SERVICE LEVEL IMPROVEMENT PLAN

FINAL

WATER SUPPLY SYSTEM

THIRUVANANTHAPURAM MUNICIPAL CORPORATION

&

KERALA WATER AUTHORITY

1.1 SECTOR WISE SLIP Template: water supply

1. Assess the Service Level Gap

The first step is to assess the existing situation and service levels gaps for Water Supply (AMRUT Guidelines; para 3 & 6). This will also include existing institutional framework for the sector. AMRUT is focused on improvement in service levels. The zone wise data shall be used in identifying the gaps. These zone-wise gaps will be added to arrive at city level service gaps. While assessing service level gap reply following questions not more than word indicated against each question.

- **What kind of baseline information is available for water supply system of the city? Detail out the data, information, plans, reports etc related to sector. Is zone wise information available? (75 words)**

  The documents from which data collected are City Development Plan 2005, Draft Master Plan 2012, Service Level Benchmark 2014-15, Census 2011.

  The drinking water supply to Thiruvananthapuram city is from the 86mld, 74mld, 72 mld water treatment plants at Aruvikkara and the 36mld plant at Vellayambalam. The source of raw water is Karamana river for all these water treatment plants. Two reservoirs at Peppara and Aruvikkara are the main surface water source. The average rainfall is around 170 cm per annum in the city and the district gets rainfall both from the southwest and northeast monsoons.

  The city is divided into five zones for the effective functioning of water supply system. New central zone, East zone, south zone, North zone and west zone.

- **Have you collected census 2011 data? Are you aware of baseline survey data of MoUD? Have you correlated data from these and other sources? (75 words)**

  - Yes. we have collected census 2011 data and the baseline survey data of MoUD .
  - We have correlated the data from these sources and a comparison is shown in the table below.

Sr. No.	Indicators	ULB	MOUD	Remarks
1	Coverage of water supply connections	78%	68.3%	Data from SLB
2	Per capita supply of water	100 lpcd	124 lpcd	
3	Extent of metering of water connections	100 %	81.4 %	
4	Extent of non-revenue water	35 %	18.2 %	MoUD data by 2011 and SLB by 2014-15
5	Quality of water supplied	92 %	77%	Data from the KWA lab
6	Cost recovery in water supply services	100 %	100 %	MoUD data doesn't look realistic
7	Efficiency in collection of water supply related charges	60 %	35.1	MoUD data by 2011 and SLB by 2014-15

- Source of data: SLB submitted by ULB 2014-15 and MoUD Data

- **What are existing service levels for water supply in the city? What is the coverage of water supply Connections? What is per capita supply of water? How much is the extent of metering? How much is non-revenue water? Provide information in table 1.1**

Table 1.1 Status of Water Supply service levels

Sr. No.	Indicators	Present status	MOUD Benchmark
1	Coverage of water supply connections	78%	100%
2	Per capita supply of water	100 lpcd	135 lpcd
3	Extent of metering of water connections	100%	100%
4	Extent of non-revenue water	35%	20%
5	Quality of water supplied	92%	100%
6	Cost recovery in water supply services	100%	100%
7	Efficiency in collection of water supply related charges	60%	90%

- Source- Service Level Benchmark 2014-'15 and MoUD data.

- **What is the gap in these service levels with regard to benchmarks prescribed by MoUD?(75 words)**

Gap in Service levels

1. Coverage of water supply connections - 22 %.
2. Existing per capita supply of water - 35 lpcd
3. Metering of water connections - Nil
4. Extent of Non Revenue Water - 15 %
5. Quality of water supplied - 8 %
6. Cost recovery in water supply services - Nil
7. Efficiency in collection of water supply related charges - 40 %

Proposals to achieve the benchmark

1. Rehabilitation of the Treatment plants - 86mld plant at Aruvikkara
2. Replacement of aged Premo/ AC/ GI lines in the existing network
3. Providing rider mains
4. Laying new distribution line network
5. Providing flowmeters at appropriate locations – Inlet/ Outlet of service reservoirs and main transmission lines.
6. To install control valves in branch lines wherever necessary
7. To Install smart meters for bulk consumers for increased accuracy
8. Replacing old and non-working water meters in service connections.
9. Strengthening the Blue Brigade mechanism for efficient functioning
10. Consumer friendly revenue collection centers and complaint redressal forums

Source of Water and Water Treatment System

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **What is the existing source of water? Is it surface water source or underground water source? What is the capacity of these sources?**

  The water supply system for Thiruvananthapuram is one of the oldest piped water supplies in the country. This was designed in 1928 and commissioned in 1933. The source of supply is Karamana River. There are two reservoirs, one at Peppara and second at Aruvikkara. Total capacities of these two dams are 92.63 Million cubic meter. The quantity of water drawn to the treatment plants is 270 mld and the amount of treated water produced and supplied to the Thiruvananthapuram city is 268 mld.

- **Is there any treatment provided to water from these sources? How much water is required to be treated daily? What is the treatment capacity installed in the city?**

  The quantity of water treated daily is 268 mld. Presently treatment plants of 72mld, 86mld and 74 mld are existing at Aruvikkara, 36 mld at Vellayambalam.

Conventional treatment including aeration, coagulation, flocculation, sedimentation, filtration and disinfection are being done in these plants.

- **What per capita water supply in LPCD (liter per capita per day) comes out, if you divide total water supply by the total population.**

Population in the year 2015	9,57,000 (as per census 2011)
Production	268 mld
Considering the NRW as 35 %	94 mld
Balance quantity for distribution	174 mld
Quantity to meet other Demand 45 %	79 mld
Current Domestic supply	95 mld

Projected population 2021

Population in the year 2021	- 10,62,599
Floating population 25 %	- 2,65,649
Design population	- 13,28,248
Projected domestic demand @ 150 lpcd	- 199.23 mld (say) 200 mld
Current domestic supply	- 95 mld

Additional Domestic requirement	- 200 – 95	= 105 mld
Savings by reducing the NRW from 35% to 20% (268 x .15)	- 40 mld	
Hence total additional Demand	- 105 – 40	= 65 mld
NRW for 65mld (15%)	- 9.75mld	
Hence capacity of WTP required	- 75 mld	

Proposed **75mld water treatment plant**

Hence considering the new developments in the city like the construction of vizhinjam Harbour and IT parks and also due to expansion of the city towards the outskirts, much more demand for water will come up in future. So a WTP of 75 mld is proposed to meet this demand.

Distribution Zones

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **City is divided into how many zones for water supply?**

  The city is divided into five zones for the effective functioning of water supply system. Central zone, East zone, South zone, North zone and West zone.

- **Provide details of total no of Households (HH) in each zone, no of HH with and without water tap connections in the Table 1.2.**

Table 1.2: Zone Wise Coverage of Households

Zone No	Total No. of households	Households with water tap connections	Households without water tap connections
Central Zone	48292	37302	10892
East Zone	52518	41528	12747
South Zone	51583	40593	11285
North Zone	46738	35748	9642
West Zone	47672	36674	10392
TOTAL	**246803**	**191845**	**54958**

Storage of Water

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **What is the total water storage capacity in the city? What is capacity of elevated and ground water reservoirs?**

There are 11 elevated reservoirs and 15 ground level reservoirs.

Total capacity of elevated reservoirs (11 nos)	- 23.67 million litres
Total capacity of ground level reservoirs (15 nos)	- 68.96 million litres
Total capacity	**- 92.63 million litres**

- **In case of surface water, does city need to have ground level reservoirs to store raw water?**

The city doesn't need to have Ground level reservoirs.

- **Is water being supplied to consumers through direct pumping or through elevated reservoirs?**

Water is being supplied to the consumers through elevated reservoirs and not through direct pumping.

- **Is storage capacity sufficient to meet the cities demand ?**

Yes, the elevated and ground level reservoirs are sufficient to meet the water demand of the projected population.

Distribution Network

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **What is the total length of water supply distribution pipe line laid in the city?**

The distribution system consists of a network with a total length of 1500 km.

- **What is the total road length in the city? Are the pipe lines laid in all streets? Is the objective of universal coverage of water supply pipe line achieved?**

  The total road length in the city is 1810 km.

  Pipe lines are laid in 1500 km

  So the objective of Universal coverage is not achieved.

- **What kind of pipe materials used in distribution lines ?**

  MS, PVC, Cast Iron, HDPE, GI, Ductile Iron, Asbestos Cement (AC) pipe.

- **Provide zone wise details of street length with and without water distribution lines in the Table 1.3.**

Table 1.3: Zone Wise length of distribution network

Zone No	Total Street Length	Street length with water distribution pipe line	Street length without water distribution pipe line
Central zone	361	292	62
East zone	385	317	69
South zone	379	306	63
North zone	336	311	56
West zone	349	274	60
Total	**1810 km**	**1500 km**	**310 km**

Institutional Framework

Please provide information in 150 words on the above responding to (however not limited to) following questions.

- **Define role and responsibilities in terms of O&M, policy planning, funding, service provision in table 1.4.**

Table 1.4: Functions, roles, and responsibilities

Planning and Design	Construction/ Implementation	O&M
Kerala Water Authority (KWA)	KWA	KWA

- **How is city planning to execute projects? Shall the implementation of project be done by Municipal Corporation or any Parastatal body? Please refer para 8.1 of AMRUT guidelines.**

  Water supply works in Thiruvananthapuram Municipal Corporation (TMC) are done by a Parastatal body called Kerala Water Authority (KWA).

  The TMC shall facilitate the execution of the projects. The Design, Execution, Project Monitoring and quality assurance are done by KWA. The Construction, commissioning and O&M is done by KWA. KWA is the sole authority for executing the water supply projects in Kerala.

Bridge the Gap

Once the gap between the existing Service Levels is computed, based on initiatives undertaken in different ongoing programs and projects, objectives will be developed to bridge the gaps to achieve universal coverage. (AMRUT Guidelines; para 6.2 & 6.3, Annexure-2; Table 2.1). Each of the identified objectives will be evolved from the outcome of assessment and meeting the opportunity to bridge the gap.

- **List out initiatives undertaken in different ongoing programs and projects to address these gaps. For this provide details of ongoing projects being carried out for sector under different schemes with status and when the existing projects are scheduled to be completed? Provide information in Table 1.4**

Table 1.4: Status of Ongoing/ Sanctioned

S. No.	Name of Project	Scheme Name	Cost	Month of Completion	Status (as on dd mm 2015)
1	Augmentation of Water supply scheme	JnNURM	87.16 crores	March 2015	86% completed as on Oct 16. (stopped the project on closure of JnNURM)
2	Augmentation of Trivandrum city region Water supply scheme	JICA Assisted	407.2 crores	March 2016	94 % completed and the balance work is going on.

- **How much the existing system will able to address the existing gap in water supply system? Will completion of above will improve the coverage of network and collection efficiency? If yes, how much. (100 words)**

  The existing system covers only 77.73% of households. On completion of the ongoing JICA Assisted Kerala Water Supply Project, water supply coverage could be improved. The new developments in the city like the construction of Vizhinjam Harbour and IT parks and also due to expansion of the city towards the outskirts, much more demand for water will come up in future. A WTP of 75 mld is proposed. Also new distribution network of about 200 km and rehabilitation of the existing network of 229 kms are proposed for meeting the above demand.

- **Does the city require additional infrastructure to improve the services? What kind of services will be required to fulfill the gap?**

  Yes. The city requires additional infrastructure. A WTP of 75 mld with pulsator/similar latest technology is proposed. Laying of 200 km distribution line, rehabilitation of the existing network for about 229 kms and Rehabilitation of the old 86 mld WTP at Aruvikkara are proposed under AMRUT to fulfill the gap.

- **How does the city visualize taking the challenge to rejuvenate the projects by changing their orientation, away from expensive asset replacement programs, focusing on optimum use of existing assets?**

  Rehabilitation of the existing network of 229 kms is proposed to focus on optimization. And also new projects like a WTP of 75 mld with pulsator/similar latest Technology, installation of 200 km distribution line and refurbishing of the old 86 mld WTP at Aruvikkara are proposed. Apart from all these programs such as installation of smart meters, strengthening the Blue Brigade and NRW cells will optimize the available resources.

- **Has city conducted assessment of Non Revenue Water? if yes, what is the NRW level? Is city planning to reduce NRW ?**

  Yes. The city has conducted assessment of NRW which is found to be close to 35%.

  The Non Revenue Water Cell of KWA is conducting studies on NRW. Leak detection equipments have been purchased and advanced meter reading techniques are being brought in. The replacement of old distribution lines also will reduce the NRW.

- **Based on assessment of existing infrastructure and ongoing / sanctioned projects, calculate existing gaps and estimated demand by 2021 for water supply pipe network, number of household to be provided with tap connections, and required enhancement in capacity of water source/ treatment plant (MLD). Gaps in water supply service levels are provided as per Table 1.5.**

Table 1.5 . Demand Gap Assessment for Water Supply Sector

Component	2015			2021	
	Present	Ongoing projects	Total	Demand	Gap
Source	Karamana River	-			
Treatment capacity	268 mld	-	268 mld	343 mld	105 mld
Storage capacity	92.63 ML	-	92.63 ML	92.6 ML	nil
Distribution network coverage	1500 km	300Km	1800 km	2000 km	200km

Objectives

Based on above, objectives will be developed to bridge the gaps to achieve universal coverage. While developing objectives following question shall be responded so as to arrive at appropriate objective.

- **Is each identified objective evolved from the outcome of assessment?**

  Yes, the identified objectives are evolved from the outcome of the objective.

- **Is each objective meet the opportunity to bridge the gap?**

  Yes, each objective meet the opportunity to bridge the gap.

- **Please provide/ List out objectives to meet the gap in not more than 100 words.**

    1. To increase the efficiency and quality of water produced - Rehabilitation of the old Treatment plants
    2. Reducing Non Revenue Water - Replacement of aged Premo/ AC/ GI lines in the existing network, Strengthening the Blue Brigade mechanism for efficient functioning
    3. To increase coverage - Providing rider mains, Laying new distribution line network
    4. To increase metering efficiency - Providing flowmeters at appropriate locations – Inlet/ Outlet of service reservoirs and main transmission lines. To install control valves in branch lines wherever necessary, To Install smart meters for bulk consumers for increased accuracy, Replacing old and non-working water meters in service connections.
    5. Increasing collection efficiency - Consumer friendly revenue collection centers and complaint redressal forums

Examine Alternatives and Estimate Cost

The objective will lead to explore and examine viable alternatives options available to address these gaps. These will include out of box approaches. (AMRUT Guidelines; Para 6.4 & 6.8 & 6.9).This will also include review of smart solutions. The cost estimate with broad source of funding will be explored for each. While identifying the possible activities, also examine the ongoing scheme and its solutions including status of completion, coverage and improvement in O&M. Please provide information on the above responding to (however not limited to) following questions.

- **What are the possible activities and source of funding for meeting out the objectives? (75 words)**

    A new Water Treatment Plant of 75 mld is proposed to be constructed at Aruvikkara Phase-1 was sanctioned earlier.

    Rehabilitation of the Treatment Plants - 86mld plant at Aruvikkara, Replacement of aged Premo/AC/ GI lines in the existing network, Providing

rider mains, Laying new distribution line network, Providing flowmeters at appropriate locations – Inlet/ Outlet of service reservoirs and main transmission lines. To install control valves in branch lines wherever necessary, To Install smart meters for bulk consumers for increased accuracy, Replacing old and non-working water meters in service connections, strengthening the Blue Brigade mechanism for efficient functioning. Consumer friendly revenue collection centers and complaint redressal forums are the activities involved in meeting the objectives.

AMRUT funding is planned to be used for meeting the above said objectives.

- **How can the activities be converged with other programme like JICA/ ADB funded projects in the city etc? (100 words)**

JICA & JnNURM

The works ongoing under JICA/ JnNURM could improve the network coverage by a good extend. The reservoirs built under JICA scheme could cater the storage need for the city.

- **What are the options of completing the ongoing activities? (75 words)**

JICA - Ongoing projects will be completed by March 2017 using the State fund.

JnNURM - The OM (No.K-14027/4/NURM-2015 dt 14th Aug 2015 mentioned that the support will be provided up to 31.03.2017 for the incomplete projects sanctioned up to 31.03.2012 in which 50% or more of the ACA has already been released and physical progress is 50% or more as on 31.03.2014. The list of 102 projects has been published in the Office Memorandum from the MoUD in which Thiruvananthapuram is not included even though it belongs to the above category satisfying the criteria. Till now, 82% of financial progress (sanctioned amount- 87.16 crores, Received- 71.61 crores, spent 71.61 Cr) and 76% of physical progress has been achieved

- **What are the lessons learnt during implementation of similar projects? (100 words)**

The typical constraints which are normally faced in the existing/completed projects are delay in the approvals from various authorities as different agencies are involved in the process, environmental liabilities, noncompliance with the rules and regulations etc. Provision for restoration of the roads to be formulated at the beginning itself, Court cases, building rules exemptions considering this as emergency service , land acquisition processes to be simplified and also the inclusion of O & M in contract for a minimum period of 5 years to be confirmed in the DPR.

- **Have you analyzed best practices and innovative solutions in sector? Is any of the practice be replicated in the city? (75 words)**

Yes, the city analyzed best practices and innovative solutions in water supply sector.

The best practices like O&M for 5 to 10 years incorporated in the project, combining PPP components in the projects, implementing good QA/QC systems in the project for the lifecycle, introducing e-tendering in all sectors to ensure transparency. Collection of user fee effectively to cover the O&M cost. Obtaining of approvals online and monitoring of projects both online and site etc. are identified. These attributes will be incorporated in the future projects to ensure timely completions and quality project output.

- **What measures can be adopted to recover the O&M costs?(100 words)**

Implementation of 100 % billing by having advanced metering system - using smart meters. Replacement of old and non working meters in service connection will improve the collection efficiency.

- **Whether reduction in O&M cost by addressing NRW levels is applied?(75 words)**

Yes, reduction in O&M cost by addressing NRW levels is applied.

KWA has formed a Non Revenue Water Cell for conducting the studies on NRW. Advanced Leak detection equipments have been purchased and advanced meter reading techniques are being brought in to reduce NRW. Also modification and replacement of old and aged distribution lines are proposed.

- **Are different options of PPP such as Design-build-Operate-Transfer (DBOT), Design Built Finance Operate and Transfer (DBFOT) are considered? (100 words)**

  These concepts are not practical to be implemented as far as the natures of the proposed projects are considered and hence avoided.

The alternative activities to meet these activities are defined as per Table 1.6

Table1.6 Alternative Activities To Meet Objectives

The activities listed above are the ones to be implemented to achieve the goals. These are being proposed under AMRUT for funding. NO alternative activities are proposed.

Sl No	Objective	Activities	Financing source
1	Coverage of water supply	Construction of 75MLD WTP	Amrut
2	Quality Improvement	Rehabilitation of Treatment Plants,	Amrut
3	NRW Reduction	Replacement of Aged pipes , Phase -1 &2	Amrut
4	Coverage of water supply	Providing Rider Mains, Phase -1 &2	Amrut
5	Coverage of water supply	Augmentation of Existing Network, for 24 x 7 water supply Phase -1&2	Amrut
6	NRW Reduction	Fixing Flow meters, Phase -1&2	Amrut
7	NRW Reduction	Replacing Aged Water meters Phase -1&2,	Amrut
8	NRW Reduction	Fixing Branch Valves, Phase -1&2	Amrut
9	NRW Reduction	Strengthening Blue- Brigade Phase -1&2,	Amrut
10	NRW Reduction	Installing Smart Meters, Phase -1&2	Amrut
11	Improving efficiency of Revenue collection	Model Revenue Collection Centers, Phase -1 &2	Amrut

Citizen Engagement

ULBs will organize and conduct city level citizen consultation and receive feedback on the suggested alternatives and innovations. Each alternative will be discussed with citizens and activities to be taken up will be prioritized to meet the service level gaps. ULB will prioritize these activities and their scaling up based on the available resources. (AMRUT Guidelines; Para 6.6, 6.7 & 7.2). Please explain following questions in not more than 200 words detailing out the needs, aspirations and wishes of the local people.

- **Have all stakeholders being involved in the consultation?**
  Yes, stakeholder consultation meetings are planned by the ULB at different levels. Meeting with the elected representatives, Residential associations will be done

- **Have ward/ zone level consultations being held in the city?**
  Yes, ward level consultations were held in the city.
- **Are alternative proposed, above crowd sourced?**

- **What is feedback on the suggested alternatives and innovations?**

- **Are alternative taken up for discussions prioritized on the basis of consultations?**

- **What methodology adopted for prioritizing the alternatives?**
  "More with Less" approach has been adopted for prioritizing the alternatives and stakeholder consultations and meetings were conducted.

Prioritize Projects

Based on the citizen engagement, ULB will prioritize these activities and their scaling up based on the available resources to meet the respective objectives. While prioritizing projects, please reply following questions in not more than 200 words.

- **What are sources of funds?**
  AMRUT fund is planned for implementing the projects.

- **Have projects been converged with other program and schemes?**

As of now, there is no convergence for funding.

- **Have projects been prioritized based on "more with less" approach?**

  Yes, "More with Less" approach has been adopted for prioritize the projects.

- **Has the universal coverage approach indicated in AMRUT guidelines been followed for prioritization of activities?**

  Yes, the universal coverage approach indicated in AMRUT guidelines is followed for the prioritization of activities.

Conditionalities

Describe in not more than 300 words the Conditionality of each project in terms of availability of land, environmental obligation and clearances, required NOC, financial commitment, approval and permission needed to implement the project.

Rehabilitation of old Treatment Plants – These are owned by KWA and hence no clearances are required.

Replacement of aged pipes and laying new lines/ Ryder mains - Project requires NOC from NH authority, ULB, PWD, Traffic Department etc.

Fixing Flowmeters/ Replacing faulty and aged water meters/ Installing smart meters - No clearance from any of the agencies required. Hence work may be started asap.

Strengthening the Blue Brigade - . This is cell under KWA and hence no clearences required.

Creating model Collection Units/ Customer care cells – Here also no clearences required as this is being planned in the available space of KWA

Resilience

Required approvals will be sought from ULBs and competent authority and resilience factor would be built in to ensure environmentally sustainable water supply scheme. Describe in not more than 300 words regarding resilience built in the proposals.

Environmental study for the route for distribution line has to be conducted to reduce environmental impact and other NOC's and permissions will be obtained as per requirement before the commencement of the project. Safety and sustainability of the project attributes will be kept in mind at all of the project. The provision for O&M to be entrusted to the Contractor in the contract and BOQ itself. All aspects of environmental safety and in the project area should be considered.

Financial Plan:

Once the activities are finalized and prioritized after consultations, investments both in terms of capital cost and O&M cost has to be estimated. (AMRUT Guidelines; para 6.5) Based on the investment requirements, different sources of finance have to be identified. Financial Plan for the complete life cycle of the prioritized development will be prepared. (AMRUT Guidelines; para 4, 6.6, 6.12, 6.13 & 6.14). The financial plan will include percentage share of different stakeholders (Centre, State and City) including financial convergence with various ongoing projects. While preparing finance plan please reply following questions in not more than 250 words

- **How the proposed finance plan is structured for transforming and creating infrastructure projects?**

  Required fund in terms of capital cost and O&M cost has to be estimated, 50% of the project cost as grant from GOI, 30 % as state fund and remaining 20% from ULB share.

- **List out individual projects which are being financed by various stakeholders?**

  There are no individual projects which are being financed by other stakeholders.

- **Is financial plan being prepared for identified projects based on financial convergence and consultation with funding partners?**

  For the identified projects, financial plan is not in convergence with other funding partners.

- **Is the proposed financial structure sustainable? If so then whether project has been categorized based on financial considerations?**

Yes, the financial structure is sustainable and the projects have been categorized under AMRUT funding.

- **Have the financial assumptions been listed out ?**

  Yes, the financial assumptions have been listed out as 50% of the project cost as grant from GOI, 30 % as state fund and remaining 20% from ULB share.

- **Has financial plan for the complete life cycle of the prioritized development being done?**

  Yes ,financial plan for the complete life cycle of the prioritized development is phased out.

- **Does financial plan include percentage share of different stakeholders (Centre, State, ULBs)**

  Yes, financial plan includes percentage share of different stakeholders like Centre 50%, State 30%, ULB 20%.

- **Does it include financial convergence with various ongoing projects.**

  No, it does not include financial convergence with any other projects.

- **Does it provide year-wise milestones and outcomes ?**

  Yes, provides year-wise milestones and outcomes.

Details in financial plan shall be provided as per Table 1.7, 1.8, 1.9, 1.10 and 1.11. These tables are based on AMRUT guidelines tables 2.1, 2.2, 2.3.1, 2.3.2, and 2.5.

Table 1.7 Master Plan of Water Supply Projects for Mission period

(As per Table 2.1 of AMRUT guidelines)

(Amount in Rs. Cr)

Sl No	Project Name	Priority number	Year in which to be implemented	Year in which proposed to be completed	Estimated Cost
Approved in SLIP 2015-16					
1	Construction of new Water Treatment Plant - 75 mld, Phase –I	1	2016	2019	45.00
SLIP 2016-17					
1	Construction of new Water Treatment Plant - 75 mld Phase-II	1	2016	2019	25.00
2	Rehabilitation of Treatment Plants	2	2016	2019	20.00
3	Replacement of Aged pipes , Phase -1	3	2016	2019	95.00

4	Providing Rider Mains, Phase -1	4	2016	2019	20.00
5	Fixing Flow meters, Phase -1	5	2016	2019	5.00
6	Replacing Faulty & Aged Water meters Phase -1,	6	2016	2019	6.00
7	Fixing Branch Valves, Phase -1	7	2016	2019	2.00
8	Strengthening Blue- Brigade	8	2016	2018	2.00
9	Installing Smart Meters, Phase -1	9	2016	2018	2.00
10	Model Revenue Collection Centers, Phase -1 . Pongummoodu and Kowdiar.	10	2016	2019	1.00
11	Establishing DMA - ulloor neerazhy-pongumoodu – prasanth nagar loop and Vazhuthacaud and Jawaharnagar area	11	2016	2019	15.00
	Total				**198.00**
SLIP 2017-18					
1	Replacement of Aged pipes Phase -2	2	2017	2020	103.00
2	Providing Rider Mains, Phase -2	3	2017	2020	28.00

3	Augmentation of Existing Network, , Phase -2.	4	2017	2020	20.00
4	Fixing Flow meters, Phase -2	5	2017	2020	5.00
5	Replacing Aged Water meters Phase -2,	6	2017	2020	6.00
6	Fixing Branch Valves, Phase -2	7	2017	2020	1.00
7	Installing Smart Meters, Phase -2	9	2017	2019	1.00
8	Model Revenue Collection Centers, Phase -2. Vellayambalam Help Line	10	2017	2020	1.00
9	Establishing DMA in Poonthura, PTP area	11	2017	2020	10.00
	Total				**175.00**
Grand Total					**373.00 cr**

Table 1.8 Details of prioritized projects proposed under AMRUT during the Mission period

(As per Table 2.2 of AMRUT guidelines) (Amount in Rs. Cr)

Sl No	Project Name	Physical Components	Change in Service Levels			
			Indicator	Existing (As-Is)	After (To-be)	Estimated amount in cr
SAAP 2015-16						
1	Construction of new 75MLD Water Treatment Plant Phase-I	Intake facilities, Aeration, mixing, coagulation, flocculation tanks	Per capita supply of water	100 lpcd	135 lpcd	45.00
SAAP 2016-17						
2	Construction of new 75MLD Water Treatment Plant Phase-2	Intake facilities, Aeration, mixing, coagulation, flocculation tanks	Per capita supply of water	100 lpcd	150 lpcd	25.00
3	Installing Smart Meters, Phase -1		Extent of NRW	35%	35%	2.29
4	Model Revenue Collection Centers, Vellayambalam, Pongummoodu and Kowdiar		Efficency in collection of water Charges	60%	70%	1.75

SAAP 2017-18						
5	Installing Flow meters,		Extent of NRW	35%	34%	10.00
6	Replacement of old damaged pipe lines		Extent of NRW	34%	33%	10.00
7	Replacement of old damaged pipe lines (Alteration of house connections- Pattoor area)		Efficency in collection of water Charges & Extent of NRW	70% & 33%	75% & 32.5%	10.00
	Grand Total					**99.04**

Table 1.9 Annual Fund Sharing Pattern for Water Supply Projects

(As per Table 2.3.1 of AMRUT guidelines)

(Amount in Rs. Cr)

Sl No	Name of Project	Total Project Cost	Share				
			GOI	State	ULB	Others	Total
	SLIP 2015-16						
1	Construction of New Water 75mld Treatment Plant Phase-1	45 .00	22.50	13.50	9.00	-	45.00
	Total	**45.00**	**22.50**	**13.5**	**9.00**	**-**	**45.00**
	SLIP 2016-17						
1	Construction of New Water 75mld Treatment Plant, Phase-II	30 .00	15.00	9.00	6.00		30.00
2	Rehabilitation of Treatment Plants,	20.00	10.00	6.00	4.00		20.00

3	Replacement of Aged pipes , Phase -1	95.00	47.50	28.5	19.00		95.00
4	Providing Rider Mains, Phase -1	20.00	10.00	6.00	4.00		20.00
5	Fixing Flow meters, Phase -1	5.00	2.50	1.50	1.00		5.00
6	Replacing Aged Water meters Phase -1,	6.00	3.00	1.80	1.20		6.00
7	Fixing Branch Valves, Phase -1	2.00	1.00	0.60	0.40		2.00
8	Strengthening Blue- Brigade Phase -1	2.00	1.00	0.60	0.40		2.00
9	Installing Smart Meters, Phase -1	2.00	1.00	0.60	0.40		2.00
10	Model Revenue Collection Centers, Phase -1 . Pongummoodu and Kowdiar	1.00	0.50	0.30	0.20		1.00
11	Establishing DMA - ulloor neerazhy-pongumoodu – prasanth nagar loop and Vazhuthacaud and Jawaharnagar area	15.00	7.50	4.50	3.00		15.00

	Total	**198.00**	**99.00**	**59.40**	**39.60**		**198.00**
SLIP 2017-18							
1	Replacement of Aged pipes Phase -2	103.00	51.50	30.90	20.60		103.00
2	Providing Rider Mains, Phase -2	28.00	14.00	8.40	5.60		28.00
3	Augmentation of Existing Network, Phase -2	20.00	10.00	6.00	4.00		20.00
4	Fixing Flow meters, Phase -2	5.00	2.50	1.50	1.00	-	5.00
5	Replacing Aged Water meters Phase -2,	6.00	3.00	1.80	1.20		6.00
6	Fixing Branch Valves, Phase -2	1.00	0.50	0.30	0.20		1.00

7	Installing Smart Meters, Phase -2	1.00	0.50	0.30	0.20		1.00
8	Model Revenue Collection Centers, Phase -2. Vellayambalam Help Line	1.00	0.50	0.30	0.20		1.00
9	Establishing DMA in Poonthura, PTP area	10.00	5.00	3.00	2.00		10.00
	Total	**175.00**	**87.50**	**52.50**	**35.00**		**175.00**
	Grand Total	**373.00**	**186.50**	**111.90**	**74.60**	**-**	**373.00**

Table 1.10 Annual Fund Sharing Break-up for Water Supply Projects (as per Table 2.3.2 of AMRUT Guidelines)

Sr. No.	Project	GoI	State			ULB			Convergence	Others	Total
			14th FC	Others	Total	14th FC	Others	Total			
SLIP 2015-16											
1	Construction of new of Water Treatment Plant 75mld Phase-1	22.50			13.50			9.00	-	-	45.00
	Total										
SLIP 2016-17											
1	Construction of new of Water Treatment Plant 75mld Phase-II	15.00			9.00			6.00			30.00
2	Rehabilitation of Treatment Plants	10.00			6.00			4.00			20.00
3	Replacement of Aged pipes , Phase -1	47.50			28.50			19.00			95.00
4	Providing Rider Mains, Phase -1	10.00			6.00			4.00			20.00

5	Fixing Flow meters, Phase -1	2.50			1.50			1.00			5.00
6	Replacing Aged Water meters Phase -1,	3.00			1.80			1.20			6.00
7	Fixing Branch Valves, Phase -1	1.00			0.60			0.40			2.00
8	Strengthening Blue-Brigade Phase -1,	1.00			0.60			0.40			2.00
9	Installing Smart Meters, Phase -1	1.00			0.60			0.40			2.00
10	Model Revenue Collection Centers, Phase -1 . Pongummoodu and Kowdiar	0.50			0.30			0.20			1.00
11	Establishing DMA - ulloor neerazhy-pongumoodu – prasanth nagar loop and Vazhuthacaud and Jawaharnagar area	7.50			4.50			3.00			15.00
	Total	**99.00**			**59.40**			**39.60**			**198.00**
SLIP 2017-18											
1	Replacement of Aged pipes Phase -2	51.50			30.90			20.60			103.00
2	Providing Rider Mains, Phase -2	14.00			8.40			5.60			28.00

3	Augmentation of Existing Network, Phase -2	10.00			6.00			4.00			20.00
4	Fixing Flow meters, Phase -2	2.50			1.50			1.00			5.00
5	Replacing Aged Water meters Phase -2,	3.00			1.80			1.20			6.00
6	Fixing Branch Valves, Phase -2	0.50			0.30			0.20			1.00
7	Installing Smart Meters, Phase -2	0.50			0.30			0.20			1.00
8	Model Revenue Collection Centers, Phase -2. Vellayambalam Help Line	0.50			0.30			0.20			1.00
9	Establishing DMA in Poonthura, PTP area	5.00			3.00			2.00			10.00
	Total	**87.50**			**52.50**			**35.00**			**175.00**
	Grand Total	**186.50**			**111.90**			**74.60**			**373.00**

(Amount in Rs. Cr)

Table 1.11 Year wise Plan for Service Levels Improvements (As per Table 2.5 of AMRUT guidelines)

Proposed Projects	Project Cost	Indicator	Baseline	Annual Targets (Increment from the Baseline Value)					
				FY2016		FY 2017	FY 2018	FY 2019	FY 2020
				H1	H2				
Water Supply									
Construction of Water Treatment Plant	75.00	Percapita supply of water	100 lpcd					150 lpcd	
Rehabilitation of Treatment Plants	20.00	quality of water supplied	92%					97%	
Replacement of Aged pipes , Phase -1	95.00	Extent of Non Revenue Water	35%			34%	32%	30%	
Providing Rider Mains, Phase -1	20.00	Coverage of water supply connections	78%			79%	80%	82%	
Fixing Flow meters, Phase -1	5.00	Extent of Non Revenue Water	35%					30%	
Replacing Faulty & Aged Water meters Phase -1,	6.00	Extent of Non Revenue Water supplied	35%					29%	

Fixing Branch Valves, Phase -1	2.00	Extent of Non Revenue Water supplied	35%					29%	
Strengthening Blue- Brigade	2.00	Extent of Non Revenue Water supplied	35%					28.5%	
Installing Smart Meters, Phase -1	2.00	Extent of Non Revenue Water supplied	35%					28%	
Model Revenue Collection Centers, Phase -1 . Pongummoodu and Kowdiar	1.00	Efficiency in the collection of water charge	60%					70%	
Establishing DMA - ulloor neerazhy-pongumoodu – prasanth nagar loop and Vazhuthacaud and Jawaharnagar area	15.00	Efficiency in the collection of water charge	60%					75%	
Total	198.00								
SLIP 2017-18									
Replacement of Aged pipes Phase -2	103.00	Extent of Non Revenue Water	35%				26%	24%	22%
Providing Rider Mains, Phase -2	28.00	Coverage of water supply connections	78%				91%	93%	95%

Augmentation of Existing Network, Phase -2	20.00	Coverage of water supply connections	78%				96%	98%	100%
Fixing Flow meters, Phase -2	5.00	Extent of Non Revenue Water	35%						22%
Replacing Aged Water meters Phase -2,	6.00	Extent of Non Revenue Water	35%						21%
Fixing Branch Valves, Phase -2	1.00	Extent of Non Revenue Water	35%						21%
Installing Smart Meters, Phase -2	1.00	Extent of Non Revenue Water	35%						20%
Model Revenue Collection Centers, Phase -2. Vellayambalam Help Line	1.00	Efficiency in collection of water charges	60%						85%
Establishing DMA in Poonthura, PTP area	10.00	Efficiency in collection of water charges	60%						90%
Total	**175.00**								
Total	**373.00**								