



CHAPTER IV

PROJECT IMPLEMENTATION

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The primary objective of the mission was to achieve universal coverage in water supply. However, none of the mission cities could achieve this objective (October 2024). Coverage of household water supply among the nine mission cities ranged from 9.39 *per cent* to 89.16 *per cent*. 100 MLD Water Treatment Plant constructed expending ₹40.62 crore at Vasoorchira in Kollam was idling due to non-completion of laying of raw water pumping main. Projects taken up by Kochi corporation to augment availability of treated water in the city remained incomplete even after spending ₹20.44 crore. Four Overhead Service Reservoirs constructed by KWA expending ₹31.51 crore in three ULBs remained idle due to non-laying of pumping mains, distribution lines, leakage in distribution line, etc.

Status of nine mission cities in the context of the sewerage system coverage was abysmal with six cities having no sewage collection and treatment systems and Kochi and Kannur Municipal corporations had a negligible coverage of three *per cent* and one *per cent* respectively. Thiruvananthapuram Corporation, which treated 34 *per cent* of the sewage generated could not expand coverage of sewer network, as KWA could not complete the work and establish connectivity with existing STP even after five years of commencement of the work. Failure of KWA/Kollam Corporation to establish network to bring sewage to the treatment plant under construction at Kureepuzha resulted in non-completion of the Plant and idling of the infrastructure created expending ₹ 16.84 crore.

Under the Urban Transport component, 47 *per cent* of footpaths test checked were constructed without clearing obstacles such as electric posts, stay wires, telecom boxes, etc. 37 *per cent* of foot paths test checked were not disabled friendly and in 53 *per cent* foot paths test checked had no tactile pavement to facilitate visually challenged persons.

Though the mission objective was to construct or maintain drains to prevent flooding, Kochi Corporation utilised scheme funds of ₹45.43 crore without preparing a definite plan to prevent sewage mixing and flooding. Scheme funds were utilised for routine maintenance activities including desilting and flooding continued to occur in the city. Thiruvananthapuram Corporation constructed a drain in Plavancode-Ulloorakonam-Andoorpoika road without establishing connectivity to primary drain leading to flooding in the area.

Under the Green Space and Parks an amount of ₹27.92 lakh expended towards construction of musical fountain in Nehru Park in Thrissur Corporation remained unfruitful as the fountain became non-functional. Construction of park on the banks of Chilavannur lake by Kochi Corporation had to be abandoned due to lack of permission from Kerala Coastal Zone Management Authority, rendering expenditure of ₹28.22 lakh incurred towards the project unfruitful.

4.1 Execution of projects

The primary objective of AMRUT scheme was to cover all households with water supply and sewerage (including septage). On achieving the universal coverage, the State/ULBs were to decide on the next priority - to construct storm water drains or fund urban transport depending on whether the local priority was to reduce frequent flooding or reduce vehicle induced pollution. However, instead of aiming to achieve universal coverage, GoK included projects in respect of all the five sectors in the SAAP and executed them. Component-wise projects proposed by ULBs and effectiveness in implementation are detailed in succeeding paragraphs:

4.2 Physical and Financial Progress of Projects

GoK had taken up 1185 projects with a project cost of ₹2535.07 crore for implementation. As of March 2024, 939 projects were completed, 172 projects were ongoing and 74 projects were cancelled. An amount of ₹1906.98 crore was incurred so far towards the project (March 2024). Sector-wise status of projects sanctioned and expenditure incurred are given in **Table 4.1**.

Table 4.1: Component-wise physical and financial progress as on 31 March 2024
(₹ in crore)

Sl. No.	Component	No. of projects sanctioned ³⁰	Project Cost ³¹	No. of projects Completed	Expenditure	No. of projects ongoing	Expenditure	No. of projects cancelled	Project cost	Total Expenditure	Percentage of projects completed ³²	Percentage of expenditure
1.	Water Supply	221	1558.54	160	800.53	57	403.24	4	18.56	1203.77	74	77
2.	Sewerage & Septage	165	381.39	101	148.46	51	99.99	13	256.94	248.45	66	65
3.	Storm Water Drainage	565	357.19	499	250.79	37	38.06	29	13.73	288.85	93	81
4.	Urban Transport	147	189.46	107	96.80	21	30.95	19	29.76	127.75	84	67
5.	Green Space and Parks	87	48.49	72	35.78	6	2.38	9	4.52	38.16	92	79
	Total	1185	2535.07	939	1332.36	172	574.62	74	323.51	1906.98	85	75

(Source: Compiled from data furnished by SMMU)

As seen from the table, even after a lapse of nine years of commencement of the project period, only 85 per cent of the projects could be completed. Sewerage

³⁰ Includes 74 cancelled projects

³¹ Project costs of cancelled projects are excluded as the savings out of cancelled projects were utilized either to sanction new projects or to meet project cost revisions in ongoing projects in the same or other sectors.

³² Excluding 74 cancelled projects

and Septage sector saw most of the cancellations, wherein projects worth 41.13 per cent (₹256.94 crore) of SAAP approved project cost for the sector was cancelled. Component wise status of achievement under AMRUT as of 31 March 2024 is given in **Table 4.2**:

Table 4.2: Component-wise status of achievement as of March 2024

Sl. No.	Component	Status of achievement
1.	Water Supply	5.37 per cent households were provided with new water connections under AMRUT. Against the Mission target of 100 per cent prescribed in the SAAP, overall achievement remained at 69.06 per cent.
2.	Sewerage and Septage	Only 0.13 per cent households were provided with sewerage connections under AMRUT. Against the Mission target of 100 per cent prescribed in the SAAP, overall achievement remained at 11.25 per cent.
3.	Storm Water Drainage	5.59 per cent of gap in drainage network was covered.
4.	Urban Transport	65 foot paths, 23 Foot Over Bridges and three Multi Level Car Parking facilities were constructed.
5.	Green Space and Parks	30 new parks were constructed and 36 parks were renovated.

(Source: Data furnished by SMMU/ULBs/KWA)

Though Water Supply and Sewerage sectors were the prioritised sectors under the scheme, three mission cities³³ could not provide any new drinking water connection through the scheme so far. In other cities percentage of water connections provided under AMRUT ranged from 0.5 per cent to 15.43 per cent. In Sewerage and Septage sector none of the mission cities except Kannur and Thiruvananthapuram³⁴ could provide new sewerage/septage connection. Detailed analysis of reasons for low performance, delayed execution, cancellation etc., are detailed in succeeding paragraphs:

4.3 Execution of Water Supply Projects

The AMRUT mission gave paramount importance to achievement of universal coverage in supply of 135 lpcd water to all households. Construction of Water Treatment Plants and Service Reservoirs, laying of distribution lines, rejuvenation/replacement of old and damaged pipelines, installation of flow/smart meters, etc., were the major projects taken up under the scheme. Mission cities had taken up 221 projects costing ₹1558.54 crore under the Water Supply Sector for execution, of which 160 projects were completed, 57 projects were in progress and four projects were cancelled. An amount of ₹1203.77 crore was incurred towards implementation of the projects (March 2024). Status of the projects sanctioned and executed are detailed in the **Table 4.3**.

³³ Kochi Corporation and Alappuzha and Guruvayur Municipalities

³⁴ New connection provided from already existed sewerage line

Table 4.3: Projects sanctioned and executed under water supply sector*(₹ in crore)*

Sl. No.	Name of ULB	No. of projects sanctioned ³⁵	Project Cost ³⁶	No. of projects completed	Expenditure	No of projects ongoing	Expenditure	No. of projects cancelled	Project Cost	Total Expenditure	Percentage of projects completed ³⁷	Percentage of expenditure
1.	Thiruvananthapuram	57	122.85	45	85.48	12	4.70	Nil	Nil	90.18	79	73
2.	Kollam	19	169.12	14	28.54	4	46.72	1	1.04	75.26	78	45
3.	Kochi	37	181.08	16	55.52	21	50.84	Nil	Nil	106.36	43	59
4.	Thrissur	29	219.32	20	107.90	8	87.11	1	17.00	195.01	71	89
5.	Kozhikode	30	216.44	28	78.15	2	111.33	Nil	Nil	189.48	93	88
6.	Kannur	13	144.08	12	119.59	1	24.34	Nil	Nil	143.93	92	99
7.	Alappuzha	12	179.58	8	82.57	3	61.87	1	0.025	144.44	73	80
8.	Guruvayur	12	170.74	6	121.30	5	13.14	1	0.50	134.44	55	79
9.	Palakkad	12	155.33	11	121.48	1	3.19	Nil	Nil	124.67	92	80
	Total	221	1558.54	160	800.53	57	403.24	4	18.565	1203.77	74	77

(Source: Compiled from data furnished by SMMU)

Of the 221 projects, audit scrutinised 81 projects involving project cost of ₹1006.85 crore in the nine mission cities and revealed deficiencies as detailed in subsequent paragraphs:

4.3.1 Kollam Municipal Corporation

In order to enhance coverage of piped water supply in the Corporation Area, KWA formulated a comprehensive scheme named Augmentation of Water Supply Scheme for Kollam consisting of construction of weir³⁸, intake well, Water Treatment Plant, OHSRs and laying distribution lines with funding from AMRUT and Kerala Infrastructure Investment Fund Board (KIIFB). Construction of WTP at Vasoorchira, weir at Njankadavu and two distribution lines to OHSRs were planned under AMRUT scheme.

4.3.1.1 Idling of WTP due to non-completion of raw water pumping main

KWA commenced construction of 100 MLD Water Treatment Plant at Vasoorchira in January 2020 and work was completed³⁹ in December 2023 by incurring an expenditure of ₹40.62 crore. However, the WTP could not be made operational so far, as KWA could not complete the laying of raw water pumping main⁴⁰ to bring raw water from intake well to the WTP (March 2024). Audit noticed that the delay in completion of this work was due to the failure of KWA

³⁵ Includes cancelled projects

³⁶ Excluding project cost of cancelled projects

³⁷ Excluding cancelled projects

³⁸ A low dam built across a river to raise the level of water upstream or regulate its flow.

³⁹ Except construction of storm water drain to release washings

⁴⁰ To be executed through KIIFB funds at a cost of ₹145.52 crore and targeted to be completed by June 2020

in conducting detailed survey to ensure availability of hindrance free land. KWA had initially planned to lay pipelines parallel to railway track for a length of 930 m by mistaking Railway Road for Perinad Panchayath Road. When permission of Railway was sought (July 2019), railway authorities informed (January 2020) KWA that pipelines could be laid only through casing pipes of 1400 mm diameter (20 mm thickness) with provision of sluice valves at every 100 m. As this recommendation was found to be technically not feasible, KWA identified alternate alignment⁴¹ through NH 183 (February 2020) and forwarded a proposal for permission of MoRTH for the new alignment (November 2020). As the proposal submitted by KWA was incomplete, as directed by MoRTH the proposal was resubmitted in July 2021. Meanwhile, the road tarring works of the stretch of NH 183 was carried out by PWD (NH) in September 2021. As the defect liability period of the road existed till September 2024, MoRTH rejected (May 2022) the request of KWA. Audit noticed that though KWA was aware as early as in February 2020 that railway insisted for such stipulation for laying pipeline in railway property and alternate alignment through NH was identified, KWA waited till November 2020 to seek the permission of MoRTH for alignment through NH 183. Further, MoRTH had accorded permission in December 2019 to cross the NH for a distance of 2480 m for another stretch of the same work⁴² and the work was executed during November 2020. Negligence on the part of KWA in conducting survey to ascertain ownership of the land before commencement of the work and lack of timely action to seek permission of MoRTH for the alternate route identified, resulted in non-completion of the work of laying pipeline to transport raw water from intake well to WTP and idling of the WTP constructed at a cost of ₹40.62 crore (March 2024). Thus, the objective of enhancing coverage of drinking water supply remained unachieved (October 2024). It is significant to note that in this instance, instead of DPR, a DER alone was prepared by KWA.

Further, construction of weir at Njankadavu entrusted to Irrigation Department, to ensure adequate supply of water to intake well was also not executed (October 2024). Audit noticed that after the award of work (June 2020), the contractor reported change in the depth of the river specified in the estimate. The depth was measured up to nine meters in the centre portion of the river (where the weir was to be constructed), against four meters specified in the estimate. Consequent to this, design was to be changed and the contractor was unwilling to continue with the sanctioned rate. Though estimate was re-casted and the re-tendering was done multiple times, work could not be awarded (December 2023). Hence, GoK cancelled the work (March 2024) and directed KWA to take up the work under AMRUT 2.0.

Thus, poor planning and execution of the project by KWA/Irrigation Department resulted in idle investment of ₹ 46.09⁴³ crore and non-achievement of objective of the scheme.

⁴¹ Elampalloor to Nanthirikkal

⁴² Neerozhukku to Elampalloor

⁴³ Laying clear water pumping main from WTP to the existing OHSR at Vadakkevila (December 2021, ₹3.56 crore), Construction of intake well at Njankadavu (May 2020, ₹1.91 crore) and WTP at Vasoorichira (₹40.62 crore)

Government stated (October 2024) that delay in completion of the pipeline happened due to uncertainty in ownership of road parallel to the railway line, non-feasibility of the proposal submitted by the railways, COVID 19 pandemic restrictions and delay on the part of NH-MoRTH in according timely permission to KWA. It was also stated that the matter has been taken up again for obtaining permission from NHAI.

However, the fact remains that KWA did not ensure hindrance free land before commencement of the project. Further, KWA took eight months to approach MoRTH for seeking permission for alternate alignment and submitted proposal without necessary details such as checklist in complete form, undertakings in stamp paper, statutory clearances from KSEB, BSNL, etc. This resulted in non-obtaining permission and indefinite delay in completion of the project.

Regarding construction of weir, it was stated that the investigation, design, estimation and execution of the work was done by Irrigation department and role of KWA was limited to issuing Technical Sanction, tendering and arranging contract. The reply is not tenable as KWA had accorded Technical Sanction, KWA cannot distance itself from the responsibility of incorrect estimate, which ultimately led to cancellation of the work.

4.3.2 Kochi Municipal Corporation

Kochi Corporation proposed 37 projects costing ₹181.08 crore to improve per capita distribution of drinking water in its jurisdiction. These projects included construction of seven OHSRs/GLSRs, laying pumping main/transmission pipelines, replacement of old and damaged pipelines and replacing 5,000 damaged water supply connections. So far 16 projects (₹55.52 crore) have been completed and 21 projects were ongoing (March 2024). Audit noticed that even after utilizing ₹106.36 crore from AMRUT funds, no improvement could be achieved in the per capita distribution of water as detailed in the following paragraphs:

4.3.2.1 Idling Overhead Service Reservoirs (OHSRs)

KWA included construction of two OHSRs viz., 40 LL⁴⁴ OHSR at Kaloor and 25 LL OHSR at Karuvelipady at a project cost of ₹35.92 crore with the objective to ensure equitable distribution of water to Kaloor and west Kochi area respectively. The 40 LL OHSR at Kaloor was intended to store water brought from the proposed WTP at Kalamassery⁴⁵. As the construction of 135 MLD WTP at Kalamassery was dropped due to non-availability of land, it was proposed to bring treated water from the transmission trunk (at Kaladarshana junction) of existing WTP at Aluva. However, the work of laying pipeline could not be awarded even after tendering multiple times. Hence, due to non-availability of treated water, the 40 LL OHSR constructed in May 2022, after incurring expenditure of ₹15.32 crore, remained unutilised (October 2024). Further, 25 LL OHSR at Karuvelipady constructed in December 2022 at a cost of ₹8.79 crore could not be utilized since September 2023 due to non-functioning of inlet/outlet valves and electric motor in the pump house. Thus,

⁴⁴ Lakh litres

⁴⁵ Not proposed under AMRUT

two OHSRs constructed by spending ₹24.11 crore to ensure equitable distribution of water could not serve their objectives.

Regarding idling of OHSR at Kaloor, Government stated (October 2024) that the estimate of the work for laying the inlet and outlet pipeline of the OHSR was recast and the work was tendered. It was also stated that on completion of this work 40 LL OHSR could be used for distribution and the work was expected to be completed by 31 December 2024.

However, the fact remains that 40 LL OHSR constructed in May 2022 by spending ₹15.32 crore remained idle for more than two years. Further, Government reply is silent on the idling of the 25 LL OHSR at Karuvelipady.

4.3.2.2 Non-completion of projects to enhance availability of treated water in the Corporation area

KWA, with the intention of bringing additional quantity of treated water (upto 18 MLD) to Kochi City from the WTP at Maradu, included two projects under AMRUT, one for laying pumping main (500 mm DI pipe) for a length of 5900 m from WTP at Maradu to pump house at Thammanam at a project cost of ₹22.50 crore and other for laying 500 mm DI pipeline from pump house at Thammanam to OHSR at Kadavanthra at a project cost of ₹9.54 crore. However, both the projects remained incomplete and the objective remained unachieved as detailed below:

(a) Laying pumping main from WTP at Maradu to pump house at Thammanam

The proposed project was to replace the existing transmission line of 500 mm AC pipe with 500 mm DI pipe, utilised for transmitting treated water from 100 MLD WTP at Maradu to Thammanam GLSR, for augmentation of water supply to Thammanam pump house at a project cost of ₹22.50 crore. The project involved laying of pipe for a length of 5850 m (3700 m through NH and 2150 m through PWD/LSGI/railway road) which required permission from PWD, NHAI and Railway authorities. Audit noticed that the work was awarded (June 2018) before obtaining the permission from the above authorities. Though NHAI denied permission (February 2018) for laying pipe for a stretch of 3700 m through NH, KWA executed (February 2020) the remaining pipe laying work through the PWD road (2524 m⁴⁶) incurring expenditure of ₹11.39 crore. As the pipe laying work for 3700 m could not be undertaken the work was pre-closed in May 2022. Thus, the augmentation of water supply to Thammanam pump house could not materialise even after spending ₹11.39 crore.

Government stated (October 2024) that as NHAI denied permission for laying pipes through NH for a length of 3700 m through the proposed open cut method and permitted pipe laying only through concrete duct, KWA recast alignment through municipal roads. However, there were no takers for the tender for laying pipeline through municipal roads. Hence, KWA again approached NHAI for permission for laying pipeline through NH 66. As NHAI has proposed road widening works from Edappally to Aroor, Government is expecting a positive response from NHAI.

⁴⁶ Initially proposed length was 1830 m. During execution length was changed to 2524 m

However, the fact remains that not obtaining mandatory permissions from authorities before commencement of work resulted in idling of the infrastructure created for the last four years and non-achievement of objective of providing additional quantity of water to Kochi city (October 2024).

(b) Laying transmission line from Thammanam pump house to OHSR at Kadavanthra

The objective of the project was to bring 17.30 MLD of treated water from Pump house at Thammanam to Kadavanthra OHSR by laying new 500 mm DI pipeline to augment water distribution in Kochi Corporation area at a project cost of ₹9.54 crore. The work was commenced in June 2018 and the pipe laying work except the railway line crossing at Ponnurunni was completed by expending ₹9.05 crore. The crossing of railway line was arranged separately, but could not be completed (March 2024). The work at the railway line crossing, even if completed, the objective of carrying additional 17.30 MLD water for distribution would remain un-achieved due to non-completion of Maradu-Thammanam pipe laying work as mentioned in paragraph above. Further, the OHSR at Kadavanthra to which treated water was proposed to be stored remained unutilised for the last 40 years due to non-availability of water with required pressure. Audit noticed that structural stability of the OHSR was not ensured by KWA before taking up the project.

Government stated (October 2024) that pipe laying work would be completed by October 2024. As the existing OHSR was nearly 40 years old, KWA has approached Cochin University of Science and Technology Engineering College for determining structural stability of the tank.

Government reply confirms the negligence in planning on the part of KWA, which resulted in indefinite delay in completion of the project.

4.3.3 Thrissur Municipal Corporation

At the beginning of AMRUT scheme, Thrissur Corporation was having 33.70 MLD of treated water, supplied to 60.48 *per cent* households with per capita supply of 93 lpcd. To achieve universal coverage, the requirement of 26.3 MLD of treated water was assessed. To overcome this deficiency, Corporation proposed 29 projects costing ₹219.32 crore consisting of (i) construction of 20 MLD water treatment plant at Peechi (ii) construction of two OHSRs at Kuttanellur and Ollur and (iii) laying of 117 km of distribution lines and providing service connections. Of the 29 projects, 20 projects were completed, eight projects were ongoing and one project was cancelled. An amount of ₹195.01 crore has been incurred for the project so far (March 2024). Observations on completed/ongoing projects are detailed in the following paragraphs:

4.3.3.1 Non-improvement of water supply in the Corporation

At the beginning of the AMRUT scheme, KWA was providing 33.70 MLD treated water to Thrissur Municipal Corporation from various WTPs available in the district (14.5 MLD and 35.5 MLD at Peechi and 1.5 MLD at Mulayam and 18 MLD at Arattupuzha). To augment availability of treated water, the Corporation proposed (SAAP 2016-17) construction of 20 MLD WTP at Peechi at an estimated cost of ₹13.17 crore. Construction of the 20 MLD WTP was

completed (March 2021) incurring an expenditure of ₹10.10 crore. However, the old WTP of 14.5 MLD at Peechi was decommissioned (April 2021) by KWA shortly after the commencement of new WTP. Audit noticed that even though new WTP of higher capacity was constructed, there was no improvement in total water made available to the city and total quantity of treated water made available to the Corporation remained at 33.70 MLD.

Government stated (October 2024) that before the implementation of AMRUT, the production was 70 MLD and supply to the corporation was 33.7 MLD. After implementation of AMRUT 1.0, the production was enhanced to 75.5 MLD and supply to the corporation was enhanced to 44 MLD. The reply is not tenable as the details furnished by KWA and ULB (February 2025) indicate that water supplied to the Corporation remained unchanged even after commissioning of 20 MLD WTP.

4.3.3.2 Reduction in scope of work due to change in site and idling of OHSR

Construction of five LL OHSR and five LL Sump in Government College, Kuttanellur was approved in SAAP 2017-18 with a project cost of ₹2.03 crore (DSR 2016) with an objective to provide drinking water to residents in Kuttanellur division of Thrissur Corporation and technical sanction for the project was obtained in February 2018. Audit noticed that, based on the request from the Principal of the College (January 2018) initially identified site was changed to another site in the college campus. However, without conducting soil study to assess the foundation requirements of the new site, KWA awarded the work (December 2018). Soil study conducted (February 2019) by the contractor necessitated change in structural design as the raft foundation included in the estimate was found not suitable for the new site and requirement of pile foundation for the OHSR was assessed. As the pile foundation was not included in the scope of work, it was agreed that pile foundation would be executed by KWA, by awarding the work separately. Though tenders were invited for executing the pile foundation, there were no takers. Hence the original contract was terminated (November 2021) and the estimate was revised (February 2022) to ₹2.50 crore (DSR 2018) and construction of 5 LL Sump was excluded from the scope to limit the estimate amount within the Administrative Sanction. The work was then rearranged (April 2022) through another contractor and was completed in March 2024 incurring an expenditure of ₹2.18 crore. However, during Joint Physical Verification (February 2025) audit noticed that distribution of water was not commenced even after 11 months of construction of the OHSR. KWA replied (February 2025) that scour line extension and isolating of pipelines around Kuttanellur OHSR were to be carried out for proper functioning of the OHSR. It was also stated that permission of PWD was not obtained for some isolation works and pipe laying work and hence the work could not be tendered.

Audit observed that awarding the work without conducting site study resulted in delay in completion of the project and reduced water storage capacity as against envisaged. Further, the OHSR constructed remained idle resulting in non-achievement of objective of providing drinking water to the residents of Kuttanellur division even after spending ₹2.18 crore.

Government stated (April 2025) that variations in dimensions occurred due to change in site. However, the reply is silent on non-conducting soil study on the new site.

4.3.3.3 Replacement of faulty meters and providing new connections

Thrissur Corporation had included in the SAAP 2015-16, a project for survey and replacement of faulty water meters and pipelines and providing new water connections in old municipal area of Thrissur Corporation, where distribution of drinking water is managed by ULB, at a cost of ₹ three crore. The aim of the project was to mitigate drinking water losses in distribution systems of Thrissur Corporation area. Scope of the work included survey to identify and replace faulty meters with new ones and providing 500 new service connections at a cost of ₹62 lakh and the work was entrusted to KWA (February 2017). Though 1114 faulty meters were identified through the survey, due to hike in cost of water meters, replacement of faulty meters was restricted to 754. KWA provided 500 new connections and replaced only 454 faulty meters as rest of the consumers replaced their faulty meters themselves and an amount of ₹71.09 lakh was paid to KWA. Audit noticed that Corporation made payment to KWA without obtaining details of the consumers where new connections/replacement of faulty meters were carried out. In the absence of details of consumers, ULB was unable to identify the consumers for billing purposes and the billing was pending since the completion of the work in December 2021, resulting in non-realisation of revenue by the Corporation for more than two years (May 2024). As consumer details were not available, KWA in May 2024 requested the Corporation to form a joint inspection team to identify the consumers.

Audit observed that negligence on the part of the Corporation in obtaining details of work carried out by KWA, before making payment, resulted in non-realisation of revenue even after spending ₹71.09 lakh by the Corporation for replacing faulty meters and for providing new connections.

Government stated (April 2025) that updated information on replacement of faulty meters would be obtained from KWA and action will be taken to ensure collection of arrears.

4.3.4 Guruvayur Municipality

At the beginning of AMRUT scheme (2015-16), Guruvayur Municipality was having 7.84 MLD of treated water, supplied to 1,624 households (9.39 per cent) out of 17,297 households with per capita supply of 36 lpcd. To achieve universal coverage (22.27 MLD), the requirement of 14.43 MLD of treated water was assessed. To overcome this deficiency, Municipality proposed 12 projects costing ₹170.74 crore having various components viz., (i) construction of 15 MLD WTP at Kottapady and intake well at Illikkal at Karuvannur river (ii) laying 40 km raw water pumping main from intake well to WTP (iii) construction of 10 LL OHSR and (iv) laying distribution networks in three zones. Audit scrutiny revealed the following:

4.3.4.1 Non-laying distribution lines for supply of water to households

KWA completed the construction of 15 MLD WTP at Kottapadi (January 2021), 10 LL OHSR at Guruvayur (August 2023), raw water pumping main from WTP to OHSR (December 2023) and laying distribution networks in two

zones⁴⁷ expending an amount of ₹134.44 crore. However, the Municipality could not provide water to any new beneficiary through the scheme (March 2024) as the distribution lines laid were of 600 mm to 160 mm diameter and only passes through main PWD/municipal roads and the Municipality did not propose project for laying smaller distribution lines, from the main distribution line, for supplying water to households. As a result, even after the expiry of one year of completion of the work and spending ₹134.44 crore, the intended objective remains un-achieved (March 2024).

Government stated (October 2024) that though entire network was designed by KWA, proposal was cut short because of paucity of funds under AMRUT and project for providing service connections was included under AMRUT 2.0. Reply is not tenable as paucity of funds occurred due to the decision taken at the State level to curtail the scope of projects under the water supply sector and to allocate funds for lower priority sectors. Further, the reply confirms the failure of SHPSC/SLTC/ULB/KWA to plan proper implementation of the scheme, which resulted in non-achievement of objective of providing drinking water to the residents even after spending ₹134.44 crore.

4.3.5 Kannur Municipal Corporation

At the beginning of AMRUT scheme, Kannur Corporation was having 21.90 MLD of treated water, supplied to 43 *per cent* of households with per capita supply of 90 lpcd. To achieve universal coverage, requirement of 23 MLD treated water was assessed. To enhance availability of treated water, the Corporation proposed 13 projects viz., project for augmentation of capacity of WTP at Chavasseriparamba from 30 MLD to 40 MLD (₹7.80 crore), construction of two OHSRs at Pallikkunnu and Thottada (₹7.45 crore) and laying distribution lines in four zones and providing service connections to households (₹128.83 crore).

KWA completed the augmentation work by constructing 10 MLD WTP in May 2019 by incurring expenditure of ₹7.80 crore. However, the benefit of augmentation of capacity of the WTP was not realised as KWA did not include installation of new motor pumps for pumping raw water to the new WTP in the estimate, and the existing motor pumps were not having sufficient capacity to pump augmented quantity of raw water. Non-installation of motor pump resulted in non-augmentation of availability of treated water from the plant for the last four years. It was seen that KWA proposed the installation of new motor pumps for the WTP in the second phase of AMRUT 2.0. Audit observed that negligence on the part of KWA to include provision for installation of motor pumps to bring raw water to the plant, in the estimate, resulted in non-achievement of the objective even after expending ₹7.80 crore (March 2024).

Further, non-installation of the motor pumps, an essential component to augment the supply of water, even five years after the construction of WTP, is indicative of the gross negligence on the part of KWA, especially when piped water supply remained inaccessible to 50 *per cent* of households in the Corporation.

⁴⁷ Guruvayur and Pookode zones

Government while agreeing to the audit finding stated (April 2025) that installation of new pump sets were essential to meet the current requirements of the ULB and proposal for installation of new pump sets were included in AMRUT 2.0.

4.3.6 Palakkad Municipality

At the beginning of AMRUT scheme, Palakkad Municipality was having 23.5 MLD of treated water, supplied to 62 *per cent* of households with per capita supply of 88 lpcd. To achieve universal coverage, requirement of 21.5 MLD of treated water was assessed. To overcome this deficiency as well as to achieve universal coverage, projects shown in **Table 4.4** were approved under three SAAPs.

Table 4.4: Water supply projects of Palakkad municipality

(₹ in crore)

Sl. No.	Project Name	Number of projects	Estimated cost	Expenditure as on 31 March 2024
1.	Construction of 45 MLD water treatment plant	1	22.26	17.43
2.	Construction of OHSRs	3	17.00	15.36
3.	Laying distribution pipelines	3	77.07	72.77
	Total	7	116.33	105.56

(Source: Data furnished by SMMU)

Construction work of 45 MLD WTP and three OHSRs to facilitate storage of treated water were completed by June 2022. Audit noticed that even after spending ₹105.56 crore under the scheme, municipality could provide new water connection to only six *per cent* of the households i.e. 2466 households (March 2024). Deficiencies noticed in the implementation of projects are detailed in succeeding paragraphs:

4.3.6.1 Idling of OHSR at Moothanthara

Construction of 23.5 LL OHSR at Moothanthara and laying of distribution network was proposed by the Municipality to facilitate distribution of treated water to Moothanthara zone and the work was completed in May 2022 incurring expenditure of ₹30.14 crore⁴⁸. However, OHSR constructed (May 2022) at Moothanthara and the distribution lines laid could not be utilized due to leakage in the distribution line to Vennakkara area. While charging the line, leakage was noticed at three metre depth from the road surface in the middle of a busy market having heavy vehicular traffic. Though contractor was directed to rectify the leakage, due to the site conditions contractor did not carry out the rectification works. However, no action was taken by the KWA against the contractor so far (March 2024). Thus, even after spending ₹30.14 crore, the objective of providing water to Moothanthara zone remains unachieved (October 2024).

Government stated (April 2025) that when the load was applied to the existing AC distribution lines, the increased pressure caused all the existing AC pipes to crack. As a result KWA has temporarily kept the OHSR idle till the replacement of old AC pipes.

⁴⁸ ₹24.92 crore for laying distribution network and ₹5.22 crore for construction of OHSR

4.3.6.2 Under performance of 45 MLD WTP at Palakkad

Palakkad Municipality formulated (SAAP 2016-17) a project for construction of 45 MLD WTP at Malampuzha and the plant was commissioned in May 2022 by incurring an expenditure of ₹17.43 crore. However, Audit noticed that during September 2022 to November 2023, the monthly average quantity of treated water produced from the WTP ranged from 8.4 MLD to 44.5 MLD. It was also noticed that treated water above 35 MLD was received only for 43 days. According to KWA, reason for this reduction in the quantity of treated water was due to defect in the graded filter media which resulted in frequent choking and backwash of the filter beds. Audit noticed that, during trial run, though the issue of frequent choking of filter beds was noticed, no action was taken by KWA to rectify the defect and the contractor was paid the entire contract amount including the performance guarantee. A comparison of turbidity and backwash data of the 45 MLD WTP with other two existing WTPs which drew water from the same source revealed that even for the same level of turbidity, number of backwashes required in the 45 MLD WTP was twice that of the other two WTPs. This indicated that the filter beds in the 45 MLD WTP were frequently choking and required more number of backwash which resulted in the under performance of the WTP. Audit noticed that the terms and conditions of the agreement mandated that the treatment process should be efficient and economical and the plant should be designed to treat raw water with turbidity up to 500 NTU. However, the filter beds got choked requiring backwashes even at a turbidity of three NTU. Thus, the failure of KWA to initiate timely action to rectify the defect of the plant resulted in under performance of the treatment plant.

GoK stated (October 2024) that filter beds of 45 MLD WTP were not faulty and it was the algae content in the raw water during the summer months (February to July) that caused choking of the filter beds. It was also replied that clear water production envisaged upto the year 2035 was only 39.95 MLD and production of 43.08 MLD was assessed by 2050.

The reply is not tenable as analysis of the turbidity and backwash data during May and June 2024 indicates that rate of back washes in filter beds of 45 MLD WTP was in the range 1.33-2.17 per day while backwashes required in other WTPs, which used the same raw water, was in the range 0.33-0.83. Further, the requirement of 45 MLD treated water, as of 2021, was projected in the SLIP, and the municipality had decided to construct an exclusive WTP for it and allocate treated water from the existing treatment plants to the nearby panchayats.

4.3.7 Installation of Flowmeters

Real time monitoring of water flow in the entire water supply system would ensure an efficient water supply system for the city and enable the water supplying agency to undertake regular monitoring of data like hours of pumping, pressure and flow of water in the distribution system. Further, installation of flowmeters at the entry and exit of overhead and underground reservoirs in the distribution network would help in real time monitoring of water supplied in the system as well as timely identification of leakages. Rightly identifying the need for monitoring of water supplied into the distribution

system, sixth SHPSC held on 26 August 2016 made it mandatory for ULBs to install bulk meters at the distribution points. However, Audit noticed that project for installation of bulk/flow meters at locations other than OHSRs was taken up only by Thiruvananthapuram Municipal Corporation.

Audit observed the following deficiencies in the installation/functioning of flowmeters in the mission cities.

- Thiruvananthapuram Municipal Corporation formulated a project for installing 53 flow meters under the AMRUT scheme and work was awarded (July 2019) to M/s Friends Engineering Corporation, Mumbai for installing the same at the quoted rate of ₹six crore. The contract was completed (April 2022) after installation of 43 flow meters and the contractor was paid ₹4.80 crore. Audit noticed that remaining 10 flow meters were not installed due to lack of permission to shut down water supply by Crisis Management Group chaired by Chief Engineer, KWA.
- Alappuzha Municipality - Audit verified (September 2024) installation of flow meters in four newly constructed OHSR and observed that two of the flow meters were not functioning. Flow meter at Kommadi was not working as power connection was not provided and flow meter at Thathampally was in damaged condition.
- In Kochi Corporation, Audit verified (November 2023) flow meters installed in OHSRs at Karuvelipadi and Pachalam and observed that both the flow meters installed were not working. KWA replied (January 2024) that as the flow meters were under the maintenance period, the contractor was directed to rectify the defects. However, the contractor did not rectify the defects in the flow meters so far (May 2024).
- Kannur Corporation - Audit noticed (January 2024) that all the three flow meters installed (January 2019) in the newly constructed 24 LL OHSR at Pallikkunnu in Kannur Corporation were not working. KWA replied (February 2024) that two flow meters were damaged in lightning and third flow meter was damaged during transmission main replacement work. However, KWA has not rectified the defects so far (October 2024).

Audit observed that non-installation of flow meters and non-ensuring proper functioning of the flow meters installed was indicative of the negligence on the part of KWA in ensuring efficient supply of water to the mission cities.

Government stated (April 2025) that KWA has been directed to address the issue urgently.

4.3.8 Installation of Smart Meters at Thiruvananthapuram

Kerala Water Authority proposed a project for installation of smart meters for bulk consumers having consumption over 500 KL/month in Thiruvananthapuram Corporation, at a cost of ₹1.27 crore. The objective of the project was to increase revenue by providing accurate bills on time, as the smart

meters would have automatic reading facility with GSM/GPRS interface with billing software of the KWA.

The work for installation of smart meters was awarded (July 2018) to a Contractor, M/s Base Electronics and Systems, Chennai at their quoted rate of ₹91.24 lakh. As per the agreement, the contractor was required to install 394 smart meters and develop an Application Programming Interface (API) to link the smart meter with the e-Abacus software (billing software) of KWA to enable real time recording of the water usage in the KWA billing system. Though, the contractor installed 381 smart meters (October 2021), he did not provide the API to KWA. As such, the objective of installing smart meters remained unachieved and ₹31.69 lakh paid to the contractor remained unfruitful.

Government stated (October 2024) that as the contractor failed to develop the necessary software, installed meters functioned as mechanical meters. Due to continued non-responsiveness from the contractor, the contract was terminated in September 2024 with plans to complete the remaining work at the risk and cost of the contractor. However, the fact remains that objective of real time monitoring of water usage remained unachieved even after lapse of three years of installation of smart meters and incurring expenditure of ₹31.69 lakh.

4.3.9 Unfruitful expenditure on upgradation of existing SCADA systems

According to Central Public Health and Environmental Engineering Organisation (CPHEEO) O&M Manual, the inspection, monitoring and control of operation and maintenance of water utility can be automated through Supervisory Control and Data Acquisition (SCADA⁴⁹) system. It consists of four components viz; (a) Field instruments, sensors and actuators (b) Remote stations (c) Communication network and (d) Central monitoring station.

In Kozhikode Municipal Corporation, 54 MLD WTP at Mavoor had a SCADA system installed during December 2017 through JICA project, which could acquire only data, and valves and pumps were to be controlled manually. KWA proposed (SAAP 2016-17) a project for strengthening of infrastructure facilities in the 54 MLD WTP for ₹2.70 crore, which included upgradation of Programmable Logic Controller (PLC) SCADA for ₹29.64 lakh to facilitate operation of control valves and pumps automatically. The work included erection of electric actuators to the existing 450 mm delivery valves to the clear water pumping station along with PLC SCADA, fixing electro-magnetic flow meters with liquid emitting diode (LED)/liquid crystal display (LCD) unit, and coupling of flow meter with data acquisition software having provision for wireless transfer through GSM.

The work was awarded (December 2018) to Sri. David Mangan for ₹2.06 crore with period of completion of six months. Audit noticed that though electric actuators and electromagnetic flow meters required for the functioning of SCADA was installed, the contractor could not install the PLC-SCADA as the system already installed in WTP using 2G SIMs was not compatible with the newly proposed system due to connectivity issues. KWA, therefore, exempted (July 2021) the contractor from the pending work of PLC SCADA. The

⁴⁹ SCADA is a computer control system used to monitor and control plant processes.

contractor was paid ₹1.92 crore (July 2021), which included an amount of ₹17.81 lakh incurred towards installation of electric actuators and electromagnetic flow meters required for functioning of SCADA. Audit noticed that SCADA system that existed in the WTP had become non-functional since September 2020. Audit observed that KWA executed the project without ascertaining the compatibility of the old system with the proposed new system. As the SCADA system was not installed the amount of ₹17.81 lakh incurred for the installation of electric actuators and electromagnetic flow meters remained unfruitful.

Government stated (April 2025) that a new SCADA project valued at ₹1.07 crore is being implemented.

The reply substantiates the audit observation that KWA had executed the upgradation without ascertaining feasibility.

4.4 Status of achievement of Service Level Benchmarks

The focus of AMRUT was to achieve service level benchmarks such as universal coverage in water supply and sewerage in five years (2015-16 to 2019-20). However, even after spending ₹1203.77 crore in water supply sector, none of the mission cities could either achieve the objective of universal coverage or bring in considerable improvement in the service levels that existed at the beginning of the mission. Status of achievement of service level benchmarks in respect of water supply sector by the mission cities is given in **Table 4.5**.

Table 4.5: Achievements of Service Level Benchmarks by mission cities under water supply

Service Level Benchmarks		Mission Cities								
		Thiruvananthapuram	Kollam	Alappuzha	Kochi	Thrissur	Guruvayur	Palakkad	Kozhikode	Kannur
Household Coverage (In percentage) Target:100 per cent	Pre- AMRUT	77.7	40.3	61	89.2	60.5	9.4	61.7	45	42.3
	Post AMRUT	78.2	55.5	61	89.2	65.8	9.4	67.3	60.4	49.3
	Achievement	0.5	15.2	Nil	Nil	5.3	Nil	5.6	15.4	7
Quantum of water supplied (In lpcd ⁵⁰) Target:135 lpcd	Pre- AMRUT	100	65	50	86	93	36	88	100	90
	Post AMRUT	113.4	61.0	76.5	Data not available	Data not available ⁵¹	60.6	115.6	87.3	70.6
	Achievement	13.4	Nil	26.5			24.6	27.6	Nil	Nil
Extent of Non-Revenue Water (NRW) (In per cent) Target:20 per cent	Pre- AMRUT	35	30	40	46.7	30	43	30	30	32
	Post AMRUT	Data not available				28.9 ⁵²	70	40.8	30.6	51.9
	Achievement	Data not available				-- ⁵⁴	Nil	Nil	Nil	Nil

(Source: Data furnished by ULBs and KWA)

⁵⁰ Litre per capita per day

⁵¹ Pre-AMRUT data pertains to entire Municipal Corporation. However, post AMRUT data pertains to the area where KWA was providing water supply. Hence not comparable.

⁵² In municipal area where KWA was providing water supply

⁵³ In municipal area where ULB was providing water supply

⁵⁴ Could not be assessed as post AMRUT data could not be compared with pre-AMRUT data

4.4.1 Coverage of water supply connections

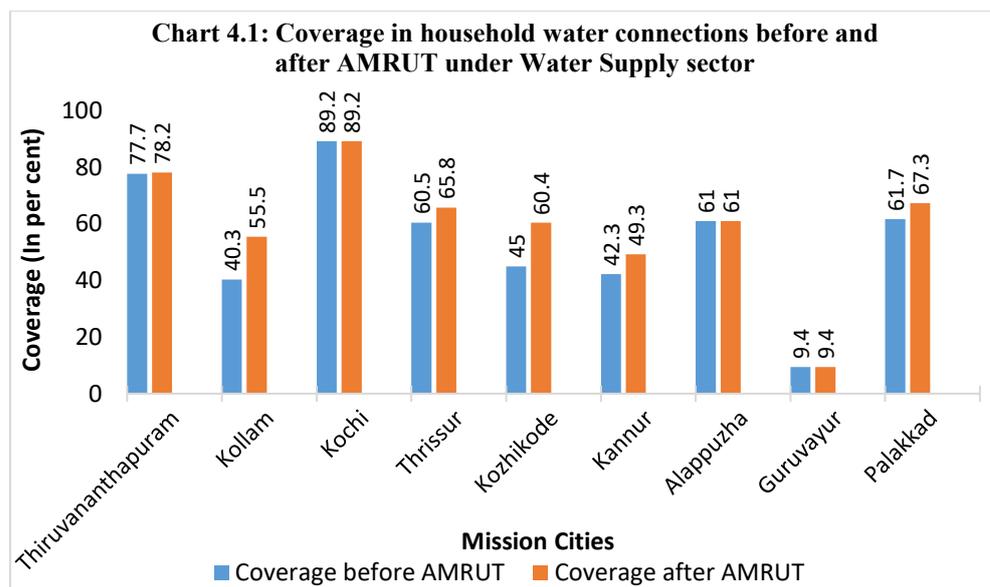
One of the primary aims of the scheme was to achieve universal coverage in supply of drinking water to all households in the nine mission cities. Status of household connections for providing drinking water and the increase in number of household connections since inception of the scheme is given in the **Table 4.6**.

Table 4.6: Status of households with tap connection

Sl. No.	Name of ULB	Total number of households as per SLIP	Households with water tap connection	Percentage of house-holds with water connection (Pre-AMRUT)	Length of distribution line to be laid to bridge the gap (Km)	Length of distri-bution line laid (Km)	No. of Water connections provided in AMRUT	Percentage of Households with water connections- (Post AMRUT)	Percentage of increase in household connections
1.	Thiruvananthapuram	2,46,803	1,91,845	77.73	310	37.79	1,206	78.22	0.49
2.	Kollam	98,367	39,662	40.32	104	17.6	14,973	55.54	15.22
3.	Kochi	1,51,412	1,35,000	89.16	0	0	0	89.16	Nil
4.	Thrissur	78,336	47,378	60.48	117	105.3	4,206	65.85	5.37
5.	Kozhikode	1,23,776	55,690	44.99	351	112.74	19,100	60.42	15.43
6.	Kannur	61,883	26,186	42.32	519	68.3	4,344	49.34	7.02
7.	Alappuzha	39,894	24,318	60.96	0	0	0	60.96	Nil
8.	Guruvayur	17,297	1,624	9.39	172	110.14	0	9.39	Nil
9.	Palakkad	44,000	27,152	61.71	110	141	2466	67.31	5.60
	Total	8,61,768	5,48,855	63.69	1683	592.87	46,295	69.06	5.37

(Source: Data furnished by ULBs and KWA)

Coverage of household water supply among the nine mission cities ranged from 9.39 per cent to 89.16 per cent at the commencement of the scheme. Audit noticed that the number of household connections increased only by 0.49 per cent to 15.43 per cent in six ULBs leaving a significant overall gap of 30.94 per cent. Kochi Corporation and Alappuzha and Guruvayur municipalities could not improve the coverage in supply of water. Audit noticed that importance given to rejuvenation of old distribution lines rather than expansion of distribution networks to uncovered areas resulted in non-achievement of significant coverage. Status of coverage of water supply before and after AMRUT is depicted in **Chart 4.1**



(Source: Data furnished by ULBs and KWA)

4.4.2 Per Capita Supply of Water

As per the SLB indicator, 135 litre per capita per day (lpcd) drinking water should be provided to households. The details of achievement with respect to per capita supply of water is given in **Table 4.7**.

Table 4.7: Achievement in per capita supply of water

Sl. No.	Name of ULB	LPCD before AMRUT	Gap identified in treated water quantity	Capacity of WTPs taken up	Capacity of WTPs executed	LPCD after AMRUT (claimed by ULBs)	LPCD after AMRUT as assessed by audit ⁵⁵
1.	Thiruvananthapuram	100	105	75	75	277	113.44
2.	Kollam	65	44.5	100	Nil ⁵⁶	50	61.03
3.	Alappuzha	50	15.9	Nil	Nil	120	76.45
4.	Kochi	86	204	Nil	Nil	NA	-- ⁵⁷
5.	Thrissur	93	26.3	20	20	70	58.42
6.	Kozhikode	100	12.0	Nil	Nil	NA	87.27
7.	Kannur	90	23	10	10	NA	70.57
8.	Guruvayur	36	14.43	15	15	70	60.63
9.	Palakkad	88	21.5	45	45	70	115.56

(Source: Data furnished by ULBs and KWA)

Out of nine ULBs, three⁵⁸ ULBs claimed to have improved the per capita water supply after the scheme. However, audit found inconsistencies in the claims by different ULBs as detailed below:

- There was no system/mechanism to measure quantity of water supplied to the mission cities as the treatment plants in a district cater to the needs of people in nearby panchayaths and other municipalities in addition to

⁵⁵ Based on e-abacus data of January/February 2024

⁵⁶ Though construction of 100 MLD WTP was completed, due to non-laying of raw water pumping main, WTP remains non-operational

⁵⁷ e-abacus data not furnished

⁵⁸ Thiruvananthapuram, Alappuzha and Guruvayur

the mission cities. KWA had not installed bulk meters to measure the quantity of water supplied to the mission cities.

- The universal provision of individual household tap connection being a necessary precondition to achieve 135 lpcd, none of the ULBs in the State achieved the SLB target as they could not ensure universal coverage in water supply connections.

Thus, the mission cities have not so far achieved the SLB target of universal coverage in household water connections and per capita supply of water.

4.4.3 Extent of Non-Revenue Water (NRW)

The term Non-revenue water denotes the quantity of water produced/supplied which does not earn any revenue. This is computed as the difference between the total water produced (ex-treatment plant) and the total water sold expressed as a percentage of the total water produced. Reducing NRW to 20 *per cent* was one of the Service Level Benchmarks to be achieved under the scheme. NRW has a significant impact on water availability, power consumption and cost recovery in a city. Reduction of NRW to acceptable standards is also vital for the financial sustainability of water supply services. The key to formulating an effective NRW reduction strategy is to develop a better understanding of the causes for NRW and its components. Components of NRW are given in **Chart 4.2** below:

Chart 4.2: Components of NRW

Non-Revenue Water	Unbilled authorized consumption	Unbilled metered consumption
		Unbilled un-metered consumption
	Apparent losses	Unauthorised consumption
		Metering inaccuracy
	Real losses	Leakages during transmission and distribution up to point of customer metering
		Leakages and overflows at Utility's storage tank

(Source: NRW Manual issued by MoUD)

According to NRW manual issued by MoUD, NRW should be established through a Water Audit. Further, NRW reduction plan should involve network mapping, leakage mapping, establishment of metered areas, leakage detection and SCADA. Audit noticed that KWA has not so far conducted water audit to analyse the extent of NRW in the mission cities. As such the extent of NRW declared in the SLIP has no authenticity. Audit assessed⁵⁹ the extent of NRW in five mission cities and found that NRW was much higher than that claimed by these ULBs.

Extent of NRW before and after AMRUT in the five AMRUT cities is given in **Table 4.8**.

⁵⁹ Based on total quantity of water claimed to have supplied by KWA and e-Abacus data on consumption

Table 4.8: Extent of NRW before and after AMRUT*(In per cent)*

Sl. No.	Name of the ULB	Extent of NRW before AMRUT as per SLIP	Extent of NRW after AMRUT assessed by Audit
1.	Thrissur	30	28.85 ⁶⁰
2.	Kozhikode	30	30.63
3.	Kannur	32	51.93
4.	Guruvayur	43	70.00
5.	Palakkad	30	40.76 ⁶¹

(Source: Data furnished by ULBs and KWA)

Audit estimated that the current level of NRW in five mission cities has resulted in a financial loss of ₹3.33 lakh⁶² per day (at the rate of ₹14.41 per kilo litre) to KWA.

Government stated (October 2024) that Audit derived the NRW figures from the total production capacity of water treatment plant serving in the city. As the water treatment facility supplies water to neighbouring panchayats also, the total production was not billed entirely to urban consumers. Hence, NRW calculation showed inflated figures. It was also stated that effective measures such as installation of flow meters for accurate measurement and billing and active leak detection were being implemented in a phased manner to enhance water management system.

The reply is not acceptable as NRW figures were not calculated based on production capacity of the WTP, rather the calculation was based on the total quantity of water claimed to have been supplied to ULB by KWA and on the data collected from e-abacus billing system of KWA. Further, the calculation of NRW was confirmed by KWA.

4.5 Execution of Sewerage facilities and septage management projects

Sewage treatment (domestic waste water treatment or municipal wastewater treatment) is a process used to remove contaminants from wastewater and convert it into an effluent that can be returned to the water cycle. According to CPHEEO Manual on Sewerage and Sewage Treatment, about 80 *per cent* of water consumed is turned into wastewater. Reuse of treated sewage water decreases the demand from aquatic sources like rivers, ponds, lakes as well as groundwater sources and less consumption of raw water helps in conserving natural water resources.

The AMRUT scheme was intended to provide basic services by creating infrastructure that had a direct impact on the real needs of people by providing sewerage connections to all households under sewerage and septage management component. This included, decentralised, networked underground sewerage system, rehabilitation of old sewerage system and treatment plants, recycling and reuse of treated water, faecal sludge management, mechanical and biological cleaning of sewers and septic tanks and recovery of operational cost

⁶⁰ Old municipal area not considered

⁶¹ As KWA did not furnish the quantity of water distributed through 1331 public taps, same was not considered.

⁶² NRW of 23126 kilo litre per day x ₹14.41 per kilo litre (lowest rate charged by KWA)

in full. Status of projects proposed and executed by the mission cities are detailed in the **Table 4.9**.

Table 4.9: ULB-wise details of sewerage/septage management projects implemented

(₹ in crore)

Sl. No.	ULB	No. of projects sanctioned ⁶³	Project cost ⁶⁴	No. of projects completed	Expenditure	No. of projects ongoing	Expenditure	No. of projects cancelled	Project cost	Total Expenditure	Percentage of expenditure	Percentage of completion
1.	Thiruvananthapuram	135	226.0	99	107.44	35	53.05	1	4.80	160.49	71	74
2.	Kollam	5	31.91	Nil	Nil	2	16.84	3	12.66	16.84	53	Nil
3.	Kochi	4	35.18	1	14.66	1	8.96	2	29.06	23.62	67	50
4.	Thrissur	4	8.36	Nil ⁶⁵	Nil	3	2.74	1	53.40	2.74	33	Nil
5.	Kozhikode	4	21.53	Nil	Nil	2	15.41	2	140.00	15.41	72	Nil
6.	Kannur	3	49.06	1	26.36	2	0.80	Nil	Nil	27.16	55	33
7.	Alappuzha	5	4.99	Nil	Nil	4	2.19	1	0.44	2.19	44	Nil
8.	Guruvayur	2	0.50	Nil	Nil	1	0.00	1	4.50	0.00	Nil	Nil
9.	Palakkad	3	3.86	Nil	Nil	1	0.00	2	12.08	0.00	Nil	Nil
	Total	165	381.39	101	148.46	51	99.99	13	256.94	248.45	65	66

(Source: Data furnished by SMMU)

Against 165 projects sanctioned, 101 projects with project cost of ₹182.48 crore were completed⁶⁶ and 51 projects with project cost of ₹198.91 crore were ongoing as of March 2024. An amount of ₹248.45 crore was incurred towards implementation of projects (March 2024). Against the SAAP approved project cost of ₹624.75 crore under this sector, 13 projects with project cost of ₹256.94 crore (41.13 per cent) were cancelled. Audit noticed that percentage of projects completed under sewerage/septage sector was only 66 per cent, while the percentage of completion in sectors such as storm water drainage and urban transport were 93 and 84 per cent respectively. This indicates that the thrust was given by ULBs for the implementation of projects under Storm water drainage and Urban Transport rather than Sewerage and Septage sector though sewerage/septage sector was prioritised next to drinking water supply under AMRUT.

Audit scrutinised 58 projects⁶⁷ and noticed various deficiencies such as, taking up projects without ensuring the suitability of land, non-ensuring of hindrance free land, delay in completion, time and cost overrun etc., as detailed in the succeeding paragraphs.

4.5.1 Thiruvananthapuram Municipal Corporation

Thiruvananthapuram Municipal Corporation has a sewage treatment plant with 107 MLD capacity at Muttathara (Commissioned in 2013) and 37 per cent of households were covered by piped sewerage system, leaving a gap of network coverage to 63 per cent of households (1,55,486). Due to non-availability of

⁶³ Including cancelled projects

⁶⁴ Excluding project cost of cancelled projects

⁶⁵ One project in Thrissur completed in February 2024 but final bill yet to be settled.

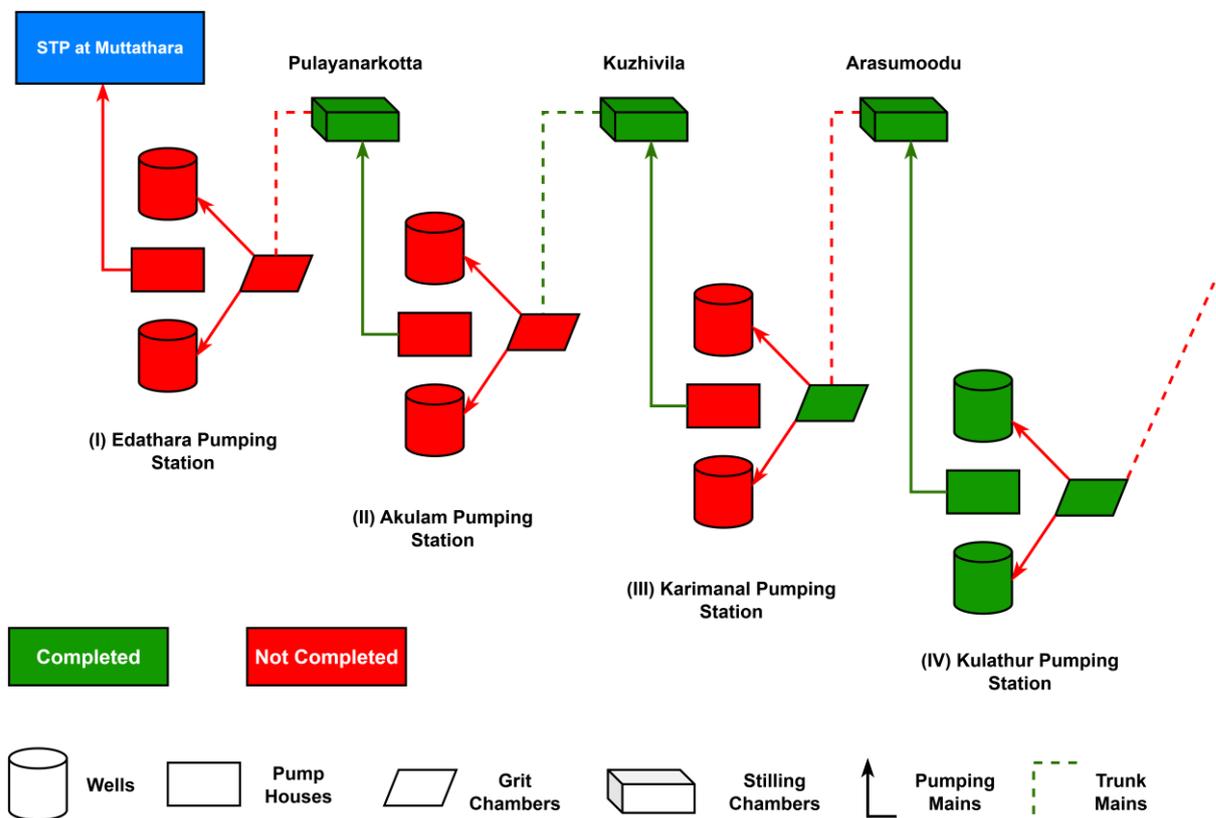
⁶⁶ 99 projects in Thiruvananthapuram

⁶⁷ Completed - 10, cancelled - 13 and ongoing projects - 35

sewer network in more than fifty *per cent* of the wards in the municipal corporation the inflow to the plant was only 44 MLD.

In order to widen sewer networks to four blocks (L, K J and I) of the Corporation and rejuvenation of the existing networks, KWA had taken up 127 projects with project cost of ₹ 201.23 crore of which 32 projects were related to establishment of new sewer network and pump houses and 95 projects for rejuvenation of existing old and damaged lines. Eighty eight *per cent* of projects for rejuvenation of existing sewer lines were completed and in respect of establishment of new sewer network, only 41 *per cent* of works could be completed (March 2024). Establishment of new sewer network included construction of four pump houses, eight wells, four grit chambers and laying of 13.07 km trunk main and pumping main of length 13.44 km. Diagram depicting the sewerage networks taken up in Thiruvananthapuram municipal corporation is shown in **Figure 4.1**.

Figure 4.1: Sewerage networks taken up in Thiruvananthapuram municipal corporation



(Source: Based on the data furnished by KWA/ULB)

Audit noticed that even after lapse of five years since commencement, the work remained incomplete and against envisaged length of 26.51 km sewer lines, length of 20.03 km could only be completed so far (March 2024) due to the reasons detailed in **Table 4.10**.

Table 4.10: Status of implementation of new sewerage network in Thiruvananthapuram and bottlenecks identified

Sl. No	Details of work	Remarks
1.	Edathara pumping station to Muttathara STP	<ul style="list-style-type: none"> The laying of Pumping main in Karali Lane (1.608 km) connecting the final stretch to Muttathara STP could not be awarded (March 2024) due to public protest Pumping main from the final converging point i.e. Edathara Pumphouse was not connected to Muttathara STP due to non-execution of NH crossing work resulting in a gap of 2.114 km. Audit noticed that contract with M/s Mary Matha was terminated (April 2022) based on the request of the contractor without invoking risk and cost clause stating that NH crossing permission was obtained only in April 2021 and his contract period came to an end in March 2021. However, audit noticed that NH crossing permission, subject to remittance of licence fee was communicated to KWA as early as in October 2020. Audit observed that by allowing the contractor to leave without executing the work, KWA did not act in the best of interest of the scheme. Though the work was retendered after splitting into six works, none of the works except supply of pipes could be completed (March 2024).
2.	Akkulam to Edathara pumping station	<ul style="list-style-type: none"> Non-acquisition of private land and non-obtaining permission from Irrigation department for crossing Amayizhanchan thodu, trunk main from Pulayanarkotta stilling chamber remains unconnected to Edathara pumping station.
3.	Kulathoor to Karimanal pumping station	<ul style="list-style-type: none"> Trunk main from Arasumoodu stilling chamber was not connected to the Grit chamber at Karimanal due to non-obtaining of permission from Irrigation department for laying pipe across the Thettiyyar thodu. As such the Kulathoor pumping station remained unconnected to Karimanal pumping station.
4.	Construction of Wells and Grit chambers	<ul style="list-style-type: none"> Pumping station at Edathara remained incomplete as the construction of grit chamber and well could not be completed due to the presence of hard and slushy soil at the site, which indicated deficiencies in the soil test conducted. Construction of well at Karimanal pumping station remained incomplete with well plugging and finishing works pending. Akkulam pumping station (95 <i>per cent</i> complete) - Finishing works, electrification, etc remained incomplete. Grit Chamber at Akkulam remained incomplete with installation of mechanical screen pending.

Sl. No	Details of work	Remarks
5.	Laying of sewer transmission main to Kulathoor	<ul style="list-style-type: none"> The work of laying trunk main intended to convey sewage from Kazhakoottam area to Kulathoor pumping station could not be executed due to non-receipt of NHAI permission and hence transferred to AMRUT 2.0.

(Source: Based on information collected from KWA/ULB)

Connectivity of pumping/trunk mains at different stretches and laying trunk mains were not possible due to the above-mentioned reasons and as such the intended objective remained un-achieved (March 2024).

Government stated (October 2024) that the delay in completing the project was due to factors such as technical challenges, contractor issues and local resistance. It was also stated that a significant delay occurred in laying pumping main from Edathara to Muttathara due to public protest in Karali area as residents demanded sewerage facilities in that area before allowing line installation. A separate project report for providing sewer facilities to the Karali area has been prepared and the work would be expedited and completed. However, the fact remains that the STP at Muttathara remained underutilised with 59 per cent of its capacity, even after a lapse of 10 years of construction.

4.5.1.1 Construction of five MLD Sewage Treatment Plant at Medical College, Thiruvananthapuram – Unfruitful expenditure of ₹ 14.65 crore

Construction of five MLD Sewage Treatment Plant (STP) inside Medical College campus at Thiruvananthapuram at a project cost of ₹19.16 crore was approved (SAAP 2016-17 and 2017-18) with the objective to establish a separate STP for Thiruvananthapuram Medical college campus (four hospitals and quarters) and Chest Disease Hospital, Pulayanarkotta. The sewage generated from these premises (3.2 MLD⁶⁸) was being collected in two collection wells within the Medical College campus and then pumped into the main sewer line and discharged to the sewage treatment plant at Muttathara. As damaged collection wells and breakdown of pumps resulted in overflowing of the sewage to the nearby canal thereby contaminating the environment, it was proposed to construct a separate STP for the campus and seventh SHPSC meeting held in December 2016 approved the construction of the plant. The work was commenced in March 2019 and was completed in January 2022 incurring an expenditure of ₹14.65 crore.

Audit noticed that the STP was not functioning properly (February 2024) as sufficient quantity of sewage was not reaching plant, and the outflow was let off to the nearby drain. Kerala State Pollution Control Board (KSPCB), after conducting analysis of the samples at inlet, outlet and unauthorised discharge point to nearby drain, informed (December 2023) that there was presence of total coliform and faecal coliform in excess of the authorised quantity, which was contaminating the nearby drain. Executive Engineer, KWA had reported (November 2023) that as the sewage reaching the plant was below the required capacity, retention time of sewage was increased and the sewage became septic

⁶⁸ Estimated by KWA based on the quantity of water supplied to the campus (80 per cent of four MLD)

resulting in malfunctioning of the plant. Further, non-generation of sludge in the plant was also an indication of the malfunctioning of the plant. During Joint Physical Verification Audit noticed that one of the Moving Bed Biofilm Reactor (MBBRs) with a capacity of 2.5 MLD capacity was idling as less than 1.5 MLD of sewage was reaching the STP. Audit noticed that super speciality block of Medical College Hospital and Chest Disease Hospital, Pulayanarkotta was not connected to the STP as gravity flow was not possible from these premises. Audit observed that construction of STP at Medical College without ensuring the availability of minimum quantity of sewage to the plant resulted in failure of the plant and rendered the expenditure of ₹14.65 crore incurred towards construction unfruitful.

Government stated (October 2024) that rectification measures were carried out in the plant and effluent quality complied with the discharge standards. Reply is not tenable as the effluent quality analysis conducted by KSPCB in November 2024 indicates that discharge parameters do not conform to the standards and there was presence of coliform and faecal coliform in excess quantities in the water discharged. Further, the Hospital has not renewed the consent to operate (January 2025).

4.5.2 Kollam Municipal Corporation

Kollam Corporation had no sewerage collection and treatment systems in the municipal area. As per the assessment made in the SLIP, Kollam Municipal Corporation required 508 km sewer network to connect 98,367 households in the entire municipal corporation area. Hence, ULB/KWA proposed projects for establishment of a Sewage Treatment Plant at Kureepuzha, three decentralized STPs⁶⁹ and laying balance sewer networks and pumping stations laid under KSUDP.

The proposed STP at Kureepuzha was having a capacity of 12 MLD and could be operated with a minimum sewage quantity of six MLD. The work was awarded to a contractor in April 2020 for an amount of ₹25.97 crore. However, the work was commenced only in October 2021 as there was dispute in the ownership of the land. As of January 2024, 92 *per cent* of the work of the STP was completed incurring expenditure of ₹16.84 crore. Pending works included completion of administrative building, installation of three electromechanical units and electrical work. However, the work remained stalled at 92 *per cent* during the last one year as sewer network to bring sewage from the households to the STP was not constructed (January 2025) and installation of machinery would leave it idle with risk of damage to the parts. Audit noticed that though line laying works in Zone III was in progress, it was six kilometres away and had no connectivity to the STP. Further, the project for extension of sewer network laid under KSUDP for establishing connectivity to the STP could not be awarded (October 2024). As such, failure of the Corporation to establish network to bring sewage to the plant resulted in idling of the infrastructure created and non-achievement of objective even after expending ₹16.84 crore.

Government stated (October 2024) that implementation of sewerage scheme for Kollam Municipal Corporation was taken up under KSUDP scheme. This

⁶⁹ Vasoorchira, Andamukkam, Karikuzhi Ela

included projects for laying sewer networks in Zone I and construction of STP at Kureepuzha. As STP could not be constructed due to public protest, project for laying sewer lines was foreclosed in August 2020. Though the project was again taken up under AMRUT, there were no takers for the project for laying sewer networks. Difficult nature of work like high depth excavation, laying pipes along narrow roads with heavy vehicular traffic, loose nature of soil, high water table etc., were identified as reasons for non-participation. As AMRUT came to an end, SHPSC decided (August 2024) to shift the project to AMRUT 2.0. However, Government's reply is silent about any effective action taken to address the local challenges and arrange works for establishment of sewer network.

4.5.3 Kochi Municipal Corporation

At the beginning of the scheme Kochi Municipal Corporation had only three *per cent* coverage of sewerage network within its jurisdiction with the 4.5 MLD STP at Elamkulam commissioned in 1956. As part of the AMRUT scheme, three projects for implementation of decentralized sewerage treatment system with 50 km network (Division 15, 16 and 17) and a project for rejuvenation of existing STP at Elamkulam was approved in SAAP (2015-16 and 2016-17) at a total project cost of ₹64.24 crore. However, due to public protest two projects for construction of decentralised STP were cancelled⁷⁰. The work for construction of decentralised sewerage treatment system in Division 16 with project cost of ₹18.66 crore, though awarded in December 2020, only 45 *per cent* of the work completed (November 2024). The proposal for rejuvenation of 4.5 MLD sewage treatment plant at Elamkulam at a project cost of ₹16.52 crore was turned down by sixth SLTC (February 2017) and suggested to construct a new STP having capacity of five MLD without adding any new network. Though construction of the treatment plant was completed in May 2022, incurring expenditure of ₹12.06 crore, plant could be commissioned only in October 2024 due to defects in the grit removal mechanism, blockage in MBBR, non-implementation of sludge treatment system, etc. However, due to non-expansion of sewer network in Kochi Municipal Corporation, coverage remains the same even after completion of the project period and incurring expenditure of ₹23.62 crore.

Government stated (April 2025) that a functional network was not established under AMRUT 1.0. It was proposed to establish network under AMRUT 2.0 and Rebuild Kerala initiative.

4.5.4 Thrissur Municipal Corporation

Thrissur Municipal Corporation had no existing capacity to treat sewage or septage and the ULB had taken up three projects for construction of STP viz, (i) Construction of 2.5 MLD decentralised sewerage scheme for Thrissur municipal corporation (ii) Construction of 360 KLD Sewerage Treatment Plant at General Hospital and (iii) Construction of 100 KLD Septage Treatment Plant at Ramavarnapuram.

Of the three projects, construction of 2.5 MLD plant at Vanchikulam could not be initiated as the land selected was wetland and permission for conversion of

⁷⁰ Implementation of decentralized sewerage treatment system for Division 15 and 17

wetland was not granted by Government. For the other two projects viz., Construction of 360 KLD Sewage Treatment Plant at General Hospital and Construction of 100 KLD Septage Treatment Plant at Ramavarnapuram, M/s Green Eco Water Systems, Hyderabad was selected (December 2019) for implementing the projects. As the contractor did not commence the work in respect of 360 KLD STP and did not execute agreement in respect of 100 KLD STP, the works were terminated at the risk and cost of the contractor and the firm was blacklisted (January 2022) by the Corporation. Audit noticed delay of one to two years in terminating the contracts by the Corporation and this resulted in delay in re-tendering the works. Though construction of STP at General Hospital was completed (February 2024), work relating to construction of STP at Ramavarnapuram could not be commenced due to public protest (December 2024). As such, the objective of providing sewerage/septage treatment facility to the residents of the Corporation could not be achieved even after completion of the project period (December 2024).

Government stated (April 2025) that availability of alternate land for the decentralised sewerage scheme was being examined.

4.5.5 Kannur Municipal Corporation

Kannur Municipal Corporation had taken up three projects viz., one for providing decentralised sewerage network with three MLD STP at Padannappalam to cover 14 wards of the Corporation (old Kannur municipal area), one MLD Septage treatment plant at Chelora and providing house connections in old Kannur area at a total cost of ₹49.06 crore. As the land for the three MLD STP was not available in the corporation area, DPR was prepared (2018) for one MLD STP to cover two wards (1500 connections) of Kanathur and Thalikkavu and 100 KLD septage plant at Chelora. Construction of one MLD STP at Padannappalam was completed in December 2023 incurring ₹26.36 crore. However, project for establishing household connections was awarded only in June 2024 and 870 domestic and 36 commercial connections could be provided (December 2024). Though work for construction of 100 KLD septage plant at Chelora was awarded in November 2019, only 60 *per cent* of the civil work was completed (December 2024). As such, coverage of sewer network remained at 1.4 *per cent* at the end of the project period (December 2024).

4.5.6 Alappuzha municipality

Alappuzha municipality had no sewage treatment plant in the city and had no systematic and organized method to collect and treat waste from septic tanks. The city was facing many challenges in the initiatives to expand sewerage network, including narrow street width, flat terrain, and high-water table. Sewage generation from 39,894 households was estimated to be 22 MLD. As decentralized sewerage/septage treatment system was considered viable solution for the city, four STP projects were approved in SAAP viz., construction of 50 KLD STP at Thottumudi Colony (2017-18), construction of 15 KLD STP at Sadabdi Mandiram (2016-17), construction of 240 KLD STP at General Hospital (2015-16) and purchase of two mobile septage treatment units (2017-18) at a total cost of ₹6.79 crore. Municipality completed the construction of 240 KLD STP at General Hospital in February 2024, incurring expenditure of

₹2.19 crore⁷¹ and purchased one mobile septage treatment unit during November 2024. However, the project for construction of STP at Sadabdi Mandiram was cancelled (March 2023) as a project for construction of an STP covering Shadabdi Mandiaram area was proposed in AMRUT 2.0. Further, construction of STP at Thottumudi Colony was cancelled (March 2024) from AMRUT and proposed in AMRUT 2.0, as the works were unlikely to be commenced by 31 March 2024. As such, sewage treatment facility for the residents of the municipality was limited to one mobile septage treatment unit at the end of the project period (December 2024).

4.5.7 Non-installation of Online Continuous Monitoring System (OCMS) in STPs

Government of India directions (July 2020) stipulate real time monitoring of parameters of treated water by installing Online Continuous Monitoring System (OCMS) in the STP. However, Audit noticed that none of the estimates prepared by the mission cities for construction of Sewerage/Septage treatment plants included provision for installation of OCMS and in none of the STPs OCMS was installed.

Government stated (April 2025) that OCMS was not included in the original scope of work and will be established using available resources/savings.

4.6 Status of Universal Coverage of Sewerage and Septage Systems

The AMRUT mission aimed to achieve universal coverage of water supply followed by universal coverage of sewerage and septage treatment. Mission cities had identified a gap of 4764 km of sewerage pipeline network and a gap of 300 MLD in treatment capacity. At the commencement of AMRUT Scheme, only Thiruvananthapuram and Kochi corporations had facility for treatment of sewage. Against the total quantity of 382.90 MLD⁷² sewage generated in these cities only 49 MLD (13 *per cent*) was getting treated. During AMRUT period only Kannur Municipal Corporation constructed STP (one MLD) for treatment of sewage generated in households while Thiruvananthapuram (5 MLD), Alappuzha (240 KLD), Thrissur (360 KLD) and Kozhikode (2 MLD) constructed STPs in hospitals. Thus, against the gap of 300 MLD treatment capacity assessed, mission cities could register only 13.7 MLD increase up to March 2024. Further, mission cities could enhance their sewage treatment capacity by only six *per cent*.

4.6.1 Coverage of sewer network in mission cities

Audit noticed that coverage of sewer network could not be improved in any of the mission cities except in Kannur as given in **Appendix 4.1**. However, Kannur Municipal Corporation could only establish sewerage network in 1.4 *per cent* of households (December 2024). Thiruvananthapuram Municipal Corporation, which was treating 34 *per cent* of the sewage generated at the commencement of the AMRUT scheme could not expand its coverage of sewer network as KWA could not complete the work and establish connectivity with existing STP even after five years of commencement of the work. Failure of KWA/Kollam Municipal Corporation to establish network to bring sewage to the STP

⁷¹ Expenditure incurred upto March 2024

⁷² 80 *per cent* of quantity of water supplied by KWA

constructed at Kureepuzha resulted in idling of the STP constructed expending ₹ 16.84 crore. Thus, at the closure of AMRUT scheme, the status of nine mission cities in Kerala regarding the sewerage system coverage was abysmal with six cities having no sewage collection and treatment systems for households and Kochi and Kannur Municipal corporations had a negligible coverage of three *per cent* and one *per cent* respectively. Thiruvananthapuram was the only city in the State which treated at least 34 *per cent* of the sewage generated. Further, only 0.13 *per cent* households were provided with sewerage connections under AMRUT. Against target of 100 *per cent*, overall achievement remained at 11.25 *per cent* (December 2024).

Recycling of water for beneficial purposes and reuse of wastewater was one of the components of sewerage sector and the benchmark was that at least 20 *per cent* of the wastewater generated in ULBs should be recycled and used for non-potable uses as per the norms prescribed. However, none of the mission cities have established a system for recycling/reuse of treated water except usage of a portion of treated water for gardening.

Recommendation 4: Government should ensure that distribution networks are also planned and executed along with the construction of Water and Sewage Treatment Plants, so as to avoid idling of such plants.

4.7 Operation and Maintenance of treatment plants under Water Supply and Sewerage Sector

The AMRUT guidelines stipulated that projects proposed in SAAP should include Operation and Maintenance (O&M) for at least five years to be funded by way of levy of user charges or other revenue streams. However, for the purpose of calculation of the project cost, the O&M cost should be excluded and the State/ULBs should fund the O&M through an appropriate cost recovery mechanism to make them self-reliant and cost-effective. The guidelines also stipulated that the tender should include O&M for five years based on user charges. However, Audit noticed that O&M agreement was not executed in respect of five water supply/sewerage projects even after completion of the projects. Details are given in **Table 4.11**.

Table. 4.11: Details of O&M in water supply and Sewage treatment plants

Sl. No.	ULB	Total number of projects which require O&M	Number of projects in which O&M was included in the tender	Number of projects in which O&M clause included in the agreement	Number of projects completed	No. of projects in DLP
1.	Thiruvananthapuram	2	2	2	2	0
2.	Kollam	2	2	2	1	0
3.	Alappuzha	1	1	1	1	1
4.	Kochi	1	1	1	1	1
5.	Thrissur	2	Nil	Nil	2	1
6.	Guruvayur	1	Nil	Nil	1	0

Sl. No.	ULB	Total number of projects which require O&M	Number of projects in which O&M was included in the tender	Number of projects in which O&M clause included in the agreement	Number of projects completed	No. of projects in DLP
7.	Palakkad	1	Nil	Nil	1	0
8.	Kozhikode	1	Nil	Nil	Nil	0
9.	Kannur	3	Nil	Nil	2	1
	Total	14	6	6	11	4

(Source: Data furnished by KWA/ULB)

Even though SAAP insisted that O & M period should be calculated as five years outside the Defect Liability Period (DLP), in two projects ULBs/KWA included O&M for five years including one-year DLP, which not only effectively shortened the O&M period by one year but also gave undue advantage to the contractor. Though the mission guidelines prohibited utilisation of project fund for meeting O&M cost and State/ULBs were to fund the O&M through an appropriate cost recovery mechanism, Thiruvananthapuram and Kochi Corporations met O&M charges of ₹7.21 crore from project fund.

Regarding non-inclusion of O&M in the tender/agreement, ULBs replied that all projects had DLPs. After the DLP, ULB/KWA took over the O&M responsibilities and managed internally and hence O&M was not included in the contract. The reply is not tenable as the guidelines stipulates for inclusion of O&M for five years based on user charges in the tender itself so as to ensure proper maintenance by ULBs.

4.7.1 Undue benefit to the contractor

In order to augment drinking water supply to Thiruvananthapuram city, a project for construction of 75 MLD water treatment plant at Aruvikkara was approved (SAAP 2016-17) with a project cost of ₹70 crore and Technical Sanction for the project was accorded (December 2017) for ₹ 68 crore. The work was tendered (lump sum contract) for ₹62.89 crore, which included O&M for five years. The work was awarded (June 2018) for ₹56.29 crore (10.5 per cent below the tendered PAC) and the construction was completed (February 2021) incurring an expenditure of ₹57.01 crore. Audit noticed that of the tendered PAC of ₹62.89 crore, an amount of ₹6.17 crore was earmarked for operation and maintenance of the plant for a period of five years, after trial run and commissioning. As the accepted PAC was 10.5 per cent below the tendered PAC, the admissible amount to the contractor towards O&M cost for maintaining the WTP for five years was ₹5.52 crore. However, after awarding the work, KWA prepared payment schedule by sharing (pro-rata share) the cost of O&M among all the items of works to be executed. Inclusion of O&M along with items of work resulted in payment of O&M of ₹4.95 crore (one per cent i.e. ₹0.57 crore was retained from the bills towards maintenance) along with all part payments. Audit observed that payment of the O&M charges, to be paid in five years after successful commissioning of the project, along with part bills resulted in undue advantage to the contractor.

Recommendation 5: Government should ensure that KWA/ULBs undertake adequate measures for operation and maintenance of the assets created to yield benefits on a long-term sustainable basis.

4.8 Execution of Projects under Urban Transport

Reducing pollution by switching to public transport or constructing facilities for non-motorised transport was one of the objectives of AMRUT. ULBs implemented various projects like construction of walkways, foot overbridges (FoB), bicycle tracks, multi-level car parking (MLCP), etc., under urban transport component. Fund allocation and facilities created are shown in **Appendix 4.2**. Out of 147 projects taken up, 107 projects were completed and 21 projects were ongoing and 19 projects were cancelled (March 2024). Against ₹189.46 crore allocated towards the projects, ₹127.75 crore was expended. Construction of 65 footpaths, 23 foot overbridges/subway and three MLCPs were the major activities carried out under the component. Reduced expenditure was on account of non-execution of MLCP projects in two⁷³ mission cities, abandoning walkway and cycle track in Kochi and foot paths in different mission cities due to lack of permission.

Adherence to the guidelines of Indian Road Congress in the construction of footpaths and walkways were verified by Audit and observations in this regard are summarised below:

4.8.1 Construction and maintenance of foot paths

Pedestrian footpaths are defined as any area primarily used by ‘all’ pedestrians. They can be adjacent to roadways, or away from the road. Footpaths should be regarded as a transportation system which is connected and continuous, just like roadways and railways. To be effective, the sidewalks should be provided on both sides of the road and above the level of the carriageway separated by kerbs. However, Audit noticed instances where foot paths were constructed without clearing obstacles such as electric post, telephone post, transformers, constructing walkway at the same level of carriage way, not constructing disabled friendly footpaths etc., as detailed in succeeding paragraphs:

4.8.1.1 Construction of foot paths without clearing the obstacles

The Indian Road Congress (IRC) guidelines for Pedestrian Facilities, 2012 stipulates that the walking zone should be clear from all obstructions – both horizontally and vertically (width-1.8 m x height-2.2 m) and no utility ducts, utility poles, electric, water or telecom boxes, trees, signage or any kind of obstruction should be placed within the walking zone. However, while constructing the footpath, mission cities ignored this requirement and footpaths were constructed without removing these obstacles or without ensuring additional spaces in these areas to facilitate the pedestrians. During Joint Physical Verification (JPV) of 19 foot paths in seven ULBs⁷⁴, it was noticed that electric posts, stay wires, telecom boxes, trees, traffic signages, etc., posed serious threat to the pedestrians in nine footpaths (47 per cent) in five ULBs⁷⁵, as shown in **Figure 4.2**.

⁷³ Thiruvananthapuram and Kollam

⁷⁴ Thiruvananthapuram, Kollam, Kochi and Thrissur corporations and Alappuzha, Guruvayur, Palakkad municipalities

⁷⁵ Thiruvananthapuram, Kollam and Kochi corporations and Alappuzha and Palakkad municipalities



Figure 4.2: Sign board, flag post and tree in AR Camp-Memu Shed footpath at Kollam Corporation

Audit also noticed instances of construction of foot path without kerbs and guard rail by two ULBs⁷⁶ (five footpaths). Details are given in **Appendix 4.3**. Instances of encroachment of footpath by shop keepers and construction of waste management facilities in the foot paths by ULBs themselves were also noticed during JPV, as shown in **Figure 4.3**, **Figure 4.4** and **Figure 4.5**.

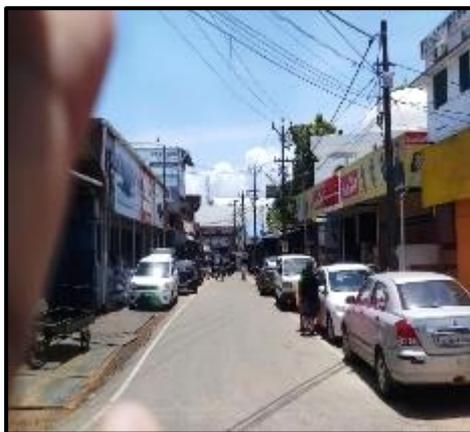


Figure 4.3: Foot path in the same height and vehicle parked throughout the foot path at Market Road in Kollam Corporation



Figure 4.4: Melamuri Kalmandapam footpath, Palakkad encroached by shop owners



Figure 4.5: Aerobic compost unit in footpath constructed at Thathampally ward in Alappuzha

⁷⁶ Kochi Corporation and Alappuzha Municipality

Non-construction of kerb and guard rail has resulted in utilisation of foot path for parking vehicles by public, defeating the purpose for which it was constructed.

Government stated (April 2025) that ULBs were directed to clear the obstacles.

4.8.1.2 Non-construction of disabled friendly footpaths

According to IRC guidelines footpaths should be at least 1800 mm wide to accommodate wheelchair users and persons with vision impairments assisted by a sighted person or guide dog. If existing paths are less than 1800 mm wide, provision of passing places, 1800 mm wide and 2500 mm long, should be made at a reasonable frequency, depending on intensity of use. During JPV, Audit noticed that in seven cases (37 per cent of the test checked cases) in four ULBs⁷⁷ the minimum width of 1800 mm was not ensured. Further, tactile pavement to facilitate visually impaired personnel was absent in 10 foot paths (53 per cent) in four ULBs⁷⁸.

Principal Secretary, Local Self Government Department (LSGD) during exit conference (September 2024) stated that GoK at present insists on the construction of disabled friendly footpaths.

4.8.1.3 Unfruitful expenditure in abandoning construction

Kochi Corporation entrusted (January 2018) M/s Kochi Metro Rail Limited (KMRL), the work of construction of Sarovaram walkway along with cycle track across Chilavannur lake (adjacent to Elamkulam Metro Station in Sahodaran Ayyappan Road to Subash Chandra Bose Road) at a project cost of ₹9.31 crore under Urban Transport component. As the construction was in the vicinity of Chilavannur lake, permission of Kerala Coastal Zone Management Authority (KCZMA) was mandatory. However, before obtaining the clearance from KCZMA, KMRL commenced the construction (January 2019) and the project was halted due to public protest. As KCZMA denied (January 2020) permission for the construction, the project was abandoned after incurring an expenditure of ₹0.95 crore. SHPSC in July 2022 cancelled the project from the AMRUT scheme and directed Kochi Municipal Corporation to bear the expenditure. As no further progress was achieved in this matter, the amount met from AMRUT remained unfruitful.

Government stated (April 2025) that KMRL has been directed to refund the amount.

4.8.2 Foot overbridges

One of the primary purposes of pedestrian foot overbridges is to facilitate and encourage walking whilst ensuring safety for all road users. These bridges should be designed by considering the pedestrian flows and movements and encourage people to consider walking as an accepted mode of transport. As per the SLIPs, locations requiring foot overbridges for pedestrians to cross the roads were identified by only two mission cities⁷⁹. Five⁸⁰ out of nine mission cities

⁷⁷ Thiruvananthapuram, Kollam, and Kochi Corporations and Alappuzha municipality

⁷⁸ Thiruvananthapuram, Kollam, and Kochi Corporations and Alappuzha municipality

⁷⁹ Kozhikode Corporation and Palakkad Municipality

⁸⁰ Kollam, Thrissur, Kozhikode Corporations and Alappuzha and Palakkad municipalities

utilised mission funds for constructing 23 foot overbridges/subways during the mission period, which were scrutinised by Audit. Audit observations in this regard are summarised in subsequent paragraphs:

4.8.2.1 Non-adherence to IRC guidelines

According to the IRC guidelines for pedestrian facilities, ramp/lift is mandatory in foot overbridges to facilitate the use of FOBs by persons with disabilities. However, 89 per cent (eight out of nine) FOBs⁸¹ constructed by four⁸² ULBs did not have this facility. Audit conducted a JPV along with ULB officials to ascertain the number of persons using the FOBs to cross the roads and the details are given in the **Table 4.12**.

Table 4.12: Results of survey regarding use of foot overbridge

Sl. No.	Name and location of the foot overbridge	Date of verification	Number of persons crossed the road in one hour	Number of persons used foot overbridge to cross the roads in one hour	Percentage of pedestrians using FoB
1.	North Stand, Thrissur	22 June 2024	73	27	37
2.	Victoria College junction, Palakkad	11 July 2023	432	22	5
3.	St. Joseph High School junction, Kollam	20 July 2023	393	123	31
4.	High School junction, Kollam	21 July 2023	413	77	19
5	New Bus stand, Kozhikode	28 December 2023	1257	1257	100

(Source: Joint Physical Verification conducted by Audit along with ULB officials)

Except in FOB constructed by Kozhikode Corporation, majority of pedestrians did not opt for the foot overbridges in other locations. Audit noticed that main reason for usage of FOB in Kozhikode bus stand was availability of lift/escalators and placing barricades to prevent the pedestrian crossing through road as compared to other FoBs where these facilities were not provided.

⁸¹ 13 Foot overbridges at Alappuzha were not considered as they were used for crossing the canal.

⁸² Kollam, Thrissur, Kozhikode Corporations and Palakkad municipality

Best practice noticed

Kozhikode municipal corporation constructed a FOB at New Bus Stand, Kozhikode and all the facilities including lift and escalator were provided. Audit observed (December 2023) that the number of persons using the FOB in one hour to cross the road was 1257 people (273 by Lift, 144 by Stairs and 840 by Escalator). Nobody could cross the road without using the FOB as there were barricades to prevent the pedestrian crossing through the road. The FOB was particularly successful because of the right location and provision of lift and escalator.

Figure 4.6: Foot overbridge at New Bus Stand, Kozhikode constructed by Kozhikode municipal corporation

***4.8.2.2 Irregular construction of foot overbridges obstructing footpaths***

As part of the scheme three foot overbridges were constructed in Kollam (i) St. Joseph junction, (ii) Chemmamukku and (iii) High school junction. During JPV, Audit noticed that all the three-foot overbridges were constructed blocking the existing footpath on both sides of the road forcing the pedestrians to use the carriageway. Images of foot overbridges are shown as **Figure 4.7** and **Figure 4.8**.



Figure 4.7: Foot overbridge constructed on footpath at Chemmamukku in Kollam



Figure 4.8: Foot overbridge constructed on footpath at High school junction, Kollam

Kollam Corporation replied that locations of FOBs were selected considering the presence of educational and other public and private institutions and because of limitation of space, maximum available space was used for construction. Reply is not tenable as construction of FOBs obstructing foot paths not only

violated IRC guidelines but also forced the pedestrians using foot paths to use carriageway exposing them to the risk of road accidents.

4.9 Execution of Stormwater drains

Construction and maintenance of storm water drains was expected to reduce and ultimately eliminate flooding in cities, thereby making cities resilient. ULBs were to identify flood prone areas and propose projects to run off rainwater to avoid flooding. The incidence of mixing grey water with rainwater was also to be eliminated as part of the scheme. Nine mission cities had taken up 565 projects with estimated cost of ₹357.19 crore and executed 499 projects by incurring an expenditure of ₹288.85 crore as detailed in **Table 4.13**.

Table 4.13: Projects sanctioned and executed under stormwater drains

(₹ in crore)

ULB	No. of projects sanctioned ⁸³	Project Cost	No. of projects completed	No. of projects on going	No. of projects cancelled	Total Expenditure	Percentage of projects completed	Percentage of expenditure
Thiruvananthapuram	124	51.99	106	11	7	37.85	91	73
Kollam	21	28.59	20	0	1	20.86	100	73
Kochi	49	53.86	48	1	0	45.43	98	84
Thrissur	76	29.93	67	0	9	28.94	100	97
Kozhikode	16	49.93	9	7	0	31.32	56	63
Kannur	12	39.35	11	1	0	36.41	92	93
Alappuzha	168	54.14	146	14	8	44.63	91	82
Guruvayur	12	13.85	11	1	0	13.18	92	95
Palakkad	87	35.55	81	2	4	30.23	98	85
Total	565	357.19	499	37	29	288.85	93	81

(Source: Data furnished by SMMU)

Audit selected 128 projects⁸⁴ for detailed scrutiny and audit observations are detailed in the following paragraphs:

4.9.1 Lack of connectivity leading to flooding

Thiruvananthapuram Municipal Corporation constructed (February 2020) 0.40 km stormwater drain incurring expenditure of ₹55.19 lakh at Plavarcodes-Ulloorakonam-Andoorpoika road in Chanthavila ward. As per the original proposal the drain was to be connected to a primary drain (Thettyar thodu) to run off the rainwater in that area. However, due to the presence of private land the alignment was changed and the drain was connected to an existing secondary drain which did not have connectivity to the primary drain. Changed drain connectivity during execution and absence of connectivity to Thettyar thodu led to flooding in that area. As such, the construction of the drain failed to achieve its objective.

The Corporation replied (January 2024) that while preparing DER of the project, the ward councillor had confirmed the availability of land for connecting the new drain to Thettyar thodu. However, the land owner refused

⁸³ Including cancelled projects

⁸⁴ 64 completed, 35 ongoing and 29 cancelled projects

to give consent to pass the drain through his land during execution. Reply indicates that availability of hindrance free land was not ensured before formulation and execution of the project.

4.9.2 Utilization of scheme funds for desilting and other routine activities in Kochi Corporation

According to the scheme guidelines, implementation of projects for construction and maintenance of storm water drains should be with the objective to reduce and ultimately eliminate flooding in cities, thereby making cities resilient. As the focus of the mission was creation of urban infrastructure that has a direct link to provision of better services to people, mission guidelines prohibited utilisation of scheme funds towards regular Operation and Maintenance activities. Under the Stormwater drain component, Kochi Corporation undertook 49 works with project cost of ₹53.86 crore, of which 48 works were completed incurring expenditure of ₹34.15 crore. Audit test checked nine works with project cost of ₹28.18 crore⁸⁵ and observed the following:

- Though, Mission Director, AMRUT had explicitly objected to the use of AMRUT funds for routine activities, Kochi Corporation utilised AMRUT funds for routine maintenance activities. Audit noticed that except two works⁸⁶ with project cost of ₹1.44 crore other projects primarily focused on routine activities viz., desilting/removal of water weeds, sidewall strengthening, fencing, etc. Of ₹21.47 crore spent on nine projects, ₹20.22 crore was spent on maintenance activities, which include an amount of ₹4.67 crore spent exclusively for desilting. Mission funds were spent for regular maintenance activities, despite spending own funds amounting to ₹32.75 crore and ₹27.93 crore respectively during 2019-20 and 2020-21 for the repair and maintenance of drains.
- Though five of the nine works with project cost of ₹ 24.26 crore were taken up to prevent choking/sewage mixing and flooding, Audit during JPV (October 2023) noticed that despite spending ₹18.06 crore, flooding and sewage mixing continued to exist in these drains.

⁸⁵ Eight works have been completed incurring expenditure of ₹10.19 crore and one work still ongoing

⁸⁶ Construction of drain along St.Vincent road and construction of drain along Kaloor Kathrukadavu road



Figure 4.9: Sewerage pipes opened to Adimuri Thodu



Figure 4.10: Water pipe and other utilities in Adimuri Thodu

- Though the project 'Construction of RCC drain, laying covering slab to drains of Stadium Link Road' with a project cost of ₹1.98 crore was taken up to prevent flooding/water logging in the Stadium link road, the project failed to achieve its objective due to failure of the Corporation in evicting encroachments/acquiring private land to ensure connectivity of the existing secondary drain to primary drain.
- Flood mitigation report published (2021) by the Kerala Irrigation Department also revealed that underlying issues contributing to flooding in Corporation area remained unresolved. Audit noticed that the issue of persistent discharge of untreated sewage into the canals, identified in both the 2016 SCMS Water Institute report and the 2021 Irrigation Department report, was not effectively addressed, highlighting the failure to tackle the root causes of flooding.
- Though Corporation had identified a gap of 110 km in coverage of drain network at the beginning of the scheme, only 1.38 km drain length was constructed, despite spending ₹45.43 crore under this sector.
- Kochi Corporation undertook these projects without conducting a comprehensive scientific study to identify reasons for flooding and gaps in drainage infrastructure. Despite the requirement to prepare SLIPs based on accurate and data-driven assessments, the Corporation did not possess a drainage master plan or a drainage map of its primary and secondary drainage networks. In the absence of drainage master plan, the DPRs were prepared for addressing maintenance requirements including desilting, which was a regular activity undertaken by Kochi Corporation.



Figure 4.11: Lack of vertical clearance in Rameswaram canal



Figure 4.12: Canal filled with water weeds in TP canal

Thus, Kochi Municipal Corporation's approach to mitigate urban flooding under the AMRUT scheme was flawed due to the absence of a scientific study and proper planning. The preparation of SLIPs without a drainage map led to the implementation of routine, non-permissible works that failed to provide a permanent solution to the city's flooding problems. This irregular use of AMRUT funds for routine activities, in addition to spending from own funds for such purposes, not only violated the scheme guidelines but also failed to address the root causes of flooding, despite spending ₹45.43 crore mission funds.

Government stated (April 2025) that Kochi Corporation primarily focused on canal rejuvenation works and extension of existing drains. It was also stated that the Corporation has not yet commenced the preparation of a drainage master plan. The reply substantiates the Audit finding.

Recommendation 6: Government should conduct a comprehensive study to analyse reasons for frequent flooding in Kochi Corporation and initiate appropriate rectification measures.

4.9.3 Failure in arranging land leading to non-achievement of objectives

Kozhikode Municipal Corporation proposed (SAAP 2017-18) construction of 'YMRC-Millath Colony drain' with project cost of ₹10.67 crore which include reconstruction of existing secondary drain (YMRC-Millath Colony drain) that connects to a primary drain (NKKR Canal) and side wall construction of the primary drain. The primary objective of construction of 'YMRC-Millath Colony drain' (1000 m) was to increase the width of the drain from 40 cm to 1.5m to mitigate flooding on both sides of the drain. DPR prepared for the project mentioned that the existing secondary drain passed through a private land and the land should be acquired to execute the work. However, without acquiring the private land, Corporation awarded the work in September 2018 and the drain was constructed up to the private land. As a result, end portion (200 m) of existing drain which connects the secondary drain to the primary drain could not be reconstructed. During site verification, Audit found that the width of the drain reduced from 1.5 m to 40 cm on reaching the private land as shown in **Figure 4.13** and was obstructing the free flow of storm water and

resulted in flooding in the surrounding area. As such the objective of mitigating flooding remains un-achieved.



Figure 4.13: New drain constructed and the end portion of drain passing through private land

4.9.4 Status of achievement of Service Level Benchmarks

According to the Service Level Benchmarks issued by MoHUA, the coverage of stormwater drain network shall be 100 per cent (length equal to that of road network), incidence of sewage mixing with stormwater shall be zero and incidence of water logging shall be zero. Audit noticed that though the mission cities had identified flooding and choking/sewage mixing points, except Palakkad municipality other ULBs did not address the gap effectively. As such choking/sewage mixing continued to exist even after spending substantial amount from the scheme. Details are given in Table 4.14.

Table 4.14: Status of coverage of stormwater drain network and choking/sewage mixing points

Sl. No	Name of ULB	Coverage of storm water drain network				Water logging points due to sewage mixing/choking		
		Gap identified in SLIP (pre AMRUT) (km)	Length of new drain constructed (km)	Gap remaining unaddressed (Post AMRUT) (km)	Percentage of Gap covered under AMRUT	Number of points identified in SLIP	Number of points addressed	Number of points remained unaddressed
1.	Thiruvananthapuram	88.30	31.55	56.75	35.73	12	9	3
2.	Kollam	386	15.43	370.57	3.99	16	3	13
3.	Kochi	110	1.38	108.62	1.25	31	12	19
4.	Thrissur	9	6.42	2.58	71.33	21	15	6
5.	Kozhikode	100	4.98	95.02	4.98	8	4	4
6.	Kannur	503	0	503	0	11	2	9
7.	Alappuzha	22	4.95	17.05	22.50	18	17	1
8.	Guruvayur	100	9.69	90.31	9.69	14	12	2
9.	Palakkad	163	8.5	154.5	5.21	17	17	0
	Total	1481.30	82.9	1398.40	5.59	148	91	57

(Source: Data furnished by SMMU)

Regarding coverage of stormwater drain network, only Thiruvananthapuram Corporation could considerably improve the status with 35.7 per cent increase in drain length. However, 94 per cent of the gap in total drain network coverage

identified by these mission cities remained unaddressed even after eight years of commencement of the scheme (March 2024).

4.10 Execution of projects under Green space and parks

Population growth and high densities in urban areas have an adverse impact on natural and environmental resources. As part of ensuring greening in urban areas, MoUD fixed a benchmark of 10-12 sqm per person for achievement by each Urban Local Body of the Country. The AMRUT scheme has green space and parks as one of the components to enhance the amenity value of cities by creating and upgrading green space, parks and recreation centres, especially for children, senior citizen and differently abled.

As per the scheme guidelines each mission city could spend a maximum amount of 2.5 per cent of the SAAP approved amount for establishment of green space and parks under this component. ULB-wise details of parks constructed/renovated are given in the **Table 4.15**.

Table 4.15: ULB-wise details of projects under green space and parks

(₹ in crore)								
Sl. No.	ULB	No. of projects sanctioned ⁸⁷	Project cost	No. of projects completed	No. of projects on going	No. of projects cancelled	Total expenditure	Percentage of projects completed ⁸⁸
1.	Thiruvananthapuram	5	6.52	4	1	0	5.30	80
2.	Kollam	11	3.41	7	0	4	3.10	100
3.	Kochi	6	5.8	5	0	1	3.93	100
4.	Thrissur	11	4.81	10	1	0	4.49	91
5.	Kozhikode	8	4.92	8	0	0	3.82	100
6.	Kannur	8	4.8	7	0	1	4.45	100
7.	Alappuzha	10	4.38	8	0	2	3.41	100
8.	Guruvayur	6	6.47	5	1	0	3.82	83
9.	Palakkad	22	7.38	18	3	1	5.84	86
	Total	87	48.49	72	6	9	38.16	92

(Source: Data furnished by SMMU)

Mission cities had allocated ₹48.49 crore and utilised ₹38.16 crore (79 per cent) towards construction⁸⁹ of 30 new parks and renovation⁹⁰ of 36 existing parks. Audit test checked 27 parks of which 13 were newly constructed. The audit observations are detailed in the subsequent paragraphs:

⁸⁷ Including cancelled projects

⁸⁸ Excluding cancelled projects

⁸⁹ Kozhikode Corporation did not construct any new park

⁹⁰ Alappuzha Municipality did not renovate any park

4.10.1 Parks not opened to public after construction/renovation

Out of the 27 parks test checked, nine parks in five ULBs⁹¹ were not opened to public, after completion of the construction/renovation by spending ₹4.93 crore. During JPV, Audit noticed that five parks in three ULBs⁹², which were not open to public, were in dilapidated condition and surroundings were covered with overgrown weeds. No specific reasons were furnished by the mission cities for keeping the parks closed. Details are given in **Appendix 4.4**. Though guidelines stipulated for construction of child friendly facilities, 14 parks in five ULBs⁹³ either did not install playing equipment for children or did not maintain the equipment installed. Images of two parks are shown in **Figure 4.14** and **Figure 4.15**.



Figure 4.14: St. John's park, Kochi



Figure 4.15: Nila Nagar park, Palakkad

Though the guidelines insisted on establishing a system for maintenance with local residents' participation, mission cities did not make any efforts in this regard or make own arrangements towards upkeep and maintenance of the parks except for two parks in Kochi Corporation and one in Alappuzha Municipality. Principal Secretary, LSGD during exit conference (September 2024) directed SMMU to follow up with respective ULBs and to take immediate action to open the parks to the public. Regarding non-maintenance of parks by the mission cities, Principal Secretary assured to issue directions to follow the good practice done by other mission cities.

⁹¹ Kollam, Kochi and Kozhikode Corporations and Alappuzha and Palakkad Municipalities

⁹² Kozhikode Corporation and Alappuzha and Palakkad Municipalities

⁹³ Kollam, Kochi and Kozhikode Corporations and Alappuzha and Palakkad Municipalities

Best practices - two parks in Kochi and one park in Alappuzha

In Kochi, residents' association took responsibility for upkeep of the parks at Mythri Nagar and at Kudumbi Colony and Alappuzha municipality made arrangements for upkeep of the park at Valiyachudukadu.



Figure 4.16: Mythri Nagar Park in Kochi maintained by Mythri Nagar residents



Figure 4.17: Kudumbi Colony Park maintained by Jawahar Nagar residents

4.10.2 Unfruitful expenditure on installation of musical fountain in Nehru Park

Thrissur Municipal Corporation had proposed in SAAP 2017-18 a project for rejuvenation of Nehru Park at a cost of ₹0.80 crore. This included installation of a musical fountain at an estimate of ₹40.44 lakh. The work of installation of musical fountain was awarded (July 2019) to M/s Aquatic Engineering for ₹32.23 lakh. The work was completed in November 2020 and an amount of ₹27.92 lakh was paid to the contractor. However, the musical fountain became non-functional after one month. Even though several requests were made by the Corporation, the contractor did not rectify the complaint. Corporation Council decided (June 2022) to terminate the contract at risk and cost of the contractor and forfeit the SD of ₹1,61,200 and an amount of ₹10.11 lakh due to the contractor towards the final bill was forfeited and credited to the account of the Corporation (March 2023). Audit noticed that, though the contract was terminated, the Corporation had not entrusted any agency with rectification of the defects in the musical fountain (December 2024). As such, the expenditure of ₹27.92 lakh incurred towards construction of the fountain remained unfruitful.

4.10.3 Unfruitful expenditure in construction of park

Kochi Corporation entrusted (January 2018) construction of a new park at Vyttila on the banks of Chilavannur lake, which was approved in the SAAP 2017-18, to M/s Kochi Metro Rail Limited (KMRL) at a project cost of ₹1.27 crore. As the construction of the park was on the banks of Chilavannur lake, permission of Kerala Coastal Zone Management Authority was mandatory. However, before obtaining the clearance from KCZMA, KMRL commenced the construction (November 2018) and the project was halted due to public

protest and non-obtaining permission from KCZMA. Hence, the project was abandoned (March 2021) after incurring an expenditure of ₹28.22 lakh. Audit observed that execution of the project without getting mandatory clearance from Kerala Coastal Zone Management Authority resulted in unfruitful expenditure of ₹28.22 lakh.

Corporation replied (January 2025) that they will carry out the park project, and the expended amount from AMRUT will be adjusted in ULB share. However, the reply is silent about obtaining clearance from KCZMA.

Recommendation 7: Government should design a definite plan to complete all incomplete projects and ensure that benefits of the completed projects are provided to the public without delay.

Recommendation 8: Government should design a definite plan and strive towards achievement of Service Level Benchmarks especially in Water Supply and Sewerage Sectors.