

CHAPTER

V

# Execution of Kaleshwaram Project





## Execution of Kaleshwaram Project

### SUMMARY

The DPR of Kaleshwaram Project was approved by the CWC in June 2018 at an estimated cost of ₹81,911.01 crore. The Project was expected to be completed by June 2022. As of March 2022, the project is still under progress and the project cost is likely to exceed ₹1,47,427.41 crore by June 2024, the revised estimated date of completion. Works under the project had been awarded in 7 links and 56 works. After award of works, changes/revisions were made in the scope of work which increased the project cost and also increased the completion time. Of the 56 works, the original stipulated date had lapsed in 48 works while the remaining 8 works were stipulated for completion by June 2022. Delay in the progress of works was on account of delay in firming up the scope of works, as well as changes in the scope of work; delays in land acquisitions and approval of designs/drawings, etc. R&R work was also to be commenced in some of the villages affected under the Baswapur, Medaram, Gandhamalla and Kondemcheruvu reservoirs.

The distributary network which is critical for carrying water to farmers and achieving the intended benefits had also not been completed. Contracts for 14,82,552 acres had been awarded, but works for creation of the remaining 3.43 lakh acres have not yet been entrusted. Even after six years since re-engineering and incurring an expenditure of ₹86,788.06 crore, the project has been able to create only 40,288 acres of new CA as against the targeted CA of 18.26 lakh acres. The project has not been able to provide water for drinking/industrial purposes as intended. Though the Department now expects the project to be completed by June 2024, with the present status of works and the volume of work yet to be done, completion of all the works and achievement of full benefits contemplated under the project is likely to take many more years to come.

### 5.1 Progress of project works

The Kaleshwaram Project was divided into seven Links for the purpose of planning and execution convenience. Each link is further sub divided into various works. In all, a total of 56 works with an aggregate agreement value of ₹82,252.75 crore<sup>112</sup> were awarded to various contractors. Due to changes in the scope of works, the total value of work to be executed under these agreements has now increased to

<sup>112</sup> These include 19 works pertaining to the erstwhile PCSS Project brought under Kaleshwaram Project after re-engineering with revised scope of work; 28 new works were taken up consequent to re-engineering and 9 more additional works awarded subsequently

₹1,02,267.99 crore, as of March 2022. Against this, the total value of work done and paid as of March 2022 was ₹70,666.48 crore (progress: 69 per cent).

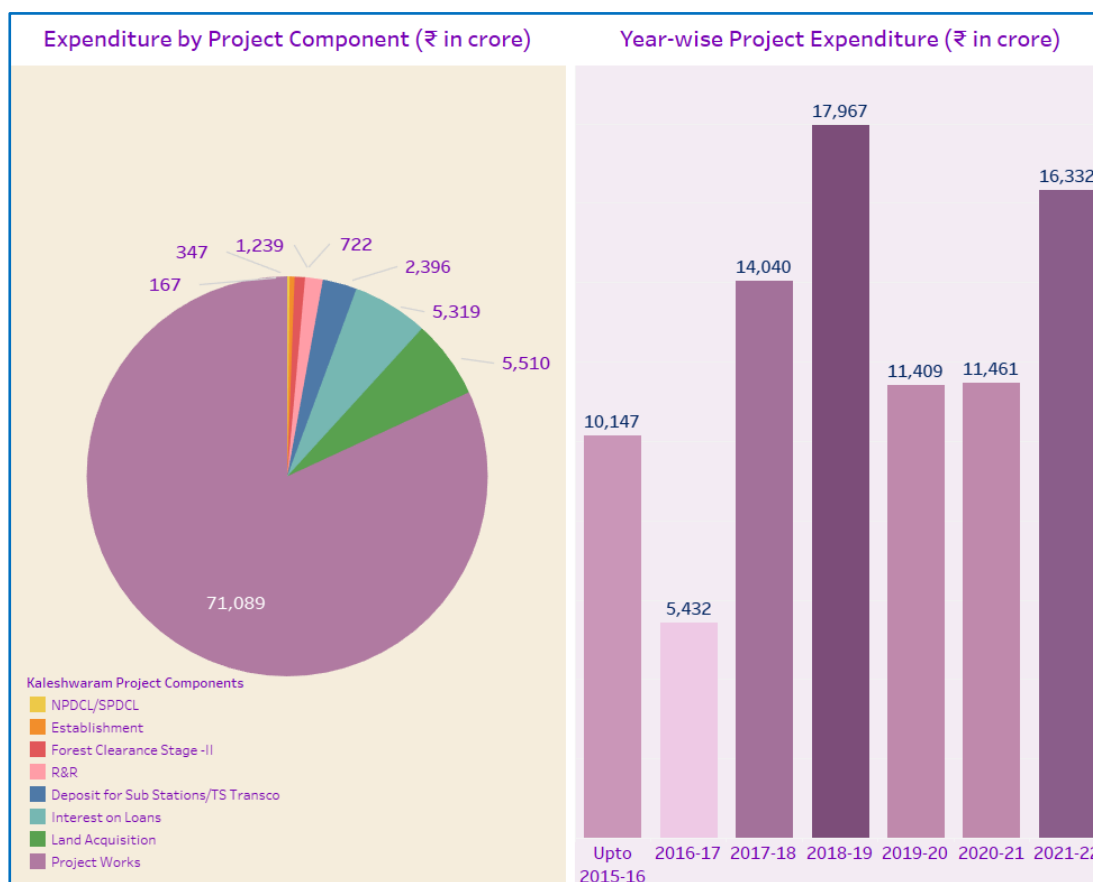
At the time of approval of its DPR by the CWC, the total cost of the Kaleshwaram Project was assessed at ₹81,911.01 crore. As discussed in Paragraph 4.4, the total project cost is now likely to exceed ₹1,47,427.41 crore by June 2024, the revised estimated date of completion. As of March 2022, the project was still under execution and a total expenditure of ₹86,788.06 crore had been incurred on the project as shown in Table 5.1 below:

**Table 5.1 – Expenditure incurred on Kaleshwaram Project as of March 2022**

(₹ in crore)		
S. No	Component	Expenditure
1	Works	71,088.67 <sup>113</sup>
2	Land acquisition	5,510.32
3	R&R	1,238.60
4	Others	8,950.47
	<b>Total</b>	<b>86,788.06</b>

Source: Information furnished by the I&CAD Department

**Chart 5.1 – Expenditure pattern in Kaleshwaram Project**



Source: Information furnished by the I&CAD Department

<sup>113</sup> This includes expenditure of ₹70,666.48 crore incurred on the 56 works and ₹422.19 crore incurred on the deleted works, consultancy/building works and other miscellaneous expenditure on works

Audit observations on the execution of Kaleshwaram Project are discussed below:

### 5.1.1 Non-completion of works

As per the agreements, all the 56 works were stipulated to be completed between February 2018 and June 2022. The position as on 31 March 2022 was that of these 56 works, in 48 works the original stipulated completion date had lapsed while the remaining 8 works were stipulated to be completed by June 2022. However, as of March 2022, only 12 works had been completed, while in 4 works the execution had not even commenced due to non-firming up of the scope of work and non-acquisition of land. Out of the 56 works, only one work had been completed in time and the time overrun in the remaining 55 works as of March 2022 ranged between 10 months to 41 months, as shown in Table 5.2 below:

*Table 5.2 – Time over-run in the 56 works of Kaleshwaram Project*

S. No.	Details of works	Awarded during	Targeted for completion by	Progress range	Time over run
<b>1</b>	<b>Works where the initial agreement period is over: 48</b>				
a.	Works completed: 12	July 2016 to January 2018	February 2018 to June 2019	Completed	15 months to 41 months (one work completed in time)
b.	Works ongoing: 34	January 2017 to July 2019	April 2019 to January 2021	3% to 99%	14 months to 35 months
c.	Works not commenced: 2	November 2017 to November 2019	November 2019 to May 2021	0	10 months to 28 months
<b>2</b>	<b>Works where the agreement period not yet over: 8</b>				
a.	Works ongoing: 6	June 2020	June 2022	17 to 73%	--
b.	Works not commenced: 2	June 2020	June 2022	0	--

*Source: Records of the I&CAD Department*

The details of package wise status of works are given in **Appendix 5.1**. The link wise details of works entrusted and the progress thereof is given in Table 5.3 below.

Table 5.3 – Link wise status of works

S. No.	Link No.	Particulars	No. of Pkgs.	CA to be created as per DPR (in acres)	Value of work to be done (₹ in crore)	Revised value of work to be done (₹ in crore)	Financial progress as of March 2022	
							₹ in crore	In %
1	I	From Medigadda Barrage on Godavari River to Sripada Yellampally Project	6	30,000	10,783.30	21,297.11	17,941.75	Works completed <sup>114</sup>
2	II	From Sripada Yellampally Project to Mid-Manair Reservoir	3	0	11,292.05	13,832.10	12,539.84	Works completed
		Additional one TMC works	4		9,989.52	9,989.52	3,785.17	38
3	III	From Mid-Manair Reservoir to Upper Manair Reservoir	3	86,150	1,522.34	1,737.28	1,258.00	72
4	IV	From Mid-Manair Reservoir to Konda Pochamma Reservoir	23	5,95,754	22,883.69	27,294.13	22,311.81	82
		Additional one TMC works	4		11,975.89	13,895.58	5,342.66	38
5	V	From Anicut to Chityala	4	2,43,500	4,202.09	4,324.61	2,202.45	51
6	VI	From Sri Komaravelli Mallanna Sagar to Singur Reservoir	3	2,80,296	2,506.72	2,506.72	1,216.42	49
7	VII	From SRSP foreshore to Bhoompally reservoir Canals and to Dilwapur and Hangarga villages	6	5,90,000	7,097.15	7,390.94	4,068.38	55
<b>TOTAL</b>			<b>56</b>	<b>18,25,700</b>	<b>82,252.75</b>	<b>1,02,267.99</b>	<b>70,666.48</b>	<b>69</b>

Source: Records of the I&CAD Department

The reasons for slow progress of works were delays in firming up the scope of works, changes to the scope of works, delays in land acquisition and approval of designs / drawings. Slow progress of works carries the avoidable risk of additional liability on account of price escalation. Besides, the risk of litigations and payment of compensation to contractors for delays also cannot be ruled out. These are discussed in detail in the subsequent paragraphs.

The Government replied (May 2023) that due to objections of Maharashtra for barrage location at Tummidihetti, re-engineering of the PCSS project, delay in acquisition of

<sup>114</sup> Financial progress not mentioned as final bills are yet to be settled despite completion of works

land, involvement of Forest land and various other reasons the work was delayed. It was further stated that all the project works are now in brisk progress and all efforts are being made to complete at the earliest.

### 5.1.2 Non-commencement of works

Audit observed that four works which were awarded during November 2017 to June 2020 have not even commenced till date, as discussed below:

**(i) Additional TMC works Packages III & IV of Link-II:** Under the additional one TMC works (discussed in Paragraph 4.1.2.1), two works of Packages III and IV in Link-II were awarded to contractors in June 2020 with a stipulation to complete in 24 months. Audit observed that both the works had not commenced yet due to change in scope of the works and non-acquisition of lands. As per the original scope of both the works, the Flood Flow Canal (FFC) of Sri Ram Sagar Project was to be widened to increase its discharge capacity to accommodate the additional flow. However, after award of works, the Department decided (July 2021) to excavate a parallel canal instead of widening the FFC. The alignments of parallel canal were approved in November 2021. The lands to the extent of 294.48 acres and 344.93 acres, respectively, required for execution of works were yet to be acquired, as of March 2022. As a result, both the works were yet to commence even after a lapse of 21 months since award of works.

The Government replied (November 2023) that Packages-III and IV of the additional 1 TMC works were delayed due to LA and R&R issues and related court cases. It was further replied that out of the 693 acres of land required, an extent of 603 acres has been acquired, the works are now in progress and the financial progress as of October 2023 in Packages-III and IV is 52 *per cent* and 50 *per cent*, respectively.

**(ii) Sangareddy Canal System Reach-II:** In Link-IV of the project, the work of Sangareddy canal Reach-II, which contemplates creation of 32,401 acres of new CA, was awarded in November 2019 for completion by May 2021. The work was awarded without finalizing the alignments and designs/drawings of the canal and without acquiring lands required for execution. The Department approved the canal alignment and designs only in June 2021 *i.e.*, after completion of the agreement period. Further, a total of 1,197.73 acres of land was required for the work. Though the land acquisition authorities had requested (September 2021 and February 2022) to deposit amounts of ₹25 crore and ₹36.94 crore for payment of land compensation, the Department did not deposit the same pending clearance from Government. As a result, not a single acre of land had been acquired so far (October 2022) and the work had not commenced even after 35 months since award of work.

The Government replied (May 2023) that the Land Acquisition process is in brisk progress and soon after completion of LA, the work would be taken up.

**(iii) Gandhamalla Reservoir:** The work of construction of Gandhamalla Reservoir did not commence due to changes in the scope of work, non-finalisation of designs and non-acquisition of lands (discussed in Paragraphs 5.2 and 5.3).

The Government replied (May 2023) that the survey work in the submergence area could not be started as the land compensation offered was not accepted by the land losers who demanded higher rates for LA and R&R. The District Administration has been appraised about the ground condition and the same is under active consideration at the highest level for resolution at the earliest to commence the work.

## 5.2 Land acquisition (LA)

In the DPR, the total extent of lands required for execution of project works was assessed at 1,06,751 acres (43,200.53 Ha). However, as seen from the records, the Department has so far identified a total requirement of 98,110.33 acres out of which an extent of only 63,972.16 acres (65.2 per cent) was acquired as of March 2022 leaving a balance of 34,138.17 acres (34.8 per cent) yet to be acquired. The work-wise details of the land requirement identified, requisitioned, acquired and yet to be acquired are given in *Appendix 5.2*.

The major portion of the lands pending acquisition was in Link-V (11,455.73 acres), Link-VII (7,986.24 acres), Link-IV (7,810.95 acres) and Link-VI (3,451.71 acres) of the project where a total extent of 17.1 lakh acres of new CA (*i.e.*, 93.64 per cent of the total contemplated new CA of 18.26 lakh acres) was to be created.

The delays in land acquisition were mainly due to delays in finalisation of as well as changes in scope of work, delays in identification of lands and sending LA requisitions to the LA authorities and delays in providing funds sought by the LA authorities.

### 5.2.1 Delays in identification of lands

Out of the 56 works where land acquisition was involved, 17 works were entrusted through Engineering, Procurement and Construction (EPC) Turnkey contracting system and 39 works were awarded under the conventional unit price contract system (locally called as lumpsum or LS contracts). Under the EPC contracts followed in the State, the contractors were required to conduct detailed survey and investigations, submit proposed alignments, designs and drawings to the I&CAD Department for approval. After receiving these approvals, the contracting agencies were required to identify the lands required for execution of works and submit the land plan schedules to the Department. The Department would conduct survey of the identified land jointly with the LA authorities and contracting agencies and thereafter, would place indents with the LA authorities for initiating the LA process. The Department would provide funds necessary for land acquisition to the LA authorities. After acquisition, the Department would hand over the lands to the contractors for executing the works. As per the EPC agreements, the contractors were required to submit the land plan schedules within three or six months, as the case may be, from the date of agreements. On the other hand, in LS contracts, the responsibility for designs and identification and acquisition of lands rests solely with the Department. As per the existing instructions<sup>115</sup> of Government, administrative approval/technical sanction for

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<sup>115</sup> GO Ms. No.94 of I&CAD (PW-COD) Department, dated 01.07.2003



irrigation works would be issued only after designs are finalized, detailed investigation is completed, and necessary lands are acquired for taking up works without interruption for the first two years.

The Department, however, awarded all the 39 LS contracts without acquiring lands. In the EPC contracts, there were delays in identification of land required for works and in placing requisitions to the LA authorities. The LA indents were being sent to the LA authorities in a piecemeal manner. As a result, even though the originally stipulated period of agreements is over in 48 out of the 56 agreements, the land acquisition had not been completed in 32 works. In the eight works which were stipulated for completion by June 2022, LA was completed in three works and was pending in five works as of March 2022, despite a lapse of 21 months since concluding the agreements.

Further, the Department has so far (March 2022) placed LA indents with LA authorities for only 85,745.88 acres out of the total assessed requirement of 98,110.33 acres. It was yet to complete the survey of the balance lands and send indents in 12 works.

Moreover, the Department is yet to fully assess the lands required for the ongoing works. It was still assessing the land requirements and sending indents to the LA authorities. During 2021-22, additional land requirement of 3,487.40 acres was assessed and LA indents for an extent of 7,477.17 acres were sent to the LA authorities as shown in Table 5.4 below:

**Table 5.4 - Change in land requirement during March 2021 and March 2022**

(extent in acres)				
S. No.	Details	Total land requirement	Total land requisitioned	Total land acquired
1	Status to the end of March 2021	94,622.93	78,268.71	56,488.57
2	Status to the end of March 2022	98,110.33	85,745.88	63,972.16
3	Change during 2021-22	3,487.40	7,477.17	7,483.59

*Source: Records of the I&CAD Department*

Delays in identification of the lands required for execution of works and acquisition thereof contributed to delays in completion of project works.

Some of the works where maximum LA is pending are discussed below:

#### **Link-V**

**(i) Package-16 (pending LA: 4,746 acres):** Package-16 work (under Link-V) was awarded in the earlier PCSS project. After re-engineering, some changes were made in the scope of work under the package and the target date for completion was stipulated as June 2019. A CA of 1.66 lakh acres was to be created under this package. Audit observed that the Department approved the canal alignments and designs between 2009 and 2019. Audit, however, observed that out of the total land requirement of 5,911 acres, LA indents for only 2,686 acres were sent to LA

authorities as of March 2022. Out of this, only 1,165 acres (19.71 *per cent*) was acquired. Indents for 3,225 acres were yet to be sent as survey of the lands required for branch canal<sup>116</sup> and distributaries was still in progress even after more than two years from the target date of completion of work. Only 51 Km (59.75 *per cent*) out of the proposed 85.36 Km of main canal could be completed due to delay in finalization of canal alignments and acquisition of lands. There was meagre progress in the work of branch canal as only 8.15 Km (7.77 *per cent*) out of total of 104.83 Km was completed. The work relating to distributaries was yet to be taken up. The financial progress in this work was only 54 *per cent* (March 2022).

The Government replied (November 2023) that the alignment of main canal, left main canal and right main canal have been approved (before re-engineering) and the land plan schedules were submitted to the District Collector, Nalgonda. It was further replied that out of the 1,671 acres of land required for the main canal, 1,437 acres has been acquired and 234 acres was yet to be acquired. Further, the earth work, CC lining and structure works relating to branch canals are completed to the extent of land acquired. The Survey and Investigation work for distributary and minors was completed and Hydraulic Particulars are under scrutiny for approval. It was further replied that out of 87.648 Kms of main canal (including the left and right main canals) 70.898 Km has been completed. The present progress of the work was stated to be around 65 *per cent*. It was also stated that the investigation work of field channels is in progress and will probably be completed by the end of March 2024.

The fact, however, remains that the Government has not been able to complete the works within intended timelines.

**(ii) Gandhamalla Reservoir (pending LA: 2,379 acres):** The Department entrusted (November 2017) the work of construction of Gandhamalla reservoir in Yadadri-Bhongir District (under Link-V of the project) to a contractor under LS contract at an agreement value of ₹719.08 crore for completion by November 2019. As per the agreement, the reservoir was to be formed with a capacity of 9.86 TMC.

The Department later decided (March 2018) to reduce the capacity of the reservoir by half and construct it with a reduced capacity of 4.28 TMC to avoid submergence areas. As per the reduced scope of the work, private lands to the extent of 2,379 acres were required. LA indents for acquisition of these lands were sent to the LA authorities during June 2017 to September 2018. The LA authorities issued notifications for acquisition of lands during September 2018 – January 2019. Audit observed that despite request (June 2019) by the LA authorities, the funds (₹75 crore) required for land acquisition were not deposited. As a result, not a single acre of land was acquired as of March 2022. Due to non-acquisition of lands, the work of construction of Gandhamalla reservoir has not commenced even after more than four years since the work was awarded.

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<sup>116</sup> A canal receiving its water supply from the main canal and acting as feeder for distributaries

The Division replied (December 2021) that higher authorities had been requested for funds which were yet to be sanctioned and released by Government.

The water from Gandhamalla reservoir was proposed to be supplied to 55,000 acres of CA under Package 15, the works of which were underway (progress: 74 *per cent*). Unless the construction of Gandhamalla reservoir is completed, the CA under Package-15 cannot be brought under irrigation.

The Government replied (November 2023) that the survey work in the submergence area could not be started as the land compensation offered was not accepted by the land losers who demanded higher rates for LA and R&R. The District Administration has been appraised about the ground condition and the same is under active consideration at the highest level for resolution at the earliest so as to commence the work.

**(iii) Baswapur reservoir (pending LA: 2,212.73 acres):** The work of formation of Baswapur reservoir (in Link-V of the project) was awarded (November 2017) to a contractor under LS contract system for completion by November 2019. For execution of work, a total of 4,230.73 acres of land under five villages was to be acquired. However, the Department awarded the work without finalising the alignments/designs of the reservoir and without even identifying the land to be acquired. The Department approved the alignment of reservoir bund in June 2018 and the designs during February 2019 to February 2020. Further, the Department has been sending LA indents to the LAOs in a piecemeal manner. There were also inordinate delays in submitting/resubmitting the LA requisitions. For example, the Department submitted requisitions to District Collector, Yadadri-Bhongir District for 1,693 acres in Thimmapur village in September 2019, for 256 acres in Rustapur village in June 2020 and for 608 acres in Jangampally village in November 2021. In case of the lands in Rustapur village, the Department submitted a revised indent for 233 acres (for bund portion and submergence lands) in May 2021. Due to delays in identification of lands and submission of LA indents, only 2,018 acres (*i.e.*, 48 *per cent*) out of the total requirement of 4,230.73 acres was acquired after more than four years, as of March 2022.

Audit further observed that though the District Collector had requested (June and September 2021) for funds of ₹43.46 crore for 113 acres in Baswapur village and ₹52.11 crore for acquisition of 160 acres in Wadaparthi village, the funds were yet to be deposited (December 2021). Due to delays in land acquisition, the work in some portions of the bund has not commenced as of March 2022 and the Department granted extension of time to the contractor up to May 2024. Non-completion of Baswapur reservoir would impact a CA of 23,000 acres proposed under it.

The Government replied (November 2023) that the balance land (1,176 acres as of November 2023) is proposed to be acquired by the end of December 2023 and water

would be released by the end of January 2024. At present the progress of Baswapur Reservoir is about 93 *per cent* (as on November 2023)<sup>117</sup>.

The fact however remains that 28 *per cent* land (1,176 acres out of 4,230.73 acres) is yet to be acquired, which has resulted in delays in execution of works.

**(iv) Package-15 (pending LA: 2,118 acres):** Package-15 (under Link-V) involves excavation of canals and creation of distributary network to irrigate a CA of 63,300 acres (8,300 acres under the main canal and 55,000 acres through the right and left main canals of Gandhamalla Reservoir). The work was originally stipulated for completion by June 2019. However, the canal alignments were approved between August 2017 to April 2019 and out of a total land requirement of 3,841 acres, LA indents for only 2,277 acres (59.28 *per cent*) were sent to the LA authorities as of March 2022. LA indents for 1,564 acres were yet to be sent as survey of the lands was not completed even after more than two years from the target date of completion of work.

Out of the total 3,841 acres of land required for the work, 1,979 acres was for main canal and distributaries and balance 1,862 acres was for canals of Gandhamalla Reservoir. Though 1,723 acres of land pertaining to main canal and distributaries was acquired as of March 2022, not a single acre of land was acquired for the canals of Gandhamalla Reservoir. Audit observed that though Department made requisitions for 407.37 acres of land for canals of Gandhamalla Reservoir, it did not deposit land compensation amount of ₹36.75 crore sought (November 2020) by the LA authorities as Government approval for funds was not received. Due to poor progress of land acquisition, only 74 *per cent* of work was completed as of March 2022.

The Government replied (November 2023) that the requisition of LA for balance land pertains to minors and sub-minors and is under progress. The earth work for the distributary canal was also completed for 10.05 Kms and the balance work is under progress. Soon after payments are released towards the balance LA, the works in the remaining canal system would be taken up.

#### Link-VI

**(v) Package-19 (pending LA: 2,647 acres):** In Package-19 (under Link-VI), which was stipulated for completion by June 2019, a CA of 78,000 acres was to be created. Out of the total land requirement of 3,100 acres in this work, only 453 acres (14.61 *per cent*) of land was acquired and 2,647 acres was yet to be acquired as of March 2022. While 89 *per cent* of land required for main canal was acquired, not a single acre of land required (2,593 acres) for the branch canal was acquired. LA indents were yet to be sent to LA authorities for 1,746 acres as of March 2022 as survey of the lands required for branch canal was still in progress even after more than two years from the target date of completion of work. So far, excavation of main canal in only 5.6 Km out of the total of 12 Km has been completed and the work of branch canal has not commenced (March 2022). The financial progress in this work was only

<sup>117</sup> The progress shown in *Appendix 5.2* in respect of all packages is upto March 2022.

13 per cent. During a joint site inspection (December 2021), Audit observed that there was no construction activity, and the camp office of the contracting agency was deserted. Audit further observed that the Department had paid the last bill to contractor in June 2021 and two bills submitted in June and September 2021 for a total amount of ₹17.95 crore were pending with the Pay and Accounts Officer for want of clearance from Government for payment to contractor.

The Government replied that land acquisition was in process.

### Link-VII

**(vi) Package-22 (pending LA: 3,170 acres):** The earlier PCSS project, *inter alia*, proposed to draw water from SRSP reservoir up to Bhumpally reservoir via Masani, Manchippa and Kondemcheruvu tanks. Under Package-22 (under Link-VII), it was proposed to create a new CA of 1.56 lakh acres. The work was awarded to a contractor in November 2008 for completion by November 2012.

In the DPR of Kaleshwaram Project after re-engineering, it was proposed to draw water for the CA under Package 22 from Sri Komaravelli Mallanna Sagar (SKMS) reservoir (instead of SRSP), carry it to Bhumpally reservoir and provide irrigation to 3.06 lakh acres. However, the Department did not implement this change, for reasons not on record.

In April 2018, a high-power committee approved a proposal to increase the targeted CA under the package work from 1.56 lakh acres to two lakh acres and to make changes in the works components of the existing package work to accommodate the additional CA. No change in the source of water (as proposed in the DPR) was discussed in this meeting. The committee directed the Department to prepare revised estimate to accommodate the additional scope of work. However, the Department has not prepared any such revised estimate so far (March 2022) and no changes were made in the scope of work of already existing contract. This indicates that the scope of work proposed to be executed under this package has not been firmed up even after nearly four years since the high-power committee recommendations.

As of March 2022, as against the total land requirement of 4,426 acres, requisitions for 2,926 acres were sent to the LA authorities and only 1,256 acres (28.38 per cent) of land was acquired, leaving a balance of 3,170 acres still to be acquired. Further, survey of the lands required for the minors/sub-minors under the package was yet to be completed. Due to delays in firming up the revised scope of work and non-acquisition of lands, the progress of work as of March 2022 was only 24 per cent.

The Government replied that land acquisition was in process.

**(vii) Package-27 (pending LA: 978.74 acres):** The work under Package-27 (part of the earlier PCSS project) was originally awarded under EPC system to a contractor in February 2009 at an agreed value of ₹714 crore for completion by February 2013. However, in August 2009, the Department initiated proposals for certain changes in the project components, location of pumphouses, *etc.* The Department took four more

years to finalize the scope of work and obtain (February 2016) approval of Government for the changes in the scope of work. Thus, it took seven years for finalisation of scope of work since award of contract.

The Department obtained Forest Clearance and acquired 797 acres of forest lands in the year 2018. In addition to the forest land, another 2,500 acres of private land was to be acquired for execution of work. However, even after a lapse of six years since finalisation of scope of work, LA indents were sent to the LA authorities for only 1,824.26 acres in piecemeal manner. Out of this, an extent of 1,521.26 acres (60.85 *per cent*) was acquired as of March 2022. Due to non-acquisition of lands, the contractor, after executing work valuing ₹447.34 crore, requested the Department for pre-closure of the contract. Accordingly, the Department pre-closed (February 2021) the contract without penalty and entrusted (May 2021) the balance work to another contractor for ₹298.51 crore with SoR 2020-21 rates. Due to change in schedule of rates, there was a cost increase of ₹31.85 crore. Further, the Department had also paid an amount of ₹39.52 crore to the first contractor towards price escalation, which could have been minimised had the finalisation of scope of work and acquisition of lands were done in a timely manner.

While the major hurdle in completion of the work by the original contractor was non-acquisition of lands, the Department entrusted the balance work without acquiring the balance lands. Audit observed that even after re-entrustment, there was no further progress in sending LA indents to the LA authorities or in acquisition of balance lands since March 2021 for reasons not on record. As a result, the new contractor was yet to commence the execution of balance work.

The Government replied that the remaining land would be acquired, and work would be completed within the stipulated agreement period.

**(viii) Package-28 (pending LA: 2,471 acres):** The work under Package-28, which was a part of the earlier PCSS project, was awarded under EPC system to a contractor in February 2009 at an agreed value of ₹486.68 crore for completion by February 2013. For execution of work, a total extent of 3,026 acres of land was required. As per the agreement conditions, the contractor was to complete the detailed survey and investigations, obtain approval of alignments/designs and submit land plan schedules to the Department for taking up the LA process with the LA authorities. However, there was delay in approval (August 2013 to October 2016) of the designs/drawings of the canals. There were also abnormal delays in acquisition of lands. As against the total land requirement of 3,026 acres, LA indents for only 981 acres were sent to the LA authorities out of which 555 acres (18.34 *per cent*) land was acquired, as of March 2022. The progress of work was only 48 *per cent*. The EPC contractor was yet to submit land plan schedules for 2,045 acres even after 13 years since the date of agreement. Because of delays in completion of sub-works, irrigation has not commenced. Despite failure of the contractor in submitting the land plan schedules, the Department did not take any penal action on the contractor and to pre-close the contract and entrust the balance work to any other contractor.

The Government replied (May 2023) that the estimate for the balance work is under approval.

Thus, delays in identification and acquisition of lands required for execution of works has not only contributed to the delays in completion of project works and achievement of contemplated benefits but also carries the significant risk of price escalation payments to contractors.

***Recommendation - 5***

***The Department should take steps to identify the lands required for the ongoing project works including distribution channel works and complete land acquisition so as to achieve intended objective of the project in time.***

### **5.3 Rehabilitation and Resettlement activities**

Filling of water in reservoirs, in some cases, would cause submergence of villages requiring Rehabilitation and Resettlement (R&R) of the affected families/persons. In such cases, water cannot be filled to the full reservoir level (FRL) without relocating the Project Displaced Families (PDFs) from the submergence areas. Thus, it is imperative that the implementing agency completes the implementation of R&R package by the time the reservoir construction is completed and water is let into it.

Under Kaleshwaram Project, 17 new reservoirs were proposed to be constructed. In the DPR, it was assessed that five new reservoirs<sup>118</sup> would cause submergence of villages and involve R&R of the PDFs. However, as per the departmental records, two more reservoirs<sup>119</sup> were causing submergence and required R&R.

As per the information furnished by the Commissioner (R&R), the R&R activities in respect of Sri Komaravelli Mallanna Sagar (SKMS), Konda Pochamma Sagar and Anantagiri reservoirs were completed and all the identified 8,947 PDFs were relocated as of March 2022 by incurring a total expenditure of ₹1,238.60 crore. The R&R activities were yet to commence in the remaining four reservoirs, as discussed below.

#### **5.3.1 Non-commencement of R&R**

**(i) Baswapur reservoir:** As per the DPR, construction of Baswapur reservoir would affect three villages. The work of this reservoir was entrusted to a contractor in November 2017 without even identifying the PDFs. The work was stipulated for completion by November 2019. The Department approved the alignment of reservoir bund in June 2018 and the designs during February 2019 to February 2020. However, as seen from the records of the Commissioner (R&R), the District Collector, Yadadri-Bhuvanagiri district had submitted proposal for R&R scheme only in September 2021. The proposal was for payment of R&R benefits to the 1,085 PDFs in B.N.Thimmapur

<sup>118</sup> Sri Komaravelli Mallanna Sagar (SKMS), Konda Pochamma Sagar, Anantagiri, Baswapur and Gandhamalla reservoirs

<sup>119</sup> Medaram and Kondemcheruvu reservoirs

village of Bhongir Mandal at a cost of ₹82.63 crore. This was approved (September 2021) by the Commissioner (R&R). In March 2022, the District Collector submitted another proposal for taking up infrastructure facilities like drinking water and electricity supply at a cost of ₹4.20 crore in the R&R colony proposed at Hussainabad village where house sites were proposed to be given to the PDFs. The proposal was approved by the Commissioner (R&R) in the same month. Though the District Collector had sent a request for release of funds in September 2019 and September 2021, the Irrigation Department was yet to release funds and implementation of R&R could not commence as of June 2022.

In respect of Lakshminayakudi Thanda, the socio-economic survey was stated to be conducted (during 2021) and approval of R&R plan was yet to be approved by Government as of January 2022. In case of the third village *viz.* Chonglanayak Thanda, there is no evidence that even the socio-economic survey was conducted.

The Government replied (November 2023) that due to involvement of various line Departments for conducting socio-economic survey, considerable time was taken for approval and in implementation of R&R policy. At present, the work for infrastructure development and amenities are in progress and the R&R Package benefits were also disbursed to the PDFs. It was also stated that the socio-economic survey in Chokla Nayak Thanda has been completed and identification of R&R site is under progress. The R&R Development works for Lappa Nayak Thanda are in progress (November 2023).

**(ii) Medaram reservoir:** Under the earlier PCSS project, it was proposed to increase the storage capacity of the already existing Medaram reservoir to 0.58 TMC by raising the FRL from +226.83 M to + 231.5 M. The work was entrusted to a contractor in November 2008 as part of Package-7 (in Link-II). During re-engineering, under Kaleshwaram Project, it was proposed to further increase the capacity of the reservoir to 0.78 TMC by raising the bund to +233 M. As the progress of work by the existing contractor was very slow, the Department deleted the work of enhancing the capacity of Medaram reservoir and entrusted it to another contractor in October 2017 for completion by June 2019.

Audit observed that in September 2016 itself, the Department had assessed that increase in FRL of the reservoir would lead to partial submergence of Chamanpalli village and affect 42 houses. This issue was discussed in the meeting (May 2017) of the State Level Standing Committee (SLSC)<sup>120</sup> and the SLSC directed that a decision in this regard would be taken after formation of reservoir as it is a post reservoir formation effect.

In May 2019, the SLSC decided that, if required, construction of a head regulator on right flank of the reservoir and construction of flood banks around Chamanpalli village would be taken up to avoid submergence of the village. It was stated in the meeting

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<sup>120</sup> SLSC is a committee constituted by Government for examination and approval of the estimates for EPC contracts taken up by the Irrigation Department



that these works would cost ₹18.53 crore which would be more economical than providing R&R which was estimated to cost ₹225 crore. The SLSC further directed to take up these works after observations in the forthcoming seasons by maintaining water inflows and outflows of the reservoir. The construction of Medaram reservoir was completed in 2018 and water storage commenced. During 2018-2021, water could be filled in the reservoir only up to a level of +230.700 M as against the maximum intended level of +233 M to avoid submergence of Chamanpalli village. The Department has submitted proposals (October 2021) to the EnC for acquisition of houses in Chamanpalli village saying that formation of flood banks to avoid submergence of the village might not be possible and that 83 houses would be affected due to submergence. The R&R proposals in respect of Chamanpalli village were yet to be prepared and submitted as of September 2022.

It is evident from the above that the Department had failed in assessing the submergence effects of construction of Medaram reservoir and the feasibility of avoiding submergence of houses through construction of protective banks in the initial stages of construction. This has resulted in delay in initiating the R&R process which is yet to take off. As submergence commences from + 231.5 M level, the Medaram reservoir cannot be put to optimum use till the R&R process is taken up and completed.

The Government replied (November 2023) that the works of distributary network system beyond MMR was yet to be developed and hence, the need to fill the Medaram Reservoir to its full level did not arise so far. It was further replied that proposals for acquisition of 83 houses of Chamanpalli village were submitted to the Commissioner (R&R) and that a Committee was also formed to finalise the R&R issue. It was also stated that the R&R of Chamanpalli would be completed before the entire distribution network system beyond MMR is developed. The Government accepted that the reservoir was being filled up to only +231.5 M level since 2018 and that all the pumps in Packages-6 and 8 were not being operated, but stated that there is no effect on the CA developed so far and stabilization of existing CA.

The fact remains that the R&R process which takes a lot of time to complete has not even started, whereas the targeted date for the completion of project including distributary system is June 2024.

**(iii) Gandhamalla reservoir:** As per the DPR, Gandhamalla reservoir was to be newly formed in Yadadri-Bhongir district (under Link-V of the project) with a capacity of 9.87 TMC. However, the Department, without finalising the designs, assessing the submergence villages and initiating the R&R process, entrusted (November 2017) the construction work to a contractor under LS contract at an agreement value of ₹719.08 crore for completion by November 2019.

During a review meeting, the Chief Minister directed (January 2018) the Department to reduce the capacity of the reservoir to 4.28 TMC to avoid submergence of Veerareddypally village and power grid lines on the upstream side of the proposed reservoir. Accordingly, the Department proposed the revised scope of work with reduced capacity which was approved by Government in March 2018. Though the

alignment of reservoir bund was approved by the EnC in August 2018, the designs of bund sections were yet not approved, for reasons not on record. Further, as per preliminary estimation, a total of 1,145 houses in three<sup>121</sup> villages were coming under the submergence areas of the reservoir. However, even the detailed study of the submergence areas and socio-economic survey were not conducted and R&R proposals were not initiated as of September 2022.

The Government replied (November 2023) that the survey work in the submergence area could not be started as the land compensation offered was not accepted by the land losers and they demanded higher rates for LA and R&R. The District Administration had been apprised about the ground condition and the same is under active consideration at the highest level for resolution at the earliest so as to commence the work.

**(iv) Kondemcheruvu:** Under Link VII of the project, it was proposed to combine two existing tanks Kondemcheruvu and Manchippa tank in Nizamabad district and construct a new reservoir with a storage capacity of 3.5 TMC with an FRL of +454.1 M. This reservoir was critical to provide irrigation to 2.85 lakh acres under Packages 21(A) and 22. There was no mention in the DPR about any requirement of R&R under the new reservoir. The work of construction of the tank was included in Package 21(A) and awarded to a contractor in April 2018 for completion by October 2020. As per the preliminary assessment made by the Department, about 647 houses in nine habitations were likely to come under submergence under the new reservoir. However, the Department was yet to finalise the alignments/designs of the proposed Kondemcheruvu reservoir and yet to conduct socio-economic survey of the submergence areas due to resistance from the villagers. As such, no R&R plan has been prepared and the reservoir work has not commenced.

The Government replied (November 2023) that there was no provision for R&R in the sanctioned estimate of Package-21A. It further stated that as per the preliminary survey, an amount ₹334.52 crore is required for LA and R&R for the reservoir and that the same would be incorporated in the project. It was further stated that after clearance of court case (details not furnished), socio-economic survey of the submergence area would be conducted and R&R action plan would be prepared. The Government also stated that even without raising and clubbing the Manchippa and Kondemcheruvu reservoirs, water can be released to some extent in the contemplated CA.

However, the fact remains that due to the delay in taking up of R&R activities, the construction work of Kondemcheruvu Reservoir did not take off and without formation of Kondemcheruvu Reservoir with 3.5 TMC capacity, irrigation cannot be fully achieved in the targeted CA.

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<sup>121</sup> Gandhamalla, Indira Nagar and Tettekunta villages

## 5.4 Finalisation of alignments/designs/drawings

In irrigation projects, the alignments of canals and bunds of reservoirs, and designs and drawings of canals, pumphouses, reservoir bunds, spillway, gates, weirs and other structures are a critical part of engineering. Conducting detailed investigations and finalisation of designs and drawings is a pre-requisite for execution of an irrigation project and achievement of the intended benefits.

### 5.4.1 Delay in finalisation of designs

It had been pointed out in Paragraph 4.1.1 that the Department showed undue haste in getting the DPR for the Kaleshwaram Project prepared. However, in respect of designs/drawings for the same, Audit observed that there were delays in finalisation of designs/drawings for the works under the Project.

In the works awarded under LS contract system, the responsibility for providing designs and drawings rests with the Department. As per the existing instructions<sup>122</sup> of Government, administrative approval/technical sanction for irrigation works would be issued only after finalization of designs.

On the other hand, in the EPC contracts followed in the State, the contractors were required to conduct detailed survey and investigations, submit the proposed alignments, designs and drawings to the Department for approval. On approval of the same, the EPC contractors are required to execute the works as per the approved designs. As per the EPC agreements concluded in this project, the contractors were required to submit the designs within three/six months from the date of agreements.

The Department has furnished only partial information (32 out of 56 works) on the status of designs in respect of some of the works (LS and EPC), which is summarised in Table 5.5 below:

*Table 5.5 – Status of approval of designs in LS and EPC contracts as of March 2022*

S. No.	Description	LS contracts	EPC contracts	Total
1	Total number of works	39	17	56
2	No. of works completed	9	3	12
3	No. of works yet to be completed	30	14	44
4	No. of works for which information was furnished by the Department	23	9	32
5	Of these, the No. of works where designs are pending	12	5	17
6	Total number designs involved in these works	2216	617	2833
7	No. of designs finalised as of March 2022	1397	343	1740
8	No. of designs pending finalisation	819	274	1093
9	Of these, the No. of designs yet to be submitted	562	187	749

*Source: Information furnished by the I&CAD Department*

<sup>122</sup> GO Ms. No.94 of I&CAD (PW-COD) Department, dated 01.07.2003

Out of the 39 works awarded under LS contract system, 9 works have been completed and 30 works are yet to be completed. Against these 30 works, the Department has furnished the status of designs in respect of only 23 works. Of these, designs were not finalised fully in 12 works<sup>123</sup>. As against the total of 2,216 designs involved in these 12 works, only 1,397 designs were finalised as of March 2022 and 819 designs were pending finalisation, despite time overrun of 10 months to 35 months since target date of completion in these works. Of these, 562 designs were yet to be prepared and submitted by the Department to the design approving authority in seven works.

Out of the 17 works entrusted under EPC system of contracting, 3 works were completed and 14 were yet to be completed. Out of these 14 works, the status of designs in respect of only nine works was furnished to Audit. Of these nine works, designs were yet to be finalised fully in five works<sup>124</sup>. As against the total of 617 designs involved in these works, only 343 designs were finalised as of March 2022 and 274 designs were pending, despite time overrun of 33 months. Of these, 97 designs were pending with the Department and the EPC agencies were yet to submit 187 designs to the Department.

Non-finalisation of designs and drawings in a timely manner was one of the factors for non-completion of the project works.

The Government replied (May 2023) that the Kaleshwaram Project consists of works involving major components such as barrages, reservoirs, underground/open pump houses, tunnels, main canals, distributaries, *etc.*, and involve major structures such as aqueducts, NH crossings, State Highway crossings, *etc.*, which would be taken up after finalization of Hydraulic Particulars. Further, wherever required, model studies are to be carried out after finalizing the design. All this process takes a lot of time. It was also stated that the submission, scrutiny and approvals of necessary designs are now in brisk progress for the distributary network system in most of the packages of Kaleshwaram Project. The finalization of designs is a continuous process. As and when the designs are completed, the LA process and subsequently works are being taken up.

The Government accepted the delay in finalization of designs. The fact remains that 40 to 50 *per cent* of the designs are yet to be finalized by the Department.

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<sup>123</sup> Of these 12 works, 11 works were targeted for completion during April 2019 to May 2021 and one work was stipulated for completion by June 2022

<sup>124</sup> These works were targeted for completion by June 2019

## 5.4.2 Defective designs

Audit observed cases of improper surveys and investigations and defective designing of project components, which are discussed below.

### 5.4.2.1 Defective design resulting in inadequate provision of energy dissipation works at the barrages

Under Link-I of the project, three barrages were newly constructed at Medigadda, Annaram and Sundilla during July 2016 to December 2021. These barrages were designed considering the Maximum Flood Discharge of 80,000 cumecs, 65,000 cumecs and 57,000 cumecs, respectively. Designs of the barrages and other related components were approved by the Chief Engineer, Central Designs Organisation of the I&CAD Department.

In November 2019, these barrages received flood water and water was released downstream by lifting the gates. After closing the gates, it was found that the RCC wearing coat, part of CC curtain walls, CC blocks constructed on the downstream side were washed away, resulting in a loss of ₹180.39 crore<sup>125</sup> being the expenditure incurred on these works.

*Figure 5.1 – Damaged CC Blocks and apron at downstream side of Annaram barrage*



Source: Photograph taken by Audit during joint site visit on 25 January 2022

<sup>125</sup> Medigadda: ₹83.83 crore, Annaram: ₹65.32 crore and Sundilla: ₹31.24 crore

*Figure 5.2 – Damaged CC Blocks and apron at downstream side of Sundilla barrage*



Source: Photograph taken by Audit during joint site visit on 21 January 2022

*Figure 5.3 – Sinking of Piers of Medigadda barrage in October 2023*



*Right: Crack in Pier No. 20 & Left: Deck slab deflection at Pier No. 20 (Medigadda Barrage)*

Source: Photo taken by the Committee to examine the reasons for sinking of piers in Medigadda Barrage in October 2023.

Studies by the Department revealed that the reason for this damage was high discharge velocities of the water released and inadequate provision of the energy dissipation works. When the Department approached the contracting agencies for attending to the damages, the agencies rejected the request citing that the work was executed strictly as per the designs and drawings approved by the Department and under supervision of departmental engineers and that the quality certification had also been issued. Later, after duly conducting revised model studies, the Department prepared estimates for a

total amount of ₹476.03 crore<sup>126</sup> for rectification of damages in the three barrages and incorporated in the revised estimates.

Thus, due to the defective designing of launching apron and Cement Concrete blocks, these works could not withstand the discharge velocities and got washed away, resulting in a loss of ₹180.39 crore being the cost of works damaged with a further commitment of ₹476.03 crore for rectification of the same.

#### **Additional Issues pertaining to defective designs**

A six-member committee was constituted (October 2023) by the National Dam Safety Authority (NDSA), Ministry of Jal Shakti to examine the reasons for the sinking of piers of Medigadda Barrage in October 2023.

As per the Committee findings, the piers had sunk due to a combination of issues involving planning, design, Operation and Maintenance (O&M), etc.

The Committee *inter alia* observed that the I&CAD Department was responsible for undertaking sounding and probing in the apron area every year immediately after the monsoon to assess the scours and launching of aprons in the vicinity of structures. The non-launching portion should also be carefully examined, particularly downstream, to ensure the effectiveness of the inverted filter. The upstream floor should be inspected every year early in the fair-weather season by probing and using underwater lamps. A careful inspection of joints is also to be carried out. The Committee observed that the Department had not inspected or maintained the cement concrete blocks or launching aprons since the commissioning of the barrage in 2019-20. In this regard, this maintenance deficiency of the dam owners has progressively weakened the barrage, leading to its failure. In its present condition, the barrage is rendered useless until fully rehabilitated as considering the commonalities, the likelihood of failure of other blocks exists. The Committee also commented on deficiencies in the project planning and design as well.

Further, the Committee pointed out that the two barrages constructed upstream of Medigadda under the Kaleshwaram Project, viz; Annaram and Sundilla barrages, have similar designs and construction methodologies, making them prone to similar failure modes.

The Government replied (November 2023) that the flexible protection works are subject to displacement/dislocation during operation of flood discharge and needs to be relocated/restored to original condition. During operation of gates, the flexible aprons were dislocated in all the three barrages during Defect Liability Period and the contractors have agreed to restore them soon after depletion of water from the barrages. It was also replied that the estimates amounting to ₹476.03 crore for rectification works were not sanctioned.

The contention of the Government that contractors accepted to restore the damage is not correct as more than three and half years have elapsed, and no restoration work

<sup>126</sup> Medigadda: ₹212.03 crore, Annaram: ₹139.50 crore and Sundilla: ₹124.50 crore

has been taken up. Audit had observed from the records that the contractor of the Medigadda barrage had informed (May 2020) the Department that the works were executed strictly as per the approved drawings and under the supervision and quality certification of the Department, and therefore, the contractor was no way responsible for the damages. The Government has not provided any documents to show that the contractor has agreed to restore the dislocated flexible aprons.

Further, post incident, in a meeting held by the EnC (Irrigation) with Telangana State Engineering Research Laboratory and contractors, it was decided to re-conduct the model studies with various options for reducing the discharge velocity of water duly re-designing the wearing coat, CC aprons, stone aprons and other associated downstream apron structures. Model studies were conducted to decide the revised parameters and estimates were prepared accordingly. Thus, there is a risk that due to defective designs, the cost of repair may have to be borne by the Department.

#### **5.4.2.2 Extra expenditure due to specification of higher diameter of tunnel**

The Indian Standard IS: 4880 (Part III) – 1976 (Code of practice for design of tunnels conveying water – Part-III Hydraulic Design) states that the average velocity of water in a concrete lined tunnel may be about 6 metres/second. It further stipulated that in the case of water carrying abrasive material, a reduced velocity of 2.5 metres/second is recommended.

The scope of work under Package-9 included excavation of a 12.035 Km long concrete lined tunnel with a discharge capacity of 16 cumecs to convey six TMC of water in 120 days. The diameter of tunnel was fixed at 5 metres. Post re-engineering, the Department proposed to carry 11.635 TMC of water (instead of 6 TMC) in 120 days through this tunnel by increasing its discharge capacity from 16 cumecs to 31.777 cumecs. For this purpose, the Department increased the diameter of tunnel from 5 metres to 5.80 metres and concluded with a contractor for ₹67.35 crore.

Audit observed that in the original estimate, the diameter of tunnel was fixed as 5 metres by considering velocity of water as 0.72 metres/second instead of 2.5 metres to 6 metres/second recommended in the IS Code. Even in the revised estimate prepared after increasing the discharge capacity of tunnel, the Department adopted a velocity of only 1.044 metres/second.

In case the minimum velocity of 2.5 metres/second, as recommended in the IS Code had been adopted, a concrete lined tunnel (D shape) with 5 metres diameter could have achieved a discharge capacity of 56.56 cumecs which was more than the required discharge of 31.777 cumecs. Thus, the original diameter of 5 metres was higher than what was necessary and further increase in the diameter (from 5 metres to 5.80 metres) was unwarranted. This resulted in avoidable expenditure of ₹67.35 crore.

The Government replied (November 2023) that during re-engineering of the project, the tunnel was designed for a discharge capacity of 31.777 cumecs with 5.80 metres diameter tunnel against 5 metres diameter considering the velocity to the extent



possible and keeping in view of already finalised Pump Parameters, Pump Centre Line and MWL in surge pool, *etc.* In this circumstance, the only left-over option is to increase diameter of the tunnel without affecting the design parameters for pumps and motors of which manufacturing was already in progress.

The reply is not acceptable since both the capacity of pumps and motors and also the discharge capacity of water conveyor system were increased during re-engineering. Therefore, the design parameters of these two components should have been fixed accordingly in sync with each other as this would have avoided the need for increasing the tunnel diameter during re-engineering process.

#### **5.4.2.3 Avoidable expenditure on construction of earthen approach bunds**

The work of formation of a new reservoir at Malkapet was entrusted to a contractor in September 2017 for ₹472.28 crore. As part of the reservoir formation, the contractor was to build hoist bridges from the reservoir bund to the off-take sluices of left and right main canals to enable maintenance staff to operate the sluice gates to release water into canals. An amount of ₹0.66 crore was provided in the agreement for this item of work. However, the Department later decided to form earthen bunds instead of hoist bridges. Accordingly, the designs were approved and the work was executed. The change in the specification from hoist bridges to earthen bunds were not supported by any justification. The Department provided an amount of ₹13.79 crore in the revised estimate for this item of work and payment was yet to be made. This resulted in avoidable extra expenditure of ₹13.13 crore.

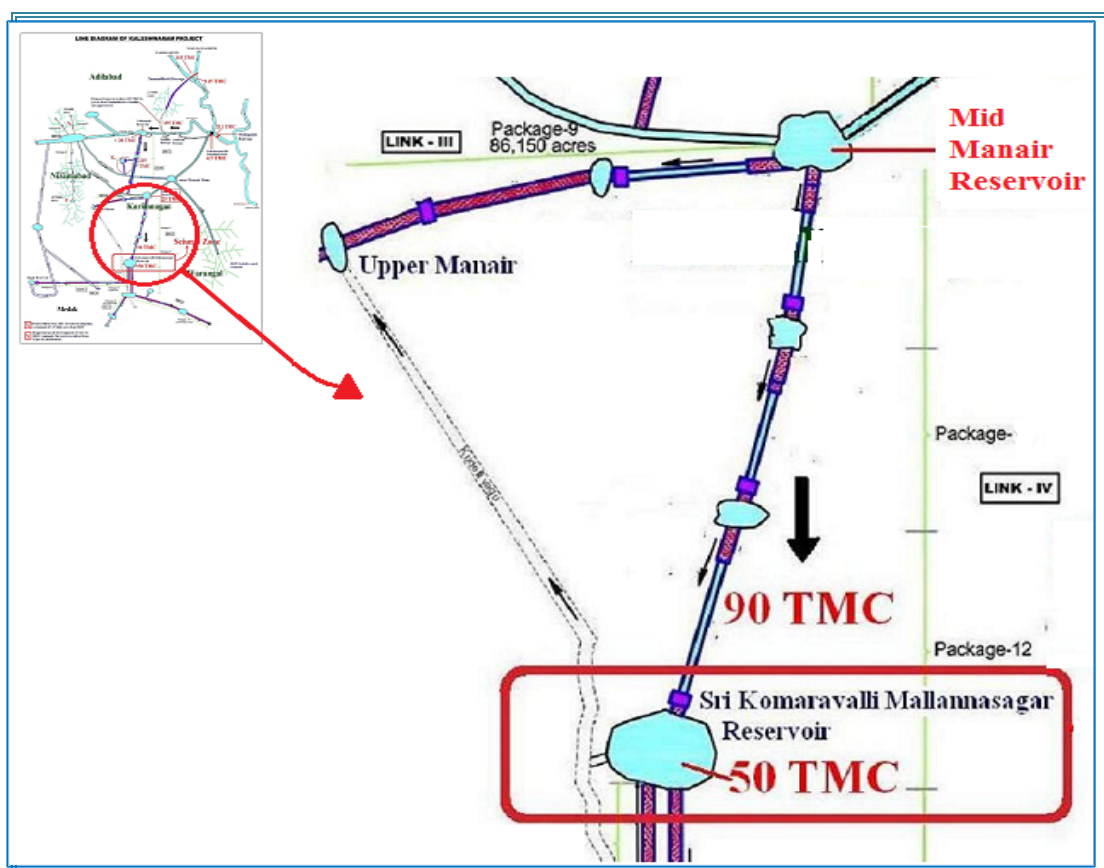
In response to the above, the Government stated (May 2023) that in the approved drawings for off-take sluice, the approach bridges (walkways) were provided from top of road at Top Bund Level to off-take Sluice. The Malkapet Reservoir is considerably huge and the work has to be tackled with heavy earth moving machinery. The column rows which are provided perpendicular to the bund alignment will be a hurdle for vibromax roller which will move parallel to the bund. The columns are a hurdle for earth moving equipment like dozers, dumpers and graders also. Generally, hoist bridges (approach bridges) are proposed to off-take sluices. But, keeping in view the ease in erection, commissioning and Operation and Maintenance of off-take sluice gates, the proposals were modified with earthen bunds for the movement of heavy machinery to the off-take sluice well points and the same were approved by Chief Engineer, Chief Designs Organisation, Hyderabad. The Government stated (November 2023) that the net increase in cost due to taking up earthen bunds instead of hoist bridges is only ₹8.04 crore.

The reply is not acceptable, as even in construction of a big reservoir like Konda Pochamma Sagar (KPS), a hoist bridge was proposed even though the height of bund is more than the Malkapet reservoir. Further, the Department was aware of the challenges posed by hoist bridges at the time of preparation of estimates and thus substitution of hoist bridges with earthen bunds at a later stage also reflects poor planning of the Department.

### 5.4.3 Construction of Mallanna Sagar Reservoir without conducting detailed seismic studies

The Project aimed to construct three barrages and 14 reservoirs with a total storage capacity of 141 TMC of water. Of these, Sri Komaravelli Mallanna Sagar (SKMS) reservoir in Link IV of the project (Figure 5.4) is the largest, constructed<sup>127</sup> with a storage capacity of 50 TMC.

Figure 5.4 – SKMS reservoir in Link-IV of Kaleshwaram Project

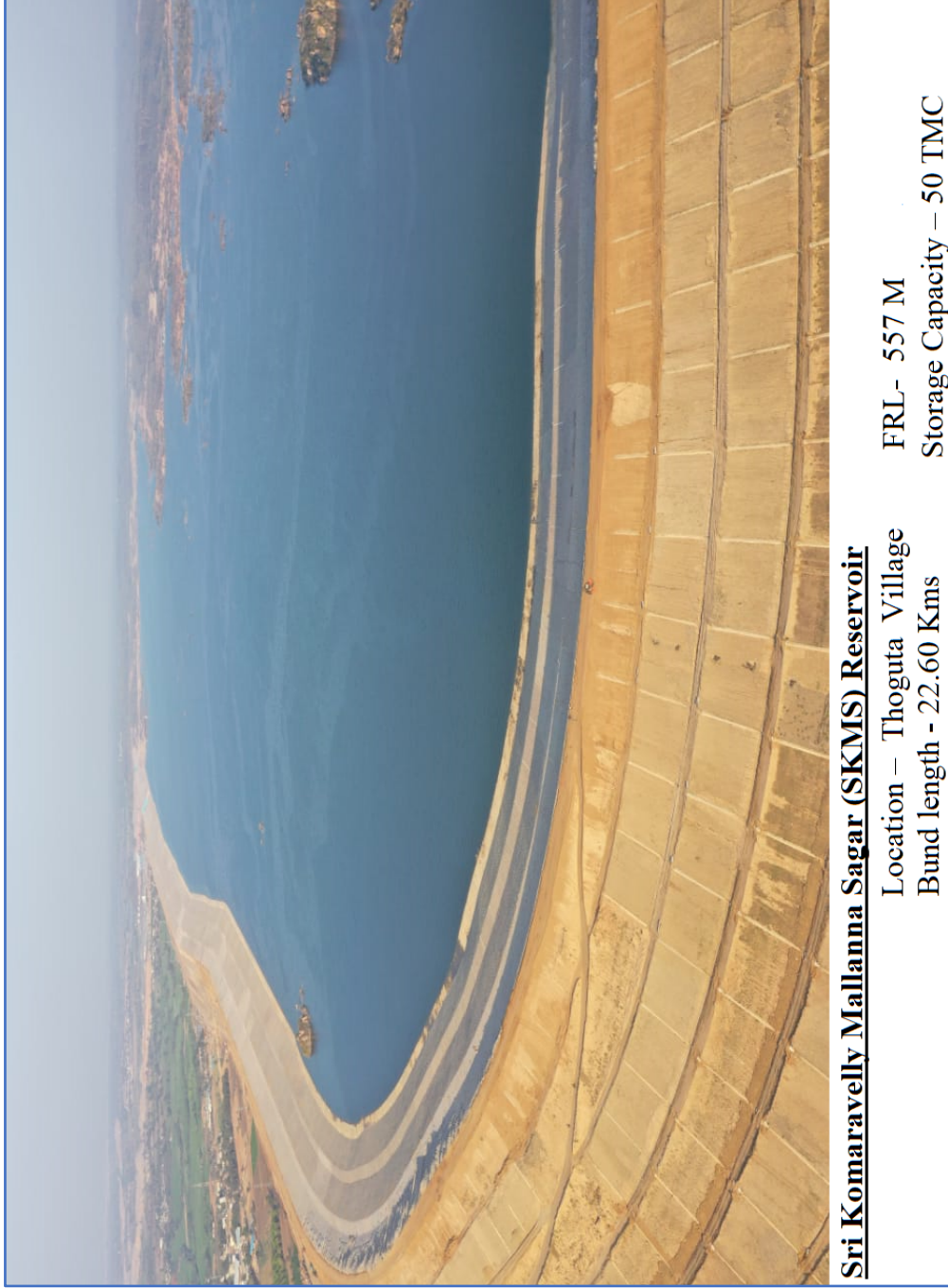


Source: As per the records of the I&CAD Department

This is the most important reservoir under the project since it is the source of water for a total CA of 10.30 lakh acres (*i.e.*, 56.42 per cent of the total CA) proposed under the project. The construction work of the reservoir was taken up in October-December 2017 and was largely completed with a total expenditure of ₹6,126.80 crore (up to March 2022). The reservoir was filled with 10.6 TMC of water in August / September 2021 and was inaugurated in February 2022.

<sup>127</sup> By increasing the capacity of the existing Imamabad reservoir from 1.5 TMC to 50 TMC

Figure 5.5 - SKMS reservoir constructed with a storage capacity of 50 TMC



Source: Photograph provided by the I&CAD Department

Considering the large capacity of the reservoir and the extent of CA covered under it, the engineering soundness and stability of this reservoir is critical in achievement of the intended benefits under the project. Audit, however, observed that the drawings of SKMS reservoir were got approved and the reservoir was constructed in undue haste without conducting the necessary investigations/studies fully, as discussed below:

***Existence of faulty zone at the reservoir location:*** While approving the preliminary drawing of the reservoir, the Chief Engineer, Central Designs Organization (CE, CDO) advised (August 2016) the Department to get a site-specific seismic studies conducted through an expert agency like the National Geophysical Research Institute (NGRI) before approval of drawings. Accordingly, the Department addressed (December 2016, August 2017 and October 2017) the Director NGRI, Hyderabad to take up site specific seismic analysis in the reservoir area. However, without waiting for a report from NGRI, the Department awarded (December 2017) the construction work of SKMS Reservoir to contractors, with a stipulation to complete the work by December 2020. In March 2018, the NGRI submitted its preliminary study report which stated that:

- The Telangana State in the Southern Peninsular shield falls in Seismic Zone-II (*i.e.*, lowest seismic activity). However, the occurrence of Koyna earthquake in 1967 and Latur earthquake in 1993 (both of 6.3 magnitude) has led to the realisation that the Southern Peninsular shield is conspicuous with stable continental region earthquakes.
- Recent moderate earthquakes occurring in Ongole region of Andhra Pradesh and Latur region of Maharashtra had caused considerable ground shaking and minor damage to structures in Telangana region.
- In 1969, a moderate earthquake of 5.7 magnitude struck Bhadrachalam region (200 Kms away from SKMS reservoir site) in Telangana which was felt in the entire South India Peninsular shield and there were reports of damage to structures in the epicentral region. The SKMS reservoir was located along the Intensity-VI<sup>128</sup> contour of this earthquake.
- In June 1983, the Medchal area near Hyderabad experienced an earthquake of 4.9 magnitude. This earthquake had a depth of more than 15 km and was felt significantly up to a distance of 200 Km because of its deep-seated origin. The epicentre distance of this earthquake is about 20 Km from the SKMS reservoir site.

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<sup>128</sup> The effect of an earthquake on earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally – total destruction.

The modified Mercalli Intensity value assigned to a specific site after an earthquake has more meaningful measure of severity to the non-scientist than the magnitude because intensity refers to the effects actually experienced at that place. The lower numbers of the intensity scale generally deal with the manner in which the earthquake is felt by the people. The higher numbers of the scale are based on the observed structural damage.

- Keeping in view the historical seismicity status of the region, an earthquake of magnitude 5 or more is likely to cause damage to non-engineered structures. Hence, any installation planned should be in standards to withstand to the levels of respective ground shaking.
- There was a deep-seated vertical fault with significant strike slip motion in the proposed location of the reservoir and that the rocks in the fault zone were highly sheared and fractured.

The NGRI report further stated that there are at least three sets of dominant lineaments<sup>129</sup> with distinct geomorphic signatures observed in the region. The NGRI suggested that it would be appropriate to conduct detailed survey with planned profile orientations to characterize their effect on shallow surface and understand their mutual relationship.

Despite the recommendation of the NGRI, the Department did not conduct any detailed survey of the location and went ahead with the construction of the reservoir.

Considering the seismicity of the region and the presence of three sets of dominant lineaments in the area mentioned in the preliminary report of NGRI, non-conducting of further detailed studies as advised by NGRI, gives rise to concerns about the soundness of the reservoir and the safety hazard it can pose in the event of an earthquake in the region. Audit observed that the DPR prepared by WAPCOS did not discuss any seismic studies conducted in the project location and the potential risks involved in construction of a large reservoir.

Audit further observed that the CE, CDO while approving (during April 2018 to May 2020) the construction drawings of earth dam sections of reservoir, repeatedly stated that in the absence of site-specific seismic studies, the approvals were being given with the available data/information in view of the urgency. The CE, CDO also suggested that the drawings should be got vetted by apex organisation like the Central Water and Power Research Station (CWPRS)<sup>130</sup>, Pune or the Indian Institute of Technology, Roorkee. However, there was no record to show that any such expert organisation was engaged for vetting the drawings of SKMS reservoir before construction.

However, after executing about 95 *per cent* of construction work, the Government, in January 2021, constituted<sup>131</sup> a Technical Committee<sup>132</sup> to resolve the technical issues like designs, stability analysis and vetting of designs relating to SKMS reservoir.

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<sup>129</sup> A lineament is a linear feature in a landscape which is an expression of an underlying geological structure such as a fault

<sup>130</sup> Functioning under the Ministry of Jal Shakti, GoI

<sup>131</sup> vide G.O. No 49 of I&CAD (project-IV) Department, dated 28 January 2021

<sup>132</sup> with EnC (General); EnC (Irrigation), Gajwel; professors of the Indian Institute of Technology, Hyderabad and Osmania University, Hyderabad; a Geo-technical expert from the Central Water and Power Research Station (CWPRS), Pune; and a Senior Engineering Geologist of Geological Survey of India as members

While the purpose of constituting this committee at such a late juncture was not clear, the Committee neither held any meetings nor submitted any report as of February 2022. In response to an audit enquiry, the Executive Engineer (EE), Irrigation Division No.6, Gajwel replied (February 2022) that the Committee had visited the site thrice in September/October 2021. However, the EE did not furnish details of technical issues referred to the Committee.

The Government replied (May/November 2023) that as per IS Code 1893-Part-1, the SKMS Reservoir falls under Seismic Zone-II (lowest seismicity level) category. Hence, specific seismic studies are not required. However, during the design of earth bund, basic horizontal seismic coefficients as per relevant code were considered and designed accordingly. It was further replied that during execution of the cut-off trench of SKMS Reservoir, the Director, Geological Survey of India (GSI), Hyderabad had inspected all along the 22.6 Km bund and the 0.62 Km saddle bund. As per the observations and suggestions of the Director, GSI from time to time, all the measures were taken and the cut-off trench was filled with impervious soils. It was also replied that a geo-technical study for seepage and stability of zoned earth dam of SKMS was conducted by the CWPRS in March 2022. The report of CWPRS concluded that the cross sections of the reservoir are safe from slope stability point of view and that pseudo-static earthquake analysis indicate that all three sections are safe for steady seepage and full reservoir conditions. The Government added that it had constituted (January 2021) a Technical Committee to resolve technical issues related to designs, stability analysis, vetting of the designs pertaining to SKMS Reservoir. Hence, all the detailed studies for SKMS were conducted and specific study, if any required in future would be conducted as per the recommendation of the Committee.

The reply is not convincing as the competent authority (CE, CDO) itself had advised (August 2016) the Department to conduct site specific seismic studies before approval of drawings. Accordingly, the study was taken up by the NGRI and in its preliminary study report, it suggested that the Department take up a detailed survey. The same was, however, not done. The other studies conducted by the Department were on the geo-technical, structural, seepage and stability aspects of the reservoir and not a detailed study on the lineaments observed in the region and their effect on shallow subsurface, which was suggested by NGRI.

***Non-preparation of Emergency Action Plan:*** In the Environmental Management Plan (EMP) submitted to the MoEF for obtaining Environmental Clearance, the Department got a dam break analysis of SKMS reservoir conducted (October 2017) by the CWPRS, Pune. The report submitted by CWPRS contained an assessment of the possible impact and the likely submergence areas in the worst-case scenario of dam break. The report also contained guidelines for preparation of Emergency Action Plan (EAP) for different emergency situations. Though the Department has started filling the SKMS reservoir in August/September 2021, it has not prepared the EAP so far (February 2023). Till March 2022, water to the extent of 10.637 TMC had been filled up in the reservoir. Non-preparation of EAP increases risk to the life and

properties of the people near the reservoir due to delayed/inadequate response in case of a dam break scenario.

Thus, the Department neither got detailed seismic studies conducted nor prepared EAP for SKMS reservoir leaving the reservoir and the lives of the people nearby at increased risk.

The Government replied (May 2023) that the Dam Break analysis and Emergency Action Plan were also conducted for Sri Komaravelli Mallanna Sagar Reservoir by Central Water and Power Research Station (CWPRS), Pune. The Government further replied (November 2023) that the guidelines of the CWPRS, Pune on EAP would be followed before utilizing the reservoir at full capacity.

The reply is not tenable since the report prepared by the CWPRS contains only the guidelines for preparation of EAP and not the EAP as such. The report discussed the inputs to be considered for formulation of EAP. However, no such EAP for SKMS reservoir was furnished by the Department to Audit.

***Recommendation - 6***

***Detailed seismic study with planned profile orientation of the SKMS reservoir as suggested by NGRI should be conducted and emergency action plan should be prepared before utilizing the reservoir at full storage capacity so as to have assurance about its stability and safety.***

**5.5 Status of creation of distributary network**

In irrigation projects, while the headworks and main/branch canals form the main water conveyor system, the distributary network consisting of major/minor canals and field channels is critical for carrying the irrigation water to the fields of farmers. Thus, creation of distributary network is vital for achieving the targeted irrigation benefits.

**5.5.1 Non-taking up of distributary network**

The Kaleshwaram Project envisaged providing irrigation to a total CA of 18,25,700 acres to be newly created as part of the project works. The DPR submitted to the CWC contained details of extent of CA proposed to be created under each Link/package work. The DPR also identified the extent of CA proposed in each mandal in each district. However, after approval of the project by CWC, the Department made changes to the CA to be developed under some of the Links/package works. Further, the works awarded by the Department as of March 2022 included development of distributary network for a total of only 14,82,552 acres, as shown in Chart 5.2 below:

Chart 5.2 – Link wise and package wise distributary network entrusted

Link/Package-wise Command Area details			Command Area Extent-DPR	Command Area Extent-Tenders Awarded
Link No	Package No (DPR)	Package No (Tenders Awarded)	Total: Ac 1,825,700	Total: Ac 1,482,552
			CA: Command Area	
Link I	3 Barrages	3 Barrages	Ac 30,000	Ac 0
Link II	No Command Area	No Command Area		
Link III	Package-9	Package-9	Ac 86,150	Ac 86,150
	Addl CA **	Addl CA work		Ac 10,000
Link IV	Package-10	Package-10	Ac 30,000	Ac 30,000
	Package-11	Package-11	Ac 110,000	Ac 110,000
	Package-12	Package-12	Ac 125,000	Ac 125,000
	Package-13	Package-13	Ac 53,000	Ac 39,000
	Package-14	Package-14 (No CA)	Ac 277,754	
	KPS Canals**	KPS Canals		Ac 237,602
Link V	Package-15	Package-15	Ac 55,000	Ac 63,300
	Package-16	Package-16	Ac 188,500	Ac 165,500
	Baswapur Reservoir**	Baswapur Reservoir		Ac 23,000
Link VI	Package-18	Package-18	Ac 15,000	Ac 15,000
	Package-19	Package-19	Ac 117,000	Ac 78,000
	Package-26	Package-26 (Deleted)	Ac 148,296	
Link VII	Package-21	Package-21 (No CA)	Ac 184,000	
	Package 21 A**	Package-21 A		Ac 200,000
	Package-22	Package-22	Ac 306,000	Ac 200,000
	Package-27	Package-27	Ac 50,000	Ac 50,000
	Package-28	Package-28	Ac 50,000	Ac 50,000

Source: Records of the I&CAD Department

(\*\*): Command Area not contemplated)

The works of creation of distributary network for a CA of 3.43 lakh acres had not been included in any of the contracts entrusted so far, as shown in Table 5.6 below:

Table 5.6 - Link wise details of CA contemplated as per the DPR and the extent of distributary works entrusted as of March 2022

S. No.	Link	As per DPR	As per contracts entrusted	Difference
1	I	30,000	0	(-) 30,000
2	III	86,150	96,150	10,000
3	IV	5,95,754	5,41,602	(-) 54,152
4	V	2,43,500	2,51,800	8,300
5	VI	2,80,296	93,000	(-) 1,87,296
6	VII	5,90,000	5,00,000	(-) 90,000
	<b>Total</b>	<b>18,25,700</b>	<b>14,82,552</b>	<b>(-) 3,43,148</b>

Source: Records of the I&CAD Department



The Links in which there was reduction in the targeted CA are discussed below.

#### Link-I

As per the DPR, a CA of 30,000 acres was proposed to be developed under the Annaram and Sundilla barrages in Link-I of the project. Audit observed that the Department did not include this CA in the scope of any of the six package works under Link-I. The Department stated (September 2021) that a separate estimate has been prepared and submitted to Government for administrative sanction.

The Government replied (May 2023) that an estimate for creation of CA of 30,000 acres was under approval and soon after the approval, the work would be taken up.

#### Link-IV

**Package-13:** The work of Package 13 was awarded (November 2008) under the earlier PCSS Project. The scope of work included lifting of water from a new reservoir at Tadkapally village to a new reservoir to be formed at Thipparam village in Medak District and creation of a new CA of 53,000 acres. The DPR of Kaleshwaram Project after re-engineering also contemplated creation of 53,000 acres of CA under this package. During re-engineering, the Department revised the scope of work under this package, closed the existing contract and entrusted (November 2017) the revised work to a new contractor. As per the departmental records, the revision was necessitated due to formation of SKMS reservoir in place of Tadkapally reservoir. In the revised scope of work, formation of Thipparam reservoir was deleted and it was proposed to create 40,000 acres of CA in Kondapaka Mandal of Siddipet District. Audit further observed that even under the revised work, the Department could finally identify only 39,000 acres leaving a further shortage of another 1,000 acres. Thus, as compared to the DPR, there is a reduction of 14,000 acres of CA under this work.

The Government replied (May 2023) that due to re-engineering of Package-13, the scope of work was changed and due to this, the Hydraulic Particulars and alignments were also changed. The original contemplated CA under Package-13 (53,000 acres) is now arrived as 40,000 acres as per new Package-13, due to submergence and change in alignment of Package-13.

The fact remains that there was reduction in contemplated CA from 53,000 acres (as per DPR) to 39,000 acres. Though, the reply stated the reason of reduction in CA from 53,000 acres to 40,000 acres as change in alignment, it is silent regarding reduction in the revised CA from 40,000 acres to 39,000 acres.

**Package-14:** The Package-14 entrusted under the earlier PCSS project contemplated lifting of water from Thipparam reservoir (of package-13) to a new reservoir to be formed at Pamulaparthi (capacity: one TMC) and to create a CA of 90,000 acres. In the DPR of Kaleshwaram Project post re-engineering, it was proposed to form a new reservoir viz., Kondapochamma Sagar (KPS) at Pamulaparthi with a higher capacity (7 TMC).

Figure 5.6 - Kondapochamma Sagar reservoir in Link-IV



**Kondapochamma Sagar Reservoir**

Location – Pamulaparthi Village  
Bund Length - 15.800 Km

FRL- 618 m  
Storage Capacity – 15 TMC

Source: Photograph provided by the I&CAD Department

It was also proposed to increase the CA under Package-14 to 2,77,754 acres. The Department deleted the work of formation of Pamulaparthi reservoir and creation of 90,000 acres of CA from the scope of Package-14. It entrusted the work of construction of KPS reservoir to a new contractor. Later, the capacity of KPS reservoir was increased (July 2017) to 15 TMC. As against the 2,77,754 acres of CA proposed in the DPR, the Department entrusted works of creation of only 2,37,602 acres (to 11 different contractors) under KPS canal system.

In addition, Government had accorded (January 2019) administrative approval for ₹426.79 crore for one more work (*viz.*, Sangareddy canal system Reach-III) which contemplated creation of new CA of 38,307 acres. However, the work was yet to be entrusted even after three years for the reasons not on record.

The Government replied (May 2023) that administrative approval for the revised estimate of Sangareddy canal is under consideration and the work would be taken up after its approval.

### Link-VI

**Package-19:** This package lies in the third (last) reach of the main canal from Mallanna Sagar reservoir to Singur (under Link-VI). This package work, which was originally taken up under the earlier PCSS project, envisaged creating 25,000 acres of new CA (in Hathnoora Mandal). After re-engineering, the DPR of Kaleshwaram Project proposed to create an additional new CA of 92,000 acres (in eight Mandals) taking the total CA to 1.17 lakh acres. In addition, the DPR also proposed to supplement water to the existing Singur project. In July 2016, a high-power

committee<sup>133</sup> recommended (i) to extend the main canal (from SKMS reservoir) up to Km 107.90; (ii) increase the length and the discharge capacity of the branch canal-1 to serve a new CA of 78,000 acres (as against 25,000 acres proposed under PCSS project); (iii) to create a further new CA of 39,000 acres through newly proposed branch canal-2; and (iv) to construct a lift system to supplement water to Singur project. However, in June 2017, the high-power committee again recommended another revised proposal restricting the work of main canal up to Km 82.00 (instead of Km 107.90) and excavation of branch canal-1. Government approved (July 2017) the proposal and accordingly, the work was being executed.

In the revised proposal, there was no mention about the branch canal-2 and the lift system to Singur project. The minutes of the meeting did not specify any reasons for deleting these components but only stated that the modifications were proposed during various review meetings held by the Chief Minister and the Irrigation Minister after detailed discussions. Also, no further proposals about taking up the leftover works were found in the departmental records. Thus, due to non-taking up the works of branch canal-2 and the lift system to Singur there is a shortfall of 39,000 acres in the targeted CA and also non-achievement of the intended objective of supplementation to Singur project.

Further, Audit observed that the entire 78,000 acres of CA under Package-19 was being created under branch canal-1 which was designed with a discharge capacity of only 15.60 cumecs. However, the main canal, from which the branch canal takes off, was designed and being executed with a discharge capacity of 78.10 cumecs. The discharge capacity of main canal was fixed considering the requirements of branch canal-2 (7.90 cumecs) and lift system to Singur reservoir (54.70 cumecs). Thus, non-taking up the works of branch canal-2 and the lift system to Singur resulted in over designing of the 82 Km long main canal from SKMS reservoir.

The Government replied that the balance works to feed Singur Reservoir and the CA of 39,000 acres of the earlier proposed branch canal No.2 are now proposed under Package-19A. The proposals for survey & investigation for preparation of estimate of Package- 19A with alternate alignment duly minimizing the area of land acquisition were submitted to State Level Standing Committee for obtaining approval.

However, the fact remains that the proposal to feed the Singur Reservoir from Package-19 remained as a proposal only. No execution has taken place.

**Package-26:** This package work (under Link-VI) awarded under the earlier PCSS project, *inter alia*, contemplated creation of two lakh acres of new CA. The DPR of Kaleshwaram, post re-engineering, mentioned that 1.48 lakh acres of CA would be created under Package-26. However, the Department dropped this package from

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<sup>133</sup> High power committee constituted vide GO Ms. No.10 dated 27 July 2014 for resolving technical, commercial and design issues relating to three irrigation projects including the PCSS project

Kaleshwaram Project. No alternative CA was identified in place of the CA of deleted package.

The Government replied (November 2023) that the Package-26 with a targeted CA of 1,48,296 acres of CA was closed due to certain technical reasons and that the CA is being covered in the Sangameswara Lift Irrigation Scheme under Kaleshwaram Project and the works are in progress.

The Government, however, did not furnish any details of the entrustment of work and its progress. Further, the reply is also silent as to why this CA has not been included in any other package till date even after re-engineering (November 2023).

#### Link-VII

**Package-22:** As already discussed in Paragraph 5.2, Package-22 which was taken up (November 2008) under the earlier PCSS project, proposed to create a new CA of 1.56 lakh acres, by utilizing the water from Sriram Sagar Project (SRSP) reservoir via Bhumpally reservoir. After re-engineering, the DPR of Kaleshwaram Project proposed to provide irrigation to 3.06 lakh acres by drawing water from Sri Komaravelli Mallanna Sagar (SKMS) reservoir (instead of from SRSP). However, the Department did not implement this change, for reasons not on record. In April 2018, a high-power committee approved a proposal to increase the targeted CA under Package-22 from 1.56 lakh acres to 2 lakh acres. Thus, as compared to the new CA of 3.06 lakh acres contemplated under this package as per the DPR, there is a shortfall of 1.06 lakh acres.

The Government replied (November 2023) that the shortfall in CA of 1.06 lakh acres under Package-22 is being catered from other packages of Kaleshwaram project like Packages-15, 21, 26 and Ramayampet canal keeping the total CA under the project as 18,25,700 acres as per the DPR.

The reply does not appear to be factually correct since it mentions Package-26 also which was deleted during re-engineering. Further, during audit, it was observed that as compared to package-wise CA proposed in the DPR, the targeted CA under Package-15 (in Link-V) was increased by only 6,300 acres and the CA of 1.84 lakh acres proposed earlier under Package-21 was deleted and a CA of 2 lakh acres was included in Package-21A (*i.e.*, an increase of only 14,000 acres). The Government did not furnish the details of further changes made, if any, in the targeted CA included in each of the package works, details of entrustment of the additional works and their progress.

Reasons for not taking up the works relating to the remaining distributary network so far were not on record. Non-taking up the balance distributary network and reduction in the CA in the works already entrusted will lead to short achievement of intended benefits from the project.

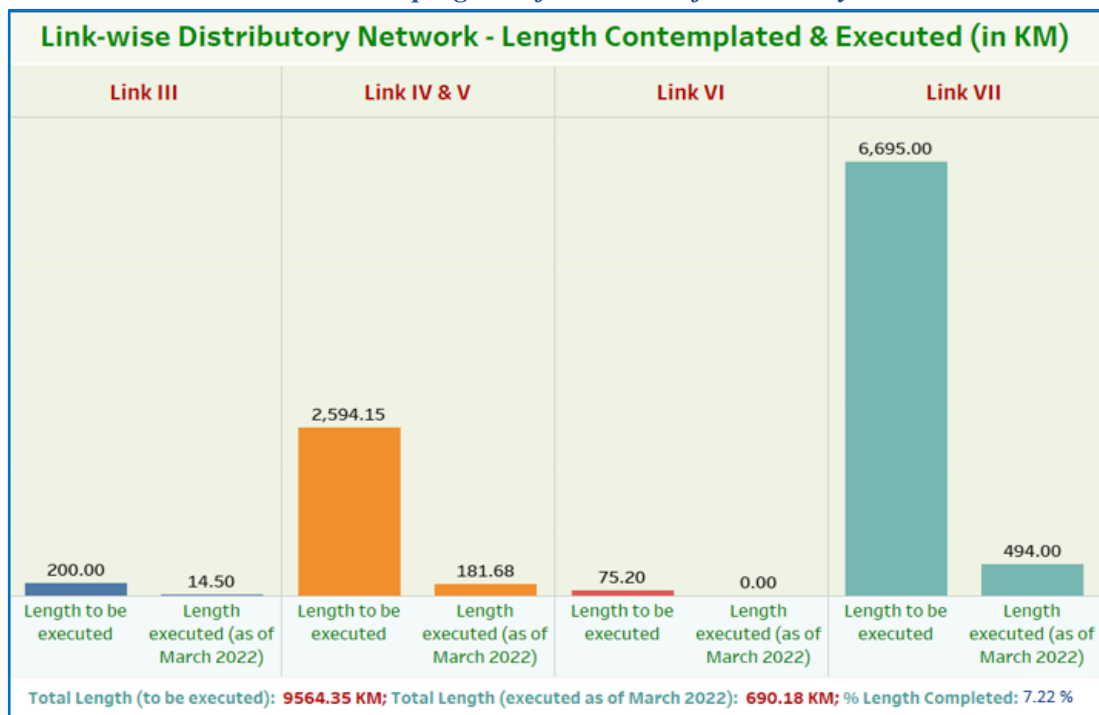
**Recommendation - 7**

*The Department should take up the works relating to the distributary network to cover the remaining command area of 3.43 lakh acres to derive the intended project benefits fully.*

**5.5.2 Poor progress in creation of distributary network**

The scope of work under the existing contracts included creation of distributary network for a total of 14.83 lakh acres in addition to the headworks/main canals. Audit observed that there was no synchronization to ensure that both these components are completed simultaneously so as to derive timely irrigation benefits. As per the information furnished by the Department, a total of 1,566.04 Kms of main canals and 9,564.35 Kms of distributaries were to be excavated under the project. Out of this, while 57 per cent (897 Km) of the main canals were completed only seven per cent (690.18 Km) of distributaries were completed as of March 2022. This shows that the Department and the contractors did not give adequate priority to creation of distributary network as was given to the headworks/main canals.

*Chart 5.3 – Link wise progress of execution of distributary network*



Source: Records of the I&CAD Department

Notes:

1. In Link-I, CA works were not awarded so far (March 2022) for 30,000 acres. Hence, length of the distributary network is not known
2. There is no CA in Link-II
3. In Link-VI, Package 18, survey work for distributaries was not done. Hence length of distributaries is not known so far
4. In Link-VII, Package 22, survey work for distributaries was not done. Hence length of distributaries is not known so far

### Case Study

The scope of works under Packages-10, 11 and 12 under Link-IV of the project involves creation of water conveyor system including construction of pump houses, supply and erection of lift systems and excavation of tunnels/canals to lift water from Mid-Manair Reservoir to SKMS Reservoir. In addition, the scope of work under these three packages also included creation of distributary network for 0.3 lakh acres, 1.10 lakh acres and 1.25 lakh acres, respectively. These works were stipulated for completion by June 2019. The works of erection and commissioning of lifts and excavation of tunnels and main canals were completed in all the three packages and the Department had also issued provisional completion certificates to this effect in June 2020. Pumping of water<sup>134</sup> was also done during March – June 2020.

Audit, however, observed that the works relating to creation of CA through distributary network was not synchronous with the progress of lifts and water conveyor system. Even after nearly two years since commissioning of the main water conveyor system, as against the CA of 2.65 lakh acres targeted to be created in these three packages, distributary network for only 35,288 acres of CA (6,040 acres, 19,500 acres and 9,748 acres in Packages-10, 11 and 12 respectively) was created as of March 2022.

Non-synchronization between the schedules of main canals and distributary network resulted in delay in providing irrigation to the targeted CA even after completion of headworks/main canals.

Out of the 18.26 lakh acres of CA targeted under the project, only 40,288 acres<sup>135</sup> of CA was created as of March 2022 despite incurring a huge expenditure of ₹86,788.06 crore on the project.

The Government replied (November 2023) that the CA served under Packages-10, 11 & 12 was 13,500 acres, 36,500 acres and 33,410 acres, respectively. The Government further replied that in head works, the linear length will be less and number of farmers involved is less whereas in the distributary network, the linear length of Distributaries, Minors and Sub-Minors will be much more and land acquisition involves higher number of farmers/villages with less extent of land and therefore, the land acquisition process involves a lot of work and will take 4 to 6 months. Further, the investigation process is a sequential process *i.e.*, after completion of investigation of main canal, investigation of distributaries will be taken up and thereafter, the investigation of Minors/Sub-Minors will be taken up. As the number of distributaries and Minors is more, it will take a lot of time to complete investigation and land acquisition process. The Government stated that the works of distributary network are in brisk progress in many packages and all efforts are being taken to complete the works at the earliest.

<sup>134</sup> Package 10: 8.65 TMC, Package 11: 6.74 TMC and Package 12: 5.14 TMC

<sup>135</sup> Package-10: 6,040 acres, Package-11: 19,500 acres, Package-12: 9,748 acres and Package-14: 5,000 acres

The reply is not acceptable as the Department should have taken into account these complexities while fixing the agreement period of the package works. The fact remains that though the original agreement period stipulated by the Department is over in majority of works, creation of distributary network is still in progress and there is no synchronization between the works of distributaries network *vis-à-vis* head works/main canals. Had the works been completed as per the stipulated period, a total extent of 14.83 lakh acres of CA would have been created whereas only 40,288 acres of new CA has been created as of March 2022. Without distributaries, the end point delivery of water to the targeted CA will be delayed and intended objectives to be derived from the projects will not be met.

## **5.6 Arrangements for supply of drinking water from the project**

In addition to providing irrigation facilities, the Kaleshwaram Project envisages supply of 40 TMC of drinking water to the twin cities of Hyderabad and Secunderabad (30 TMC) and the enroute villages under the project (10 TMC).

The Government of Telangana (Panchayat Raj and Rural Development Department) has already been implementing a flagship program called ‘Mission Bhagiratha’ to provide protected and assured drinking water to all households of the State by tapping water from various reservoirs, projects and river flows in the State.

Though 40 TMC of water was allocated under Kaleshwaram Project for drinking water purposes, it appears that neither the Irrigation Department nor the Engineer-in-Chief (EnC), Mission Bhagiratha have any comprehensive plan for achieving this objective. To an audit enquiry, the EnC (Irrigation), Gajwel replied (July 2022) that the Government had approved<sup>136</sup> (October 2017) allocation of 22.77 TMC of water from Kaleshwaram Project to Mission Bhagiratha and another 9.06 TMC of water was proposed to be allocated from Sri Komaravelli Mallanna Sagar (SKMS) Reservoir. However, Audit observed from the Government orders that the 22.77 TMC of water was allocated from the reservoirs of the already existing projects<sup>137</sup> (which are proposed to be used as transit reservoirs in Kaleshwaram Project) and no fresh allocations were made from the new reservoirs formed/being formed under the Kaleshwaram Project. Further, even though it was proposed<sup>138</sup> to draw 9.06 TMC of water from SKMS reservoir of Kaleshwaram Project, the Irrigation Department was yet to obtain approval of Government for the same.

Moreover, as per the information furnished (June 2022) by the EnC, Mission Bhagiratha, a total of 10 works were taken up by the Mission Bhagiratha Department for drinking water supply from Yellampally, Medaram, Mid-Manair, Lower-Manair and SKMS reservoirs. Out of these, nine works were taken up prior to Kaleshwaram Project and were completed later. One work for drinking water supply from SKMS

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<sup>136</sup> GO Rt.No.885 of I&CAD (WRG-GRC) Department dated 30 October 2017

<sup>137</sup> SRSP: 6.5 TMC; Yellampally: 2.82 TMC; Medaram: 0.18 TMC; Mid-Manair: 1.41 TMC; Lower Manair: 6.16 TMC and Singur: 5.70 TMC

<sup>138</sup> During a joint inspection of the project by the EnC, Kaleshwaram project and the EnC, Mission Bhagiratha on 24 June 2020

reservoir to the Hyderabad Metropolitan Water Supply and Sewerage Board (HMWSSB) was taken up only in August 2021 and is in progress.

It is clear from the above that the project has not been able to provide the contemplated drinking water as of June 2022. In the absence of any comprehensive plan, the objective of utilising 40 TMC of water from Kaleshwaram Project for drinking water supply is unlikely to be achieved for a long time.

The Government replied (November 2023) that a comprehensive plan has been prepared and is being implemented through Mission Bhagiratha from the last two years at various drawal points as per requirements for utilizing the drinking water supplied through Kaleshwaram Project. The main trunk of the project is completed and is ready for integration with Mission Bhagiratha. It was further replied that drinking water is being provided from SKMS reservoir by the Mission Bhagiratha Department and that 10 TMC of drinking water is being supplied to Hyderabad and Secunderabad from Sripada Yellampally Project as per Government Orders (August 2008).

The reply is not convincing as the Government did not furnish any records in support of its reply that a comprehensive plan to supply water has been prepared. The work for drinking water supply from SKMS reservoir to HMWSSB is still in progress. Further, Yellampally Project is an already existing project and the Government Orders for supply of 10 TMC of water from this project were issued long back in August 2008 and these orders were not with reference to the PCSS or Kaleshwaram projects.

## **5.7 Arrangements for water supply to industries**

The Kaleshwaram Project envisages supply of 16 TMC of water for industrial usages. When Audit enquired about separate plan, if any, for utilization of Kaleshwaram water for industrial uses, the EnC (Irrigation), Gajwel replied (July 2022) that water to industries would be allocated based on the applications received from the individual industries. It was further replied that so far (July 2022) permissions had been accorded (May 2021 to June 2022) to three industrial units for drawal of a total of 16.3 million litres per day (MLD), but agreements were yet to be concluded and the industries were yet to establish water drawing system. It was also replied that two more applications were under process. Thus, no water has been released from Kaleshwaram Project for industrial purposes as intended (upto March 2022).

The Government replied (November 2023) that the main trunk of Kaleshwaram Project is completed and is ready for supply of water to industries. It was further stated that water is being supplied from Sripada Yellampally Project (which is one of the balancing reservoirs of Kaleshwaram Project System), to industries such as National Thermal Power Corporation (NTPC), Ramagundam and to the Urea plant of M/s Ramagundam Fertilizers and Chemicals Ltd (RFCL), Ramagundam, Peddapalli District. Applications are being received from various industrial units and permissions were given to three units. The Government further replied that the process of water



supply to industries involves several stages like preliminary enquiries by the industrial units, submission of applications, approval of the same by competent authorities and making water drawal arrangements by the units and takes time. It was also stated that even though 10 TMC of water is allocated for industries, the setting up of industries is time taking process and that many industries have shown interest in setting up units.

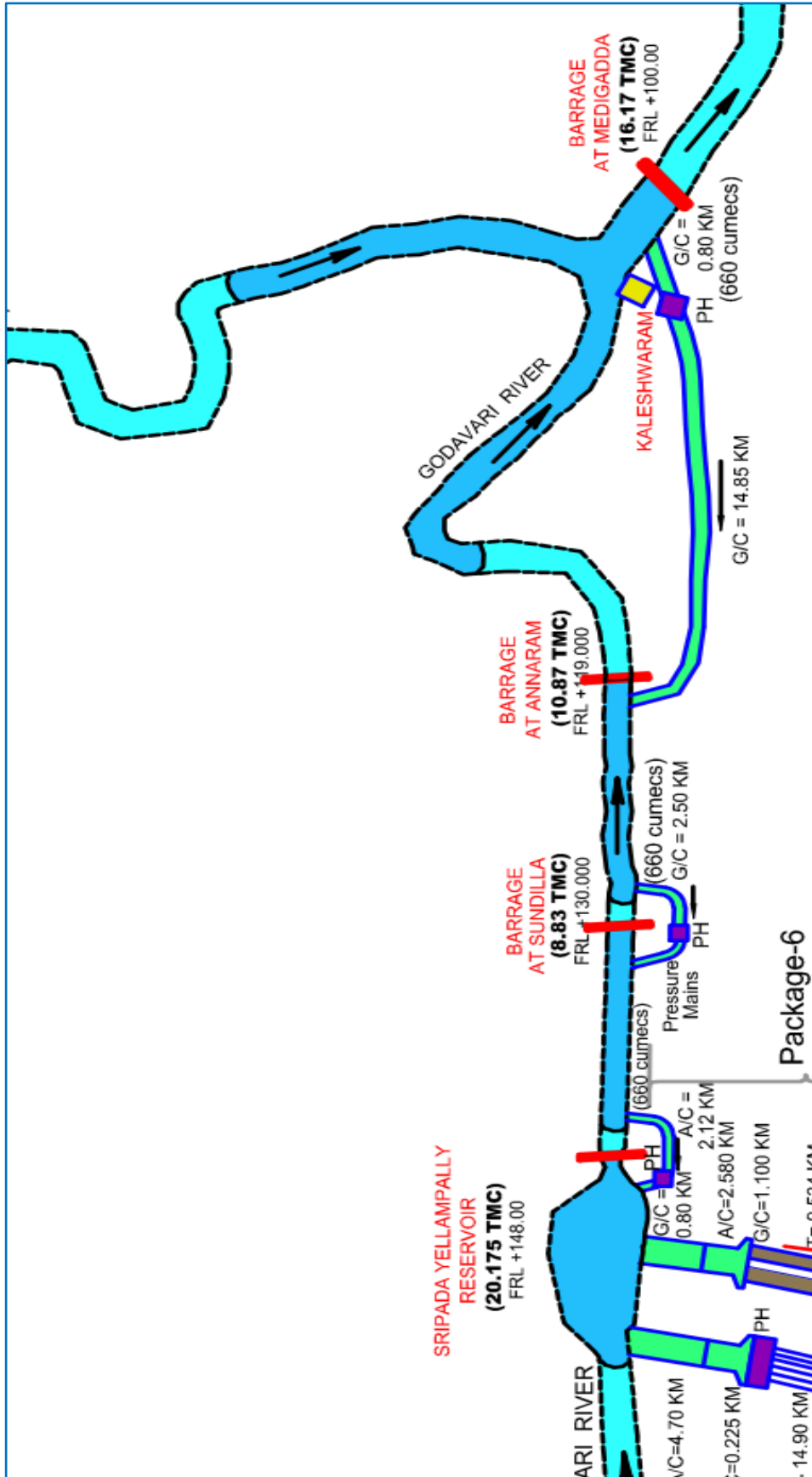
The reply is not tenable as supply of water through Yellampally Project is an already existing arrangement and in respect of Kaleshwaram Project, permissions have been given to only three units (for drawal of 0.21 TMC).

## 5.8 Overall status of the project and its outcomes

The Link wise status of the project works executed as of March 2022 is as given below:

**Link-I:** The Link I of the project consists of construction of three barrages and three lifts at Medigadda, Annaram and Sundilla and water conveyer system to lift 195 TMC of water from River Godavari and convey the same up to Sripada Yellampally Reservoir. In addition, a CA of 30,000 acres was to be created under this link. All the six package works relating to the three barrages, three lifts and water conveyer system were completed. The link is ready to lift water (at the rate of 3 TMC per day) from Medigadda and carry it to Yellampally Reservoir. However, no CA was created under this link as the work of creation of 30,000 acres of CA was yet to be taken up, as of March 2022.

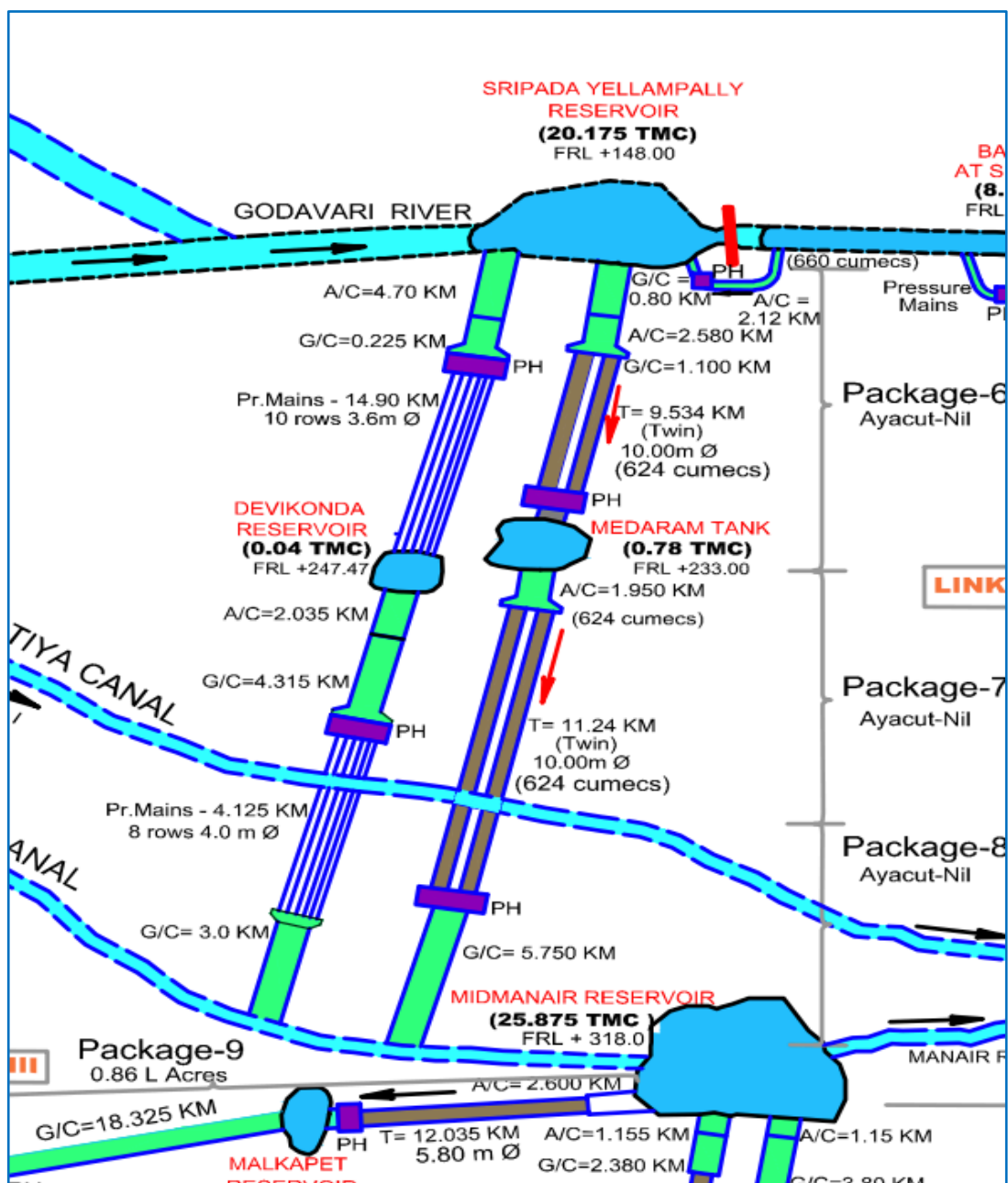
Figure 5.7 - Line diagram of Link-I (From Medigadda Barrage to Sripada Yellampally Reservoir)



Source: Records of the I&CAD Department

**Link-II:** The Link-II consists of two lifts and water conveyor system to lift and carry water from Yellampally Reservoir to Mid-Manair Reservoir via Medaram tank. The two lifts and conveyor system initially awarded under three packages to carry 1.9 TMC of water per day were completed. The Department later took up four more works (two lift works and two canal works) to convey additional 1.1 TMC of water per day. Out of these, two lift works were ongoing (physical progress: 40 per cent to 42 per cent) while the two canal works were yet to start, as of March 2022. The link is ready to lift 1.9 TMC water per day from Yellampally Reservoir and carry it to Mid-Manair Reservoir and to supplement water to the already existing Sri Ram Sagar Project and the Flood Flow Canal. There is no direct CA under this link.

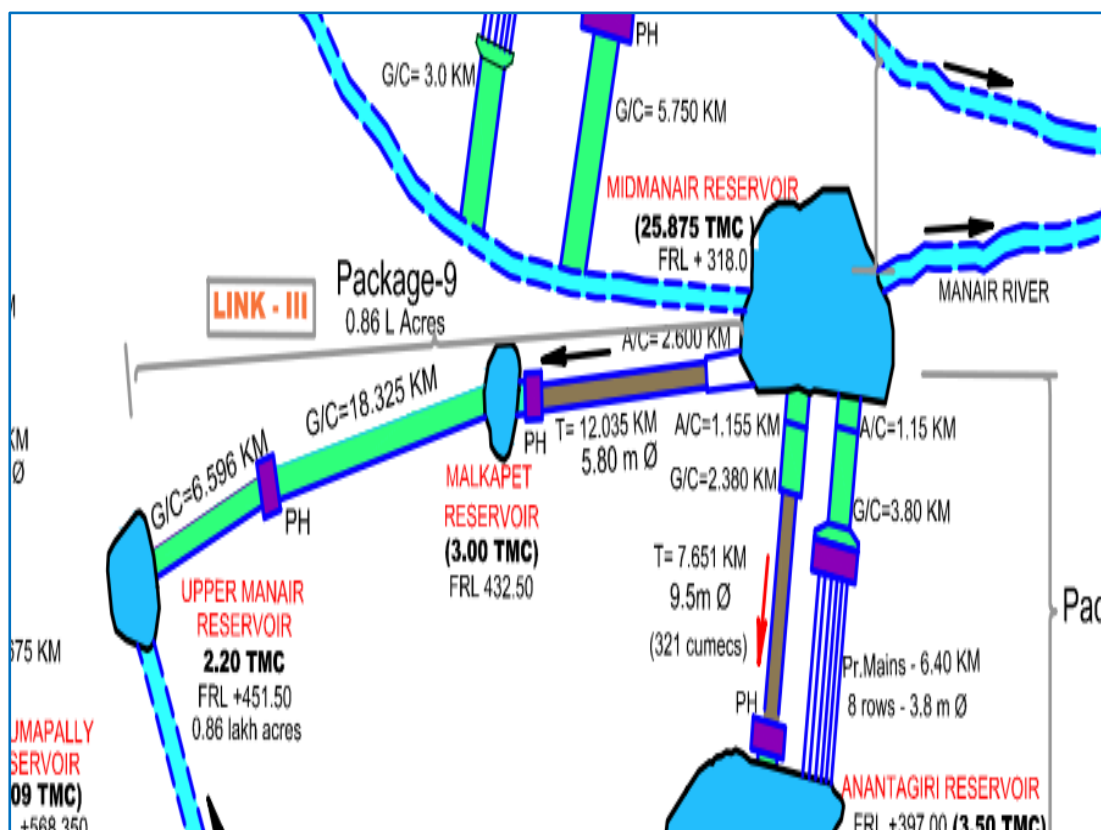
**Figure 5.8 - Line diagram of Link-II**  
(From Sripada Yellampally Reservoir to Mid Manair Reservoir)



Source: Records of the I&CAD Department

**Link-III:** The works under Link-III include water conveyer system from Mid-Manair Reservoir to Upper-Manair Reservoir including enhancing the storage capacity of Malkapet Reservoir along the way. The link has an CA of 96,150 acres. There are three package works under this link and all are ongoing with progress ranging from 3 per cent to 80 per cent. While the progress in earth work component was 95 per cent, the progress in construction of structures and distributaries was only 3 per cent and 7 per cent, respectively. No CA was created under this link, as of March 2022.

*Figure 5.9 - Line diagram of Link-III (From Mid Manair to Upper Manair Reservoir)*

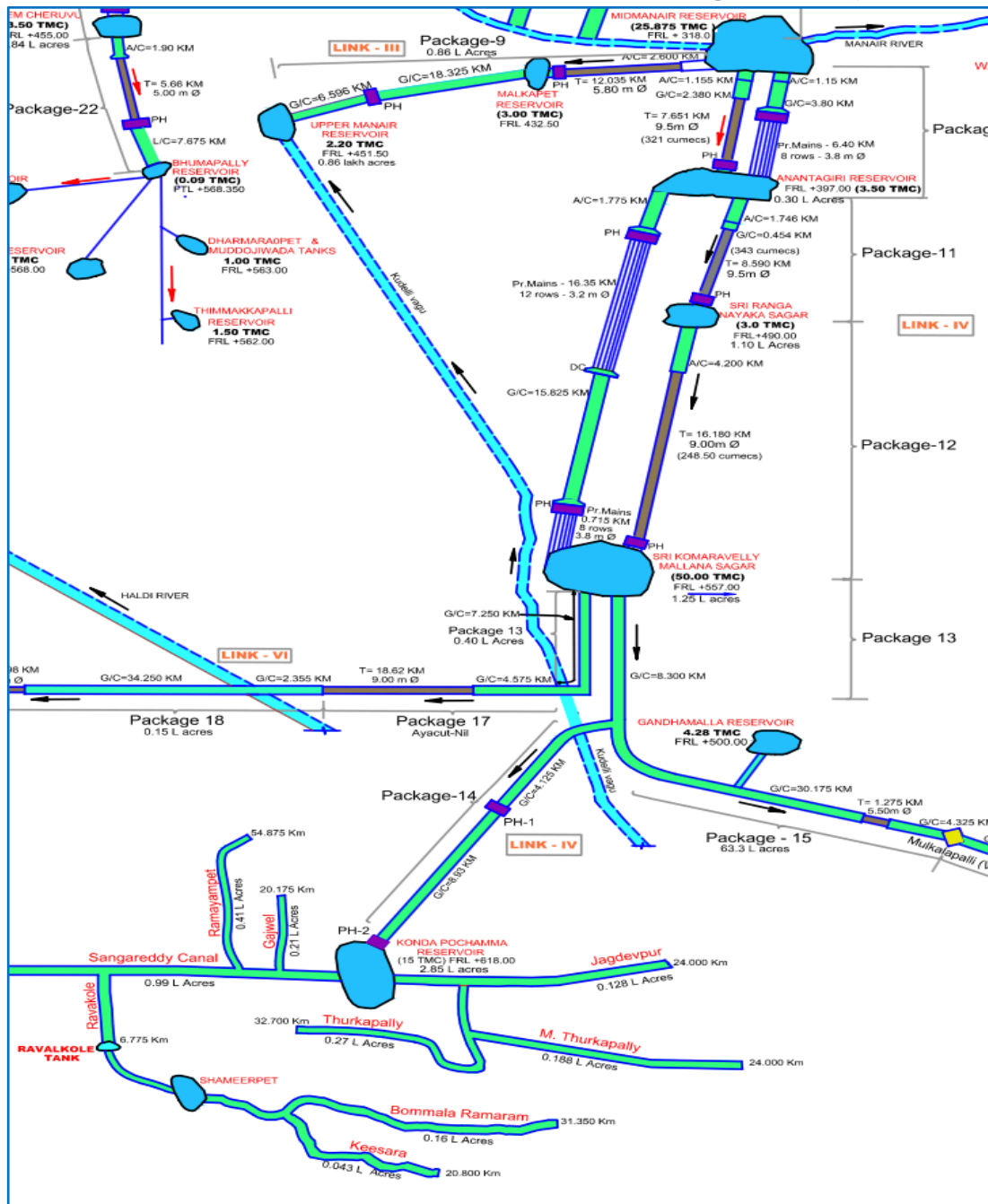


Source: Records of the I&CAD Department

**Link-IV:** The Link-IV was to convey water from Mid-Manair Reservoir to Kondapochamma Sagar and feeding the en-route reservoirs of Ananthagiri, Sri Ranganayaka Sagar and Sri Komaravelli Mallanna Sagar (SKMS), to be newly formed. A total CA of 5.42 lakh acres was to be created under this link. The link consists of 27 package works (including four works relating to additional carriage capacity of one TMC). Of these, only three works have been completed and one work has not yet commenced. The remaining 23 works are ongoing with progress ranging from 17 per cent to 99 per cent. All the four reservoirs (viz., - SKMS, Kondapochamma Sagar, Ananthagiri and Sri Ranganayaka Sagar reservoirs) have been largely completed and filling of water has been commenced. The link is ready to convey 0.76 TMC of water per day from Mid-Manair Reservoir to SKMS Reservoir and 0.64 TMC of per day from SKMS to Kondapochamma Sagar Reservoir. As per

the information furnished by the Department, only 40,288 acres<sup>139</sup> of CA was created under this link, as of March 2022. The shortfall was due to non-completion of the other related works and distributary network. Out of the eight lift systems, only three were completed and remaining five lift works were in progress. The branch canals were yet to be completed. The progress of construction of structures and distributaries was only 26 per cent and 8 per cent, respectively.

Figure 5.10 - Line diagram of Link-IV  
(From Mid-Manair Reservoir to Konda Pochamma Sagar Reservoir)

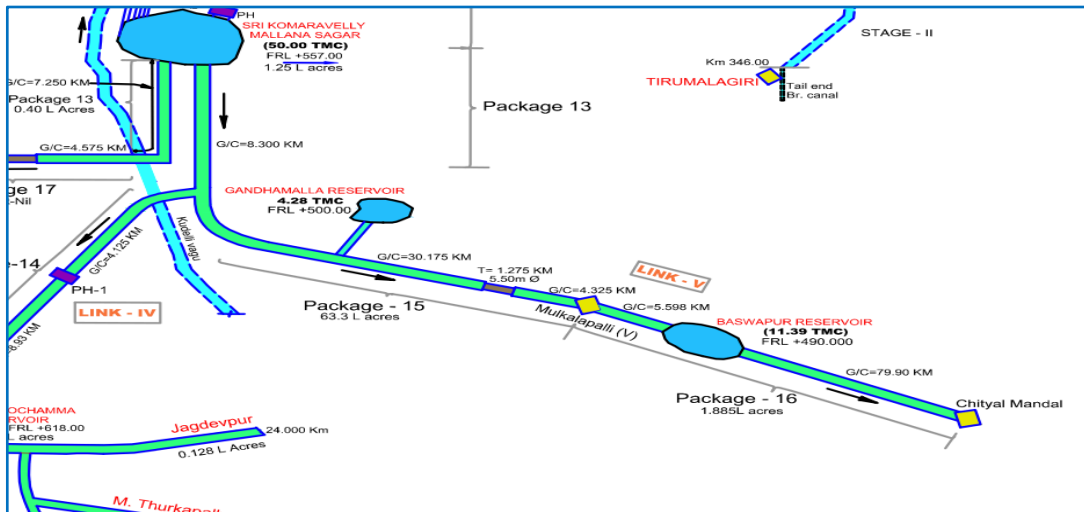


Source: Records of the I&CAD Department

<sup>139</sup> Package-10: 6,040 acres, Package-11: 19,500 acres, Package-12: 9,748 acres and Package-14: 5,000 acres

**Link-V:** This Link proposes to carry water from SKMS reservoir to feed the Gandhamalla and the Baswapur reservoirs to be newly formed and to create a CA of 2.52 lakh acres. Out of the four package works under this link, one work has not commenced and the remaining three are ongoing (progress: 34 per cent to 74 per cent). The construction work of Gandhamalla reservoir has not commenced. No CA had been created under this link, as of March 2022 as the progress of distributary network is only two per cent.

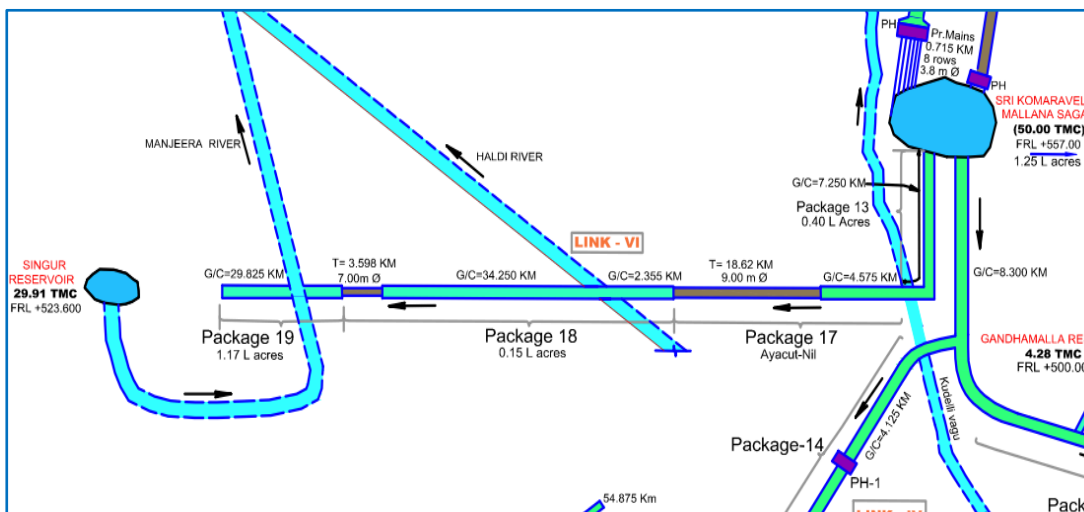
**Figure 5.11 - Line diagram of Link-V (From Anicut to Chityal Mandal)**



Source: Records of the I&CAD Department

**Link-VI:** This Link envisages carrying water from SKMS Reservoir to Singur Reservoir and creation of a CA of 93,000 acres besides supplementation of water to Singur and Nizamsagar projects. There are three package works under this link and all were ongoing (progress ranging from 15 per cent to 33 per cent). While the main canal works were in progress the work relating to distributary system has not commenced yet and no CA had been created. Further, the work relating to supplementation of water to Singur project had not been taken up, as of March 2022.

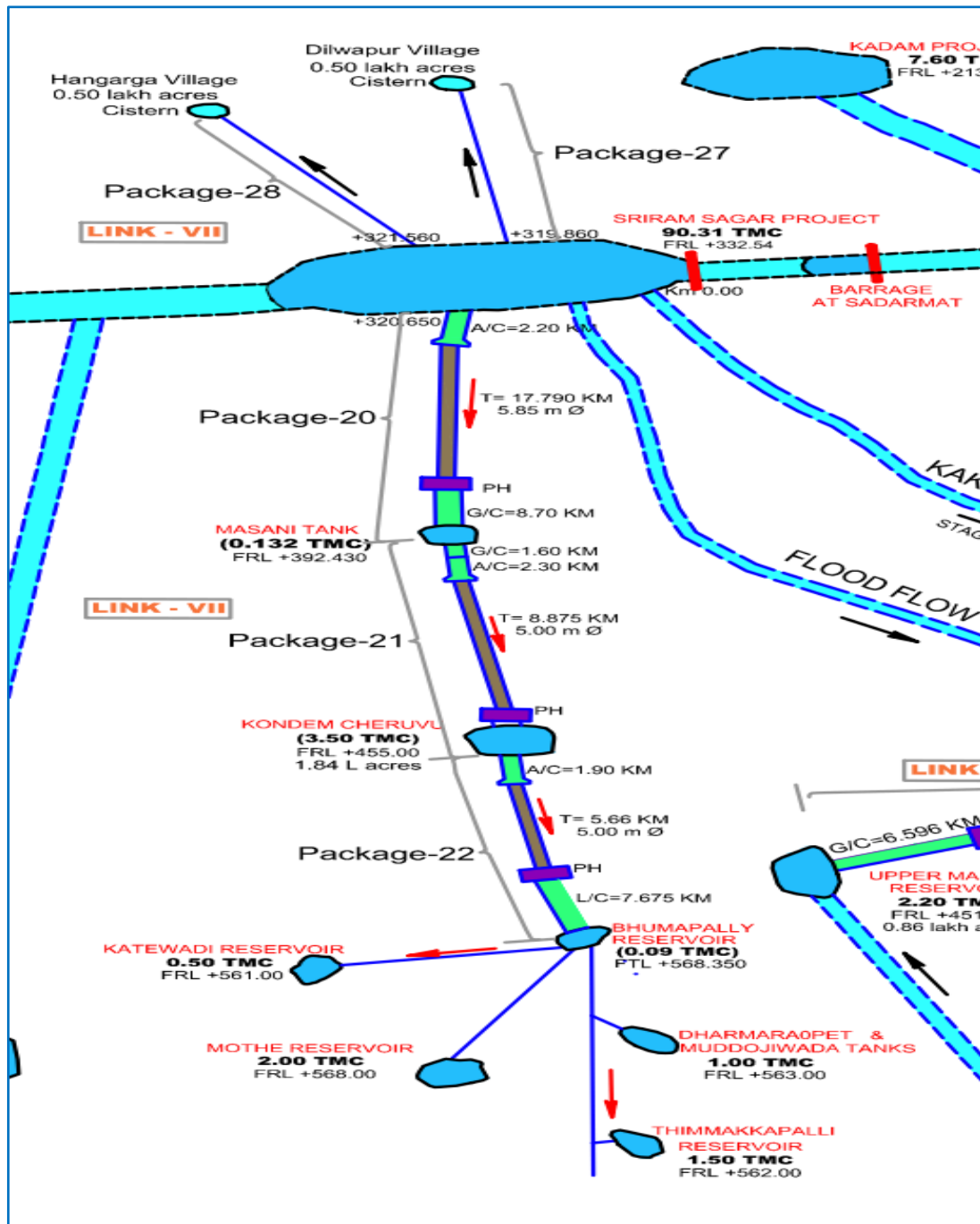
**Figure 5.12 - Line diagram of Link-VI (SKMS Reservoir to Singur)**



Source: Records of the I&CAD Department

**Link-VII:** This Link proposes to draw water from the foreshore of Sri Ram Sagar Project (SRSP) reservoir and create a total CA of five lakh acres on either side of SRSP. The link consists of six package works and all the works were ongoing with progress ranging from 11 per cent to 88 per cent. None of the 10 lifts were completed and there was dismal progress in all the work components viz., earth work (5 per cent), concrete work (31 per cent), main canal (47 per cent), structures (2 per cent) and distributaries (7 per cent). No CA had been created under this link, as of March 2022.

*Figure 5.13 - Line diagram of Link-VII (SRSP Reservoir to Bhoompally Reservoir and Nirmal and Mudhole Assembly Constituencies)*



Source: Records of the I&CAD Department

The overall progress of the Project works as of March 2022 is given in Table 5.7 below:

*Table 5.7 - Component wise progress of execution as of March 2022*

S. No.	Component of work	Quantity of work to be done	Work completed so far	Progress percentage
1	Earth Work (in lakh Cu.M.)	8,123.47	4,629.22	57
2	Concrete (in lakh Cu.M.)	226.76	150.64	66
3	Structures (No.)	11432	2093	18
4	Main Canal (in Kms)	1,566.04	897.00	57
5	Distributaries (in Kms)	9,564.35	690.18	7
6	Lifts (No.)	31	10	32
7	Barrages/Reservoirs (No.)	17	8	47

Source: Records of the I&CAD Department

Thus, the main water conveyor system is ready to lift River Godavari water from Medigadda Barrage and convey 1.9 TMC of water per day up to Mid-Manair reservoir, 0.76 TMC of water per day up to SKMS reservoir and 0.64 TMC of water per day up to Kondapochamma Sagar reservoir. However, due to non-completion of the work relating to other lifts, branch canals and distributaries, only 40,288 acres of CA had been created as of March 2022.

*Chart 5.4 – Package wise progress of creation of new command area*

		Total: Ac 14,82,552	Total: Ac 40,288
Link No	Package No	Command Area Tendered (in acres)	Command Area Created (in acres)
Link I	3 Barrages	0	0
Link II	No Command Area		
Link III	Additional Command Area work	10,000	0
	Package-9	86,150	0
Link IV	KPS Canals	2,37,602	0
	Package-10	30,000	6,040
	Package-11	1,10,000	19,500
	Package-12	1,25,000	9,748
	Package-13	39,000	0
	Package-14 (No Command Area)		5,000
Link V	Baswapur Reservoir	23,000	0
	Package-15	63,300	0
	Package-16	1,65,500	0
Link VI	Package-18	15,000	0
	Package-19	78,000	0
	Package-26 (Deleted)		0
Link VII	Package-21 (No Command Area)		0
	Package-21 A	2,00,000	0
	Package-22	2,00,000	0
	Package-27	50,000	0
	Package-28	50,000	0

Source: Records of the I&CAD Department



As already mentioned earlier (in Paragraphs 5.6 and 5.7), the project has also not been able to provide drinking and industrial water as contemplated in the DPR.

Thus, even after six years since re-engineering and spending a huge amount of ₹86,788.06 crore, the Project has been able to create only 40,288 acres of new CA as against the targeted CA of 18.26 lakh acres. The Project has not been able to provide water for drinking/industrial purposes as intended. Though the Department now expects the Project to be completed by June 2024, with the present status of works and the volume of work yet to be done, completion of all the works and achievement of full benefits contemplated under the Project is likely to take many more years to come. Moreover, even after completion, the Project will not be able to provide irrigation to the full extent of targeted CA of 18.26 lakh acres since the water allocation for irrigation is likely to fall short of actual requirement (as discussed in Paragraph 4.2).

The Government replied (May/November 2023) that the works of main trunk from Medigadda barrage up to Kondapochamma Sagar reservoir have been completed and water is impounded in the three barrages in Link-I and reservoirs like Annapurna, Sri Ranganayaka Sagar, SKMS, Kondapochamma Sagar reservoir, *etc.* It further replied that even though some of the packages may not be completed in full shape, the completed portion of main trunk is serving and water was provided for stabilization of CA under the existing SRSP Stage-1 below LMD, SRSP Stage-2, Nizamsagar, FFC and Singur projects in the form of crucial wettings for the standing crops in the last three years and that there was a remarkable increase in the groundwater table due to impounding of water in reservoirs. The Government stated that the total CA irrigated during 2022-23 was 2,48,375 acres which included new CA of 1,30,500 acres and remaining CA through filling up of minor irrigation (MI) tanks and check dams and that a CA of 16,99,356 acres was also stabilized. The Government also furnished the latest status of various works, which showed progress ranging from 12 to 99 *per cent.* It was also stated that all works of the project are in brisk progress and all efforts are being made to complete the works at the earliest.

The reply is not acceptable as the main objective of the project was creation and providing irrigation to new CA of 18.26 lakh acres and not providing irrigation through MI tanks/check dams and recharging of ground water. As of March 2022, only 40,288 acres of new CA had been created so far. Further, the original agreement period stipulated by the Department is over in 48 out of the 56 works. Had these works been completed within the stipulated agreement period, a total new CA of 14.83 lakh acres could have been created under these works. Besides, the works relating to creation of 3.43 lakh acres of CA had not even been entrusted. Considering the volume of work yet to be done, the project works cannot be completed within the contemplated completion period of June 2024.

## 5.9 Implementation of Environmental Management Plan (EMP)

The Ministry of Environment, Forest & Climate Change (MoEF) had accorded (December 2017) Environmental Clearance (EC) for the Kaleshwaram Project after considering the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP)<sup>140</sup> submitted by the State Government. The approved EMP contained various measures proposed to be taken up at a total cost of ₹16,230.43 crore to overcome the environmental effects arising due to implementation of Kaleshwaram Project. The EC conditions stipulated that the EMP shall be strictly adhered to, and the budgetary provision for the implementation of EMP shall be fully utilized without diverting it for any other purpose. As per the information furnished by the Department (September 2022), the details of approved cost of the activities proposed in the EMP and the expenditure incurred thereon (upto August 2021) are given in Table 5.8 below.

*Table 5.8 - Component-wise cost and expenditure incurred under EMP*

S. No.	Component	Total cost (₹ in crore)	Expenditure incurred (₹ in crore)	Implementing Department
1	Catchment Treatment Plan	125.29	156.01	Irrigation
2	Command Area Development Plan	1,326.86	174.31	Irrigation
3	Compensatory Afforestation	722.30	722.30	Forest
4	Biodiversity & Wildlife Management Plan	3.36	4.97	Forest
5	Greenbelt Development Plan	19.21	--	Irrigation
6	Fisheries Conservation and Management Plan	485.00	209.57	Fisheries <sup>141</sup>
7	Reservoir Rim Treatment Plan and River Bank Stabilisation	236.75	1,042.15	Irrigation
8	Water, Air and Noise Management Plan	25.93	54.49	Irrigation
9	Sanitation & Solid Waste Management Plan	16.40	33.27	Municipal
10	Local Area Development Plan	28.24	13.06	Revenue
11	Resettlement & Rehabilitation Plan (including Land Acquisition)	13,241.09	6,775.27	Irrigation & Revenue
	<b>Total</b>	<b>16,230.43</b>	<b>9,185.40</b>	

Source: Records of the I&CAD Department

As per the EC conditions, the responsibility for implementation and monitoring of EMP rests fully with the I&CAD Department. Though the Department stated that a total expenditure of ₹9,185.40 crore has been incurred on EMP, it did not furnish further details of activities/sub-components on which the above expenditure was incurred and by whom.

The Government replied (May 2023) that an amount of ₹9,980.05 crore was expended under various components of the EMP. It was further replied that an amount of ₹6.74 crores was spent towards plantation and ₹106.44 crore towards construction of 35

<sup>140</sup> Prepared by the Environment Protection Training and Research Institute (EPTRI)

<sup>141</sup> The Fisheries Department stated in August 2022 (pointed out in Paragraph 5.9.2) that the funds had not been released to them by the I&CAD Department but have been allocated from their normal budgetary allocation (as commented in Paragraph 5.9.2).

check dams from January 2021. An amount of ₹7,613.76 crore was spent till date towards Land Acquisition and R&R for the Project. The greenbelt development plan is under progress. Turfing and revetment rip rap works were taken up as a part of reservoir rim treatment. Further, year-wise plantation programme all along the approach road to barrages and reservoir periphery and along the canal length was planned to be taken up by the Project authorities with a target to complete phase-wise on priority basis. About 253 Piezometers/observation wells were constructed for monitoring the depth of water levels in the Project area with a total cost of ₹3.35 crore and ₹1.56 crore were spent to install 159 Nos. of Digital Water Level Recorders (DWLR). Ambient Noise level monitoring is being conducted as per Noise Pollution (Regulation and Control) Rules, 2000 and 2010. Under CA Development Plan, an amount of ₹684.16 crore was spent on construction of main canal including distributary network for the packages pertaining to Package Nos. 10, 11,12 and canals under Kondapochamma Sagar. The Government further replied (November 2023) that an amount of ₹4.98 crore was deposited towards Bio-Diversity & Wildlife Conservation which is part of ₹722.30 crore deposited in CAMPA account and out of this, an expenditure of ₹0.58 crore was incurred.

Audit could not cross check the above expenditure as the activity/ sub-component wise details and the supporting documents were not furnished during audit. Further, as seen from the Government reply, the expenditure incurred on canal works are also being claimed as part of EMP which is not acceptable.

### **5.9.1 Implementation of Compensatory Afforestation**

A total of 3,168.13 Ha of forest lands were diverted for execution of the Kaleshwaram Project. The MoEF had accorded Stage-I clearance for diversion of the above extent of forest lands in October 2017 with a condition that compensatory afforestation (CA) over non-forest land equal to the forest land being diverted shall be raised on identified land within three years. As against the 3,168.13 Ha of forest lands diverted for the project, non-forest lands to the extent of 3,367.14 Ha were transferred to the Forest Department. Audit observed that:

- The Forest Clearance (FC) conditions stipulated that the non-forest land transferred to the State Forest Department should be notified as Reserve Forest under the provisions of the Forest Act within six months from the date of FC. Though alternative land of 3,367.14 Ha was transferred to the Forest Department in November 2017, no evidence was found in the records of Forest Department to show that these lands were notified as Reserve Forest even after more than four years (as of July 2022).

The Government replied (November 2023) that out of the 3,367.62 Ha of non-forest land handed over, 496.58 Ha has been notified, 12.26 Ha has been partially notified and proposals for notification of an extent of 218.11 Ha are sent to Government.

The fact remains that even after a lapse of six years since grant of Stage-I Forest Clearance, complete notification has not yet been done. The reply is silent on the status

of the remaining 2,640.67 Ha of non-forest land and reasons for delay in notification of the non-forest land.

- In the FC accorded for the project, the MoEF had directed that CA should be carried out by planting at least 1,600 plants per Ha in the in the alternate non-forest lands of 3,168.13 Ha (total plantations to be done: 50.69 lakh). Accordingly, the Forest Department collected an amount of ₹722.30 crore from the I&CAD Department towards CA cost. Audit, however, observed that while a total extent of 3,168.13 Ha of forest lands was diverted for the project, the Forest Department took up CA in only 2,653.12 Ha of non-forest lands. The Forest Department did not furnish the reasons for not taking the CA in the remaining land. Non-taking up of CA in the remaining land resulted in net reduction of the overall forest cover by 515.01 Ha (3,168.13 Ha *minus* 2,653.12 Ha).

The Government replied (November 2023) that the Forest Department had stated that the reduction in CA area is due to the non-suitability of non-forest land for planting and that to compensate this reduction, plantations were taken up elsewhere in the degraded forest land.

The reply is silent as to why the Forest Department had accepted the land which is not suitable for raising CA and what action was taken to rectify this.

- Further, though FC conditions stipulated for planting of 1,600 plants per Ha in the identified non-forest lands, the Forest Department was planting only 446 plants per Ha, which is 72 *per cent* less than the 1,600 plants stipulated by MoEF. The Forest Department proposed to take up the remaining plantations in the degraded forest lands already under its control. Audit observed that in the degraded forest areas, where only supplementation of plantations was required because of the already existing forest, plantations were being taken up at the rate of 1,275 plants per Ha, which is nearly three times as compared to the density of plantations taken up in the non-forest lands, as shown in Table 5.9 below:

***Table 5.9 - CA plantations as stipulated in the FC and as being done by Forest Department***

S. No.	Type of forest land	CA stipulated in the FC			CA planned by Forest Department		
		Area (in Ha)	Plants per Ha	Total plants	Area (in Ha)	Plants per Ha	Total plants
1	Non-Forest Land	3,168.13	1,600	50,69,010	2,653.121	446	11,84,359
2	Degraded Forest Land	--	--	--	2,680.696	1,275	34,17,954

*Source: Records of the Forest Department*

Due to the low density of plantations in the non-forest lands, the very objective of the CA was not being achieved.

The Government replied (November 2023) that as per the guidelines (dated 08 November 2017) on CA, the number of plants to be planted over CA land shall be

1,000/Ha and when the requisite number of plants cannot be planted on the Non-Forest Land (NFL), the balance plants will be planted in degraded forest land. Accordingly, CA is proposed with 200 to 400 plants/Ha in 2,653.121 Ha of non-forest area and with 1,111 plants/Ha in 2,680.696 Ha of degraded forest land and bund plantation was proposed for 309.76 Km and accordingly, the compliance report is forwarded to the MoEF & CC duly mentioning the extent of area under plantation in non-forest land and degraded forest land for each Division. It was further replied that as of June 2023, CA was achieved in 2,292.181 Ha of non-forest land and 2,816.62 Ha of degraded forest land (more than the proposed area of 2,680.696 Ha).

The reply is not convincing as the Stage-I FC conditions clearly stipulated planting of 1,600 plants per Ha in the identified non-forest lands whereas the CA plantations planned was only 446 plants per Ha. The reply also did not explain the reasons for proposing lesser number of plants in the non-forest land for raising CA in the plans.

- As per the FC conditions, a Monitoring Committee should be constituted with a nominee of the Central Government to monitor the implementation of the stipulated conditions including CA plantations. However, no such Committee had been constituted as of March 2022.
- As per the CA plan prepared by the Forest Department, a total of 51.44 lakh plants were proposed for plantation. Though the details of the extent of non-forest lands in which the CA plantations were taken up, number of plantations done and expenditure incurred were called for (April 2022), the Principal Chief Conservator of Forests did not furnish the same to Audit (August 2022).
- The FC conditions also stipulated that the State Government should ensure that the user agency (the I&CAD Department) submits annual compliance report in respect of the FC conditions to the State Government and to the Regional Office of MoEF regularly. However, Audit observed that the I&CAD Department was not submitting the compliance reports.

The Government replied (May 2023) that the compensatory afforestation programme is under progress and is being taken up by the State Forest Department with a total grant of ₹722.30 crore and as per the procedure the total grant amount has already been deposited with State Forest Department. Implementation of FC plan is a continuous process and all necessary steps were being taken to plant saplings as per the EMP. Accordingly, the Forest Department is implementing the Compensatory Plan stage-wise with the available saplings against the accepted plan and it will be completed at the earliest as per FC conditions. It was further replied that as reported by the Forest Department, an expenditure of ₹111.84 crore was incurred till date and the implementation of the plan would be completed at the earliest.

The Government did not furnish specific reply regarding non-constitution of Monitoring Committee. The details of actual progress of plantations were also not furnished. As regards the non-submission of compliance reports, though the Government replied that the compliance report is forwarded to MoEF, no evidence in support of the same was furnished to Audit.

## 5.9.2 Implementation of Fisheries Conservation and Management Plan

In the EMP, an amount of ₹485 crore was proposed for implementation of the Fisheries Conservation and Management Plan (FCMP) to be implemented in 15 districts covered under Kaleshwaram Project. The activities proposed under FCMP included enhancing seed production, enhancing fish production, harvesting support, marketing support, infrastructure development, encouraging innovative projects and capacity building. The FCMP was to be implemented by the Fisheries Department of Government of Telangana.

Audit observed that the Government of Telangana did not allocate/release any funds to the Fisheries Department for implementation of FCMP. The Commissioner of Fisheries replied (August 2022) that though sanction of funds for the fisheries component under EMP is pending, the Department had taken up some of the components of FCMP under the other ongoing schemes<sup>142</sup> implemented with the normal budgetary allocations.

The reply is not acceptable as the above-mentioned schemes were not framed with reference to the components of FCMP. Audit observed that activities like establishment of freshwater fish seed hatcheries, captive fish seed rearing ponds, pen culture, re-circulatory aquaculture system, *etc.*, which were proposed under FCMP, were not covered under the existing schemes.

The Government replied (May 2023) that out of an allocated amount of ₹485 crore, about ₹245.46 crore has been spent towards Fisheries Development by the Telangana State in the Project area till date. It was further stated that the Kaleshwaram Project was inaugurated at Medigadda in June 2019 and subsequently, the reservoirs *i.e.*, Annapurna, Sri Ranganayaka Sagar, Kondapochamma Sagar and Sri Komaravelli Mallanna Sagar were inaugurated and impounded with water by 2022. Further, about 1,900 linked MI tanks were also filled with Kaleshwaram water which resulted in huge increase in fish production. In view of the recent development in fish production, the Government of Telangana is taking all necessary steps to regularize the development of fisheries industry. The FCMP implementation is a continuous process and will be implemented completely as per the EMP plan stage-wise in consultation with all the concerned Departments and authorities in due course.

The reply is not specific to the audit observation. Further component/subcomponent wise expenditure as per approved FCMP was not furnished along with the reply.

## 5.10 Wasteful/unfruitful/extra expenditure

### 5.10.1 Unfruitful expenditure on consultancy services

The Department entrusted (March 2019) the work of 'preparation of DPR/master plan for beautification and development of certain facilities in Link-I and Link-II of Kaleshwaram Project' to a consultancy firm for ₹6.35 crore plus taxes.

<sup>142</sup> viz., Integrated Fisheries Development Scheme (IFDS), Blue Revolution Scheme (BRS) and Pradhan Mantri Matsya Sampada Yojana Scheme (PMMSY)

The contractor completed the work and an amount of ₹7.25 crore was paid. Audit observed that though the contractor submitted (March 2020) the DPR, plans, designs and drawings, the Department did not take up the beautification/development works as of December 2021. As a result, the expenditure of ₹7.25 crore incurred on consultancy services remained unfruitful.

The Government replied (November 2023) that the contractor has submitted the Detailed Project Report consisting of plans, detailed designs and drawings and the beautification works would be taken up after receiving approval from the Government.

However, the fact remained that even after four years of Agreement, no beautification work was taken up utilizing the DPR.

### **5.10.2 Execution of work outside the scope of Kaleshwaram Project**

The work of Package-14 of Kaleshwaram Project was entrusted to a contractor in November 2017. The scope of work under this package included excavation of gravity canal and construction of two stage lifts to feed water to Konda Pochamma Sagar Reservoir. No CA was proposed to be created in this reach.

During execution of work, the Department entrusted (September 2019) an additional work of 'Eravally pilot micro irrigation scheme' to the same contractor at an additional cost of ₹10.99 crore. This additional work contemplated filling of five irrigation tanks by lifting water from Kurelivagu by constructing pump houses, installation of pumps and laying of pipes for a length of 5.2 Km. Audit observed that the Eravally piped micro irrigation project has no direct link with the Kaleshwaram Project. The water source for this project was a stream called Kurelivagu.

Despite being independent of Kaleshwaram Project, the work was included in the Package-14 which was outside the scope of the Project. The expenditure of ₹10.99 crore incurred on this work was met from the loans raised by M/s KIPCL for the Kaleshwaram Project.

The Government replied that the source of water for Eravally Pilot Micro Irrigation Scheme is Kurelivagu. The Kurelivagu originates at Pedda Cheruvu (of Chembarthy village, Markook Mandal), which is fed through Kaleshwaram project. It was further replied that the micro irrigation project was proposed to stabilize the CA covered in five tanks under Kurelivagu by filling them depending upon water availability in Kondapochamma Sagar and that the pilot project was entrusted to the existing agency of Package-14 after obtaining revised administrative approval from Government.

The reply is not acceptable since the DPR did not envisage any micro irrigation scheme for stabilization of existing CA under minor irrigation tanks and execution of the Eravally micro irrigation project at a cost of ₹10.99 crore was in deviation to the DPR.