



**POLICY**  
*FOR REUSE OF*  
**TREATED**  
**WASTE WATER**



Government of Gujarat



# PREAMBLE

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Water is a critical resource for social and economic development of any region besides being elixir of life. Water resources are getting depleted due to adverse changes in climatic conditions, scanty and erratic rainfall, increasing industrialization, population growth, exploitation of ground water, increasing demand for domestic purposes etc. This problem is getting amplified due to uneven natural distribution (availability) of water resources in different regions of the state mainly due to diverse topography.

The Government of Gujarat has launched a scheme titled “Swarnim Jayanti Mukhya Mantri Shehri Vikas Yojana” (SJMMSVY) for undertaking various infrastructure development projects and plans for providing basic services in urban areas and Rurban Infrastructure Development Plan for rurban areas. Further, the Govt. of Gujarat is also implementing Centrally Sponsored Schemes (CSS) such as the “Atal Mission for Rejuvenation and Urban Transformation” (AMRUT), the “Swachh Bharat Mission” (SBM), the “Smart City Mission” and the “Shyama Prasad Mukherji Mission” for Rurban regions which are supplementing the sanitation infrastructure. All these schemes are augmenting the collection system of municipal sewage and its treatment capacity in the state leading to need for comprehensive policy on reuse of treated waste water.

The policy for promotion of use of Treated Waste Water is prepared with a vision to maximise the collection & treatment of sewage generated and reuse of treated wastewater on a sustainable basis, thereby reducing dependency on fresh water resources. Further, the policy promotes use of treated waste water as an economic resource.

To achieve this vision, the policy lays a time-bound and systematic plan with an ultimate goal of reusing Treated Waste Water fully by 2030.

The policy shall be in force from the date of its notification and shall subsume the already notified policy i.e. “Gujarat State Policy for Promotion of Waste water Recycle and Reuse”, dated 15th June, 2017 of Urban Development and Urban Housing Development Department.

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# 1. BACKGROUND

Water is the most important natural resource required to sustain all life forms on Earth. Availability of water is undisputedly one of the most critical component for sustaining all economic activities in a state. Gujarat has limited availability of natural water resources due to its geographic location and diverse climatic conditions.

Gujarat occupies 6.39% of the country's geographical area, but has access to only 2.28% of its water resources. The availability of water is also constrained by imbalances in intra-state distribution. Out of 185 rivers, the State has only eight perennial rivers and all of them are located in the southern part of the state. Around 69% of the state's surface water resources are concentrated in central and southern Gujarat, whereas the remaining three-quarters of the State has only 31% resources.

Thus, Gujarat has a high portion of water stressed area i.e. 58.6% of the total area due to arid, semi-arid and saline conditions.

# 2. NEED FOR WASTE WATER REUSE POLICY

Given the background of very high stress on existing water resources and its distribution, Government of Gujarat is continuously looking for additional sources of water to supplement the limited fresh water sources available in the state. Thus it becomes imperative to explore option of reusing treated waste water and use it as source of water for various purposes.

Apart from the need of reducing the pollution of surface and ground water, world over the municipal waste water is increasingly seen as a water resource for reuse of water that can ideally be utilised for non-potable purposes. The treated waste water (TWW) produced by treating municipal sewage can provide a reliable source of water. Hence, there is an ardent need to adopt new perspective towards municipal waste water and its reuse.

In order to address the uneven distribution of water resources across the State, Government has launched schemes for inter-basin transfer of water such as 'Sujalam Sufalam Yojana', 'Sauni Yojana', 'Lift Irrigations schemes in Tribal areas' etc

wherein water from surplus region is transferred through canals and pipe lines to water scarce regions in the state. Further, the Government has implemented 'State wide drinking water supply grid' to provide safe drinking water to all people. These schemes have been transformative and have resulted in paradigm shift by switching over from excessive dependency on ground water to surface water. These schemes have brought significant economic benefits to the people of the state. However, the costs of transferring water through canals or pipelines and loss of water during transfer have been high. Therefore, developing locally available alternative source of water or reuse of treated waste water will help to decrease dependency on inter-basin transfer of water and improve overall water use efficiency.

Moreover if untreated or partially treated municipal sewage or waste water goes into streams, ponds, lakes or rivers, it will have adverse implications on environmental safety and public health. In case it gets percolated to the sub-surface strata, it may contaminate the groundwater source and thus prove to be a health hazard.

Insignificant reuse of treated waste water for economic activities or non-availability of buyer for it, has led to very little incentive for local body / operators of STP in up-keeping and maintaining it. This has created a mechanism of low accountability as there is no direct user group of TWW which can bring pressure on STP management. In order to enhance the accountability of local body/STP operators, it is important that TWW should be promoted as an economic commodity bringing in a user group with significant stakes.

Also, there is a strong need to price the TWW based on principle of cost recovery which is reflective of actual costs. This will generate a new revenue stream for local bodies which will ensure that operation of STP can be undertaken on financially sustainable basis.

### **3. STATUTORY AND POLICY FRAMEWORK**

The concept of waste water recycling and reuse; and the need to include the same in all water supply and Waste Water management programs is recognized by the most policy frameworks and institutions in India. Constitutional provisions, various central statutes and policies; and state statutes and policies mentioned in Annexure-I are referred while framing the policy.

## 4. VISION

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**“The policy envisions maximising the collection and treatment of sewage generated, and reusing the treated waste water on a sustainable basis, thereby reducing dependency on fresh water resources; and to promote treated waste water as an economic resource”**

## 5. OBJECTIVES

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The policy lays down following objectives:

- To reach minimum 80% coverage and collection of sewage in all municipal towns.
- To reach a level of 100% treatment of collected sewage as per the prescribed standards.
- To reuse at least 25% of total fresh water consumption from TWW within the time limit set under policy by every municipal body.
- To reuse 70% of TWW by 2025.
- To reuse 100% of TWW by 2030.

## 6. IMPLEMENTATION TIMELINE

Considering different stages of development of infrastructure in terms of Collection and Treatment of Sewage in different towns, policy suggests a staggered timeframe to ensure implementable development goals for different cities. Following table lays down the timeframe for achieving the policy objectives for different cities.

**Table 1** *Timeframe for achieving the objectives*

Existing System in Local Body	Target/ Goal	Maximum duration for implementation of reuse of treated wastewater
Both UGD Collecting system and STP Exists	Minimum of 25% of Fresh water consumption in Local Body or Present output of operational STP(s)*	One year
UGD Collecting system exist, but STP is not available	Minimum of 25% of Freshwater consumption in Local Body or Treatment capacity of proposed STP(s)	Six months from the date of Start of operation of STP
No UGD collecting system or STP facility exist	Minimum of 25% of Freshwater consumption in Local Body or Treatment capacity of proposed STP(s)	Four years

\*In case, a town is having functional STP(s), but additional STP(s) are planned, then the additional capacity so created shall be utilized within a six months of time of such STP being made operational.



**Future goals:** Further, it shall be endeavor

1. To increase Under Ground Drainage (UGD) collecting system network based on fund availability.
2. To increase treatment capacity to treat collected sewage.
3. To increase reuse capacity to maximum leading to full utilization of TWW.

## 7. POLICY CONSIDERATIONS

The policy is developed on following premises:

### 7.1 Ownership of TWW

The prime responsibility for treatment of waste water, waste water recycling and reuse will be with the local body. Accordingly, creation of capacity for waste water management and, planning and implementation for waste water reuse infrastructure will be the responsibility of the local body, depending on availability of the funds. However, the state government will seek to augment these efforts.

Thus, economic rights on the TWW shall reside with respective Local body. The economic rights include any economic activity generated downstream due to supply of TWW in water bodies such as streams, rivers, canal, lakes etc. However, the guidelines under this policy will be followed by all local bodies wherever the financial assistance from state/central government is extended to local body for the purpose.

### 7.2 Prevention of contamination of other sources of water

TWW shall meet all the statutory quality standards. Stringent quality standards will be adopted such that it does not contaminate other sources of water.

### **7.3 Consider TWW as an additional source of water**

TWW shall be considered as an additional source of water through its reuse to suitable users.

### **7.4 Promote TWW as an economic resource**

TWW shall be considered as an economic commodity and used to generate resources which shall be used primarily for sewage collection and treatment besides paying for fresh water resources.

### **7.5 Develop sewage treatment projects on a financially sustainable basis**

The price of TWW shall be based on principle of recovery of cost incurred on treatment and distribution to have sustainable projects.

### **7.6 Reuse of domestic waste water of Industrial units**

Industrial establishment shall treat domestic waste water generated from their units and reuse it for appropriate non-potable use whereas the industrial effluent shall be treated and disposed as per prevailing standards of Water Pollution control authorities.

## **8. MANDATE OF USE OF TWW**

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TWW shall be used on the principle of substitution of fresh water with it. While making such a substitution, suitability of TWW to use shall be considered. While making use of TWW, necessary care will be taken that treated waste water is not mixed with or used with potable water.

TWW shall be mandated for use for different class of users depending on its availability. It shall be endeavour to use available TWW to maximum, but not less than the limits prescribed in Implementation timeline. As and when more TWW is available the same shall be put to use following same principles.

## 8.1 NON POTABLE USE

### 8.1.1 MANDATORY USE

#### 8.1.1.1 Thermal Power Plant:

It shall be mandatory for all the Thermal Power Plants within a distance of 50 km from the STP or city limits to use TWW.

#### 8.1.1.2 Industrial Units:

It shall be mandatory, for all Gujarat Industrial Development Corporation (GIDC) estates, all industrial units in Special Investment Region (SIR), Industrial parks and large industrial units which are consuming minimum one lakh litre of fresh water per day for non-potable purpose, and which are situated within 50 km distance from STP or city limits to use TWW. However, it shall not be mandatory to use TWW wherever it comes in direct contact with human beings or is used in processes resulting in products for human consumption.

### 8.1.2 Mandatory on fulfilling certain conditions

#### 8.1.2.1 Construction activities

The concerned local body/implementing agency shall

- i) provide facility for filling tanker with TWW to construction sites on payment. Such filling points may be provided at more than one place depending on demand assessment at local level.
- ii) lay special supply lines for TWW in developing areas, if found feasible.
- iii) stop supplying municipal water once above mentioned facility is made available.

#### 8.1.2.2 Large Commercial or Institutional users

Local body shall make endeavor to lay down TWW line to institutional areas, business districts or areas having large number

of such users to cater their need. If TWW is made available, such users can be dispensed with the need of making their own STP. In such a situation, it shall be mandatory for such users to use TWW for the purpose of flushing, watering green areas, water for fire hydrants etc.

#### *8.1.2.3 Municipal uses*

TWW shall be used for following municipal purposes mandatorily after laying such infrastructure as may be necessary.

- Maintenance of parks and gardens and developing urban landscaping.
- Rejuvenation of ponds, lakes and rivers.
- Supplying water for emergency purposes like fire brigade etc.

#### *8.1.2.4 Other non potable uses*

Local bodies may also find other users for non-potable use unique to their context etc. and make it mandatory for them to use TWW and restrict use of fresh water.

### **8.1.3 Agriculture / Irrigation**

Treated waste water can be used for agriculture/irrigation purposes provided surplus water is available after above mentioned uses.

## **8.2 POTABLE USE**

Considering social sensitivities and the public perception towards treated waste water, presently it shall not be used for potable purposes and uses which involve direct human contact. However, in future with the increase in water demand, advancement in treatment technology, competitive rates and change in public perception, TWW may be used for potable purposes.

## 9. ALLOCATION OF WATER

### 9.1 Availability of TWW

The local body shall declare availability of TWW within 2 months of declaration of the policy and thereafter on 1<sup>st</sup> July and 1<sup>st</sup> of January of every year. The coming in to effect shall contain details on both quantity and quality of water besides location of treatment plants where TWW is available.

### 9.2 Application by user

All water users who are consuming more than 1 lac litre of water per day including industrial clusters shall apply on central portal indicating their requirement of water. All new applicants shall also follow similar procedure.

### 9.3 Allocation of water

Keeping in view availability of TWW, SHPC shall allocate water- TWW or fresh water; in following manner:

#### 9.3.1 *Where availability of TWW is more than demand*

In case, the availability of TWW is more than demand, then all the mandatory users will be provided with the required quantity of TWW. After this provisioning to mandatory users, the other users or other mandatory users outside the supply zone (50 kms distance) can be allocated water. Utilization of the balance TWW after providing to mandatory users shall be decided by the SHPC.

#### 9.3.2 *Where availability of TWW is less than demand*

In case the availability of TWW is less than demand, the TWW shall be provided to users proportionally or in such manner as may be decided by the state government.

### 9.3.3 *Where there is no availability of TWW*

Efforts will be made to create infrastructure for collection and treatment of waste water to make TWW available. Fresh water may be continued till the time TWW is made available.

## 9.4 **Discontinuation of existing fresh water supply**

The existing fresh water supply shall be discontinued within a period of one year of TWW allocation made and being made available. However, fresh water supply can be allowed to the extent of drinking water and specific process requirements of such user.

## 9.5 **Enforcement of use**

Enforcement of use shall be enforced by Irrigation department/ SSNNL/ GWSSB/ GWIL which give permission or supply fresh water to users. Also, mandatory users shall not be given allotment of fresh water/ reservation of fresh water except as per provisions of the policy. Further, the existing allotment/reservation of fresh water shall stand cancelled within one year from date of TWW being made available.

# 10. ENVIRONMENTAL ASPECTS

The development of projects will take into account all environmental aspects, while choosing method of treatment, storage of waste water and sludge management. Effective procedures will be put in place to adequately factor in environmental and social opportunities and concerns during all stages of reuse of TWW projects.

Effective strategy shall be evolved to keep vigilance and evaluate quality of TWW.

## 10.1 Quality standards and treatment norms

The treatment of waste water shall be done according to effluent discharge norms laid by the government from time to time. However, it would be prerogative of the Government to setup better standard of treatment, if it chooses to do so. BOD and TSS of TWW for supply to different users except for rejuvenation of ponds, lakes & rivers and agriculture/irrigation, shall not be more than 10 mg/L each.

If a user needs TWW of better quality, the same shall be done by user at his end. It is up to local body's discretion to make decision regarding higher level treatment of waste water on substantial demand from users. In case such a decision is made, charges for capital and operation and maintenance of higher level of treatment will be recovered from the Users.

## 10.2 Technology options

A key component in any strategy aimed at increasing the coverage of waste water treatment will be the application of appropriate waste water treatment technologies that are effective, simple to operate and low cost; both in capital and in operation & maintenance.

Technological options for waste water recycling plants can be categorized based on treatment standard, quantum of sewage inflow, location of plants or utilization of recycled waste water etc., Chapter 7 of part A of Manual on Sewerage and Sewage Treatment Systems (2013), CPHEEO discusses in detail the different types of treatment technologies suitable under different conditions. The manual also provides details on the design considerations and operating requirements for a variety of technologies which will be suitable for different usage. Appropriate technology shall be adopted so as to meet the quality standards of TWW under the policy. However, it shall be ensured that new STPs conform to such standards so as to enable utilization of TWW directly by the users enumerated in the policy as far as possible.

The policy suggests use of conventional or generic technologies. However use of innovative technologies developed by IITs/NEERI may be used while implementation of project for tertiary treatment of sewage if required. Further the policy suggests that low requirement of space, power and efficiency shall be main consideration while choosing the appropriate technology.

## **11. PREPARATION OF TWW REUSE PROJECTS**

### **11.1 Identification and Preparation of projects**

#### *11.1.1 Preliminary Information*

Preliminary Information regarding present infrastructure or projects under execution, underground drainage collection and treatment shall be collected by the local authority. This will include information on underground collection system, treatment capacity, location of sewage treatment plant, potential users with their demand and location, etc.

#### *11.1.2 Identification of viable project*

Based on the availability of TWW and potential users, a project for use of TWW will be identified. Shelf of such projects will be prepared by SHPC which will accord in-principle approval for the same.

#### *11.1.3 Preparation of Detailed project report(DPR)*

If the project is found technically feasible and financially viable, then DPR will be prepared. DPR shall include, but not limited to the following:

1. Profile of local body (Location of STPs, quantity of sewage generated, operational framework of STPs etc.).



2. Profile of users (type of usage, quantity required, distance etc.) within the threshold distance.
3. Approximate cost of project.
4. Suggestions on implementing agency which can be a local body itself, an agency decided by government like GWSSB, GWIL or other government company or an agency decided on PPP model.
5. Funding source.
6. Level and nature of private sector involvement.

### **11.2 Approval by SHPC**

Based on the recommendations of by STC, SHPC shall give in principal approval for the project and decide the following.

1. Allocation of water to different users.
2. Implementing Agency.
3. Financial and management structure of the project.
4. Pricing of water.

## **12. PRICING PRINCIPLES**

The TWW shall be considered as an economic commodity while determining the price of TWW. The price of TWW shall be determined based on investment made, quality of water supplied, requirement of distribution infrastructure and other social, cultural and business factors.

### **12.1 Price of fresh water**

The price of TWW shall be kept lower than the price of fresh water as notified by the government from time to time.

## 12.2 Factors to be considered

While deciding price of TWW, SHPC shall consider following factors.

1. Recovery of capital and operation & maintenance of cost incurred on distribution network of TWW.
2. Recovery of Operation and Maintenance cost of the Sewage Treatment Plant (STP).
3. Recovery of Capital and Operation and Maintenance cost of tertiary treatment, if any.
4. Recovery Operation and Maintenance cost of sewage collection system may also be considered.

## 12.3 Variation and escalation

The price fixed so shall be for first year of the project and a suitable price escalation clause shall be kept in agreement made with users. The price of TWW can be reviewed by SHPC every five years.

## 12.4 Recovery and Billing

Implementing Agency shall have automated systems of measurements, billing and recovery of water charges.

## 12.5 Escrow Accounts

An escrow account shall be kept by the local body for the amount received by it which will be used for waste water related works only, which would ensure sustainability of treated waste water projects.

## 12.6 Purchase Agreements

A purchase agreement shall be made in between the **implementing** agency and user. The agreement will suitably reflect terms and conditions of water purchase.

## 13. PRIVATE/EXTERNAL SECTOR PARTICIPATION

The use of TWW is of high order of priority. All effort shall be made to expedite to plan, prepare implement such projects.

### 13.1 Possibilities of funding

The possibility of funding from external funding agencies shall be explored by the government.

### 13.2 Options of PPP

All efforts will be made to explore the possibility of projects being implemented with private capital by using various procurement models based on Public-Private-Partnership (PPP).

The models may be any one or combination of following:

1. **DBO**
2. **DFBOT/BOT – Annuity**
3. **BOT - User Charges**
4. **BOT- End User**
5. **Hybrid Annuity Model (HAM)**

PPP model shall be finalised after adequate due diligence and detailed assessment. The model for private participation will be proposed and final decision in this regard shall be taken by SHPC.

## 14. STAKEHOLDER ROLES AND RESPONSIBILITIES

### 14.1 Local body

Apart from waste water treatment, water recycling and reuse will be the primary responsibility of the local body. Accordingly, creation of capacity for Waste Water management, planning and implementation for water recycle plant infrastructure, keeping in view availability of the funds, is primary the responsibility of the local body.

### 14.2 Implementing agency

It's an agency appointed by SHPC who shall plan, execute, operate and maintain TWW project.

### 14.3 Users

A user of TWW shall apply for permission to take TWW as per conditions of this policy.

### 14.4 Regulatory Agencies

They shall assist in finalizing the legal framework and quality standards / treated waste water norms for using TWW for various purposes.

## 15. GOVERNANCE ARRANGEMENT

To ensure proper, efficient and timely management of TWW projects and to aid swift decision making, following committees will be formed:

- (1) State level High Power Committee
- (2) State level Technical Committee

## 15.1 State level High Power Committee (SHPC)

State level High Power Committee shall be the apex body to take decision regarding implementation of the policy. The functions include project approval, price determination, allocation of water, selection of implementing agency, monitoring, policy advisory, resolution of disputes etc.

## 15.2 State level Technical Committee (STC)

State level Technical Committee shall give Technical Approval of projects, finalize formats of project agreements, monitor projects execution, lay guidelines for O&M etc, and carry out such other function as may be decided by the Government or SHPC.

The State government may from time to time by notification appoint the members of the above committees

## 15.3 TWW Cell

A separate Cell with appropriate set up of staff headed by an officer of the level of Chief Engineer shall be appointed for co-ordination and implementation of projects pertaining to TWW. The cell shall undertake the following activities.

### 15.3.1 Preparation of DPR:

The cell will appoint a transaction advisor and will prepare DPR in consultation with local body concerned.

### 15.3.2 Providing secretarial assistance to STC/SHPC

The cell will provide all secretarial assistance; and assist STC and SHPC in discharging their duties.

### 15.3.3 Management Information System:

A Data Management and Information System will be developed to

have regular information with respect to waste water generation, treatment, reuse, technology adopted for waste water treatment plants, costing for operating infrastructure, revenue generated from the projects etc. Information will also be collected regarding potential users of waste water individually and as a class of users. A central data base will be maintained collating information from all local authorities.

#### *15.3.4 Capacity Building, Research & Development*

The frontiers of knowledge in waste water treatment and utilisation will be pushed forward through focused action research, development and promotion of state-of-art technology and training for effective and economic management of water resources.

A perspective plan for training shall be worked out for planners, managers, designers and users, by coordinating with Water and Land Management Institute (WALMI), Gujarat Engineering Research Institute (GERI), Gujarat Jalseva Training Institute (GJTI), Agriculture Universities, engineering colleges and similar such organizations for getting optimum productivity and maximum utilization of water. Importance shall be given to the latest technological systems. The Cell shall serve as a nodal unit and create an umbrella to bring all stake holders in its ambit.

#### *15.3.5 Public Awareness:*

Public awareness is an essential component to promote and develop acceptance of reuse of TWW. Education is the key to overcome public fears about a reuse system, particularly fears related to public health and water quality.

Broadly, in-depth public relation programmes and demonstration projects are helpful for the reuse projects. Therefore, it is desired

to have very strong I-E-C programme and waste water management plan after public consultation and having clarity about use of TWW. Such programmes will be designed to address following critical issues:

- Raise public awareness of waste water issues and needs to foster support for creative solutions.
- Educate the public and identified target groups in order to increase awareness and encourage behavioural changes.
- Coordinate with other public as well as private entities for optimum use of TWW.

## 16. MISCELLANEOUS

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The state government may issue such directions as it deems fit, for the purpose of carrying out objectives as set out in the policy time to time. Further the SHPC can take decisions as required for the smooth implementation of the projects.



# ANNEXURES

## Annexure I : Statutory and Policy framework

The concept of waste water recycling and reuse; and the need to include the same in all water supply and waste water management programs is recognized by most policy frameworks and institutions in India. Some of the significant legislations and documents that have been considered in framing the policy are:

### Constitutional provisions

- The constitution of India in its part IV lays down directive principals of state policy/Article 48 A states -“The state shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country”.
- Fundamental duties of every citizen of India in Article 51A states that “ It shall be the duty of every citizen of India to protect and improve the natural environmental including forests, lakes, rivers and wild life, and to have compassion for living creatures.
- Role of self-Government (73<sup>rd</sup> and 74<sup>th</sup> Constitutional Amendments) – These amendments make it obligatory on the state governments to constitute urban local bodies and transfer responsibility of water supply and sanitation services to them .

Thus, there is constitutional mandate to preserve, protect and promote natural resources and water forms the most important ingredients of it.



## Central statues and policies

- **The Environment Protection Act 1986** : As per the Act 1986 (Chapter 2, General Powers of Central Government), the Central Government shall have the power to “take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environmental pollution” and “laying down standards for the quality of environment in its various aspects”.
- **Policy statement for Abatement of Pollution, 1992** : The policy broadly suggests developing relevant legislation and regulations, fiscal incentives, voluntary agreements, education programs, information campaigns, need for environmental considerations into decision making at all levels, pollution prevention at source, laying principle of Polluter Pays for Pollution etc.
- **The National Water Policy 2012** : The National Water policy 2012 promotes and incentivizes the reuse of waste water, including through Section 6.3: “Recycling and reuse of water, including return flows, should be the general norm”. Section 7.3 ; ‘Recycling and reuse of water, after treatment to specified standards, should also be incentivised through a properly planned tariff system, and Section 11.7; ‘Subsidies and incentives should be implemented to encourage and recycling/reuse , which are otherwise capital intensive.
- **The National Sanitation Policy, 2008** : The policy aims at creating awareness, behavioural change, making cities free of open defecation, safe disposal of wastes and proper operation and maintenance of sanitary installations.
- **Manual on Sewerage and Sewage Treatment Systems, by Central Public Health and Environmental Engineering Organization (CPHEEO), MoUD, 2013** : This manual sets out design consideration, technology and treatment standards for waste water.

## State statues and policies

- **The Gujarat Provincial Municipal Corporation Act :** As per the Act “The commissioner may, for purpose of receiving, treating, storing, disinfecting, distributing or otherwise disposing of sewage, construct any work within the city or purchase or take on lease any land, building, engine material or apparatus either within or without the city or enter into any arrangement with any person for any period not exceeding twenty years for the removal or disposal of sewage within or without the city”. The Act empowers the Municipal Corporation regarding all activities relating to water and sewage management.
- **The Gujarat Municipal Act, 1993 :** The statute gives complete authority and jurisdiction of all urban amenities including water supply and sanitation with municipalities.
- **The Gujarat Panchayat Act 1993 :** In Schedule-I, section 99 it is the duty of village panchayat of “constructing, altering and maintaining public latrines, urinals, drains, sewers, drainage works, sewage work”.
- **The Gujarat State Policy for Promotion of Waste water Recycle and Reuse, (dated 15th June, 2017)** It lays down broad framework for treatment and use of waste water.

## Annexure II : Existing Scenario in Gujarat

### Rainfall Pattern and Topography

The rainfall pattern in Gujarat is erratic and uneven which leads to imbalances in distribution of water in different regions. Almost 95% of the total annual rainfall occurs during few days of the monsoon period (June to September) which brings in seasonal winds from the South-West direction. There is a wide variation in the availability and distribution of rainfall across the State.

North Gujarat area has rechargeable aquifers; however, rainfall in this region is scanty while the ground water withdrawal is very high. Excessive ground water withdrawal is for both irrigation purposes and a high industrial water demand. Thus, the ground water table is depleting very rapidly in this region.

The Southern and Central parts of Gujarat are heavily developed agricultural and industrial areas that require large volumes of water usage. The Saurashtra region comprises of rocky formations and a very low recharging capacity, leading to meagre ground water replenishment. The coastal area of Saurashtra is also affected by salinity ingress leading to deterioration of water quality. Kachchh is an arid zone with scanty rainfall and no perennial rivers.

### Availability of Water Resources

Availability of the quantum of water resources in the state varies widely from region to region as mentioned below:

Area	Total Water Quota (M.cum)	Surface Water (M.cum)	Underground Water (M.cum)	Storage capacity of existing reservoirs (Except Sardar Sarovar) (Million cubic Mtrs)	% of Water Resources	% of area
Central & South Gujarat	38105	31750	6355	10400	69	25
North Gujarat	6342	2100	4242	2100	11	20
Saurashtra	9723	3600	6123	2250	17	33
Kutch	1438	650	788	250	3	22
<b>Total</b>	<b>55608</b>	<b>38100</b>	<b>17508</b>	<b>15000</b>	<b>100</b>	<b>100</b>

\*Source NWRWS website

## New Challenges

The water demand is likely to rise considerably in the future due to high population growth and economic development. The urbanisation is increasing at a rapid pace in state and currently almost half of the population in the state is in urban areas or nearby conglomerates.

The indiscriminate pollution of water resources, especially due to discharge of industrial effluents into water bodies, is increasingly affecting the availability of safe fresh water, in addition to causing serious environmental and public health hazards. Thus, availability of fresh water has become a limiting factor, particularly for drinking, agricultural and industrial purposes.

There is over dependence on single surface source, hence for water security local sources need to be rejuvenated and treated waste water could be considered as an alternative source of water which may be used for other than drinking purposes.

## Drinking Water Network

Drinking water network of the state is mainly dependent on Narmada besides other surface water sources. Narmada water from the Sardar Sarovar Reservoir is conveyed through Narmada Main canal and other branch canals. Majority of the drinking water grid off takes are on Narmada Main canal & Saurashtra Branch canal from which raw water is transmitted to Central Gujarat, North Gujarat, Saurashtra and Kachchh.

This has also made it imperative to have In-Village water supply schemes which are being implemented through WASMO.

## **Underground Drainage System (Collection and Treatment)**

Presently, Underground drainage system is available in all 8 municipal corporations, 153 out of 162 municipalities and 85 urban areas. These system collect sewerage which is treated through STPs established for the purpose. Presently about 2600 MLD sewerage is being treated through 52 STP, approx. 161 STPs are under planning or execution which will add to about 2800 MLD treatment capacity within a span of 2 years. With this the total TWW availability will rise to more than 5000 MLD in the state. This offers a tremendous opportunity to use TWW and augment water resources economically.

## ABBREVIATIONS

AMRUT	Atal Mission for Rejuvenation and Urban Transformation	KL	Kilo Litre
BCM	Billion Cubic metre	MLD	Million Litre per Day
BOT	Build, Operate, Transfer	MW	Mega Watt
CAPEX	Capital Expenditure	NEERI	National Environmental Engineering Research Institute
CPHEEO	Central Public Health and Environment Engineering Organization	OPEX	Operational Expenditure
CSS	Centrally Sponsored Schemes	PPP	Public Private Partnership
DBO	Design, Build, Operate	SBM	Swachh Bharat Mission
DFBOT	Design, Finance, Build, Operate, Transfer	SIR	Special Investment Region
GDCR	Gujarat Development Control Regulations	SJMMSVY	Swarnim Jayanti Mukhya Mantra Shaheri Vikas Yojana
GERI	Gujarat Engineering Research Institute	SHPC	State level High Power Committee
GIDC	Gujarat Industrial Development Corporation	STC	State level Technical Committee
GJTI	Gujarat Jalseva Training Institute	SSNNL	Sardar Sarovar Narmada Nigam Limited
GWIL	Gujarat Water Infrastructure Limited	STP	Sewage Treatment Plant
GWSSB	Gujarat Water Supply and Sewerage Board	TWW	Treated Waste Water
HAM	Hybrid Annuity Model	UGD	Under Ground Drainage
IIT	Indian Institute of Technology	ULB BODY	Urban Local body
		WALMI	Water and Land Management Institute
		WASMO	Water and Sanitation Management Organization





“ Reuse of treated waste water will usher a new era of water security and sustainable development in Gujarat ”

Shri Vijaybhai Rupani  
Chief Minister, Gujarat



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