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Urgent

KERALA WATER AUTHORITY

Jalabhavan
Thiruvananthapuram-695033
Kerala

No. KWA/JB/PIU1/AE4/01/2021 (I)

Dated: 28.05.2022

From

The Managing Director

To

Additional Chief Secretary
Water Resources Department
Govt of Kerala
Thiruvananthapuram

Sir,

Sub:- Fourteenth Five Year Plan (2022-27) Formulation-Details submitting reg:-

Ref:- D. O. No. 297/2021/PCD/SPB Dated 29.04.2022 of the Additional Chief Secretary, Member Secretary, Kerala State Planning Board

Kind attention is invited to the letter cited under reference. I am submitting herewith the Fourteenth Five Year Plan Proposlas (2022-27) for favour of information and kind necessary action.

Encl : Proposals for 14th Five Year Plan

Yours faithfully,
ANILKUMAR K K
Chief Engineer (Projects and Operations)
(For The Managing Director)

KERALA WATER AUTHORITY

PROPOSALS FOR 14TH FIVE YEAR PLAN

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I OVERVIEW OF THE SECTOR

1. The Organization

Kerala Water Authority was established on 1st April 1984 under the Kerala Water and Waste Water Ordinance, 1984 by converting the erstwhile Public Health Engineering Department to provide for the development and regulation of water supply and waste water collection and disposal in the State of Kerala and for matters connected there with. The Kerala Water Supply and Sewerage Act 1986 (Act 14 of 1986) replaced the ordinance.

Drinking water sector is given much importance in Kerala as water remains pivotal for sustainable development and is linked to several local and global challenges. Kerala Water Authority is the major service provider both on urban and rural areas.

The Authority was established by vesting the properties and assets of the erstwhile Public Health Engineering Department under section 16 of the Act, and the assets, rights and liabilities of the local bodies and Kerala State Rural Development Board in so far as they pertain to the execution of water supply and sewerage schemes under 18 of the Act.

The main functions of the Authority are the following,

- Preparation, execution, promotion, maintenance and financing of the schemes for the supply of water and disposal of waste water.
- Planning for the State's water supply and sewerage requirements.
- Fixation and revision of tariff, taxes and charges of water supply and maintenance service in the areas covered by the water supply and waste water system of the Authority.
- Establishment of standards for water supply and waste water services.
- Assessment of the requirements for man power and training in relation to water supply and sewerage services in the State.
- Carrying out applied research for efficient discharge of the functions of the Authority.
- Making provisions for manufacture and marketing of packaged drinking water, mineral water, aerated water or any other processed water and of goods or articles necessary for water supply and sewerage.

Vision

To provide quality water supply and waste water services in an environmental friendly and sustainable manner.

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Mission

To transform ourselves into a customer friendly organization providing services at the doorstep.To achieve 100% Functional Household Tap Connections and to achieve 100 % networked sewerage all over Kerala.

Strategic Aims of KWA

- Meet our statutory obligations – 100% FHTC, 100% networked sewerage
- Operate as a financially independent and autonomous body
- Improve commercial and operational practices
- Focus on customer services
- Restructure KWA to become a process organization
- Invest in developing our employees
- Plan, invest in and maintain assets
- Operate all our assets efficiently
- Making full use of IT and IS investments

2. Water supply in Kerala

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Kerala Water Authority, with its aim to ensure drinking water supply for all the people of Kerala, now provides water supply to nearly 56% people from the existing 928 Water Supply Schemes through 40.88 lakh connections and 2 lakh public taps. We have made good achievements already in the rural and urban water supply sector through various Water Supply Schemes implemented with the help of central/state governments and financial institutions. Presently KWA is distributing treated water to 884 panchayats out of 941 panchayats from KWA schemes, 77 municipalities out of 87 municipalities and 6 corporations. Currently Kerala Water Authority is supplying 3159 million litres of treated water per day.

3. Sewerage

At present KWA is having only 4% coverage in the Sewage sector of the State and this vacuum has to be filled in a time bound manner. To cope with the emerging need of waste water management, a Sewerage Vertical Wing has been created in KWA with Chief Engineer, PPD & WASCON as its head. Investigation, Planning, Design and DER preparation of sewerage projects is being taken up in this wing.

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II. 13th PLAN OUTLAY AND EXPENDITURE

(Attached separately as Annexure 1)

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III. SIGNIFICANT ACHIEVEMENTS OF KWA DURING THE 13TH FIVE YEAR PLAN(2017-2022)

KWA has made good progress in the Rural and Urban water supply sectors, by commissioning various Water Supply Schemes, implemented with the help of Central/State Government aided schemes (JJM, NABARD, State Plan, NRDWP, KIIFB, AMRUT ,RKI etc.) and grants. KWA is presently entrusted with projects worth more than Rs.27000 crores under JJM, NABARD, KIIFB, AMRUT, RKI and State Plan which are in various stages of implementation. On completion of these projects more than 2,300 MLD (million litres per day) of drinking water will be additionally available for distribution in the next 5 years.

KWA has undertaken a number of new projects under various heads and has achieved considerable progress in the on field execution of these projects, which are briefly described below.

Jal Jeevan Mission (JJM) The project is envisioned to provide safe and adequate drinking water through individual Functional Household Tap Connection (FHTC) to all rural households by 2024. The project will benefit the rural poor, especially the families in the SC/ST colonies, the families living in the hilly areas where safe drinking water is not yet available, and the women and girls who have to travel long distances daily for drinking water. This project is implemented on a 50:50 cost sharing basis between the Central and State Governments. On 08.06.2020, Government of Kerala had issued relevant orders for the implementation of Jal Jeevan Mission project across the State.

Out of the existing 70.68 lakh rural households in Kerala, only 17.5 lakh households were provided with piped water supply connection till 01.04.2020 (24.76% coverage). During 2020-21, the State has provided 4.04 lakh water supply connections to rural households through the mission, which is a remarkable achievement amidst the unprecedented crisis caused by Covid-19 pandemic. During 2021-22, additional 6.64 lakh FHTCs were given to rural households.As on 31.3.2022, a total of 28.18 lakh rural households of the State are provided with drinking water connections (39.87% coverage).

Apart from providing FHTC’s, drinking water supply has also been ensured to all Rural schools and Anganwadis through JJM, achieving a statewide 100% coverage. Under JJM, priority is given to provide FHTCs in quality affected habitations, SAGY villages, SC-ST dominated habitations and Aspirational district - Wayanad.

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In addition to the above, 12 District level Quality Control Laboratories of KWA and 32 sub district labs have achieved National Accreditation Board for Testing and Calibration Laboratories' (NABL) accreditation. In continuation to the same, in total 84 laboratories at district levels, sub-district levels and those functioning in Water Treatment Plants have been planned for acquiring NABL accreditation. More than 5000 Kudumbasree workers were trained for testing using the field test kits.

KIIFB: KIIFB has so far accorded sanction and approval for funding 72 drinking water projects of KWA including pipe replacement projects at an estimated cost of Rs. 4498.981 crores. In this, 61 projects worth Rs. 4091.361 crores are water supply projects and 11 projects (94 works) worth Rs. 407.62 crores are replacement works in 11 PH Circles.

Out of these, 14 water supply projects worth Rs. 335.65 crores providing around 120 MLD of treated water benefitting around 13.5 lakh people have been completed. Some of the major Water Supply Projects completed under KIIFB are the following:

1. Augmentation of UWSS to Thodupuzha Municipality
2. CWSS to Ponnani Municipality
3. CWSS to Thachanattukara, Alanalloor and Kottopadam panchayats
4. Augmentation of UWSS to Shornur and Vaniyamkulam Panchayats
5. WSS to Ambalappara Panchayat Phase I & II
6. CWSS to Kozhinjampara, Vadakarapathy & Eruthenpathy panchayats Phase I

In addition to this, 40 replacement works worth Rs. 103.07 crores in 11 PH Circles have been completed.

KIIFB has accorded funding sanction for Kuttanad Drinking Water Project Phase II for an amount of Rs. 289.54 crores. Land acquisition for various components of this project is under progress.

In addition to the above 72 projects, Government has accorded Administrative Sanction for Rs.521.2 crores for Phase 2 for the following schemes vide government order dated 31-3-2022.

1. WSS to Koyilandy Municipality Phase II
2. Augmentation of UWSS to Thodupuzha Municipality Phase II
3. WSS to Thanur Phase II
4. WSS to Mattannur and Iritty Phase II
5. Augmentation of WSS to Shornur Municipality and Vaniyamkulam Panchayats Phase II

AMRUT: For 9 AMRUT cities including 6 corporations and Alappuzha, Guruvayur and Palakkad Municipalities, works to the tune of Rs.1151.69 crores (173 works)in Water Supply and Rs.321.45crores (116 works) in Sewerage sector have been sanctioned under AMRUT-I. Out of which 231 works amounting to Rs.670.39 crores have been completed. Major completed works

include Construction of 75 MLD WTP at Aruvikkara,20 MLD WTP at Peechi, 5 MLD STP at Medical College, Thiruvananthapuram etc. Balance works are in progress and are envisaged to be completed by March 2023.

RKI: Government has accorded Administrative Sanction for Rs.202.32 crores, including seven water supply works for an amount of Rs.182.60 crore and balance Rs.19.72 crores for survey works and energy optimization works. All these works are awarded and among which two works viz Energy optimization-I and WSS to Erumeli Zone-IV have been completed and balance works are in various stages of execution.

State Plan: Modernisation of Aruvikkara pumping station was completed during the 13th five year plan. Robotic cleaning of manholes was adopted in KWA. Various water supply projects in Rural and Urban Water Supply Sector were also completed. Another significant achievement made is the Commissioning of Guruvayur Drainage Scheme which was held up due to various reasons since 1973.It is indeed notable that the project was completed and commissioned amidst the Covid-19 pandemic, by dividing the whole network into three different zones, laying pipelines for a total length of 7340m, constructing 256 manholes, installing pump sets & motors and constructing and commissioning a 3 MLD capacity Sewage Treatment Plant.

Achievements made under the various schemes sanctioned in State Budget during 13th Five Year Plan are appended separately as ***Annexure 2***

ADB assisted Kerala Urban Water Services Improvement Project (KUWSIP): KWA has envisaged to provide 24x7 water supply in Kochi and Thiruvananthapuram city regions, under the financial assistance of Asian Development Bank (ADB:State Share - 70:30). Government of Kerala has accorded Administrative Sanction for the above project for a total outlay of Rs. 2511 Crores. The project also aims at reducing the NRW to the National benchmark of 20% in both the above cities, by replacing the old and damaged pipes, making necessary modification/renovation of the production components, installing flow meters, pressure release valves etc, and inclusion of innovative technologies like SCADA telemetry. Consequent to Covid-19 pandemic situation, the project activities got hampered severely. However the activities as per ADB guidelines for signing the loan agreement are in progress. The Expression of Interest (EOI) for selecting Loan Implementation Support Unit (LISU) has been invited and firms shortlisted for which ADB has given their NOC. The draft Request for Proposal (RFP) for appointing LISU and draft bidding document for Kochi distribution network are submitted to Government of Kerala for approval. Approval of Government is also sought for incorporating ADB guidelines on International Arbitration with venue as Singapore in the above documents. Further progress of the KUWSIP is subject to approval of the submitted documents from GoK.

Apart from this, KWA undertakes deposit works of various agencies like local bodies, Smart city missions , Fisheries and Coastal area Departments, MLA- ADF, MLA LAC-SDF etc.

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Sewerage

In Kerala, the coverage of sewerage facilities is extremely low. Around 30% in Thiruvananthapuram and 5% in Kochi Corporation areas have sewerage facilities, probably one of the lowest in the country. A new scheme for Guruvayur of 3mld capacity is commissioned and has 7km sewer network. Thiruvananthapuram city has about 602.5 km sewerage coverage and for Ernakulam, it is 28 Kms. The sewage treatment plant at Muttathara, Thiruvananthapuram has the facility to treat both the septage and sewage with the capacity of 107MLD.

A study undertaken in Kerala indicated that percapita consumption of water in the study areas varied from 183 lpcd to 148 lpcd which is higher than National average of 135 lpcd. Quality of life was found to be a determining factor in the total consumption of water in the study area. Percapita water usage in high income group varies from 183 L to 242 L, middle income group 140L to 188L and low-income group 72 L to 122 L.

Wastewater disposal is a major challenge in the State. It was found that majorities (as much as 61%) of the families are disposing their wastewater directly to either the drainage channels/irrigation channels or to the open spaces.

DETAILS OF STPs FUNCTIONING UNDER KWA:

a) 107 MLD STP in Thiruvananthapuram District at Muttathara (Activated Sludge with extended aeration process).

The present sewerage system cover 43 out of 100 wards of Thiruvananthapuram corporation area either partly or fully. For convenience, the city area was divided into 5 blocks which were commissioned in different periods. At present only 55MLD out of the 107 mld STP is used. Completion of ongoing works will enhance the utilization by 20%. Full utilization can be achieved only by expanding the sewer network. Considering the contamination of Karamana river and for providing sewerage systems for the 19 wards on the bank of this river, DPR prepared and submitted to GoK on 16.10.2021 for issuing AS under RKI. Later it was directed to decentralised the work and is under preparation. Sewer laying work of this 19 wards can be finished by 31/12/23, subject to the availability of funds.DPR for the remaining 81 wards for the full capacity utilisation of 107 mld STP is under preparation and expected to be completed by November 2022.

b) 4.5 MLD STP at Elamkulam, Ernakulam (Activated sludge process)

The existing Sewage Treatment Plant located at Elamkulam is having a capacity of 4.50 mld. The plant works in activated sludge treatment process. In Kochi, the existing sewerage system covers only 5% of Kochi Corporation. The Kochi Corporation is spread over 94.88 km2 and has been divided into 74 wards with total population of 6,02,046 as per 2011 census. Considering 80% return, total sewage quantity in the year 2052 is estimated to be 147.80 MLD.The existing Sewage Treatment Plant located at Elamkulam is having a capacity of 4.50

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mld. Present utilisation capacity of this plant is only 3MLD. DER for utilizing unutilized capacity of Elamkulam plant is under preparation. The plant was commissioned as early in 1959 and maintenance of the sewage Treatment Plant is done by KWA. For the planning and implementation purposes the entire Municipal Corporation areas and Panchayaths was divided into four zones A, B, C, and D. Out of these zones, only a part of Zone B was commissioned. Zone B, which is further subdivided into five sewerage blocks (A, B, C, D and E) for planning purpose. Block A (fully) and Block B (partially) is functional at present and are connected to the existing STP of 4.5 MLD which is being rehabilitated to 5 mld under AMRUT

c) **3 mld STP at Guruvayur (Activated sludge process)**

The Guruvayoor Sewerage Treatment Plant is to provide an effective sewerage system for the thickly populated area under Guruvayoor Municipality. The main aim of the scheme is to collect the sewage from houses, flats, hotel etc. and to treat in sewage treatment plant of capacity 3 mld at Chakkumkandam, Guruvayoor. The work completed and is functioning from September 2021. Length of network is approximately 7 km. Plant technically commissioned on 30.09.2021 and partially commissioned on 20.10.2021 with 85 % of network.

d) Thiruvananthapuram - Medical College 5MLD STP

Works of 5MLD STP under AMRUT for Medical College, Thiruvananthapuram completed and started functioning from Sep 2021. This STP is exclusively for Thiruvananthapuram Medical college campus.

The other significant achievements of KWA include the following:

- Kerala State Energy Conservation Award is given as recognition to the selected enterprises, organisations and individuals who have made systematic and serious attempts for the efficient utilisation of energy, conservation of energy, research and promotion of energy efficiency in the State of Kerala. KWA's effort in energy conservation has been recognised by State Level Monitoring Committee for Energy Conservation in Kerala, considering the efforts taken in this sector during 2020-21. The Committee recommended Commendation Certificate to KWA under the category institutions and organisations.
- Indigenously developed Flow Failure Alert System was implemented in all major 29 WTPs in Kerala.
- Indigenously developed Chlorine Dosage Alert System- pilot project was implemented in the WTP at Aruvikkara.Plan worked out to roll out to other 29 major WTPs.This ensures uninterrupted 24x7 disinfection and is ready to roll out across the state, as it was found successful.
- Automation of 270 rural submersible pumps completed in 2020-21 shows promising results in O&M expenditure, optimisation and efficiency. Automation of 214 pumps

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completed in 2021-22.Altogether 675 pumps automated with comes to 28% of the total pumps.

- Unmanned security watch towers were made operational for improving the security of dams.
- 24X7 surveillance of the major WTP at Aruvikkara made possible with the installation of CCTV cameras.
- Online water connection portal eTAPP rolled out and service modules added in eTAPP and trial ongoing in two section Offices now.
- Collection of fees for water quality testing has been made online.
- Testing of water sources like open wells, tube wells in all panchayaths across the state are being carried out with Field Test Kits.
- In-house Energy Audit team was formed, which is aimed at conducting walkthrough audit and for improving energy efficiency in KWA
- Of the 273 HT pumping stations, energy audit for 6 HT pumping stations are completed and energy audit of 16 HT pump houses are going on. It is targeted to complete the energy audit of balance 251 pumping stations through the In- house Energy Audit Team by December 2022.
- Taken steps for exploring alternate sources for drinking water, utilising sea water desalination with expertise from NIOT and Fisheries Department and after field visit and discussion 8 locations identified for further feasibility studies and preparation of DPR.
- Occupational safety has been given due preference and use of safety gadgets for safe work culture mooted. Action taken for purchase of safety gadgets also.
- Kerala Water Authority has launched 18 IT initiatives recently
- Self-reading software has been launched, through which consumers can enter their water meter reading themselves and upload photos of the water meter
- Paperless e-office software (DDFS) has been rolled out in all offices of KWA
- "AQUALOOM", the complaint redressal portal for KWA, through which consumers can register complaints and check the status of registered complaints has been launched.
- SMS alert for bills, payments, service interruption etc. has been implemented.
- Contractor license management software has been launched, through which the contractors can apply online for new licenses and renew expired licenses.
- GIS based optimal site selection software has been launched.
- FAMS (Finance and Accounts Management System) is the digital banking solution to review and monitor revenue with the help of graphs and trend diagrams.

IV CRITICAL GAPS IN THE SECTOR AND INPUTS THAT SEEK TO ADDRESS THESE GAPS

Major challenges faced by KWA are

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1. Increasing demand and depleting sources
2. Ageing assets – Huge Investment Requirement
3. High NRW
4. Neglected Sanitation Sector – Huge Investment Requirement
5. Shortage of staff and Poor Asset Management – More Focus on Creation and Less on Maintenance
6. Shortage of fund
7. Widening gap between cost of production and revenue recovered.

1. Increasing demand and depleting sources

100% household coverage with FHTCs by the year 2024 in rural areas with a service level of 100 lpcd is proposed under JJM and 100% household coverage with FHTCs by the year 2026 in the urban areas with a service level of 150 lpcd is proposed under AMRUT 2.0.Even though majority of the LBs have been covered with treated water, the service levels are not all that desirable. Some of the old schemes need augmentation and capacity enhancement. Piped water supply to all at 100 lpcd in rural areas and 150 lpcd in urban areas is intended during this plan period.

Kerala blessed with abundant water resources is unfortunately facing huge drinking water scarcity, especially in summer. We need to ensure that this essential resource will continue to be sustainable for future generations to come. Hence source improvement and water storage by constructing check dams, regulators and other conservation methods are essential.This conservation measures shall get more attention during nextt plan period based on the lessons achieved from the drought season. .

KWA is not utilizing the full established capacity of its production unit for various constraints. These reasons range from the inadequate size/inefficiency of the pumping system to the deficiency of distribution system. KWA plans to address these issues and optimize the production and distribution during the forthcoming plan period.Enhancing the production capacity of WTPs by using dual filter media , automation of pumphouses etc are proposed.

2. Ageing assets – Huge Investment Requirement

There are 928 schemes in operation in KWA which have various civil structures like intake, water tanks, pump houses etc which are aging and require maintenance. These assets are to be maintained in a phased manner for protecting the assets created and to improve the quality of service. Mandatory buffer zone maintenance, fire way track,landscaping etc are also envisaged.Many of the offices of KWA are functioning in old buildings which are in dilapidated and dangerous situation and has space constraints.In the 14th five year it is intended to improve the condition/rehabilitate these offices preferably by utilising the available space under the over head reservoirs.

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3. Reduction of Non-Revenue Water

Non-Revenue Water of KWA is estimated to be at 50% which is huge considering the national bench marks. The reason for this huge figure of NRW is the age old pipes and the improper connections. A considerable length of such pipes has been replaced during the last plan period. It is proposed to replace the remaining stretches of such pipes in the next plan period.

4. Sewerage and sanitation systems

Even though KWA has the mandate to take up sewerage systems, the only such systems in the state is a one covering a part of the Thiruvananthapuram Corporation and a very small area of Kochi corporation. More emphasis will be given for providing appropriate sanitation system in corporations and major cities. This will need huge investment.

5. Shortage of staff and Poor Asset Management

After the implementation of JJM and AMRUT 2.0, production components/ storage/transmission and distribution network will increase manifold and with limiting human resources, it will be very difficult to maintain all these water supply and sewerage system. Development of human resources is indispensable.

6. Shortage of funds

The main source of income of KWA is revenue from sale of water. From the formation of KWA, it is continuously running at a deficit, which is made good to some extent by the Non-plan grant received from Government of Kerala (GoK). The increase in revenue collection from increased number of connections and receipt of Non-plan grant was not at all in the same proportion of increase in the revenue expenditure of the Authority. The revenue available at the disposal of KWA is too inadequate to meet the operation and maintenance expenditure like payment of monthly power charges, establishment expenditure, and repayment obligation of funds borrowed for execution of drinking water projects in the past.

As per the provisional accounts of 2021-22 the annual deficit of KWA is Rs. 529.20 crore. The last five years income, expenditure and deficit is given below.

YEAR	2017-18	2018-19	2019-20	2020-21	2021-22
Total Income including Non Plan Grant	1227.05	1267.01	1323.99	1407.04	1519.7
Total Expenditure	1721.48	1777.46	1845.59	1840.29	2048.91
Deficit	494.43	510.45	521.60	433.25	529.21

The pending commitments of KWA as on 31.03.2022 is Rs.2070.34 crore

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7.Widening gap between cost of production and revenue recovered

The wide variation between the cost of production and revenue is depicted below:-

STATEMENT SHOWING COST OF PRODUCTION PER KILO LITRE		
Particulars		
	mly	mld
Quantity Produced	10,47,550	2,870
Quantity Sold (considering inherent NRW loss)	6,28,530	1,722
	Rs. in Crore	**Cost per KL**
(a) Production & Distribution Cost		
(1) salary, allowances and HR including Operators	312.66	4.97
(2) Depreciation for WTP, Intake Well, RWPM	130.63	2.08
(3) Chemicals & Consumables	15.35	0.24
(4) Power Charges	308.96	4.92
(5) Operation and maintenance	87.33	1.39
Sub Total (A)		**13.60**
(b) Administration Cost		
(1) Payment and provision to employees	229.15	3.65
(2) Pension and pensionery benefits	319.04	5.08
(3) Office expenses	16.94	0.27
(4) Electricity Charges	9.09	0.14
(5) Depreciation for vehicles and office buildings	6.70	0.11
Sub Total (B)		**9.25**
Total cost of production	**1,435.85**	**22.85**

As against the above cost of Rs.22.85/KL, income was only Rs.10.92/KL. The gap between the average cost and average returns works out to Rs.11.93 per KL or Rs.1.19 Paisa per Litre. This deficit is likely to increase with the commissioning of new schemes, as the maintenance expense and administrative overhead is added to the cost of production.

The wide variation between Revenue and Expenditure during the last five years is as shown below

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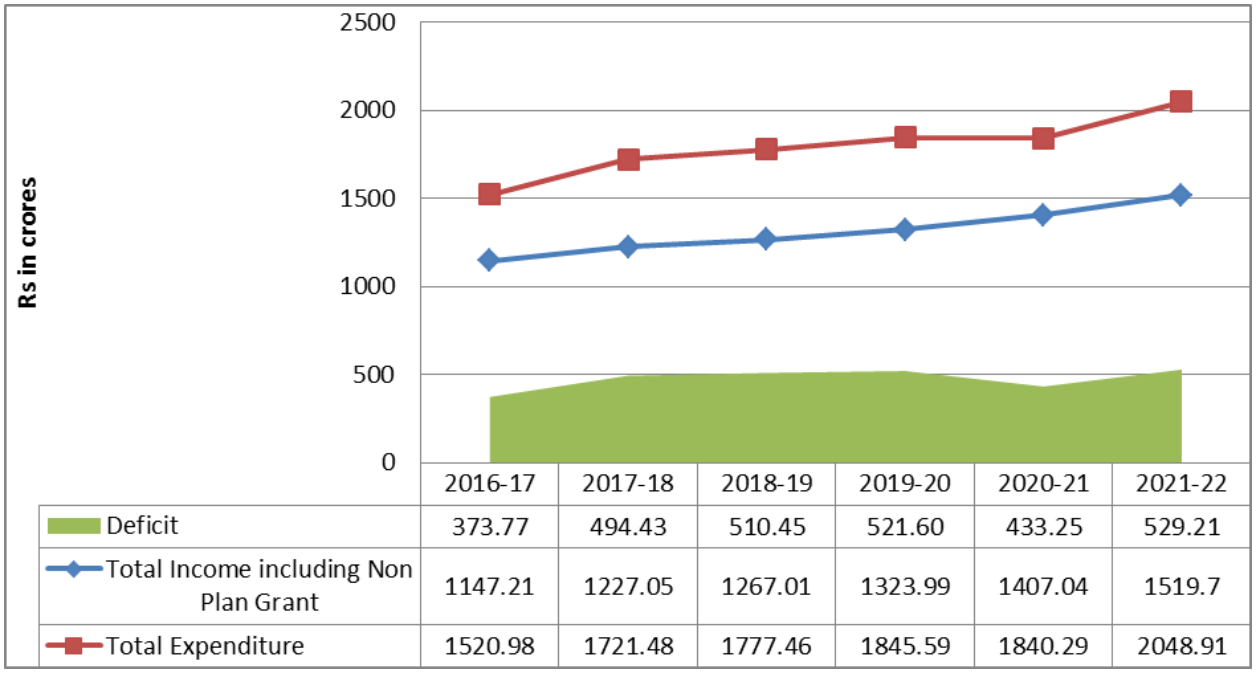

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Deficit	373.77	494.43	510.45	521.60	433.25	529.21
Total Income including Non Plan Grant	1147.21	1227.05	1267.01	1323.99	1407.04	1519.7
Total Expenditure	1520.98	1721.48	1777.46	1845.59	1840.29	2048.91

As the Water Charges/KL levied is far below the cost of production, Establishment expenditure, O&M Charges, Electricity charges, etc., are met with the support of GoK by way of Non Plan Grant. The total committed liability of the Authority as on 31.03.2022 towards various revenue expenditure is Rs.2070.34 crore. Year on year, the revenue deficit (as depicted above) has been increasing which is partly compensated through the Non Plan grant. As the liabilities on the Authority are mounting on a large scale with expansion of services to meet the aspirations of the people and the Government, KWA cannot run its service as usual with low cost recovery, notwithstanding steps to improve efficiency. A reasonable upward revision in tariff cannot be postponed.

WINDING UP OF LONG PENDING SCHEMES/PROJECTS

- · JICA assisted Kerala Water Supply Project envisages the implementation of five water supply projects in Thiruvananthapuram, Meenad, Cherthala, Kozhikode and Pattuvam. All the projects except part of the Distribution system in Meenad and Kozhikode and Rehabilitation of two WTPs at Thiruvanathapuram have completed and commissioned.
- The distribution works of Kozhikode Scheme were closed as on 31.03.2020 and distribution works in Meenad Scheme was closed as on 31.12.2020, as per decision of KWA Board held on 03.01.2020.
- ·As the JICA loan has expired as on 27/07/2015, and the Consultancy contract was closed with effect from 31.03.2016, the balance work has been arranged through State Plan.
- An amount of Rs. 5 crores has been allocated under State Plan for the financial year 2022-23 for settling the final bills and closing of contracts.

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V. KEY INITIATIVES IN THE 14TH FIVE YEAR PLAN

The suggestions put forth in the approach paper and the working group report is considered while putting forth new proposals. The following new drives are proposed during the 14th FYP.

1. Providing treated water in all Local Bodies by completion of ongoing schemes and implementing new schemes at 100 lpcd for rural areas and at 150 lpcd for urban areas under JJM and AMRUT 2.0
2. Reducing the gap between installed capacity and actual production in order to reduce the gap between the installed capacity of Treatment Plant and actual production, special emphasis will be given to
    - Renovation of WTPs
    - Improving pumping systems
    - Extending the distribution network
3. Providing 24x7 water supply in 5 Corporations and Palakkad, Guruvayur and Alappuzha Municipalities
    - Replacement of old and damaged AC/Premo/PVC/HDPE pipes
    - Reduction of NRW to 20% through
    - Timely preventive maintenance
    - Quality assurance
    - Bulk flow measurement
    - Domestic meter replacement
    - House Service Connection rehabilitation
    - Leak Detection equipment.
4. Improvement of Sewerage and sanitation systems
5. Introduction of Independent quality assurance through new material testing labs, special water quality cells etc.
6. GIS based database through
    - Asset mapping
    - Consumer database overlays
    - Digital elevation modeling
6. Introduction of Enterprise Resource Planning and having a comprehensive data base.
7. Demonstrate Pilot Desalination Technology for matching coastal area demand
8. Automation of all Pump houses for efficient operation
9. Measures for NRW reduction
10. Completing Energy Audit of all schemes and take energy conservation measures
11. Harnessing potential of alternate Energy Sources
12. Facilitate real time data communication for enabling informed decision making

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13. Enhancement of Revenue collection
14. 100% reading/ billing and collection
15. Implementation of Pilot Pre Paid water meters

WATER SUPPLY COVERAGE TO HOUSEHOLDS

KWA have so far provided cumulative water connections of 40.88 lakhs across the state which includes 3640624 domestic water connection, 223082 non-domestic,2745 industrial connections, 33581 special casual connections and 187873 public taps. 3159 MLD water is produced and supplied from the schemes with WTPs and without WTPs.

Gap in Treated Water Availability

The installed capacity is 3780 MLD (urban and rural) and the production capacity is 3179 MLD.The installed capacity can be further bifurcated into two categories namely – Treated Water (capacity of water supply scheme with WTP) and Untreated Water (capacity of water supply scheme without WTP but with simple treatment like chlorination). With the completion of various on-going schemes additional 2300 mld of water can be produced in the next 3 years.

Scheme Details in KWA in nos

- Total Schemes -928
- Urban schemes- 91
- Rural schemes- 772
- Urban/Rural Schemes- 65
- Non - WTP based schemes – 687
- WTP based schemes- 241

Kerala Water Authority is implementing several new water supply and sewerage related works in Kerala under JJM,KIIFB,AMRUT, State Plan, NABARD etc.

Rural Water Supply

According to Niti Ayog, performance of the state of Kerala in terms of Theme 7 – Rural drinking water is 15 out of 17 Non-Himalayan States. This conclusion is based on several indicators. Indicator 20 (b): Proportion of total rural habitations fully covered with drinking water supply in Kerala is only 28%, which is 17th position out of 17 Non-Himalayan states. Indicator 20 (d): Number of villages provided with 24*7 piped water supply in Kerala is zero.

Till recently the service level adopted in the rural sector based on NRDWP norms was 70 lpcd. But Kerala being of rurban character, there is not much difference in the consumption pattern between urban and rural sectors. The KWA has therefore adopted a service level of 100 lpcd in all its new rural projects. The rural water supply sector has gained immense momentum with the

commencement of JJM projects all across the country. Kerala also has set a target of 100% rural household coverage by 2024.

Total Rural House Holds in Kerala	70.68 Lakhs
No of households provided with FHTCs (coverage as on 01.04.2021)	28.17 Lakhs
Balance households to be provided by 2024	42.51 Lakhs

Plan for Full Saturation	
Year 2022-23	Year 2023-24
32.97 Lakhs	9.54 Lakhs

As per IMIS, districts of Alappuzha, Kollam, Palakkad, Pathanamthitta, and Thrissur are heavily contaminated with chemicals (more than 20% sources) and Coliform and E-Coli forms the major portion of the overall contamination of the water sources in Kerala. Based on IMIS estimates, more than 70% of the water sources are contaminated with coliform. Alappuzha, Thiruvananthapuram and Thrissur have high incidence of e-coli.Fluoride problem exist in district of Palakkad & Alappuzha. Coastal regions and regions near estuaries / backwater lagoons particularly suffer from saline intrusion and is prevalent in Alappuzha and Kasargod. In some districts, chemical contamination due to heavy presence of fertilizer and pesticides industries is also seen.

The CPHEEO criterion for service level in rural areas is 70 lpcd. Kerala in view of its consumption pattern has adopted a service level of 100 lpcd. All new KWA schemes are designed with this enhanced service level. The urgent requirement is to ensure equity in distribution so that the tail ends receive sufficient quantity. Usage of IOT equipment's , automation in the distribution network, management on the basis of micro units/zones etc are to be implemented.

Considering the natural variability and uncertainties in long term predictions, ensuring reliability in water supply is a critical factor particularly in rural areas. In these days wherein the climate imposed water deficiencies are on the rise, ensuring a reliable water supply is becoming more difficult. However with an efficient strategy to proper management of water supply risk, reliability in water supply can be ensured. As per the Detailed Project Reports (DPR) for various water supply schemes by the Kerala Water Authority (KWA), most of the water supply schemes are designed for 24 hours of operation. As per the 12th Five Year Plan 2012-17 by the State Planning Board, single GP rural water supply schemes implemented by KWA are designed for 8 hours of supply whereas majority of the multi-GP water supply schemes are designed for 16 hours of operation. However, small Gram Panchayat water supply

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schemes including the Swajaldhara schemes are designed for 4 hours of operation in a day. Only the Comprehensive Regional Water Supply Schemes which are covering more than 2 GPs are designed for 23 hours of operation wherein this 23 hours operation is not achieved due to non-availability of power at required voltage during peak hours. During the summer season mainly due to the low electricity voltage, the average supply hours in single GP water supply schemes is between 4-6 hours whereas for multi GP water supply schemes it is between 8-12 hours. However, the recently launched JJM Project envisages to cover 100% rural households with FHTCs ensuring regularity & quality of water supplied. Also the newly designed schemes are for 24x7 supply at a service level of 100 lpcd.

Urban Water Supply

As per the Niti Ayog report on Composite Water management index, the State of Kerala is positioned as 14 out 17 Non-Himalayan states in theme 8 – Urban Water Supply and Sanitation. The report consists of the performance of the state during the year 2015-16, 2016-17, 2017-18. The report says that there was no significant improvement during the above three years. Niti Ayog report also says that water demand will double by 2030 compared to the demand in 2019.

As far as the coverage of urban water supply is concerned, Niti Ayog report says that it was 53% in 2015-16 and 2016-17. The coverage was improved to 63% in 2017-18. At present water is supplied to two-third population in urban area. Comparing with the other non-Himalayan states, the state is positioned as 13 out of 17. Though the national norms for urban water supply is 135 lpcd, Kerala, considering its consumption pattern has adopted a service level of 150 lpcd. All its new projects are designed with this enhanced service level.

Unlike in rural schemes most urban schemes are having water treatment plants which ensures quality of water produced and supplied. The treatment plants have inbuilt quality control labs in addition to the surveillance activities carried out by the Quality Control wing of KWA. However most of the existing WTPs are designed to satisfy CPHEEO Standards whereas there has been changes in standards, especially in the limits of turbidity and iron. KWA needs to modify its existing plants to achieve the recently introduced water quality standards.

Even though KWA is able to ensure water quality standards at the production stage, there are reports of failed water samples collected from distribution systems. This may be because of failure to ensure residual chlorine or because of pollutants entering the system. This may be addressed by ensuring adequate level of chlorination including online chlorination and online monitoring of water quality, etc.

The CPHEEO criterion for service level in urban areas is 135 lpcd. Kerala in view of its consumption pattern has adopted a service level of 150 lpcd. All new KWA schemes are designed with this enhanced service level. The urgent requirement is to ensure equity in distribution so that the tail ends receive sufficient quantity. Usage of IOT equipment, automation in the distribution network, management on the basis of micro units/zones etc are to be implemented.

Though all urban schemes are designed for continuous supply, most systems in India are unable to satisfy this criterion mainly because of network operational issues, high level of NRW including

physical loses. In order to ensure regularity in supply, we need to ensure that the installed capacity of WTPs are utilized to the maximum and the distribution system is operated optimally. Dual filter media, liquid chlorination, plate settler, etc will ensure that incremental investments in WTP infrastructure yields greater outputs. Control of NRW including active leak detection and rectification, online monitoring of the system using pressure and flow sensors, automated systems for water balance etc may be introduced. Demand management and supply side management including educating the customers on judicious use of water will go a long way in reducing consumption and thereby achieving regularity of supply.

Most of the urban water supply schemes in the state are surface water-based systems. But these sources, especially which are located in rivers without upstream storage structures, face shortage issues during summer. As a water security measure, the state has adopted a principle of converting rivers as storage structures by building check dams, regulators etc at vantage points. Also in major cities the possibility of dual source is being explored and adopted.Kochi already is supplied from Periyar and Muvattupuzha rivers. A new system based on Karuvannoor river is under implementation for Thrissur Corporation. Similarly Thiruvananthapuram is going to have additional supply from Neyyar.

Recycling of used water especially in urban areas where source availability ensurement is difficult has to be taken up in a massive scale. Twenty percentage of the drinking water source in the next 5 years should be made available through recycling. As both urban and rural areas in Kerala along the 560 km of coastal line has geographical advantage of taking desalinated water for consumption. Twenty percentage of the drinking water source along with recycling as mentioned above has to be made available through these methods.

The urban areas in Kerala already have a coverage of over 65%. Also new systems and augmentation projects are underway wherever there is gap in production and distribution of water. With JJM urban having a target of 100 % saturation of urban areas before 2026, huge infrastructure investment in the distribution network has to be made. In urban areas as time is of essence, O&M, complaints redressal mechanism, automation etc needs to be developed and corresponding investment to be made.

Strategies & Action Plan for improvement of Water Supply Schemes

- Source development and watershed management is quite important for any sustainable water supply. Special attention is necessary in water supply schemes where shortage of water is experienced especially in the summer months. The low-income group, densely populated areas, areas with high rise buildings, industrial parks, commercial business areas to be given preference.
- Reliable sources in terms of quality, quantity and availability round the year is a primary requirement for establishing a sustainable water supply system. Kerala, in spite of having 3000 mm of rainfall has been experiencing recurring droughts and floods and in recent years the climate events have been getting severe. The drinking water sources has to be made climate resilient to make the water supply systems calamity ready. Efforts are already on to build more check dams,

desilt reservoirs, deepening wells, prevent sand mining, preventing waste disposal, etc. Traditional knowledge and water conservation techniques will help in source protection, augmentation as well as creation of new sources.

- Water security plans and water safety plans to be prepared for all GPs.
- Time bound completion of projects ensuring quality of assets created.
- Proactive measures to control NRW shall be ensured.
- Establish Water Quality Monitoring and Surveillance Protocol with the involvement of educational institutions and beneficiary communities.
- Efforts should be made to transform all the intermittent water supply schemes to 24x7 system with 100% coverage within the 14th FYP period.At least reliable water supply shall be ensured to all consumers.
- An integrated approach where traditional and modern trends merge together to achieve sustainable development. This is all the more important in a State like Kerala with a 'well culture' and limited and ephemeral surface water sources. Climate change factor is also to be considered, especially possibilities of erratic rainfall and sea water rise and its impact on coastal water sources, both ground and surface.
- Water Audit may be conducted in every panchayat. Local bodies should give sufficient importance to water supply schemes and make the land available for water supply schemes.
- Immediate steps should be taken to reduce the expenditure of KWA and improve the revenue.
- Unskilled & semiskilled works for daily operation of the KWA schemes need to be outsourced.
- Services of engineering colleges having water management centers to be availed to conduct data collection, feasibility study, design, DPR preparation, supervision, maintenance etc. Thus the local problems can be addressed effectively and engineering students will have access to the field problems.
- Kudumbasree units may be trained to take up works in the water sector including the day-to-day operation of various schemes. This will become a direct help to the women and marginalizes sections of the society, while reducing the expenditure of KWA.
- Frequent flood and drought faced by the state is a direct threat to the water sources which supply water to several water supply schemes. Climate change makes the situation more complex. Immediate steps for long term sustainance of these sources should be taken up on priority basis.
- Even certain water supply schemes in the coastal belt are facing problems of salinity intrusion due to low flow in summer season and rising sea water level. Magnitude of these problems are likely to intensify in the near future. Effective steps to provide safe drinking water on long term basis is essential.
- Aim should be not only to meet the requirement by making available water for part of the time on a day but all through the day in an economic manner also. Awareness shall be created among all concerned on the optimal use of water.
- Existing Irrigation and Hydel reservoirs can be linked to supplement the drinking water supply schemes in the higher elevations not having sufficient sources for drinking water. An optimal

operation policy may have to be followed without impacting the purposes for which water is harvested. The success stories of Malampuzha and Peechi tempts one to think of this option.

- As far as possible, a single agency should be made responsible for water supply in a region and aim at achieving single water tariff for all schemes.
- Computerized hydraulic simulation model for all water supply schemes may be developed and maintained for identification of problems, evaluation of alternative solutions, augmentation of existing systems etc. There should be a well updated and calibrated model of all the schemes to study at any time. Engineering colleges can be effectively utilized for these simulation studies.
- KWA revenue needs to be improved through water audits and reduction of non-revenue water. Lots of work in this connection can be carried out without any additional manpower or any costly equipment. After initial study, further improvement can be achieved with the help of sophisticated equipment. Overall 40% non-revenue water is reported in Kerala. Focused effort to reduce the same is necessary. KWA should have a time-bound action plan for this purpose and the same may be implemented with the existing infrastructure.
- Among different sizes of water meters, bigger size water meters used for non-domestic connections are less in number which fetch major revenue to KWA. Hence it is necessary to give special attention to these meters with continuous monitoring. Meters with Automated meter reading (AMR) facility with dedicated software can monitor these consumptions effectively through a central monitoring system. It can improve the revenue of KWA as well as develop confidence among consumers. Meter policy adapted by KWA contains the preventive maintenance aspects and these need to be strictly enforced.
- At present the consumer is responsible for providing and maintaining water meter. The utility providers should ensure that empaneled vendors provide water meter for rent. This will ensure that the empaneled vendor brings in quality water meter as prescribed by the utility provider. The consumer will be liable only to pay the meter charges and will not be liable for faulty meters. The water meters typically have a lifespan of 5 to 7 years. The empaneled vendor may refurbish the same meters after its lifespan there by extending its life period, providing at reduced cost and reducing wastage.
- It is necessary to assess the economic viability of each scheme. It is reported that schemes in Trivandrum and Ernakulam are economically viable projects even now. This need to be studied in detail. Every scheme should be made economically viable and if necessary, manpower may be re-deployed. At least operation and maintenance of every scheme should be met from the revenue from consumers..
- It is impossible to have a substantial increase in water tariff to cover the entire expenditure of KWA. However, an upward revision is inevitable. Restructuring of water tariff can be thought of.. Any increase in tariff may be implemented after detailed study.
- Automation of operations in treatment plants need to be examined and the same may be implemented wherever economically feasible.
- All pumping systems shall be examined for its operational efficiency. Necessary modifications may

be implemented wherever economically feasible. .

- Residential societies/communities may be involved effectively in implementation and maintenance of water supply systems in their area. These communities can even take up responsibilities like: augmentation of water supply, effective metering and revenue collection, usage of recycled water etc. They can even get financial support from local bodies if necessary. Thus KWA can reduce its responsibility to supply the desired quantity of water to the above communities.
- Energy Auditing similar to water audit has to be carried out in all the KWA plants and pump houses. In house Electro Mechanical Units have to be strengthened for this purpose.
- KWA has 2430 pumps of which automation of 417 pumps are already completed and automation of 220 submersible pumps are expected to be completed by Dec 2021-22. Automation of balance 402 submersible pumps,416 VT pumps,850 centrifugal pumps and 125 pumps of other category is targeted to be completed in 2022-23.
- In order to achieve the target of 100% coverage with FHTCs, the sector requires a multi-pronged approach which includes development of fresh sources, augmentation of existing sources, water treatment and network infrastructure.The physical infrastructure development requires tremendous human efforts and so capacity building and training of personnel in the sector is critical for achieving the targets. For achieving 100% saturation heavy infrastructure investment has to be made. In Kerala, a decentralized approach will ensure the load on the individual LSGs will be minimal.
- KWA engineers may be effectively used in engineering activities like studying the problems, designing and executing the water supply schemes and providing technical assistance to O&M operators. Modernization of KWA with suitable revision of duties and delegation of powers can improve the present situation. Cost of governance shall be brought to minimum by utilizing IT solutions.
- The capital flow in the water supply sector has been witnessing tremendous increase in recent years, especially with funding from KIIFB and JJM. The absorption capacity of the sector organizations also has to be enhanced commensurate with the increased fund flow.
- The Total amount outstanding to KSEBL as on 31.3.2022 is Rs. 984.64 cr (including interest and penal interest). KWA has about 281 HT connections which are charged by KSEBL at the maximum tariff i.e. HT 1 (A) Industrial. Even though KSEB is revising the power charges on a frequent manner, the same cannot be absorbed in water tariff since the revision of water tariff is not done regularly as in KSEB. Since there is reduced power tariff to Jalanidhi, Swajaladhara, Jaladhara schemes, same concession rate may made applicable to KWA also.
- A fixed charge may be incorporated in the water tariff to account for the leak repair works in the communication pipes & alteration of water connections. By introducing such a system the consumer will be relieved off procedures and financial liability associated with the above works.
- Roll out of three Mobile water treatments units with CSIR-CSMCRI support for meeting drinking water supply in case of emergencies like Floods/natural calamities etc.
- KWA will give top priority in utilizing GIS for its wise use of resources and management of water supply by copying the latest available techniques in the field.

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- KWA aims to develop a comprehensive IT Solution which brings all existing software in heterogeneous platforms under a unified platform in a single Database (RDBMS Platform) which functions as an in-house ERP for the organization.
- IT initiatives also aim at elimination of all physical touch points between consumer/applicant and department, implementation of IoT (Internet of Things) devices and automation to be implemented wherever possible
- Measures for desiltation of Aruvikkara dam is being considered in order to restore the full capacity of Aruvikkara Dam.
- Upgradation of laboratories attached to all treatment plants.
- Setting up pipe testing, material testing labs at SRI – Building work in progress
- Setting up of effluent testing lab all over Kerala
- Setting up of Mobile Laboratories
- Setting up IoT based real time monitoring systems in WTP's – Work in progress

WATER QUALITY MONITORING & SURVEILLANCE (WQM&S)

More than 600 000 people annually contract some form of gastrointestinal illness for which they seek medical help. The study conducted by CWRDM, IIT Chennai and other agencies indicate that 70 % of drinking water wells in Kerala have fecal contamination (CWRDM 2007).

There are two competing risks involved in the management of drinking water sources especially in State like Kerala. They are groundwater protection and better sanitation. Therefore, one of the options is to study the defects in existing sanitation methods and it is also necessary to address the issue whether poor sanitation alone is responsible for the groundwater contamination. If so, it is appropriate to implement the corrective measures to improve the sanitation methods practiced in Kerala.

Water and sanitation infrastructure in Kerala is extensive and valuable. According to a recent survey by CWRDM, there are **67 lakh open wells**. A rough estimate indicates that 60% of the population relies on groundwater for many uses.

The short, fast-flowing, monsoon-fed rivers of Kerala often encounter salinity intrusion into their lower stretches during the summer months. When the freshwater flow reduces, two major problems are encountered in these water bodies: (i) salinity propagates more into the interior of the river and (ii) the flushing of the system becomes less effective. The pollution problems are reported mainly from the downstream of the rivers. Biochemical Oxygen Demand is reported to be within 10 mg/l in the rivers. Bacteriological pollution is one of the major water quality problems of the Kerala Rivers. Lack of proper sewerage treatment system is one of the major reasons for the bacteriological contamination of the rivers. Kerala does not have a proper liquid waste management policy. Solid waste is also posing serious threats to the water bodies of Kerala.

The groundwater quality problems of Kerala are associated with mineralogical origin, human interference, industrial effluents, municipal solid waste, burial grounds etc. The location

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specific groundwater problems in Kerala are due to the presence of excess salinity, iron, fluoride, hardness, and coliforms. Seawater intrusion, domestic sewage, mineralogical origin, and agricultural and industrial activities are the major causes.

. Open wells of Kerala have the problem of bacteriological contamination. The open character of the wells and inadequate maintenance habits and use of buckets and rope to draw the water, kitchen waste and pit latrines with average family load factor (5 members) at a distance of less than 5 m from wells are some of the factors which are found to be contributing to the bacteriological contamination.

The groundwater quality problems due to high fluoride content are reported from Palakkad and Alappuzha districts of Kerala. Fluoride content of 1.5 to 2.6mg/l is observed from the deeper aquifers tapping Varkala formations in the Alappuzha town. Some of the deep wells in Palakkad district in Chitoor taluk and a few wells in Kanjikode and Muthalamada area also reported to contain fluoride concentration greater than 1 mg/l. Most of the latrines constructed in these areas are deep leach pit type, which, given the porous nature of soil accentuate biological contamination of these wells. Lack of adequate systems for solid and liquid waste management further adds to water contamination.

Though infrastructure facilities are available in different centres in Kerala, they are not completely capable of analyzing the water quality for public. NABL accreditation is available for 8 Distrcit labs of KWA. In all these labs testing for private samples is also conducted. Under JJM 85 labs are targeted to receive NABL accreditation. All Higher Secondary Schools, Engineering Colleges and other life science institutions should be equipped with water quality testing facilities available for public. Field Test Kits (FTKs) to be made available in all LSGs as well as ensuring atleast 5 Kudumbasree workers per ward are trained for doing field tests. Hence sufficient infrastructure facilities may be made available to cater the needs of the public for testing their drinking water quality. Since providing safe drinking water is one of the major thrust areas of the Government, setting up of such facilities by the State Government shall in long way help in ensuring safe water for all.

The mobile water analysis laboratory can be used for the field work and the analysis can be performed more conveniently and efficiently. Moreover, the importance of protecting the drinking water sources and simple methods of treatment will be popularizing among public.The establishment of Mobile Water Analysis Laboratory will help the consumers especially in the rural areas to know the status of the drinking water quality of their source. The distribution of drinking water cards will help the people to get awareness on the importance of the assurance of drinking water quality, methods of simple treatment and also the need to protect the drinking water resources. The Mobile Laboratory will also be used to attend to assure the drinking water quality during any calamity especially during floods, drought and natural disasters.

SEWERAGE

The state hitherto has been promoting on site sanitation. Though waste water collection

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treatment and disposal is a mandate of KWA, the sector did not so far get its due attention for various reasons. The absence of proper wastewater and municipal solid waste disposal systems have adversely affected the surface and groundwater quality in the state. Most of the water bodies in urban areas are carrying black water affecting aquatic life and also public health in general. Kerala being a prime tourist location needs to keep its water environment clean if it has to sustain its tourist industry. The state and KWA is taking necessary initiative to provide 100% sewerage coverage for the urban areas. KWA is taking steps to implement and expand sewerage networks in Thiruvananthapuram, Kochi, Thrissur, Kollam Kannur and Kozhikode.

The sewerage sector has been witnessing new developments in both treatment and network technologies. The state has to adopt the state of the art technologies as conventional systems are not favoured by the people of Kerala for aesthetic reasons.

Piped sewerage is the most prevalent system for wastewater collection. But, Kerala being thickly populated, narrow roads with heavy traffic, sewer laying natural gradients is a challenge. Also the NIMBY syndrome together with high land cost do not favour large network based systems. Appropriate choice of technology with robust and reliable designs are essential for building sewerage systems in the state.

Two ULBs were selected in each district for implementing the sewerage schemes and the DPR preparation of these 28 ULBs and four Corporations identified(Kochi, Kollam, Kozhikkode and Kannur) have been initiated by KWA.DPR preparation for the 100% coverage of Thiruvananthapuram corporation is also under progress and in this, 19 wards abutting the highly polluted stretches of Karamana river is considered as first priority. Master plan for the coverage of Kochi Corporation is already prepared and DPR of 5MLD STP and network prepared and can be placed under AMRUT 2. Remaining DPRs of Kochi Corporation are under preparation. DPRs of sewerage system for nine AMRUT cities are under preparation based on the availability of fund under AMRUT 2. DPR of 12 ULBs are completed in which only five ULBs have Government /municipality /KWA land. Sorted out ULBs with Government /Municipality /KWA land and action is being taken to prepare DPRs for placing it before the Government for Administrative Sanction.

Construction works of 5 MLD STP at Elamkulam and 12 MLD STP at Kureepuzha STPs are under progress. Expected date of commissioning of the 5MLD Plant at Elamkulam is second week of June 2022. For the full utilization of this plant a DPR of Sewerage network of 1.75 MLD has been prepared and submitted to GoK for AS. Expected date of commissioning of Kureeppuzha Plant is July 2022 and DPR for the full capacity utilization of this plant is under preparation. Administrative Sanction has been received for the construction of Common Effluent Treatment Plant in Edayar Industrial area and action is being taken to implement it.

The proper disposal of treatment plant effluent or reuse requirements is an essential part of planning and designing wastewater treatment facilities. In order to remove our liquid waste out to sea, vast quantities of water are needed as a transporting agent in our river systems. Since the output of both domestic and industrial effluent is increasing more or less directly in relation to the

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growing abstractive demand, the pollution load becomes progressively harder for water resources to absorb. Thus effluent disposal and the subsequent deterioration in water quality influence both the use and conservation of water because, as the pressure on resources continues to build up, so the degree of pollution and the amount of feasible re-use of water will, in many respects, determine the real availability of supplies.

Sludge Management

Sludge management is one of the most difficult and challenging tasks of wastewater treatment plants due to its high water content and poor dewater ability and strict regulation for sludge reuse or disposal. Sewage sludge is the solid, semisolid, or slurry residual material that is produced as a by-product of wastewater treatment processes. . Many sludge are treated using a variety of digestion techniques, the purpose of which is to reduce the amount of organic matter and the number of disease-causing microorganisms present in the solids. Digested sludge is passed through dewatering step; the dried solids are disposed off and the water is sent back to secondary treatment. The most common treatment options include anaerobic digestion, aerobic digestion, and composting. Biological sludge can be disposed of by incineration; the carbon, nitrogen, and Sulphur are removed as gaseous by-products, and the inorganic portion is removed as ash. Currently, sewage sludge management is a huge challenge in the field of environmental engineering.

New effective solutions for the treatment of wastewater led to an improvement of the quality of the final effluent but considerably increased the volume of produced sewage sludge, which increases each year and mountains. Faecal sludge management (FSM) is the collection, transport, and treatment of faecal sludge from pit latrines, septic tanks or other onsite sanitation systems. Faecal sludge is a mixture of human excreta, water and solid wastes (e.g. toilet paper or other anal cleansing materials, menstrual hygiene materials) that are disposed in pits, tanks or vaults of onsite sanitation systems. Faecal sludge that is removed from septic tanks is called septage. FSM is necessary in densely populated areas where a proportion of population is not connected to a sewerage network, and the covering and rebuilding pit latrines is not possible

3R CONCEPT

The 3R concept of waste management basically includes 4 key activities, viz. reduce, reuse, recycle and recover

A. Reduce: Only the most optimal amount of resources must be used in order to avoid wastage of any usable resources. This can be considered as a sort of a conservation effort which aims at reducing the needs to reduce the waste.

B. Reuse: Before trying to acquire newer resources, we must first analyse if the resources available with us can be used again.

C. Recycle: whatever material can be reused through some form of processing, must go through recycling. Recycling gives a new life to base material and makes it fit to be used

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in the same capacity as before

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REGULATORY/LEGISLATIVE CHANGES

The following matters affecting the smooth functioning requires interaction and co-ordination with other departments and Government level decision/interaction are required to solve the issues.

Road Cutting & Utility Shifting: A MoU between LSGD/PWD/NHAI and KWA may be entered into, for ensuring road cutting sanction to rectify emergency leaks across the State. This shall avoid delay in leak rectification works thus reducing hardships to the general public. Also road cutting sanction for new projects shall be issued in a time bound manner to avoid delay in project completion resulting in time and cost overrun.

INDUSTRY-INSTITUTION LINKAGE

Need for linking knowledge points is the need of the hour. The engineers in the departments need to service their knowledge for keeping abreast with the ever-changing technologies in their respective fields. Building linkages with academic institutions having highly qualified and experienced professionals in various engineering faculties is a step in this direction. Such linkages will be a cross cutting learning opportunity for both the sides. The vibrant student community can come up with out of the box ideas and solutions which can be tried and tested in the wide canvas of the departments. Their presentations and success stories can be shared with the officers across the sector so that both sides benefit. This will ensure entrepreneurship and creates new job opportunities for youngsters who can be readily accommodated in the ever expanding water sector. Research oriented implementation will take place leading to cost cutting, better service delivery, etc with the local populace.

Desalination in water sector can be defined as a purification process that removes salts and mineral components from saline water so as to produce fresh water. Both waste water recycling and desalination techniques are vital considering the fact that both are rain-independent. Although both are costly techniques, these become inevitable as alternatives for other sources as the depletion of reserves is a critical problem worldwide. Desalination is an eco-friendly and long lasting technology. Most of the modern interest in desalination is focused on cost-effective provision of fresh water for human use.

Kerala has a coastal line of 590 km. Kerala Water Authority in collaboration with Fisheries Department and National Institute of Ocean Technology (NIOT), is exploring the possibility of installing desalination plants along coastal belts (Fishing Harbour and Fishing Villages) to solve the problem of water shortage in these areas of Kerala. KWA is thus planning to create a chain of desalination plants connecting all coastal villages with a view of producing 1 lakh litres/hr of desalinated water so as to supply the additional water produced to Ports, Coastal Industries, Naval bases etc. The Fisheries department will identify fishing villages with acute water shortages, while KWA is to fine tune the selection in accordance with present coverage and scope, and NIOT

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is to provide appropriate technology. A list of the villages experiencing water shortage was provided by the Director of Fisheries. The list contains information about fishing villages in Thiruvananthapuram, Kollam, Malappuram, Kozhikode, Kannur, Ernakulam, Alappuzha and Thrissur where water is in short supply. As a first step towards assessing whether desalination plants can be installed at these sites, a preliminary survey for data collection and analysis of water that can serve as a source for the desalination plant is to be undertaken. After that the technology of desalination will be decided according to the data collection and analysis. As the depletion of reserves is a critical problem worldwide, Kerala should not hesitate to start a desalination plant, bottled water plant or even water from air plant wherever economically feasible. Kudumbasree units can operate these plants based on the income from consumers. Certain mobile units can be effectively used in places facing natural calamities.

HUMAN RESOURCE AND CAPACITY BUILDING

Kerala Water Authority is the major provider of drinking water in the state of Kerala.KWA is still following the staff pattern followed by the erstwhile PHED, even though there is considerable increase in coverage and production has been achieved since inception. JJM and AMRUT 2.0 projects are to be materialised by 2024 and 2026. Various other projects also are in the anvil, supervision of all these projects in a satisfactory manner and maintenance of service quality (through preventive maintenance, customer friendly approach etc.) after commissioning requires additional man power to be allotted urgently. The skill of existing staff is to be developed and kept updated through proper planned training sessions and other initiatives. Modernisation of the working environment through statewide implementation of e-office facilities, SCADA, leak detection equipments etc.is inevitable. Training from premier institutions for improving the overall efficiency of the organisation covering project implementation, customer interaction, managerial skill development etc. to be made available.

State of the art techniques including computerization, automation etc. are to be adopted wherever feasible to make the system efficient and economical. Existing procedures need a thorough review. Sensor based, IoT enabled techniques for monitoring quality and quantity to be adopted. GIS based asset mapping & informed decision making should become the practice.

SUSTAINABLE FINANCIAL MODELS

Income V/s Expenditure

The comparative statement of income and expenditure of KWA for the last five year is given below.

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		Pre-Audited				Provisional
		(Rs.in Crore)				
INCOME		**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
1	Operating Income	625.53	662.47	716.87	864.12	935.7
2	Grants from GoI & GoK	284.63	359.02	273.53	347.44	321.05
3	Other Income	255.44	207.54	294.94	164	169.39
	Total Income	**1,166**	**1,229**	**1,285**	**1,376**	**1,426**
EXPENDITURE						
1	Operating & Maintenance Expenses	370.25	241.36	465.43	440.77	507.14
2	Payment & Provision to Employees	823.54	895.05	904.48	923.88	1017.49
3	Office & administrative Expenses	118.37	47.28	31.36	22.09	31.19
4	Interest	281.89	289.07	298.7	295.39	295.39
5	Depreciation	127.43	137.55	145.61	158.17	197.71
	Total Expenditure	**1,721.48**	**1,610.31**	**1,845.58**	**1,840.30**	**2,048.92**
6	Transferred to Capital Work-In-Progress	61.45	37.97	38.65	31.48	93.57
		1,660.03	1,572.34	1,806.93	1,808.82	1,955.35
	Excess of Expenditure over Income	494.43	343.31	521.59	433.26	529.21
7	Prior Period Adjustments	-2.46	-969.22	-4.64	16.09	0
Excess of Expenditure over Income after prior period adjustments		**449.35**	**529.21**	**516.95**	**449.35**	**529.21**

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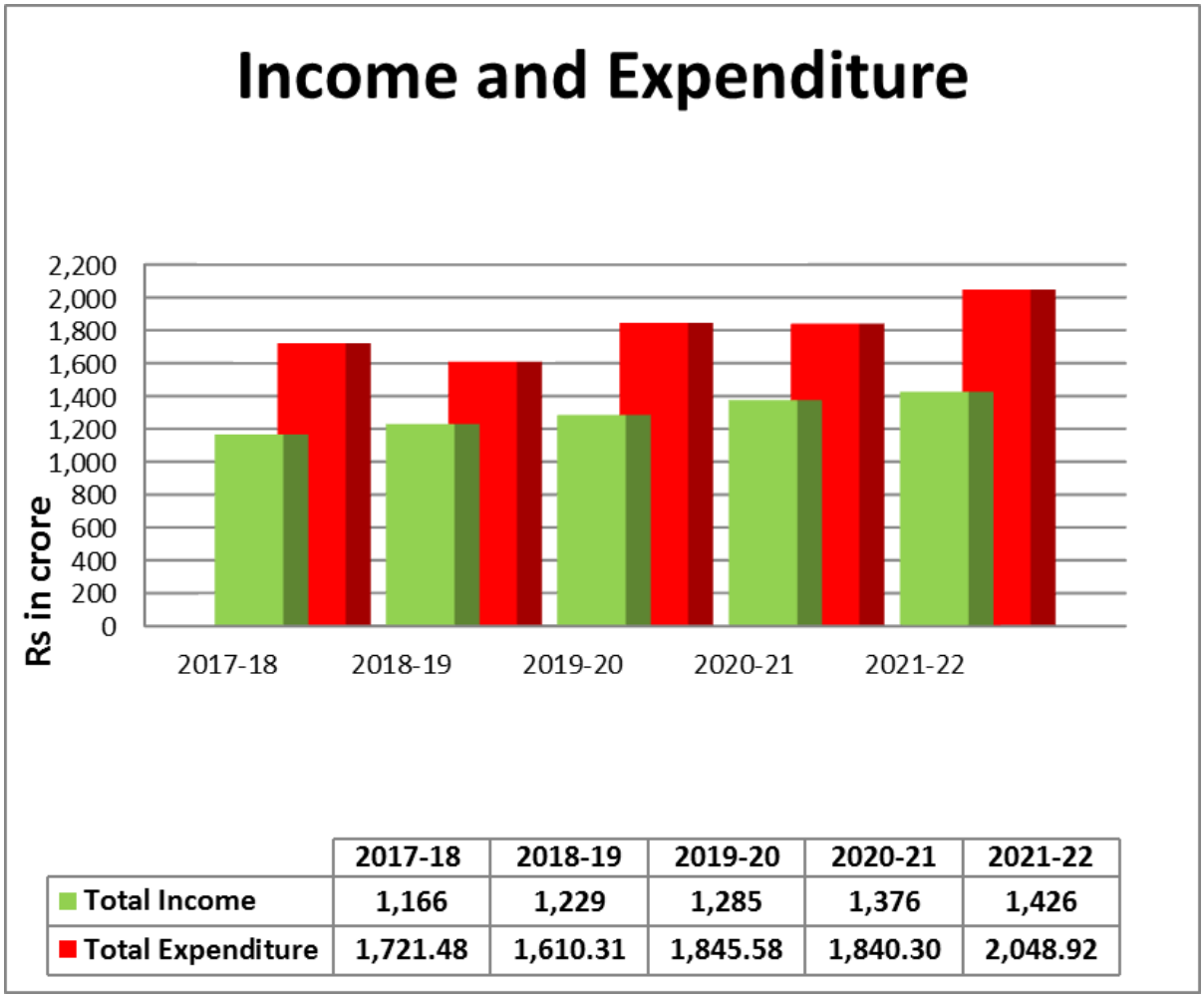
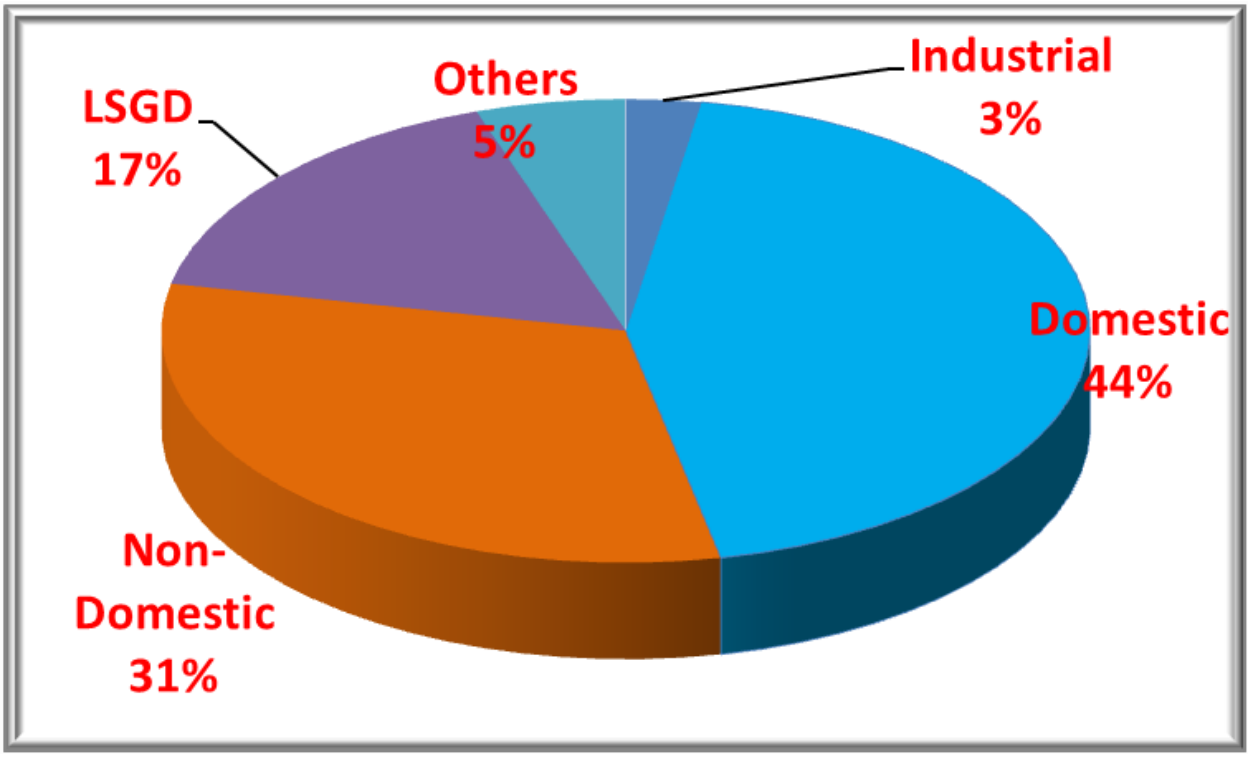


	2017-18	2018-19	2019-20	2020-21	2021-22
Total Income	1,166	1,229	1,285	1,376	1,426
Total Expenditure	1,721.48	1,610.31	1,845.58	1,840.30	2,048.92

Contribution of each category of consumers towards the revenue of Kerala Water Authority is as follows.



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As per the provisional annual report 2021-22, KWA is facing serious financial crisis. Income from consumers was Rs. 935.70 crores, whereas the total expenditure was Rs. 2048.92 crores. Operation & Maintenance cost alone was Rs. 507.14 crores. Payment and provision to employees alone was Rs. 1017.49 crores. This shows that the income from consumers is not sufficient even for the salary of employees. This is not a sustainable situation. Immediate steps to reduce the gap between income and expenditure is necessary.

TARIFF RATIONALISATION

The main source of Income of Kerala Water Authority is collection of water charges. From the formation of Kerala Water Authority, it has never earned any surplus Income and is continuously running at deficit, which is made good to some extent by the non-plan grand received from Government of Kerala.

Though as per section 23 of the Kerala Water Supply and Sewerage Act, 1986," the Authority shall not, as far as practicable and after taking credit for any grants or subventions or capital contributions or loans from the Government under section 24, carry on its operations under this Act at a loss and shall so fix and adjust its rates of taxes and charges under this Act as to enable it to meet as soon as feasible the cost of its operations, maintenance and debt service and where practicable to achieve an economic return on its fixed assets", year after year, the revenue deficit has been increasing. As the liabilities on the Authority are mounting on a large scale with expansion of services a reasonable upward revision in tariff cannot be postponed.

Kerala Water Authority meets its monthly commitments such as monthly salary and pension, HR Wages, Pensionary benefits, Earned Leave Surrender, Medical Expenses, Terminal surrender, etc. by collection of Water Charges from its consumers as well as the Non-plan grant received from Government of Kerala. GoK normally releases the entire Budget allocation of Non Plan Grant to Kerala Water Authority during the concerned year itself. Decreased revenue collection due to Covid-19 lock down adversely affected the financial position of the Authority. Due to shortage of funds, there are long pending commitments towards pensioners, employees as well as KSEB.

Kerala Water Authority collects its revenue from the consumers at a tariff fixed by the Government of Kerala from time to time. KWA has a consumer base of 40.43 Lakh consumers, In which about 2.24 lakh consumers belonging to non domestic & industrial category. In the remaining 39.19 Lakh of domestic consumers, more than 75% of the consumers that is approximately 29 lakhs consumers, fall in the consumption category of 15 KL or less.

Though Kerala Water Authority submitted water tariff revision proposal during 2018 , 2020 and 2021, the same has not considered yet. However, GoK has accorded annual tariff increase of 5% from 01-04-2021 to water charges along with other user fee charges as a part of the condition of GoI for the increase in overall borrowing limit to the State. The lowest tariff is Rs. 4.41

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per KL and highest tariff is Rs. 55.15 per KL for domestic consumers. Revision in the water tariff is necessary for the smooth running of the Authority. One paisa per litre (OPPL) should be adapted urgently to tide over this financial crisis.

OPERATION AND MAINTENANCE (O&M)

Operation and maintenance refers to all of the activities needed to run a water supply and Sewerage scheme, except for the construction of new facilities. The overall aim of operation and maintenance is to ensure efficiency, effectiveness and sustainability of water supply and Sewerage Schemes. The two activities of “operation” and “maintenance” are very different in nature. Operation refers to the routine activities and procedures that are implemented to ensure that the water supply system is working efficiently. The activities that contribute to the operation of a water utility are undertaken by technicians and engineers who have responsibility for controlling the functions of the system .Maintenance, on the other hand, is to do with the technical activities, planned or reactive, which are needed to keep the system working.

Operation and maintenance has been neglected in the past, or been discussed and introduced only after a project was completed. Realizing the fact that this neglect or delay in applying proper operation and maintenance has affected the quality of service offered to a great extent, a separate wing (Operations Unit) under KWA monitors the O&M of water supply and sewerage services and formulate appropriate policies and operating guidelines as and when required.

PPP Models

Public-Private partnership is a key in the current globalized environment. In the water sector innovation and technology infusion can be greatly achieved by incorporating private partners who are specialists in it. Both financial support, sustainable revenue model, better service delivery, quick response on complaints can be brought in PPP models.

Corporate Social Responsibility: The possibility of obtaining financial aid from banks (like SBI) shall be explored for new schemes under CSR.

Validate concepts through a pilot-based approach: States can initially launch pilots before implementation of large-scale initiatives and innovative projects to test and validate concepts and project ideas with a small proportion of the total target audience. This can help in identifying and addressing potential implementation challenges and risks early in the project in a resource-efficient and timely manner.

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PROPOSALS FOR 14TH FIVE YEAR PLAN

ONGOING SCHEMES

1. Survey and Investigation **HoA-2215-01-190-99(1)**

14th Five Year Plan: Rs. 1000.00 lakh

- With JJM and AMRUT 2.0, the no of survey works to be carried out have increased 10 times
- Survey and investigation works for new water supply and sewerage schemes
- Soil investigation for various projects
- Procurement of modern survey equipments

2. NABARD Assisted Rural Water Supply Schemes Rural Infrastructure Development Fund

HoA-4215-01-102-98-01

14th Five Year Plan: Rs.60000.00 lakh

- Providing water supply schemes and sewerage network in rural areas
- Amount required for the completion of ongoing tranches - Rs.345091.80 lakhs

3. Manufacturing units for bottled water

HoA-2215-01-190-96

14th Five Year Plan: Rs.387 lakh

- KWA decided to install bottling plants making use of surface water sources in view of increasing demand for packaged drinking water
- Initiative was intended to reduce the exploitation of ground water resources and for making available good quality water at affordable rate to public
- Bottling plant at Aruvikkara is handed over to KIIDC on 28.2.2020
- An amount of Rs.387 Lakhs has been requested as Demand for Grants in 2022-23 for settling the pending bills. If the same is granted, the head can be winded up.

4. Renovation of existing civil structures owned by KWA

HoA 2215-01-190-92

14th Five Year Plan: Rs. 20000.00 lakh

- 928 schemes in operation in KWA
- Preventive maintenance of assets of KWA
- Mandatory buffer zone around the WTPs, STPs, KWA offices
- Construction of compound walls around vacant plots to clearly demarcate the land owned by KWA and landscaping
- Providing fire way track
- Rain water harvesting measures over the roof top of office buildings, treatment plants etc of KWA having large area

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5. Innovative technologies and modern management practices

HoA 2215-01-101-97(1)
14th Five Year Plan: Rs. 3500.00 lakh

- Reduce NRW , increase NWR
- Efficiency improvement of schemes
- Reduce wastage of treated water
- Modernisation of schemes and adoption of new technology
- Quantitative assessment of water produced in the schemes

6. Human Resources Development, Research &Development and Quality Control

4215-01-800-91
14th Five Year Plan: Rs. 600.00 lakh

- To improve the quality, efficiency and knowledge of officers of KWA
- Training personnel of KWA to be exposed to rapidly changing technological and management practices
- Up-gradation of training facility in KWA (CWEd)

7. Sewerage schemes of KWA

HoA 4215-02-190-99
14th Five Year Plan: Rs. 40000.00 lakh

- To carry out urgent maintenance/ repair works in existing sewer lines
- Ensuring 100% sewerage network for Kerala
- Expansion of sewerage systems in Thiruvananthapuram and Kochi
- Establishing decentralised sewerage systems in other major cities and towns
- Robotic cleaning of sewage manholes
- Additional proposals are to be taken up to meet the NGT guidelines

8. Rehabilitation/improvement works of Urban Water Supply Schemes

HoA 4215-01-101-97
14th Five Year Plan: Rs. 50000.00 lakh

- 100% coverage of piped water supply in urban areas
- Laying distribution systems in schemes where production components are completed
- New schemes/augmentation of existing schemes
- To build climate resilience, desalination plants are to be explored

9. Rural Water Supply Schemes

HoA 4215-01-102-97
14th Five Year Plan: Rs. 20000.00 lakh

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- 100% coverage of piped water supply in rural areas
- New schemes/augmentation of existing schemes are to be carried out to increase coverage in unserved and underserved areas
- To build climate resilience, desalination plants are to be explored
- To help in achieving the universal and equitable access to safe and affordable drinking water.

10. Water Supply Scheme to specified institutions/locations

HoA- 4215-01-800-90
14th Five Year Plan: Rs. 15000.00 lakh

- Improvements of water supply to specified institutions like Medical Colleges, Taluk Hospitals, mini Civil Stations, old age homes, orphanages, rural schools and other educational institutions etc.
- Pilgrim centres and connected locations.

11. Optimisation of production and transmission

HoA 4215-01-800-89
14th Five Year Plan: Rs. 100000.00 lakh

- Pipelines are to be replaced wherever pipes with high fault rates & AC
- pipes are in place
- Rehabilitation/augmentation of WTPs to enhance installed capacity and to
- improve production capacity
- Pipeline extensions where there is potential for saturation/better capacity
- utilization and to improve coverage
- Decrease NRW

12. Drinking Water/Drought Mitigation

HoA 2215-01-800-47
14th Five Year Plan: Rs. 7500.00 lakh

- Proposed to take up works for providing water supply during natural calamities and emergencies
- Construction of check dams and other source improvement measures.
- Pipe line extensions to drought hit areas, additional pumping and capacity enhancement during drought period
- AS for drought mitigation works to be issued prior to drought season.

13. Modernisation of Aruvikkara Pumping Station

HoA 4215-01-101-96
14th Five Year Plan: Rs. 280 lakh

- Modernisation of Aruvikkara Pumping Station
- Strengthening production at Aruvikkara to ensure additional supply of water to Thiruvananthapuram city

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- Replacing the old and damaged pumps, motors, electrical and mechanical installations
- Work is completed
- An amount of Rs.280 lakhs has been requested as Demand for Grants in 2022-23 for settling the pending bills. If the same is granted, the head can be winded up.

14. E-governance/GIS and Information Management

HoA 2215-01-190-88
14th Five Year Plan: Rs. 5000.00 lakh

- To develop well equipped web based management system
- Better informed decision making and customer relations
- Development of new in house software and IT infrastructure for KWA
- Implementation of comprehensive GIS, IT and banking solutions
- Annual maintenance contract for up keeping of computers, printers,
- servers, network components etc.

15. Source Improvement and Water Conservation

HoA 4215-01-800-92
14th Five Year Plan: Rs. 2500.00 lakh

- Enhancement of storage capacity at water sources and thereby improving scheme efficiency
- Construction / Strengthening of water retaining structures/sources
- Source sustainability and better usage of capital investment in case of existing schemes.

16. Works for the prevention of river pollution and creating awareness for the compliance of NGT direction

HoA 2215-02-106-97
14th Five Year Plan: Rs. 2500.00 lakh

- To ensure prevention of sewage pollution in rivers
- To conduct awareness programmes through public gatherings, posters, awareness advertisements in print and visual media regarding the importance of maintaining the water quality of rivers as per standards.
- Improving the water quality by reducing the proportion of untreated waste water being released in to the rivers
- STPs are to be setup at feasible locations

17. JAL JEEVAN MISSION(NRDWP) - 50% CSS

HoA 4215-01-102-92
14th Five Year Plan: Rs.2125500.00 lakh

- Envisioned to provide safe and adequate drinking water through individual household tap connections by 2024 to all rural households in India and to benefit

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the rural poor, especially families in SC / ST colonies, women and families living in the hilly areas that do not yet have access to safe drinking water.

- This project is being implemented on 50:50 cost sharing basis between Centre and State Governments.
- 41.25 lakh connections are targeted to be completed by 2024.

18. Kerala Water Supply Project, JICA (One time sustenance support under the State Plan)

HoA 4215-01-800-88
14th Five Year Plan: Rs.600 lakhs

- An amount of Rs.600 lakhs has been requested as Demand for Grants in 2022-23 for settling the pending bills.

19. ADB Assisted Kerala Urban Water Supply Improvement Project – KUWSIP (EAP)

HoA 4215-01-101-94
14th Five Year Plan: Rs.38000.00lakh

- Improving the water supply in Kochi and Thiruvananthapuram Corporations by rehabilitating the old production components and the network
- Achieving 24 x 7 supply in the above areas by considerable reduction of NRW and overall improvement of efficiency.

19. Energy efficiency improvement, Optimisation of electromechanical items, Safety audit and ensuring safety in operation of WTPs and Pumphouses

HoA 4215-01-800-87
14th Five Year Plan: Rs. 15000.00 lakh

- To improve energy efficiency thereby lowering the cost of energy, which accounts for a significant portion of operating expenses
- A new electromechanical unit has started in KWA
- To reduce annual power charges and the power consumption of KWA
- Replacement and rehabilitation of obsolete pumps and motors and other electro-mechanical installations
- To avoid any untoward incidents originating from a dangerous working environment by ensuring safety protocol, placing safety gears and equipments in appropriate places.

20. Infrastructure development and surveillance activities under Quality Control Wing of KWA

HoA 4215-01-800-86
14th Five Year Plan: Rs. 2500.00 lakh

- Surveillance and monitoring the quality of water supplied through various water supply schemes
- To enable the public for an easy access for testing their water samples

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- The Laboratory networks under KWA will be elevated to international level
- confirming ISO/IEC 17025:2017 by 2022 and need to be maintained with scope upgradation of NABL standards.
- Upgradation of existing labs associated with major Water Treatment Plants
- To upgrade the State Lab gradually to NABL accreditation/BIS certification for water quality testing
- To enable minimum infrastructure facilities for testing effluent water especially from STPs

21. Enterprise Resource Planning

HoA 2215-01-004-99
14th Five Year Plan: Rs. 5000.00 lakh

- The approximate investment and customer base increased manifold over the years and ERP is the best tool to manage the above tasks.
- Facilitate information sharing, business planning and decision making on an
- enterprise-wide basis.
- In–house team is proposed to be developed, joining hands with engineering/ management institutions, instead of adopting an external/outsourced model which may fail due to lack of post implementation support or the heavy cost involved.
- ERP systems streamline and automate processes, creating a leaner, more accurate and efficient operation thereby increasing efficiency and productivity by helping users navigate complex processes and preventing data re-entry.
- ERP provides complete visibility into core business processes and it can allow business to expand without the addition of IT or staffing costs.

NEW SCHEME

Construction of new buildings for arranging office space under OHSRs and KWA owned land

14th Five Year Plan Rs. 25000 lakhs

- Many of the offices of KWA are functioning in very old buildings which are in dilapidated and dangerous conditions.
- New office space has to be arranged in the vacsnt spaces below the over head reservoirs and in the KWA owned land
- New scheme is necessary for this.

KERALA WATER AUTHORITY (OUTLAY AND EXPENDITURE-13TH FIVE YEAR PLAN)

(Rs. in Lakh)

Sl No.	Name of Scheme/ Programme	Major Head	BUDGET					RELEASE					ACTUAL EXPENDITURE				
1	2	3															
			2017-18	2018-19	2019-20	2020-21	2021-22	2017-18	2018-19	2019-20	2020-21	2021-22	2017-18	2018-19	2019-20	2020-21	2021-22
1	Survey & Investigation (2215-01-190-99-01)	(2215-01-190-99-01)	200.00	200.00	200.00	100.00	100.00	100.00			66.56	90.89	99.49	102.87	132.80	66.56	90.90
2	NABARD Assisted RWSS (4215-01-102-98-01)	(4215-01-102-98-01)	10000.00	10000.00	8000.00	6000.00	5180.00	8463.31	8907.58	7658.14	10343.58	8342.71	6881.39	7548.04	8681.42	10322.54	8526.16
3	Manufacturing units for Bottled water (2215-01-190-96)	(2215-01-190-96)	1300.00	500.00	500.00	200.00	90.00	600.00			200.00	63.34	195.08	517.03	133.12	200.00	63.34
4	Accelerated Rural WSSs -50% State share (2215-01-190-99-18)	(2215-01-190-99-18)	10000.00					11500.00					12496.36				
5	Renovation of Existing Civil structures owned by KWA (2215-01-190-92)	(2215-01-190-92)	1500.00	500.00	500.00	300.00	300.00	500.00			299.79	771.30	803.06	259.73	0.00	289.08	767.48
6	Drought Relief Works sanctioned by Government of Kerala (2215-01-800-84)	(2215-01-800-84)											2011.60				
7	Human Resources Development Research & quality control	(4215-01-190-99)	275.00	275.00	200.00			125.00					124.98	44.61	36.98		
8	Sewerage scheme of Kerala Water Authority	(4215-02-190-99)	2000.00	5000.00	950.00	800.00	2460.00	704.80			736.86	1758.02	391.72	30.46	28.52	742.13	1758.07
9	Rehabilitation /Improvement of UWSS	(4215-01-101-97)	5000.00	5000.00	10000.00	5000.00	4500.00	2229.30	1500.00		1911.32	645.48	5530.92	532.22	295.96	1894.04	645.44
10	Modernisation of Aruvikkara Pumping Station	(4215-01-101-96)	600.00	1.00	1.00	100.00	100.00				632.08	99.09		1.00		632.08	99.09
11	Rural Water Supply Scheme	(4215-01-102-97)	9000.00	8000.00	13000.00	1000.00	1000.00	6757.07	2800.00	2000.00	7140.13	5619.60	7333.63	1675.18	1985.89	7143.20	5618.96
12	Water Supply Scheme to Specified Institutions / Locations	(4215-01-190-98)	225.00	250.00	200.00			100.00					76.44	23.82			
13	E.governance, GIS and information management	(2215-01-190-87)	700.00	917.00	500.00	100.00	100.00	393.00			149.99	90.45	31.56	394.25	100.60	149.99	98.90
14	Optimisation of production and transmission	(4215-01-190-97)	14000.00	14000.00	10000.00			10078.87	4432.00	3000.00			15861.21	5536.39	2054.41		
15	Innovative technologies and Modern Management Practices	(2215-01-101-97 (01))	2000.00	2000.00	100.00	50.00	100.00	243.00			19.08	89.16	5.32	279.98		19.08	90.54
16	ERP	2215-01-101-97(02))	1000.00														

Sl No.	Name of Scheme/ Programme	Major Head	BUDGET					RELEASE					ACTUAL EXPENDITURE				
1	2	3															
			2017-18	2018-19	2019-20	2020-21	2021-22	2017-18	2018-19	2019-20	2020-21	2021-22	2017-18	2018-19	2019-20	2020-21	2021-22
17	JBIC assisted Projects	(4215-01-190-96)	7000.00	7500.00	7500.00			2056.00	2056.00				3178.25	4579.82	2492.85		
18	Drinking water Drought Mitigation	2215-01-800-47	3055.00	3000.00	3000.00	1000.00	1000.00	2197.31	2197.31	2215.00	938.46	999.97		2912.88	918.98	999.90	997.44
19	Accelerated Rural WSSs -50% State share NRDWP	4215-01-102-93		10000.00	10000.00				10776.92	2500.00				10823.78	6191.13		
20	Completion of ongoing NRDWP	4215-01-102-95		10000.00	5000.00	500.00											
21	Source Improvement and water Conservation	4215-01-800-92		500.00	400.00	200.00	200.00				26.83	179.85				26.83	179.84
22	Jala Jeevan Mission (NRDWP 50% CSS - State share)	4215-01-102-92				40000.00	40000.00				37946.95	135344.31				28199.65	105957.19
23	ADB assisted Kerala Urban Water Supply improvement Project - KUWSIP (EAP)	4215-01-101-94				1000.00	10000.00										
24	Human Resources Devt. Research & Devt & qlty control	4215-01-800-91				100.00	100.00				28.41	32.07				28.40	30.40
25	Water Supply Scheme to Specified Inst/ locations	4215-01-800-90				75.00	100.00				72.36	96.13				72.36	95.58
26	Optimisation of production and transmission	4215-01-800-89				5000.00	5000.00				12464.92	14723.81				12623.18	14773.64
27	JICA assisted Projects	4215-01-800-88				1000.00	750.00				1565.76	743.95				1600.00	743.95
28	Works for prevention of river pollution and creating awareness or the compliance of NGT direction	2215-02-106-97					500.00										
28	Jala Jeevan Mission (NRDWP 50% CSS - Central share)	4215-01-100-93				40000.00	40000.00				37946.95	135344.31				28199.65	95784.22
	TOTAL		**67855.00**	**77643.00**	**70051.00**	**102525.00**	**111580.00**	**46047.66**	**32669.81**	**17373.14**	**112490.03**	**305034.44**	**55021.01**	**35262.06**	**23052.66**	**93208.67**	**236321.14**

PERFORMANCE OF 13th FIVE YEAR PLAN - PHYSICAL

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
1	Survey & Investigation (2215-01-190-99-01)	46 numbers of projects amounting to Rs 99.49 lakhs have been achieved	68 numbers of DER/PER Prepared toRs 102.87 lakhs have been achived	21 numbers of DER/PER prepared	50 numbers of DER/PER prepared	8 works with total propject cost of Rs. 61.32 lakh completed
2	NABARD Assisted RWSS (4215-01-102-98-01)	RIDF XIV- Out of 39 schemes, 5 Scheme, 5 Scheme are completed. Four Schemes Partially completed , Remaing scheme ongoing. RIDF XVI- 5 Scheme are ongoing RIDF XVII- 2 major schemes RIDF XVIII- 7 schemes are ongoing RIDF XIX - 8 scheme are in progress RIDF XX- 9 scheme are in progress RIDF XXII- 6 Scheme are in progress RIDF XXIII- 3 Scheme are in progress	RIDF XIV- Out of 39 schemes, 5 Scheme are completed. Four Schemes Partially completed , Remaing scheme ongoing. RIDF XVI- 5 No Completed RIDF XVII- 2 Completed RIDF XVIII-5 No completed and 3 schemes are ongoing RIDF XIX - 8 scheme - 3 completed and 5 No Ongoing RIDF XX- 9 scheme- 6 No completed and 3 No ongoing RIDF XXII- 6 Scheme-1 No completed and 5 No are in progress RIDF XXIII- 3 Scheme are in progress	18 schemes benefitting a population of 1230260 completed in the financial year 2019-20	5 schemes with total project cost of Rs.5940.00 lakhs completed	RIDF - XXVI - 2 Schemes Administrative sanction for an amount of Rs.71.54 crores & RIDF XXVII - 2 schemes Administrative sanction for an amount of Rs.78.96 crores was obtained on 25.08.2021 for the year 2021-2022. 5 schemes worth Rs. 51.72 crores have been completed in this financial year .
3	Manufacturing units for Bottled water (2215-01-190-96)	Civil and machanical works are almost completed . Electrical connection completed. BIS food and safty departments sanction awaited.	The civil and Mechanical work is almost completed. Electrical connection completed. BIS/Food and safety departments sanction awaited.	The civil and mechanical work are completed.The bottled water plant has been handed over to KIIDC	The civil and mechanical work are completed.The Bottled water Plant at Aruvikkara has been handed over to KIIDC on 28.2.2020	The civil and mechanical work are completed.The Bottled water Plant at Aruvikkara has been handed over to KIIDC on 28.2.2020

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
4	Renovation of Existing Civil structures owned by KWA (2215-01-190-92)	FS issued for Rs 1500 lakhs and AS issued for Rs 1392.42 lakhs for various works. Renovation of civil structures such as KWA office building guest houses and pump houses in Kochi, Kottayam, Palakkad, Kozhikode etc are under various stage of	AS issued for Rs 546.16 lakhs for various works. 59 structres through out kerala such as KWA office building, guest houses, tanks, staff quarters and pump houses are completed	2019-20- renovation of 48 civil structures through out Kerala such as KWA office buildings, guest houses, tanks, staff quarters, pump houses are completed	31 works which include maintenance of civil structres through out Kerala such as KWA office buildings, guest houses, tanks, staff quarters and pump houses are completed.	14 works with total project cost of Rs. 125.22 lakh completed
5	Modernisation of Aruvikkara Pumping Station (4215-01-101-96)	Action being initiated	Modernisation of pumping station is on progress- overall 40% completed	Modernisation of pumping station 70% completed in 2019-20	Work completed. Minor civil works pending.	Work completed. Minor civil works pending.
6	Innovative technologies and Modern Management Practices (2215-01-101-97(1)	6 No completed. RO plant set up in sabarimala to benfit 2 cr devottes during the year 2017-18. Projects under NRW management including 1. Water Audit in trivandrum, Kochi, kottayam, Kasagod and Nedumangad. 2. 24 x 7 water supply in peroorkada zone of thiruvanathapuram. 3. bulk metering for all major schemes in KWA. 4. smart metering of for consumers with consumtion above 500 KL per month. 5. replacment of meters of all non domestic and part of domestic consumers in kowdiar with FCRI sertified meters. 6. Pump house automation - pilot study. 7. Desalination Program. 8. Base line survey for asssessing service level	During the year 2018-19,installation of AMR flow meters for schemes in KWA through out kerala is ongoing which monitor the real time flow and take decision for managing the NRW. The work of setting up of electromechanical untis in each district in kerala is also ongoing	During the year 2019-20,2 works which includes the installation of solar panels on the roof top of KWA buildings are completed. 2 works which includes the installation of Bulk flow meter are completed.	During the year 2020-21,11 works which includes setting up of solar power plants over roof top of tanks, automation of pumphouses, procurement of sophisticated equipments for the State Referral Lab at Nettoor etc.are completed.	5 works with total project cost of Rs. 9.95 lakh completed

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
7	Human Resource Development, Research and Development and Quality Control -(4215-01-190-99	2017-18- 118 training courses with 3018 participants were conducted	2018-19- 113 traning courses with 2877 participants were conducted	2019-20- Inhouse training- 2128 persons in 70 batches. Outside training- In state- 34 persons in 10 batches, Outside state- 34 person in 8 batches. Total 2196. Mtech - 4 nos. Workshop (including JJM), Seminar- 791 persons in 16 batches persons.	A total of 2154 officials were trained in the in-house training and outside training in the year 2020-2021	A total of 5734 officials were trained in the year 2021-2022
8	Sewerage schemes of KWA (4215-02-190-99)	1. Thiruvanathapuram sewerage Division maintains the sewerage network of Thiruvanathapuram corporation in addition to the maintenance work take up under state paln, Amrut, MLA's fund and various deposit works. During 2017-18 sewerage network augmented by additon 3575m of new sewer pipe line and 204 manholes. Under Ernakulam district in 4.5 MLD STP 8 No of aerator fans were repalced for 9 Lakh ruppes . In Guruvayoor draingae the 3 MLD treatment palnt at Chakkumkandan is 99 % completd . 6815m pipe line is laid and 249 manholes are constructed till date. Storage tanks in tandem with 3 pumping station is already completed long back.	Thiruvanathapuram sewerage Division maintains the sewerage network of Thiruvanathapuram corporation in addition to the maintenance work. under statePlan, during 2018-19 sewerage network augmented by additon 1679m of new sewer pipe line was laid and 201 manholes were constructed	Thiruvanathapuram Sewerage Division maintains the sewerage network of Thiruvanathapuram Corporation in addition to the maintenance work. Under State Plan, during 2019-20, 15 No of works were completed. The sewerage network augmented by additonal 914m of new sewer pipe line and 362 manholes were newly constructed /raised.	17 works completed which includes replacement of old sewer lines, extension of sewerage network,rehabilitation of old dilapidated man holes,construction of new man holes etc.	7 works with total project cost of Rs. 277.33 lakh completed

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
9	Rehabilitation/Improvement Works of Urban Water Supply Schemes (4215-01-101-97)	Works on the schemes are in various stage of implementation 2 No of urban schemes have been completed 1. Nilambur WSS 2. Kottayam Pattiyam CT WSS	2018-19 - 2 No of Urban scheme completed - 1. UWSS to Ollur - Edakkunny census Town Villages in Thrissur Corporation. 2.Augmentation of Kochi WSS- Improvement of Water Supply to divisions 13,14,15 & 16 of Edakochi area in Kochi Corporation.	2019-20-One no of major urban scheme CWSS to Chittoor – Thathamangalam Municipality and Vadavathoor Panchayath in Palakkad District (Green Book) was completed.3 numbers of works/ improvements to urban water supply schemes were also completed.	The work " Imrovement of WSS to Manjeri-Veetikkunnu ward No. 28,29,20,31 and 32 of Manjeri Municplaity" amounting to Rs. 280 lakhs completed. Calicut WSS-Interconnection and shifting of service lines from old AC pipe to newly laid PVC lines of JICA at various wards at Kozhikode Corporation amounting to Rs. 35 lakhs also completed.	1 work with total propject cost of Rs. 4950.00 lakh completed
10	Rural Water Supply Schemes (4215-01-102-97)	2017-18 - 1. Kilimanoor Pazhayakunnumal 2. WSS to Kumarakama Thiruvarppu 3. WSS to Feroke and Karuvanthuruthy have been completed.	2018-19- 24 minor works for rehababilitaion of the Rural water supply scheme has been completed. Also 4 works which includes major components of the 1.RWSS to WSS to Chithara and adj.pts, 2.WSS to Adoor and adj. Panchayaths, 3.RWSS to Anakkara , 4.WSS to Onchiyam, Chorode etc. completed.	During 2019-20- Eleven number of schemes completed. One major scheme (ARWSS to Kumarakom/Thiruvarppu in Kottayam District) and 10 minor works for improvement of water supply to rural population has been completed.	During 2020-21,3 No. of projects (CWSS to Ayroor-Kanjettukara in Pathanamthitta-Phase II, CRWSS to Elappara and adjoining villages- Providing distribution lines in Peermade panchayath and WSS to Eruvatty village in Pinarayi Panchayath of Talassery Taluk in Kannur district-Laying Distribution network,Maintenance of existing OH tank at Mullankunnu and BMBC crossing by HDD) each worth more than 5 crores were completed and 3 no. of minor works for improvement of water supply to rural	1 works with total project cost of Rs. 25.40 lakh completed

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
11	Water Supply to Specified Institutions/Locations 4215-01-190-98	2017-18- RO palnts have been installed at sabarimala annd distributed 6.6L litre of qualitiy water to pilgrims. This time KWA have introduced hot water supply also.	2018-19- RO plant of capacity 2000 lph (2 Nos.). 1000 lph (1no) for Drinking water supply to Sabarimala and Pampa was installed	2019-20- Five number of schemes for supplying water to Govt hospitals, Medical Colleges and other Government Institutions completed.	***HoA changed in 2020-21***	
12	Water Supply to Specified Institutions/Locations 4215-01-800-90				Administrative sanction is issued for an amount of Rs. 75 lakhs for 5 works in 2020-21 which includes water supply to taluk hospital,school,civil station etc. Three works amounting to Rs. 104.30 lakhs were completed in 2020-21	2 works with total project cost of Rs. 35.20 lakh completed

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
13	E-governance, GIS and Information Management	KWA brought 4 lakh more connections to the centralized spot billing system e abacus. Achieving 93 5 of consumer population(ie more than 1960630 out of 2100000 wtaer connections) development and integration of state service delivery gate way(SSDG) project formulated under the national E governance plan (neGP) is to fullfill the vision of providing easy and conveneient services to the citizens through remote access primarly through common service centres(CSCs) and there by enabling the state portal by implementing the key components state portal Viz SSDG, eelctronic form(ie form) Application and computing Infrastructure was completed. KWA intergated 5 new services to SSDG portal also mobile applications for service delivery developed as a part of SSDG project which is a amjor foot step in M governance. KWA revamped its website to uptodate standred and cutting edge technology. KWA developed a software for monitroing of consumer complaint whcih has a provsion for consumers to register complaints online. the speciality of system is that higher managment can easyly give immediate direction realted to complaint redressel to the concerned officals and they can involve if there is any delay in the process and can have a chat like discussion in each case seperatly. KWA integrated with SWIFT - single window interface for fast and transparent clerance	***Merged with scheme under Sl no. 14 and details entered under Sl No.15***			
14	Enterprise Resource Planning (ERP) for Institutional Strengthening (2215-01-11-97(02)	Retendered the work for ERP and selection of Project consultant	Merged with scheme under Sl no. 13 and details entered under Sl No.15			

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
15	Enterprise Resource Planning (ERP), e-governance, GIS and Information Management-(2215-01-190-87		Implementation of ERP in KWA - First Tender cancelled and new tender is to be invited. Selection of a Project Monitoring Consultant for implementing ERP and recruitment of consultant for KWA is in progress. •Hiring cost for staff under NICSI for maintenance and Support of KWA-Wide Area Network. Contract Staff 3 no:s employed for development of in house software like Court Case Management, KIIFB and AMRUT Management, Electrical Inventory Management. • For availing support for DDFS, MARCH and O&M software. • For implementing Pension Software in KWA through NIC. • For the extension of attendance management system throughout the state •For Annual Maintenance Contract for up keeping of computers, printers. •For purchase of computers and peripherals, UPS, UPS batteries , Network components, Antivirus software. •For leased line and internet connectivity management in existing offices and rollout in pending offices	Implementation of ERP in KWA - System study, preparation and approval of Software Requirement Specification documents, procurement of licenses, hardware, system integration etc by Project Monitoring Consultant and consultant for KWA,procured server for Data center 2 amounting to Rs.23 lakhs, procured UTM Firewell worth Rs.5 lakhs for Head Office,KWA, introduction of Call center for 24 hrs for complaint redressal, contract Staff 3 nos employed for development of in house software like Vehicle Monitoring Software, Purchase Software, Bill Seniority Software,for availing support for DDFS, MARCH and O&M software,AMC for LIMS software,Implementing Pension Software in KWA through NIC,developed in house software for various wings in KWA like Materials Management Software, Contractor Information Management Software,for Annual Maintenance Contract for up keeping of computers, printers, servers, network components, Photocopier etc,for purchase of Network components, Servers, Antivirus software, For leased line and internet connectivity management in existing offices and rollout in pending offices,Completion of URS for revamping.	Contract Staff 3 nos employed for the development of new in house software and developed two software,for availing support for DDFS, MARCH and O&M software, LIMS, Pension Software in KWA through NIC completed and it's testing going on,.Development of new in house software are in progress for various wings in KWA,For AMC for up keeping of computers, printers, servers, network components etc,Purchase of Network components, multifunctional printers, computers, Antivirus software,desktop monitors, computers, laptops, scanners, raid cards etc,.For leased line and internet connectivity management in existing offices, 100% achievements in implementing Quick pay portal, implementation of BBPS,100% Computerisation of all revenue collection centers of KWA,100% Implementation of Introducing POS machines based on banks willingness at all Revenue centers, implementing Mobile application for meter readers and spot point of water charges wherever the consumer requires,revamping of e-Abacus completion activities,implemented the 24 Hours Call center for complaint redressal (1916)	Contracts Staffs employed for the development of inhouse software for Call Centre(KSITM 1916), BSNL leased line connectivity management, DDFS implementation, AMC of march and O&M, AMC of pask, Maintenace/ toner replacement of printer/photocopier, AMC computer
16	Optimisation of production and transmission-4215-01-190-97	2017-18 1. AS issued for optimisation production and transmission for Rs. 16240.8 lakhs. 218 works completed out of 224 works and other works are under various stages of execution	a)Renovation of 33 number ofold water treatment Plants, b) 194 Km old pipes of exisiting water supply schemes are replaced and some are extended , c) Rehabilitaion of 53 obselete pumps and Motors	182 no of works completed which includes a)Renovation of 29 number of old water treatment Plants, b) 250.97 km old pipes of exisiting water supply schemes are replaced and some are extended c) Rehabilitation of 68 obselete pumps and Motors	HoA changed from 2020-21	

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
17	Optimisation of production and transmission-4215-01-800-89	---	---	---	During the financial year 2020-21, 156 works were completed which includes renovation of old water treatment plants, pipe replacement of existing Water Supply Schemes, pipe lines extensions, replacement of obsolete pumps, motors etc. The performances of the schemes were improved and the output was enhanced by such works. Out of the 156 works completed, 10 works are worth more than 1 crore.	66 works with total propject cost of Rs. 666.63 lakh completed
18	Kerala Water Supply Project, JICA (One time sustenance support under the state plan)-4215-01-190-96	1. Thirvanathapuram Scheme- 93.8 % completed. 2.Meenad Scheme- 91.52 % completed 3.Cherthala- 100 % completed 4. kozhikode scheme- 91.13% completed 5. Pattuvam Schmeme-99.29 % completed.	1. Thirvanathapuram Scheme-94 % completed. 2.Meenad Scheme94 % completed 3.Cherthala- 100 % completed 4. kozhikode scheme100% completed	2019-20- Laying of 32 km completed for Meenad and 18 km at Kozhikode completed	***HoA changed from 2020-21***	
19	Kerala Water Supply Project, JICA (One time sustenance support under the state plan)-4215-01-800-88	---	---	---	The distribution works of Kozhikode scheme was closed on 31.3.2020 and Meenad scheme on 31.12.2020. Physical progress during 2020-21 is 22 km distribution main.Balance distribution lines in Kozhikode and Meenad schemes are being arranged through Jal Jeevan Mission	JICA projects under closure
20	National Rural Driking Water Programme(50 % State Share) 2215-01-190-99(18)	2017-18	***Discontinued from 2018-19***			

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
21	Accelerated Rural Water Supply Scheme (50 % css)-4215-01-102-93	---	New scheme in 2018-19. 10 schemes completed	27 schemes benefitting a population of 1694066 completed in the financial year 2019-20	***Discontinued scheme from 2020-21 onwards***	
22	Drinking water - Drought mitigation-2215-01-800-47	450 work completed.	2018-19- Due to flood, the budget outlay for drought has been utilised for floof relief work- out of 624 flood relief work under state plan240 works completed and the balance work are ongoing	During the year 2019-20- 1226 works has been carried out for improving the water supply during drought.	During the year 2020-21, 240 works has been carried out for improving the water supply during drought and covid pandemic periods.	AS for an amount of Rs. 997.54 lakhs issued for 219 works for drought mitigation and the works are in various stages of execution
23	Source improvement and water conservation-4215-01-800-92	---	New scheme in 2018-19 - Various source improvement works are ongoing through out Kerala	Various source improvement works are ongoing throughout Kerala.In year 2019-20, 5 No of works completed.	In year 2020-21, 9 works were completed.	4 works with total project cost of Rs.32.40 lakh completed
24	Completion of on-going National Rural Drinking Water (NRDWP) Programme-4215-01-102-95	---	New scheme sanctioned in 2018-19 NIL	Eventhough Rs. 50 crore was allocated, no fund was released to KWA and all the works were continued under the head Accelerated Rural WSS	***Discontinued scheme from 2020-21 onwards***	
25	Jal Jeevan Mission (NRDWP) Scheme (50 % CSS) 4215-01-102-92	---	---	---	***New scheme sanctioned in 2020-21*** . 4.05 lakh connections were given in 2020-21	4.58 lakh FHTC's given.Drinking water supply has also been ensured to all Rural schools and Anganwadis.12 District level Quality Control Laboratories and 32 Sub District Lab of KWA could achieve National Accreditation Board for Testing and Calibration Laboratories' (NABL) accreditation

Sl No.	Name of Scheme/ Programme	Achievements				
		2017-18	2018-19	2019-20	2020-21	2021-22
26	ADB assisted Kerala Urban Water Supply Improvement Project-KUWSIP (EAP) 4215-01-101-94	---	---	---	***New scheme sanctioned in 2020-21*** - An amount of Rs 1000 lakh was provided for the project during 2020-2021,which has not been utilised yet.Expression of interest for selection of the loan implementation support unit(LISU) has been invited and shortlisting of consultants completed.The draft request for proposal and draft bidding document to Kochi networks is submitted to GoK to obtain sanction to include conditions related to International Arbitration.	The activities as per ADB guidelines for signing the loan agreement are in progress. The Expression of Interest (EOI) for selecting Loan Implementation Support Unit (LISU) has been invited and firms shortlisted for which ADB has given their NOC. The draft Request for Proposal (RFP) for appointing LISU and draft bidding document for Kochi distribution network are submitted to Government of Kerala for approval. Approval of Government is also sought for incorporating ADB guidelines on International Arbitration with venue as Singapore in the above documents. Further progress of the KUWSIP is subject to approval of the submitted documents from GoK.
27	of river pollution and creating awareness for the compliance of NGT direction (2215-02-106-97)	---	---	---	---	***New scheme sanctioned in 2021-22*** . AS issued for an amount of Rs.331.42 lakhs