ABSTRACT

Jal Jeevan Mission – Tamil Nadu – Issue of Operation and Maintenance policy of Water Supply Schemes in Tamil Nadu – Approved – Orders - Issued.

Municipal Administration and Water Supply (WS.1) Department

G.O.(Ms.) No.26 **Dated: 27.02.2024.**

சோபகிருது, மாசி-15

திருவள்ளுவர் ஆண்டு-2055

Read:-

From the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board Letter No.F.2-2/SLSSC/JJM/2022, Dated 7.12.2023.

* * * * *

ORDER:-

In the letter read above, the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board has stated that in the Annual Action Plan 2023-24 meeting held on 10.3.2023, the Secretary, Department of Drinking Water and Sanitation, Ministry of Jal Shakti, Government of India, has instructed the State to develop Operation and Maintenance Policy of Water Supply Schemes. During the Joint review meeting of Chief Secretary to Government of Tamil Nadu and Secretary, Department of Drinking Water and Sanitation, Ministry of Jal Shakti, Government of India held on 11.04.2023, it was instructed that the Operation and Maintenance Policy for the state is to be evolved. The policy should also involve concepts like provision of new Functional Household Tap Connections, maintenance of water supply, payment of energy cost, Operation and Maintenance Policy Gap funding, etc.

2. Accordingly, the Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board has sent the Operation and Maintenance policy of Water Supply Schemes in Tamil Nadu and also stated that the suggestions of the National Jal Jeevan Mission, Government of India, Water Resources Department and Central Ground Water Board have been incorporated in the above Operation and Maintenance policy and also the Operation and Maintenance policy of Water Supply Schemes in Tamil Nadu was placed in the 13th State Level Scheme Sanctioning Committee meeting held on 06.10.2023 and the State Level Scheme Sanctioning Committee accorded approval to the Operation and Maintenance policy of Water Supply Schemes in Tamil Nadu.

3. The Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board has therefore requested the Government to approve the Operation and Maintenance policy of Water Supply Schemes in Tamil Nadu.

4. The Government after careful examination, have decided to approve the Operation and Maintenance policy of Water Supply Schemes in Tamil Nadu as annexed to this order for implementation in all the water supply schemes in Tamil Nadu.

(BY ORDER OF THE GOVERNOR)

D. KARTHIKEYAN
PRINCIPALSECRETARY TO GOVERNMENT

To:

All Members of the Apex Committee of Jal Jeevan Mission
All Members of the Executive Committee of Jal Jeevan Mission
All Members of the State Level Scheme Sanctioning Committee of Jal Jeevan Mission

[Thro Mission Director, Jal Jeevan Mission / Managing Director, Tamil Nadu Water Supply and Drainage Board, Chennai-5.]

The Principal Secretary, Rural Development and Panchayat Raj Department, Secretariat, Chennai-9.
The Mission Director, Jal Jeevan Mission and Managing Director, Tamil Nadu Water Supply and Drainage Board, Chennai-5.
The Director of Rural Development and Panchayat Raj, Chennai-15.
All District Collectors (through the Managing Director, Tamil Nadu Water Supply and Drainage Board, Chennai-5).
All Project Directors, District Rural Development Agency, (through the Managing Director, Tamil Nadu Water Supply and Drainage Board, Chennai-5).
The Director of Municipal Administration, Chennai-28.
The Director of Town Panchayats, Chennai-28.
The Chief Executive Officer, Tamil Nadu Water Investment Company Limited, Chennai-32.

Copy to:

The Office of the Hon'ble Minister for Municipal Administration, Secretariat, Chennai – 600 009.
The Office of the Hon'ble Minister for Rural Development, Secretariat, Chennai – 600 009.
The principal Private Secretary to the Principal Secretary to Government, Municipal Administration and Water Supply Department, Chennai–600 009.
The Municipal Administration & Water Supply (OP.2) Department, Chennai-9.
The Finance (MAWS/RD&PR) Department, Secretariat, Chennai–600 009.
The National Informatics Centre, Secretariat, Chennai–600 009.
Stock file / Spare Copy.

//FORWARDED BY ORDER//

Lon.

SECTION OFFICER.

ANNEXURE

G.O.(Ms.)No.26,

Municipal Administration and Water Supply (WS.1) Department,

Dated 27.02.2024

Jal Jeevan Mission in Tamil Nadu

Operation and Maintenance policy of Water Supply Schemes in Tamil Nadu.

INDEX

Abbreviations/ Short forms

Abbreviation/ Short forms	Explanation
BIS	Bureau of Indian Standards
CWSS	Combined Water Supply Scheme(s)
DPR	Detailed Project Report
EB	Electricity Board - (referring TANGEDCO)
FHTC	Functional Household Tap Connection
FTK	Field Test Kits
GIS	Geographic Information System
G.O.	Government Order
Govt.	Government
GRM	Grievance Redressal Mechanism
ID	Inner Diameter
IEC	Information Education Communication
IoT	Internet of Things
IVDN	In-Village Distribution Network
JJM	Jal Jeevan Mission
LPCD	Liters Per Capita per Day
MA&WS	Municipal Administration and Water Supply
MLD	Million Liters per Day
MVS	Multi Village Scheme
NGO	Non-Governmental Organisation
Nos.	Numbers
O&M	Operation and Maintenance

Abbreviation/ Short forms	Explanation
OHT	Over Head Tank
PPM	Parts per Million
PRI	Panchayat Raj Institutions
RD&PR Dept.	Rural Development and Panchayat Raj Department
RIRD	Regional Institute of Rural Development and Panchayat Raj
RLB	Rural Local Body
Rs.	Rupee
SDG	Sustainable Development Goals
SHG	Self Help Group
SOP	Standard Operating Procedures
SOR	Schedule of Rates
SVS	Single Village Scheme
TANGEDCO	Tamil Nadu Generation and Distribution Corporation
TWAD	Tamil Nadu Water Supply and Drainage
VP	Village Panchayat
VWSC	Village Water and Sanitation Committee
WTP	Water Treatment Plant

Chapter I – Introduction

1.1. Tamil Nadu – an Overview:

Thousands of years ago, people of Tamil Nadu were endowed with distinctly rare and exemplary knowledge in water management. Ancient Tamil literature speaks eloquently about judicious use of water. Kings have built tanks and lakes to store water, which continue to exist and serve till date. Water , to them, was sacred. In Sangam literature, Water has the two attributes of being sweet and easy to use. Tamil scholars have said, 'sweetness and excellence are the essential qualities of water, as water is cool, the word neer (water) is expanded by Tamils to tanneer or cool water. This is how a tropical population relates to water.

In the current era, recognizing the Centrality of supply of clean water in developmental outcomes, UN in its Sustainable Development Goal (SDG) 6–mandated all member states to provide Clean Water and Sanitation i.e. to ensure availability and sustainable management of water and sanitation for all. The targets cover all aspects of both the water cycle and sanitation systems, and their achievement is designed to contribute to progress across a range of other SDGs, most notably on health, education, economics and the environment. With great historical inheritance about water management techniques and deeply aware of criticality of clean water supply in achieving and sustaining developmental outcomes, it is critical to create O & M policy for the sustainability and durability of the water supply system.

Appreciation of state's geomorphology also places importance of water supply systems. Tamil Nadu is a drought prone state and it is mainly dependent on monsoon rainfall. As the state is lying on the leeward side of Western Ghats, it receives minimal South west monsoon rains and North east monsoon is one of the highly variable weather phenomena in India, placing abundant stress on the water supply systems in the state. Tamil Nadu, also being lower riparian, is at a disadvantageous position in terms of water sharing during lean years, also, the state's geomorphology consists of around 70% rock strata which are resisting the percolation / storage of water under subsurface layer and further increasing the water stress. With increasing per capita income, increase in agriculture productivity, strong industrialization and urbanization, the water use intensity has increased manifold and thus O&M policy for water supply schemes assumes paramount importance to protect the capital invested so far.

Within the above challenges, the state of Tamil Nadu places a great deal of importance on the rural water supply sector, as approximately 52% of the state's population resides in rural areas. This sector has become increasingly significant in the light of recurring droughts, decreasing groundwater levels, sea water intrusion, climate change and floods, which have led to the decrease in the per capita availability of water.

1.2. Introduction to Water Supply Schemes:

The major sources for the water supply schemes are surface & sub – surface water from the river beds. With the support of such source, the water supply schemes are designed and implemented for public use.

As per the report published by the Central Ground Water Board, more than 50% of the block falls under the over exploited, critical, semi-critical and saline category and only 37% of block falls under Safe category. Tamil Nadu being a water deficit state with no perennial rivers faces difficulty to meet the water demand. Since, more than 50% of the blocks are either over exploited or critical & semi critical, Water supply to these habitations needs to be provided either through Combined Water Supply Schemes maintained by Tamil Nadu Water Supply and Drainage Board (TWAD) or through Single Village Schemes (SVS) maintained by the concerned Village Panchayats for sustainable water supply of required quantity at prescribed quality to the rural households.

There are two types of water supply scheme i.e. **i.** Single Village Scheme and **ii.** Combined Water Supply Schemes /Multi Village Schemes.

i. **Single Village Scheme:** The project where the water is drawn from a sustainable source within the Village Panchayat and distributed amongst its inhabitants. These schemes have very smaller infrastructure designed to supply water for one or more rural habitations within the village panchayat with in-situ local sources like bore wells/ Infiltration wells/ open wells.

ii. **Combined Water Supply Scheme:** On account of unavailability of dependable water source, CWSS / MVS brings water from faraway area, usually surface or subsurface water from a dependable river and the water is either conveyed through pumping or gravity to more than one habitations. By its very nature, MVS / CWSS is capital intensive, maintenance dependent water supply system.

1.3. Need for the O&M Policy:

The State of Tamil Nadu resolves that infrastructure and asset based approach necessitates to provide drinking water supply is not sufficient to achieve sustainable services.

This necessitates the need for this operation and maintenance policy for both combined water supply schemes and single village schemes.

Infrastructure in water supply sector should be accompanied with comprehensive policy on operation and maintenance for both combined water supply schemes and single village schemes. The aim of this water supply scheme O&M policy is to facilitate in improving efficiency and sustainability of rural water supply schemes across the State. With increasing demand on freshwater on one side and the resource base being finite on the other hand, there is an urgent need for smart water management by all the stakeholders. Operation & Maintenance measures have to be nested with legal, policy and regulatory mechanisms as well as institutional architecture. The O&M policy is a long felt need and will enhance capacity of sector stakeholders for sustainable operation and maintenance.

1.4. Vision of the O&M Policy of water supply schemes:

a) To provide sustainable water supply to the citizens with required quantity and assured quality on a regular and long term basis.
b) To implement the standard operating procedure for the processes involved in the operation and maintenance of all components is CWSS / SVS.
c) To benchmark quick response standards in the context of disaster management for adaptation and mitigation.
d) To develop capacity building to all the stakeholder's regarding the O&M of CWSS / SVS.
e) To ensure reduced O&M cost and effective cost recovery for **financial** sustainability of the CWSS / SVS.

1.5. Mission of the O&M Policy of water supply schemes:

a) To ensure sustainable, safe and potable drinking water supply to the general public through Single Village Schemes /Combined Water supply Schemes, the state shall endeavor to test all the water sources at source & distribution both pre & post monsoon to ensure the quality of water supply to the public. Further, climate resilient water supply schemes shall be designed and built at vulnerable locations.
b) Standardization of the process involved in the operation and maintenance of CWSS / WSS / SVS by following standard operating procedure to ensure efficiency and effectiveness of CWSS/ SVS.

c) By preparing capacity building action plan for personnel at various levels of the water supply departments and monitor its implementation, arrange Training of Trainers (ToTs), IEC material use, etc., skill development, training and awareness generation among communities, Engineers/staff & other personnels involving in O&M of CWSS/SVS. Training & Capacity Building shall be customized to suit different levels covering various technical, managerial and leadership aspects. For long-term water security, concerted efforts need to be made to bring the mindset change to make engineers as Public Health Engineers and Utility/ Service managers.

d) One of the essential criteria for hassle free operation and maintenance of water supply schemes is cost recovery and proper financing policy. The progressive reduction in O&M cost and effective cost recovery for **financial** sustainability of the CWSS/SVS will be ensured and thus potable water at the required level of supply will be provided at an affordable water charges. This will increases the **financial viability and sustainability** of local bodies, TWAD Board & TANGEDCO.

Chapter II. Institutional Setup, Governance and O&M of WSS:

In Tamil Nadu, TWAD Board is the nodal agency to design, implement and Operation & Maintenance of Combined water supply schemes (MVS). RD&PR Department is to design, implement and Operation & Maintenance of SVS and in-village component of CWSS/MVS and SVS.

2.1. Municipal Administration and Water Supply Department.

The Municipal Administration and Water Supply Department is responsible for the development of urban areas in the State and ensuring provision of water supply to all the areas of the State.

The Municipal Administration and Water Supply Department is the nodal department for water supply to rural areas in the state.

Under this department, TWAD Board is designated for design and implementation of water supply scheme in a comprehensive manner and O&M of such schemes by collecting water tariff.

2.1.1.TWAD Board:

Combined water supply schemes covering more than one local body are being maintained by TWAD Board.

TWAD Board has been functioning as an engineering body, implementing water supply schemes to provide safe drinking water to the people in rural and urban areas of Tamil Nadu and underground sewerage schemes in urban areas, excluding the Chennai Metropolitan Area.

Roles of TWAD Board in Rural Water Supply:

- Planning, design and implementation of water supply schemes to rural areas in Tamil Nadu.
- Operation and maintenance of combined water supply schemes upto OHT.
- Testing and monitoring the quality of water supplied.

At present, TWAD Board maintains 544 combined water supply schemes, covering 12 corporations, 65 municipalities, 346 town panchayats, 52,361 rural habitations and 568 industries / institutions, benefiting a population of 4.53 crore. An average of 2,104 MLD of water is supplied up to the over head tanks of the respective local bodies through these 544

combined water supply schemes. For rest of the beneficiaries, the water for public, is being supplied by the respective local bodies with local water source.

TWAD Board is functioning with four Regional Offices, located at Vellore, Thanjavur, Coimbatore and Madurai, each headed by a Chief Engineer to carry out the design and implementation of water supply and sewerage schemes and also the maintenance of combined water supply schemes. One Hydrogeology Cell is functioning for identification of sources of water for various water supply schemes implemented by TWAD Board through the applications of remote sensing and GIS Technology and One state level laboratory at Chennai, with its sub-ordinate laboratories are functioning at various levels for testing of Chemical and bacteriological parameters in the water being supplied and appropriate remedial action are taken.

2.2. Commissionerate/Directorate of Rural Development and Panchayat Raj

The Rural Development and Panchayat Raj Department design and implement single village schemes (SVS) and in-village component of CWSS/MVS. These works include the creation of water source, in-village infrastructure, construction of overhead tanks and provision of functional household tap connections (FHTCs).

In Tamil Nadu there are 37 districts except Chennai. In these 37 districts there are 37 District Panchayats, 388 Block panchayats, 12,525 Village panchayats governing 79,396 rural Habitations. The Water supply to the rural habitations through tap connections are effected from the OHTs by RD and PR.

Providing Functional household tap connections, maintenance of existing water supply connections, collection of user charges are important water supply functions carried out by the RD and PR Department.

2.3. District Administration.

At the district level, District Water and Sanitation Mission (DWSM) is headed by District Collector along with Members from diverse Departments who are stakeholders. DWSM will consider and recommend Administrative Approval of the in-village water supply schemes, plan protection and preservation of village water sources, grey water management, preventing water bodies/sources from getting polluted, etc. Further, the DWSM will prepare district Annual Action plan in consultation with people's representatives such as MP/ MLAs/ chairperson of district Panchayat.

In each district, all water supply projects in the districts are monitored by the District Collector /Chairman of the DWSM.

Chapter III – O&M policy statement of SVS & CWSS:

3.1. Single Village Schemes

A scheme to provide water supply to more than one habitation or to cover all the habitations in a village panchayat, if the source is available within the VP is referred as Single Village Scheme.

The entire O&M of Water Supply to rural areas inside the Village Panchayats (In-village infrastructures) will be done by Rural Development and Panchayat Raj Department. Whereas the common component infrastructure i.e. up to Sumps/Over Head Tanks from the Combined Water Supply Schemes will be maintained by Tamil Nadu Water Supply and Drainage Board.

Village Panchayats (Local Bodies) shall maintain the in-village infrastructures of Single Village Schemes and Multi Village Schemes. The in-village infrastructures consist of source for SVS (bore-wells), Pumping/ feeder main, Over Head Tanks, in-village Distribution networks, control valves, FHTCs., etc.

3.2. Combined water supply Schemes (MVS):

Combined water supply schemes are the comprehensive projects which covers more than one local body with sustainable and reliable sources like river bed, good aquifer, etc. through both gravity & pumping mode of operation. These types of projects contain huge infrastructures with high capital cost & operating cost. With regard to Common component of CWSS O&M will be done by TWAD Board whereas the O&M of in-village infrastructures of Single Village Schemes and Multi Village Schemes will be done by the Village Panchayats (Local Bodies) concerned.

The objective of an efficient operation and maintenance of a Combined Water Supply System is to provide designed, safe and clean drinking water, at adequate pressure at convenient location and as economically as possible on a sustainable basis.

Operation refers to timely and daily operations of the components of a Combined Water Supply System such as head works, treatment plant, machinery and equipment, transmission mains, service reservoirs and distribution system etc., effectively by various technical personnel, which is a routine function.

Maintenance is defined as the art of keeping the water supply infrastructures, water treatment plants, machinery and equipment and other facilities in an optimum working condition. Maintenance includes preventive maintenance or corrective maintenance, repairs and corrective action.

The minimum requirements for good operation and maintenance are

(a) Preparation of plan for operation and maintenance

(b) Periodical maintenance of the critical components

(c) Providing required personnel to operate and maintain

(d) Availability of spares and tools for ensuing maintenance

(e) Maintaining records such as the history of equipment, costs, life etc.

(f) Regular supervision of the O&M of all the components

(g) Premises of O&M infrastructures shall be kept neat and tidy.

(h) Establishing a sound financial management system.

The water supply schemes have the following major components:

Head Works	-	Source, Pump set, Pump room
Treatment Works	-	Full scale or partial treatment, Chlorinator
Transmission system	-	Pumping main, Gravity main, Branch main
Collection Mechanism	-	Sumps, Service Reservoir
Distribution	-	Distribution main, Functional Household Tap Connection (FHTCs)

3.3. Policy Statement for O&M of SVS and CWSS

The Policy on Operation and Maintenance is intended to serve as a guide to strengthening the technical, operational and managerial capabilities required of the concerned personal to operate and maintain water supply services as per acceptable norms of quantity, quality, sustainability, reliability and cost.

3.3.1. Sustainable water sources:

i. RD and PR shall ensure the sustainability of the sources of all SVS being maintained and shall take earnest step to ensure sustainability of the sources by pooling their resources available at village panchayat level for source augmentation by clearing inlet & outlet channels, desilting and strengthening of bunds which are sources for SVS. The Village Panchayats shall implement rain water harvesting structures in all community and private buildings to ensure adequate sustainability of the sources.

ii. Protection of sources like borewells, open wells must be done using suitable fencing arrangement similarly, bore pits shall be provided for reducing the source contamination.

iii. TWAD Board shall ensure the sustainability of the sources of all CWSS and shall take earnest step to ensure that necessary quantity of water is being drawn from sources like borewells / Infiltration wells/ Collector Wells/ Collection wells/ Open Well, etc., in coordination with the District Administration and Departments concerned.

iv. During the lean period, necessary flow diversion channels leading to Infiltration wells/ Collector wells shall be made to sustain the water supply.

v. The yield of individual head works like borewells / Infiltration wells/ Collector Wells/ Collection wells/ Open Wells, etc. shall be monitored by the field engineer concerned regularly.

vi. Once the yield of the well is drawn down to below 50% of the required yield, attention shall be given to such head works and necessary rectification works like flushing of borewells/ flushing of radial arms in Collector wells/ cleaning of surface of porous media in Infiltration wells/ deepening of open wells or an alternative arrangements, may be made.

vii. Necessary Hydro-geological survey shall be conducted for reason of reduced yield and also to substantiate the existing head works.

viii. By providing necessary storage structures such as sub surface dykes, check dams, barrages for CWSS and artificial rain water recharge structures at the areas of sources/Head works of SVS, Sustainability of the source for an uninterrupted and designed quantity of water supply shall be attained.

3.3.2. Provision of FHTCs:

The village Panchayat shall provide FHTCs to all households. A deposit of Rs.1000/- and monthly user charges will be collected.

3.3.3. Quality of Water Supply:

i. TWAD Board and RD and PR draw water from sustainable sources and after appropriate treatment, supply safe drinking water by pumping the water upto respective OHTs and upto FHTCs at Household level respectively.

ii. TWAD Board and RD and PR shall supply water complying with the quality standards of BIS 10500 specifications.

iii. The water supplied from the source to FHTCs shall be free from contamination with necessary disinfection by chlorination.

iv. In case of Water Treatment Plant, the Surface water shall involve pre-chlorination & post chlorination based on the characteristics of the raw water/clear water without any dilution.

v. The disinfection shall be done at an appropriate quantity so as to maintain 0.20 ppm at the FHTCs.

vi. Complete records of bacteriological and chemical analysis test report of water from sources to FHTCs, Schools, Anganwadis and Public institutions should be maintained. Bacteriological and chemical analysis test shall be done for all the sources during pre and post monsoon period.

vii. Preventing external pollution by properly protecting the ventilators, manhole openings and over flow pipes in water storage structures, sumps, OHTs, etc., should be monitored.

viii. Periodical cleaning of reservoirs, sumps/OHTs should be done at least once in a month and general cleanliness in and around the reservoirs, sumps/OHTs should be maintained. Access control measures shall be established in all storage structures to prevent access to unauthorised persons.

ix. Water quality shall be tested through the distributed Field Test Kits in the village panchayats. 5 Self Help Group members in each Village Panchayat have been trained to test 13 water quality parameters using Field Test Kits and the details shall be updated in WQMIS for comprehensive monitoring.

x. Regular monitoring of water quality shall be done by SHGs through testing of water samples, at all water sources, FHTCs, Schools, Anganwadis and Public institutions using Field Testing Kits and it shall be ensured across all panchayats and cases of contamination should be notified in WQMIS.

xi. In case of quality aspects not meeting established standards, immediate remedial action shall be taken to enable the beneficiaries to get potable water supply.

xii. The cost towards operation and maintenance of Water Quality laboratories i.e., chemicals, manpower, reviving the O&M of equipments shall be met

out from the collection of water charges for CWSS/MVS and collection of user charges from the Panchayats / collection of water sample testing charges from any general public/ private entity.

3.3.4. Priority for water use:

i. In case of less yield in water source of a CWSS /SVS, the drinking water needs of the people will have highest priority among competing uses of water.

ii. Whenever there is reduced yield in the sources / head works of a SVS / CWSS, priority of water supply share shall be given to the public drinking water. Rest of the quantity shall be spared with the industrial/ commercial/ institutional beneficiaries under that WSS.

3.3.5. Disaster risk mitigation and adaption in water supply system:

A. Mitigation measures

i. Sand mining within 500 m radius around the head works at River bed location of CWSS/SVS shall be strictly prohibited.

ii. The sand removed portion near the Infiltration Wells / collector wells should be filled up by sand.

iii. The exposed cable and connecting main should be fully covered with sand in the river bed. Proper Anchoring arrangements of connecting main & electric cables shall be made.

iv. Flood protection arrangements should be made around pump house and sump, so that no flood water enters into pump room and sumps. Especially the above flood protection arrangements should be done in the low lying areas in which the head works is located.

v. Pumpsets and other electromechanical items should be lifted, to avoid submergence of equipments in water.

vi. It should be ensured that the pipes and jointing materials required for attending the pipeline damage works during flood should be immediately arranged in the event of flood occurs.

vii. During drought, flow diversion in river, flushing of bore wells & Radial arms of Collector well, cleaning of surface of porous media in Infiltration wells, deepening of open wells, shall be done to augment required water from the existing head works.

viii. **Breakdown of the System:** For any immediate trouble shooting in SVS / CWSS, the contact number and address of the local Officer-in-Charge may be published to the people. The contact number and address have to be updated then and there.

ix. **Emergency Situation** handling for SVS/ CWSS:

a) Identify situations or events, locations that could trigger an emergency condition or disaster and require immediate action to protect life and property.

b) Emergency Action Plan: Set out the procedures to be followed in this connection sequentially to mitigate the effects of the disaster.

c) Identify primary and auxiliary communications systems, both internal (within the Department) and external (between Department and Public, outside entities.

B. Adaptation measures:

i. Ensure the working condition of Diesel Generators and adequate stock of Diesel for running the Diesel Generators.

ii. If Diesel Generators are not available, make necessary arrangements, for hiring of Diesel Generators. The Vendors' address with their contact number shall be readily available.

iii. Fill the sumps and OHTs to its maximum capacity whenever situation warrants in order to combat scarcity because of power failure.

C. Cleaning and disinfection activities to be carried out during Disaster:

i. Ensure covering of all the Air vents in sumps and OHTs with mosquito nets to prevent entry and breeding of mosquitoes.

ii. In case of any contamination of water, create awareness among the public not to use the contaminated water through social media, News Paper, Electronic media. Also, arrange to supply potable water from other sources.

iii. Ensure adequate quantity of bleaching powder for disinfection activities. Action should be taken to maintain the residual chlorine level at supply points.

iv. Avoid stagnation of waste water at all infrastructures related to water supply to avoid cross contamination.

D. Post disaster activities :

i. Necessary rectification works for revamping of Head works, pipelines, storage tanks, sumps, electromechanical components, shall be carried out.

ii. Coordinate with various departments of state Govt. such as, Power, Irrigation & Water Resources, Health etc. for immediate restoration.

iii. Contingent plan shall be evolved to face adverse disasters like drought, floods and other natural calamities.

3.3.6. Recharge Structures – Quality and Quantity of Source:

i. Whenever any government department like Water Resource Department, Agricultural Engineering Department and Rural Development and Panchayat Raj Department is planning to construct any artificial recharge structures / Augmenting water resource like Micro/Mini/Mega Check dams/Weirs, Recharge pits, Rainwater harvesting structures, etc, preference shall be given to the areas which can augment water sources for Head works of the CWSS/SVS and Hydrogeology wing of TWAD Board may be consulted. On saturation of those areas, other areas can be taken up.

ii. District recharge plans prepared by CGWB based on National Aquifer mapping (NAQUIM) studies, need to be taken into account while implementing Artificial Recharge Schemes (ARS).

iii. Standard Operating Procedure (SoP) on "Sustainability of Ground Water Sources" prepared by CGWB, Ministry of Jal Shakti (MoJS) is to be followed while implementing the ARS schemes.

iv. Drilling of observation wells with Digital Water Level Recorders (DWLR) (Telemetry) is required around the major ARS schemes so that impact assessment can be carried out.

v. In addition to regular monitoring by TWAD and RD and PR, Impact assessment of ARS schemes constructed for source sustainability may be done through water level and quality monitoring on monthly basis by involving local people/farmers through participatory approach to create awareness among the public.

3.3.7. Infrastructure Maintenance in Water Supply schemes

i. All the infrastructures like WTPs, Pipelines, Sumps, etc., are designed to serve 30 years. Some of the components like Pipelines, Storage reservoirs

etc., are prone to damage due to various reasons viz. corrosion, leakages caused during repair works. Revamping works shall be taken up in the Combined Water Supply Schemes / Single Village Schemes that has outlived its designed life period in which a reduction in yield of sources or a decrease in the efficiency of pump sets and damages in pipe lines, valves, etc. are encountered.

ii. A detailed record of breakdowns and leaks occurred and repaired shall be maintained so that more vulnerable leaks could be identified and special measure to repair/ replacement could be under taken.

iii. If any silt content noticed, the bore should be flushed and the submersible motors erected in sedimentary bores should be removed, serviced and re-erected. Problems noticed in the motor should be analyzed and noted in the logbook for future study.

iv. Slot portion of all sedimentary bore wells should be flushed and cleaned using special type air blower for removal of silt deposit at least once in two years.

v. Dry running of the pumps should be avoided.

vi. Pumps should be operated only within the recommended Head range.

vii. Operation of all Scour valves in the Pumping /Gravity main should be done periodically.

viii. Leak detection surveys should be undertaken particularly for bursting of pipes and leaky joints, when the difference in quantity of water produced and water supplied is more than 15% i.e. loss of water due to leakage.

ix. A regular schedule of inspection and servicing of valves including air and scour valves should be carried out and the same followed scrupulously.

x. In case of MS pipes, anticorrosive painting must be done at least once in five years for pipes and at least once in two years for appurtenances such as sluice valve, scour valve, air valves etc.,

xi. Devices for measuring the inflows and outflows such as water level indicators and recorders should be provided and they should be maintained properly.

xii. All Dilapidated Over head tanks/structures, shall be dismantled immediately so as to avoid accidents and new structure shall be constructed without affecting the regular water supply.

3.4. Quantity Monitoring System and Other components:

3.4.1. Measuring bulk water supply through metering:

i. Bulk Water Meters shall be installed at appropriate locations to measure water supplied to beneficiaries, water charges collection and to assess the Non- Revenue water.

3.4.2. Centralised Monitoring System:

i. Centralised Monitoring system shall be established using Internet of Things (IoT) for monitoring the water supply effected.

ii. With the help of such sophisticated system, proper monitoring & control over the vast area is achieved and thereby the service delivery of the Government shall be assured by providing regulated water supply with required quantity. This will be useful in non revenue water and increase in efficiency of schemes.

3.4.3. Damage to water distribution and pumping network:

i. Damages caused to any component of existing water supply schemes such as raw water main, clear water mains, distribution pipelines etc. during construction activities carried out by any other departments / agencies, they shall be solely liable for restoration of infrastructure and water supply service, for which the cost shall be borne by the damage causing institution/ party/ department/ contractor.

ii. Prior permission of the TWAD Board/ RD and PR Department shall be obtained by the departments like highways, railways, other agencies, etc. to carry out their constructional works in the alignment of existing water carrying pipeline. Further, they shall shift the existing pipelines / pay necessary compensation to meet out such shifting to the water supply department, so as to ensure the regular water supply is being made to the public.

iii. Hence, the line department shall include necessary provisions for utility shifting in their detailed estimates for water supply pipelines shifting works, if any.

3.4.4. Unauthorized tapping of water:

i. Unauthorised tapping of water & damaging of pipelines of the CWSS/SVS is an offence. In such cases, Official concerned shall lodge a complaint with the concerned authorities against unauthorized tapping, damaging of pipelines, illegal connections and vandalism and take necessary further action.

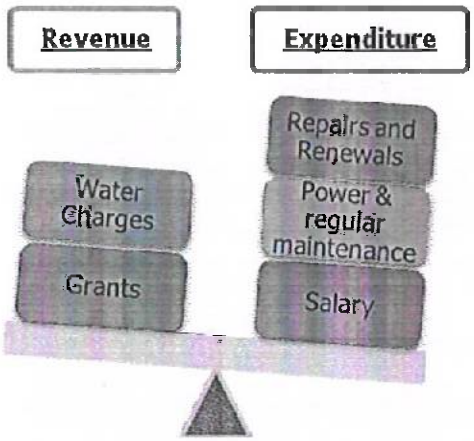
3.4.5. Resolving issues in the Power supply connections.

i. The uninterrupted power supply is essential for supplying required quantity of water to the public, whereas the quality of power supply is essential for the effective performance and life of the Electro-Mechanical machineries. Hence, both uninterrupted and quality power supply shall be ensured in coordination with TANGEDCO on priority basis.

ii. If the CWSS is to be designed for more than 20 hours for want of source a separate EB feeder line is to be provided so as to provide uninterrupted water supply and designed quantity of water to the public without power break down.

Chapter IV – Financial Management of Water Supply Schemes

4.1. Revenue and Expenditure for CWSS:



i. The operation and maintenance of the water supply scheme is crucially dependent on the sound financial position and management by the TWAD Board for MVS.

ii. The operation and maintenance policy places central importance on proper on maintenance of the capital assets built for MVS and brings the focus on efficient resource mobilization and rationalization in O&M expenditures.

iii. The policy lays emphasis on proper design and good engineering practices for overall optimization in O&M expenditure as poorly built capital assets leads to high life cycle costs.

4.2. Financial sustainability & Management for CWSS (MVS):

A. Measures to augment Revenue:

i. The tariff fixed for consumers may be on par with the production cost and O&M cost. There shall be annual revision taking into account accumulated liabilities, increase / decrease in operational expenditure and increase / decrease in power tariff.

ii. Adequate O&M gap filling funds and other funds will be released to TWAD Board by the Government at the appropriate time as per the recommendations of State Finance commission.

iii. The RD and PR Department will collect the water charges from the rural beneficiaries & pay to TWAD Board on a monthly basis.

iv. TWAD Board shall endeavor to collect all outstanding water charges with accumulated interest from all the beneficiaries in a timely manner.

v. TWAD Board shall endeavor to collect the current monthly water charges from all the beneficiaries within 30 days of the succeeding month.

vi. TWAD Board shall diligently process the request for new water supply connections from commercial/ industrial/ institutional organizations to maximize the revenue without affecting the existing water supply to the beneficiaries.

vii. TWAD Board shall undertake an exercise to identify schemes which have crossed intermediate stage to ultimate stage yet the pumpsets are only at intermediate stage which causes sub-optimal utilization of civil infrastructures created for ultimate stage and also depriving the general public of assured water supply. Such pumpsets shall be replaced to ultimate stage to improve the service delivery and augment revenue to the Board.

viii. Smart water meters shall be installed at all the service delivery locations so as to ascertain the quantity of water and billing may be done accordingly.

B. Measures to optimize Expenditure:

i. Operating pumpsets at optimal efficiency will reduce the electrical energy cost and will ensure desired quantity of pumping. TWAD Board shall endeavor to audit its pumpsets regularly to achieve this objective.

ii. Energy audit and water audit will be conducted in the CWSS & SVS at regular intervals.

iii. Whenever the leak & burst is noticed/ intimated, immediate action shall be taken (i.e. switch off the pumpsets, controlling the valves in gravity /pumping system), to attend the leak and burst in conveying mains, without any due delay, thereby to reduce non- revenue water.

iv. Functioning of water meters shall be monitored scrupulously to assess the Non-Revenue Water and also excess/deficit quantity of water supplied to the beneficiaries.

v. Proper maintenance of Electro-mechanical components like Control Panels, Variable Frequency Drives, Power factor controller, cable joints, Circuit breakers, etc., have huge potential to reduce O&M cost and TWAD Board shall endeavor to achieve the same.

vi. TWAD Board shall endeavor to automate the operation and maintenance of CWSS and reduce the man power cost and increase efficiency.

vii. TWAD Board shall endeavor to get exemption from belated payment surcharges levied by TANGEDCO on account of special nature of service rendered by the Board to ensure financial viability of the water supply scheme.

viii. TWAD Board shall optimise the expenditure incurred on personnel by merging similar alignment schemes together and increase efficiency.

ix. TWAD Board shall ensure and enforce properly defined, quantifiable parameters on service delivery by O&M contractors.

C. Expenditure optimisation during design & execution of CWSS:

i. Locating ridge points during the design stage so as to make use of gravity as a source of water transmission where ever possible thereby reducing the power charges.

ii. Necessary internal lining of pipes shall be done so as to reduce the frictional loss during water transmission and reduce non-revenue water.

iii. Schemes shall be designed in such a manner to have minimum number of bends and joints to maintain the pressure so as to ensure last mile service delivery and also to reduce power charges.

iv. Adopting star rated energy efficient pumpsets, accessories and other electromechanical equipments at design and execution shall be ensured.

v. Renewable energy sources such as Solar, Wind, etc., shall be adopted wherever feasible to reduce the O&M cost of the water supply schemes.

vi. Variable frequency drive shall be installed at feasible pumping stations for reducing the power charges.

vii. Necessity of HT and LT connections shall be ascertained as per the demand at all pumping stations and shall be changed accordingly to avoid excess power bills.

viii. Surge protection valves shall be provided at appropriate location to safe guard the pumping machineries and pipelines so as to reduce the repair and renewal costs.

E. Principles for setting up tariff

The volumetric tariff ensures water conservation by charging the quantity of water used which indirectly promotes water conservation. The following principles are followed in fixing rates for various water consumption slabs for the Water Supply Scheme:

1) Follow volumetric tariff/fixed tariff.
2) Take into account revenues from existing connections.
3) Accumulate additional revenues from the new connections
4) Utilize funding for O&M costs, asset replacement, and expansion in future.
5) Undertake assessment of cost of O&M.
6) Assessment for cost of preventive maintenance (at least 3-5% of the estimated capital costs).
7) Considering affordability of water particularly for the low-income households.
8) Review tariffs every three years by Government agency.

The overall tariff structure is based on the basis of estimating the total O&M costs and total expenses and matching it with the projected revenues, based on various tariff options, keeping the principles of tariff setting into consideration.

4.4. Audit

All transactions made at the Village Panchayat level shall be audited by the Deputy Block Development Officers (Audit), Random audit by the Assistant Director (Audit), Periodical Inspection and Audit by the concerned Block Development Officer and Assistant Director (Audit) and Assistant Director (Panchayats).

Chapter V – Information, Education, Communication, Capacity Building and Grievance Redressal Mechanism

5.1. Information, Education, Communication and Capacity Building

i. Both RD and PR and TWAD Board shall facilitate capacity building of engineers, contractors, consultants, NGOs and other sector stakeholders together with people's representatives, and VP personnel such as VP president, VP secretary, VWSC members, SHGs, Pump Operators, by preparing training modules on design, execution, operation and maintenance of water supply systems and conducting the sessions on yearly basis. Upon training SHGs shall be involved in the operation and maintenance of SVS / in – village component of MVS & IEC activities of JJM.

ii. 5 persons in each category such as OHT Operators, Fitters, Plumber, Electricians and Motor Mechanics in every block shall be trained. Apart from this, Multi Skilled Training to 2 persons in every panchayat shall be trained and Village Panchayats can utilise their services.

iii. Capacity building of Self help groups in each VP will be done on periodical basis to enable them to discharge their duties in utilizing Field test kits.

iv. TWAD Board and RD&PR shall facilitate exposure visits across the country for engineers, contractors, consultants, NGOs and other sector stakeholders together with people's representatives, and VP personnel such as VP president, VP secretary, VWSC members to enable cross country learning.

v. Capacity Building at Panchayat Level including leadership, knowledge, skills, Quality & Quantity Management and experience to operate and maintain the drinking water supply systems is provided through Regional level Training Institutes {Regional Institute of Rural Development and Panchayat Raj (RIRD)}.

vi. Community consultations shall be held at Village Sabha meetings at least annually and feedback received from Village Sabha shall be considered by the VP in the operation, maintenance and management of rural water supply systems including IVDN and SVS.

vii. VP shall do the needful to mobilize community for achieving 100% FHTCs, habitual payment of O&M tariff, and disciplined use of treated water and metered consumption of water at the consumer levels.

viii. The motto of the Government for providing 55 LPCD for each rural population through FHTCs shall be ensured vide IEC activities and involving Community participation.

ix. IEC activities should be done in local State official language - Printing and fixing of Posters, Printing of pamphlets, Hoardings / wall Painting activities, School Competition Rallies, Documentation of success stories and Short films making and publishing awareness creation on water quality testing, judicious usage of water, Grey water management, usage of Field user APP, etc.

5.2 Grievance Redressal Mechanism (GRM):

5.2.1 Mechanism :

i. The Grievance cell shall be formed at the District level and they shall record all the calls /emails in a register.

ii. The compliant shall be communicated to the officials concerned to take necessary action.

iii. After the rectification is made, reply shall be communicated to the public and the compliant may be closed in the register.

5.2.2 Contact Persons for Grievances:

i.	State Level	Additional Director (JJM) & Joint Chief Engineer (O&M), TWAD Board.
ii.	District Level	District Collector and the Project Director, District Rural Development Agency.
iii.	Block Level	Block Development Officer (VP) and Deputy Block Development Officer (Panchayat)

5.3 Human Resources for Water supply scheme.

a. The Water supply schemes are being maintained by TWAD Board and RD and PR with various size and capacity. Hence, unique human resource planning has been done. The conditions shall be revised then and there based on the requirements.

b. At present, TWAD Board is adopting the human resources requirement norms at various levels / skills for maintenance of CWSS viz. B.P.Ms. No.5, O and M Wing, dated 22.02.2018.

c. An Established system in RD&PR Department is functioning to maintain water supply systems in the Village Panchayats. OHT Operator, Panchayat Secretary at Village Panchayat level, Engineering wing and Zonal Deputy BDOs and Block Development Officer (VP) at Block level,

Assistant Director (Panchayats), Engineering wing at District level are being functioning for maintaining the Water Supply systems in the Village Panchayat. A separate Water Supply Monitoring Unit at State Level is being constituted to monitor the Water Supply systems of Village Panchayats.

d. The departments concerned will undertake periodical training for the human resources deployed with advances in water supply systems.

e. Village Panchayats may also engage SHGs and Co-operative societies for carrying out the O&M activities for the in – village infrastructures / SVS by providing necessary capacity building.

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D. KARTHIKEYAN
PRINCIPAL SECRETARY TO GOVERNMENT

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SECTION OFFICER