industrial units[36] were drawing water from Samal barrage and paying water tax at ₹5.60 per unit. As per the revised order, the unit price of the water shall be ₹6.16/6.78/7.46 per unit from 1 April 2017/1 April 2018/1 April 2019 respectively.	The division had recovered at ₹6.16 per unit during 2017-18, but during 2018-20 water rate was recovered at ₹6.72 and ₹7.28 instead of ₹6.78 and ₹7.46 per unit. This led to short recovery of water rate of ₹2.40 crore towards drawal of 2,398.50 lakh unit of water during 2018-20 (September 2019). Government stated in reply that the EE, charged water taxes as per Odisha Irrigation (Amendment) Rules 2010 and its successive amendments from time to time. The reply is not acceptable since the Gazette notification provided for enhancement of water tax at 10 *per cent* per annum on the prevailing water rate, but the EE recovered at lesser rates.
3	RLBC	Due to non-achievement of designed ayacut of RRBC/RLBC the Samal barrage water was diverted to the river Brahmani resulting in availability of water in its downstream. So water drawn from the downstream should be treated as irrigation source and water rate levied at ₹5.60 per 1000 cum.	Three industries[37] were drawing water for 739.10 lakh cum per year from the downstream but paying water tax at ₹4.50 per cum as against the irrigation rate of ₹5.60 per cum leading to short recovery of water tax of ₹43.54 crore. Government stated that the classification of water source and recovery of water rate were finalised by Government and the EE had raised demand notices accordingly. The reply is not acceptable as the water diverted from Samal barrage was drawn by industries. Hence, the source should be treated as irrigation source.

[36] National Thermal Power Corporation (NTPC), Jindal India Thermal Power Limited (JITPL) and Jindal Steel and Power Limited (JSPL)

[37] National Aluminium Company (NALCO), Talcher Thermal Power Station (TTPS) and Mahanadi Coalfields Limited (MCL)

Sl. No	Name of the Project	Nature of discrepancies	Impact on discrepancies
4	RLBC	Irrigation rule stipulates that the industries drawing water should execute agreement with the EE and install a flow meter in support of the actual drawal of water failing which six times the water rate should be collected.	Contrary to the above, one industry[38] was drawing water for 47.696 cumecs without executing agreement and without installation of flow meter. But six times penalty of ₹505.08 crore was not recovered during 2014-19. Government did not furnish any specific reply on non-execution of agreement and non-installation of flow meter.
5	RLBC	Irrigation Rules provided that the water rate is to be recovered from the industrial units drawing water. In case of default in payment, compounded interest at two *per cent* per month was to be recovered along with the principal. An industry[39] was drawing 47.696 cusecs of water from 1999 and was not paying the water rate despite issue of demand notice regularly.	Against total water charges of ₹697.32 crore, the Government however waived the interest of ₹644.67 crore and mutually settled for payment of ₹52.65 crore in March 2018 resulting in loss of Government revenue for ₹644.67 crore which was in contravention of Irrigation Rule. The compound interest are to be collected after getting subsequent orders from Hon'ble Court as the matters are sub-judice and pending at Hon'ble High Court of Odisha.

[38] NALCO
[39] NALCO

Appendix-II
(Refer paragraph 5.5 at page 55)
Statement showing other irregularities noticed in Contract Management

Sl. No	Name of projects	Extra cost (₹*in crore)*	Irregularities noticed
Irregularities noticed in tenders			
1	SIP	1.46	In the works Construction of Spillway of Haldia Dam of SIP tender was called by OCC for ₹134.71 crore in stead of the value of work proper of ₹133.38 crore which led to extra cost considering corporation charges. Government stated that the tender for the work has been invited for ₹133.38 Crore excluding contingency charges. This was factually incorrect as tender was called for ₹134.71 crore.
2	RRBC	50.01	The EE, RRBC awarded a work of right bank canal from RD. 86 Km to 89 Km to a contractor for ₹43.55 crore. The department closed the contract (June 2000) after executing work for ₹7.70 crore including equipment advance of ₹1.53 crore without attributing any reason. The contractor filed a case in June 2000 itself in the Hon'ble High Court of Odisha who gave verdict in favour of the contractor. However, the contractor did not resume the work. The department executed the balance works through another contractor at a higher cost leading to extra expenditure of ₹50.01crore. Government stated that as the scope of the work was changed, the contract was closed and retendered. The reply is not acceptable as extra expenditure could have been avoided had the contract was continued with the quoted item rate.
3	LIIP	15.66	Central Vigilance Commission instructed (January 2009) to follow a fair, transparent and open tendering procedure. Contrary to the above provisions, the EE, LIIP awarded three irrigation canal works[40] to OCC at a cost of ₹60.12 crore between May 2016 and August 2016 at a tender premium of 15.49 to 23.19 *per cent*. Audit observed that during 2014-18, Canal lining works were awarded to contractors at 14.99 *per cent* less than the estimated cost. Direct entrustment of work to OCC led to extra cost. Government stated that the works were awarded to OCC to avoid delay in tender procedure and early completion. The reply is not acceptable as the project remained incomplete as of March, 2019 even after award of works to OCC at much higher rates in comparision to other works which were awarded to private contractors.
Extra cost due to provision of excess lead			
1	SIP	15.56	In construction of Haldia dam and construction of Baisinga Feeder cum link Canal of SIP, the EE provided 12 km and five Km lead for burrow earth/ disposal of earth instead of seven kms/one kms respectively. Similarly in two works i.e. (i) Restoration of SMC from 7.95 Km to 8.84 Km and construction of spillway of Haldia Dam of SIP, the EE allowed transportation of sand with lead ranging from 24 to 27 Km against 11 to 24 Km which led to extra expenditure of ₹15.56 crore. Government stated that though earth was available within seven km lead it was not suitable for utilising in the earth dam section. The reply is not acceptable as the earth from seven Km was already

[40] Construction of balance work of (i) Bangomunda Branch Canal, (ii) Construction of CC lining of Khariar distributaries and (iii)construction of balance work of LMC from RD.20 km to 29 km.

Sl. No	Name of projects	Extra cost (₹*in crore*)	Irregularities noticed
			utilized in the earth dam.
2	RRBC	16.78	In the work of "Excavation of Right Bank Canal from RD. 83.60 to RD. 89.50 km" the excavated materials were dumped in the embankment but lead for disposal was provided ranging between one to five km at ₹72 and ₹97.40 per cum instead of ₹51.40 per cum. Similarly, for DI (dis integrated) rock the lead was provided from three to five km at ₹120.80 and ₹138.25 per cum instead of ₹66.02 per cum. This resulted in extra cost of ₹16.78 crore. Government accepted that a part of excavated earth had been deposited on canal bank. However, due to huge quantity of the excavated materials, an initial lead of 5 km was provided in the estimate for its disposal. The reply was not acceptable as the EE was required to prepare the estimate economically as per OPWD code and the contractor would have quoted his rate as per site condition. Besides, the EE was required to ensure the lead before payment.
Extra Cost due to Non-adoption of Schedule of Rates/Analysis of Rates			
1	SIP	3.71	Analysis of Rate (AoR) for special items of irrigation works provided for use of sheep foot roller for compaction of earth in dam and canal embankment at ₹77.58 per hour for compaction of 100 cum. In respect of 19 works while preparing the estimates, the divisions adopted vibratory road roller at ₹994 per hour for compaction of 100 cum for execution of 34.04 lakh cum of earth in the embankment which led to extra cost of ₹3.71 crore Government stated that Vibratory Roller has been adopted for 98 *per cent* compaction. The reply is not acceptable as the AoR provided for sheep foot roller for compaction of earth in irrigation works.
2	RLBC	17.86	As per SoR, the rate of stone should be taken as basic cost plus cost of transportation from the quarry to work site. Audit noticed that the EE, RLBC recovered only the cost of stone for 4.99 lakh cum in two works[41] issued to the contractor. Thus, non realisation of cost of transportation charges led to short recovery of ₹17.86 crore at ₹358 per cum.
3	SIP/LIIP	10.97	Mechanical excavation of earth being economical should be adopted for works. In deviation to the above, the EEs adopted manual excavation of 10.32 lakh cum of earth in 21 works at the rate ranging between ₹82.60 and ₹146.50 per cum instead of ₹19.25 which led to extra expenditure of ₹10.97 crore. Government stated that though the rate of mechanical excavation is definitely cheaper, manual means was adopted due to non availability of items in SoR. The reply is not acceptable as the SoR provided for excavation of earth work through mechanical means in irrigation works such as excavation in all kind of soil, excavation in base stripping etc.
Deviations from BIS Code			
1	RLBC/UIIP	25.60	Para 5.2 of BIS (IS3873-1993) stipulated that for discharging water in canal from 0-5 cumsecs and 5 to 50 cumsecs, the required thickness of cement concrete lining was 50-60 mm and 60-75 mm respectively. In deviation to the BIS code, the EE of two projects provided cement concrete (CC) lining of 75-100 mm in 11 works. Thus, excess provision of 15 mm to 25 mm led to avoidable extra

[41] (i) Excavation of left bank Canal of RLBC from RD 94 Km to 98 Km, (ii) Excavation of left bank Canal of RLBC from RD 98 to 100.43 Km.

Sl. No	Name of projects	Extra cost (₹*in crore)*	Irregularities noticed
			payment of ₹25.60 crore. Government stated that the estimated cost has no bearing of quoted value. The reply is not acceptable as the estimate prepared was in deviation to BIS code.
2	RRBC	2.55	BIS code provided for construction of canal lining work in plain cement concrete of M15. In deviation to the above provision, in three linning works the EE, RRBC had provided 7,711 cum of RCC work with utilisation of 4,630 quintal of steel which led to avoidable extra cost of ₹2.55 crore. Government stated that RCC retaining wall inside canal have been provided in vulnerable cutting reaches. The reply is not acceptable as this was not in the report accompanying estimate after due survey and investigation and is an after thought.

GLOSSARY OF ABBREVIATIONS

Glossary of Abbreviations

Sl. No.	Abbreviation	Description
1.	ABP	Anandapur Barrage Project
2.	AG	Accountant General
3.	AIBP	Accelerated Irrigation Benefit Programme
4.	AoR	Analysis of Rates
5.	BBC	Betnoti Branch Canal
6.	BCM	Billion Cubic Meter
7.	BCR	Benefit Cost Ratio
8.	BIS	Bureau of Indian Standards
9.	C&AG	Comptroller and Auditor General
10.	CA	Central Assistance
11.	CA	Compensatory Afforestation
12.	CAD	Command Area Development
13.	CC	Cement Concrete
14.	CCA	Culturable Command Area
15.	CCE	Chief Construction Engineer
16.	CDAO	Chief District Agriculture Officer
17.	CE	Chief Engineer
18.	CE&BM	Chief Engineer and Basin Manager
19.	CLSRP	Canal Lining and System Rehabilitation Programme
20.	cum	Cubic Metre
21.	CWC	Central Water Commission
22.	DA&FE	Department of Agriculture and Farmers' Empowerment
23.	DA&FP	Directorate of Agriculture and Food Production
24.	DFO	Divisional Forest Officer
25.	DLC	Dry Lean Concrete
26.	DoWR	Department of Water Resources
27.	DP	Displaced Person
28.	DPC	Duties Powers and Conditions of Service
29.	DPR	Detailed Project Report
30.	DTCN	Detailed Tender Call Notice
31.	EE	Executive Engineer
32.	EIC	Engineer in Chief
33.	EPC	Engineering Procurement and Construction
34.	FC&BM	Flood Control and Basin Manager
35.	FSD	Fully Supply Depth
36.	GFR	General Financial Rules
37.	GoI	Government of India
38.	GoO	Government of Odisha
39.	GST	Goods and Services Tax
40.	HLB	High Level Bridge
41.	IP	Irrigation Potential
42.	IR	Inspection Report
43.	JICA	Japan International Cooperation Agency
44.	JPV	Joint Physical Verification/Visit

Sl. No.	Abbreviation	Description
45.	LAO	Land Acquisition Officer
46.	LIIP	Lower Indra Irrigation Project
47.	LMB	Lower Mahanadi Basin
48.	MCM	Million Cubic Meter
49.	MDF	Moderately Dense Forest
50.	MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
51.	MIP	Minor Irrigation Project
52.	MIS	Management Information System
53.	MLP	Mega Lift Project
54.	MMI	Major and Medium Irrigation
55.	MoEF & CC	Ministry of Environment, Forest and Climate Change
56.	MoU	Memorandum of Understanding
57.	MT	Metric Ton
58.	NABARD	National Bank for Agriculture and Rural Development
59.	NH	National Highways
60.	OCC	Odisha Construction Corporation
61.	OHPC	Odisha Hydro Power Corporation
62.	OPCL	Odisha Power Consortium Limited
63.	OPTCL	Odisha Power Transmission Corporation Limited
64.	OPWD	Odisha Public Works Department
65.	ORRP	Odisha Rehabilitation and Resettlement Policy
66.	OSCSCL	Odisha State Civil Supplies Corporation Limited
67.	OTC	Odisha Treasury Code
68.	PBC	Parjang Branch Canal
69.	PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
70.	PP	Pani Panchayat
71.	PSU	Public Sector Undertakings
72.	PWD	Public Works Department
73.	R&R	Rehabilitation and Resettlement
74.	RA	Running Account
75.	RD	Reduced Distance
76.	RLBC	Rengali Left Bank Canal
77.	RRBC	Rengali Right Bank Canal
78.	SBC	Subarnarekha Branch Canal
79.	SE	Superintending Engineer
80.	SMC	Subarnarekha Main Canal
81.	SoR	Schedule of Rates
82.	TAC	Technical Advisory Committee
83.	UC	Utilisation Certificate
84.	UGPL	Under Ground Pipe Line
85.	UIIP	Upper Indra Irrigation Project
86.	WAPCOS	Water and Power Consultancy Services
87.	WRCP	Water Resources Consolidation Project