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## STATUS OF WASTE WATER TREATMENT IN GUJARAT

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### ABSTRACT

Water is considered vital for human lives and required for all types of economic activities. Water is a scarce resource. Use of water in economic activities results into water pollution. Industrial use of water generates waste water with harmful chemicals. Gujarat is the state of India with high concentration of industries. Gujarat Pollution Control Board has given guidelines for saving natural water bodies. As per guidelines, industries should treat polluted chemical water before discharging them into nearby landfills or rivers or ponds or other natural resources. This paper explains various types of water treatment plants. It discusses the condition of waste water treatment in Gujarat. Government of Gujarat has initiated for the first time water treatments in India. This paper highlights about initiatives and incentives by Government of Gujarat for Common waste water treatment plants and also opportunities in the waste water technology.

**KEY WORDS:** water pollution, water treatment, government policy, Gujarat Pollution Control Board

### INTRODUCTION

Gujarat is one of the fastest growing states of India. Gujarat has geographical area of 196 lakh hector and area under cultivation is 125 lakh hectors. It has remained leader in field of both Agriculture and industrial development. People of Gujarat are enterprising in nature with good business aptitude. State also contributes to growth of industries with investor friendly policies. State has large number of small and medium industries like textiles, chemicals, ceramics, diamonds and apparels, pharmaceuticals, engineering, petrochemicals etc. Gujarat also has grown in terms of agricultural activities and growth of agriculture in state is higher than of national agriculture growth. These positives of state's growing economic activities also have negative side in terms of deterioration of environmental quality and degradation and depletion of natural resources.

Among all natural resources, water is considered the most vital. Water is an essential resource for all aspects of human enterprise: for agriculture, energy production, industrial production and human health. Water resources are

limited in Gujarat State. Despite having 185 rivers, 5.96% of the total area of the country and 4.93% of the total population, Gujarat has only 2.28% of the total surface water resources available in India. 70% of Gujarat's fresh water resources are located only in 30% of its geographical area. At present, there is disparity in water availability across different regions as South and Central Gujarat has more than 50% of the total water availability. Gujarat, one of the leading states in terms of economic growth and industrialization, falls under the water-stressed category.

### REVIEW OF LITERATURE

M.N. Murty and Surendra Kumar(2011) explains that the water quality monitoring results obtained by CPCB during 1995 to 2009 indicate that organic and bacterial contamination was critical in the water bodies. The main cause for such contamination is discharge of domestic and industrial wastewater in water bodies mostly in an untreated form from urban centres. Secondly the receiving water bodies also do not have adequate water flow for dilution. Therefore, the oxygen demand and bacterial pollution is increasing.

Household borne effluents contribute a substantial proportion of water pollution in India. Untreated effluents from households pollute surface and groundwater sources. Local governments (city corporations, municipalities, and panchayats) have the responsibility of water supply and sanitation and are supposed to treat the effluents as per national water pollution standards or minimal national standards (MINAS) However, about 70 per cent of the effluents are not treated and disposed off into the environmental media untreated.

**Mihir Shah and Himanshu Kulkarni (2015)** states that a rapidly emerging element of urban water , requires much greater focus on recycling and reuse, is industrial water. Indian industry is currently excessively dependent on fresh water and tends to dump its untreated waste water into rivers and groundwater. The water footprint of Indian industry is too high, which is bringing industry into conflict with other parts of the economy and society. There is huge scope for reducing the industrial water footprint. This can be done through technologies and investments which have short payback period. The maximum water saving will be delivered when both behavioural change and hard measures are successfully adopted by the end user.

**Attila Moraes Jardim Junior, Jorge Madeira Nogueira, Pedro Henrique Zuchi (2012)**, observes that in a short period of time, a greater reduction of environmental pollution caused by waste water can be obtained when changes are made on Waste Water Treatment Project implementation process. There are comparative advantages of deploying Waste Water Treatment Project by assimilation of marginal costs of pollution reduction in relation to a desirable standard individually achieved by each system.

## OBJECTIVES

Importance of water is undisputed for strong economic position of the Gujarat State. Water Resources are going on depleting (reducing) day by day due to adverse changes being taking place in the environment, scanty and erratic rainfall, increasing industrialization, population growth, exploitation of ground water, increasing demand for domestic purposes etc.

Following are the objectives of this paper.

1. To understand the functioning of water treatment plants
2. To explain the existing situation of water treatments plants in India and Gujarat
3. To analyze the problems with use of water treatment plants
4. To understand government's role in reducing pollution by initiatives and different incentives to industries

5. To understand the further potentialities and innovations in the field of water treatment plants

## METHODOLOGY

This paper is based on analysis of secondary data from various government institutions and tries to understand the gap between existing water demand and future demand. It also describes the state of common effluent treatment plants at India level and in Gujarat state.

## EXISTING TECHNOLOGY FOR WATER TREATMENT

The gap between demand and supply requires managing available water resources and to reduce the burden on environment in the form of water pollution. These demands improving the functioning of waste water treatment plants in industries before discharging it to different natural water bodies and recycling and reusing of water.

Any good which is scarce and people choose more of it is an economic good. Waste water is an economic good in India as water is very scarce and waste water treatment in India has become an extremely important area of focus due to increasing water scarcity, health awareness and population pressure. Industrial wastewater needs to undergo a treatment process which is to remove the specific pollutants generated by the production process to a limit which does not negatively affect the aquatic environment or human uses, or allows a proper treatment together with wastewater originating from household activities in a public wastewater treatment plant.

Under the Water (Prevention and Control of Pollution) Act, 1974, every industry has to provide adequate treatment of its effluents before disposal, irrespective of whether it is in stream, land, sewerage system or sea. Gujarat Pollution Control Board (GPCB) is the regulatory authority for enforcing the rules and regulations related to Environmental Protection. The major improvement in environment protection has come due to the creation of the Water Treatment Plants. Some of the major important types of wastewater treatment process are as follows:

1. Effluent Treatment Plants (ETP)
2. Sewage Treatment Plants (STP)
3. Common and Combined Effluent Treatment Plants (CETP).

It is estimated that every year 1.8 million people die due to suffering from waterborne diseases. A large part of these deaths can be indirectly attributed to improper sanitation.

Wastewater treatment is an important initiative which has to be taken more seriously for the betterment of the society and our future. Wastewater treatment is a water purifying process wherein the contaminants are removed from wastewater as well as household sewage, to produce waste stream or solid waste suitable for discharge or reuse. Wastewater treatment methods

are categorized into three sub-divisions, physical, chemical and biological.

### **Effluent Treatment Plants (ETP)**

An ETP is a plant where the treatment of industrial effluents and waste water is done. The ETP plants are used widely in industrial sector like in pharmaceutical industry to remove the effluents from the bulk drugs. During the manufacturing process of drugs, varied effluents and contaminants are produced. The effluent treatment plants are used in the removal of high amount of organics, debris, dirt, grit, pollution, toxic, non toxic materials, polymers etc. from drugs and other medicated stuff. The ETP plants use evaporation and drying methods, and other auxiliary techniques such as centrifuging, filtration, incineration for chemical processing and effluent treatment.

The treatment of effluents is essential to prevent pollution of the receiving water. The effluent water treatment plants are installed to reduce the possibility of pollution: biodegradable organics if left unsolved, the levels of contamination in the process of purification could damage bacterial treatments beds and lead to pollution of controlled waters. Many of the small and medium scale industries are unable to set up ETP plants individually for treating polluted water as it requires huge capital investment. Common Effluent Treatment Plants (CETP) is considered a viable treatment solution for collective treatment of effluents, from small and medium scale industries particularly for water treatment before disposal to natural water bodies.

**The Ministry of Environment and Forest, Government of India** has launched the centrally sponsored scheme called Common Effluent Treatment Plant in order to reduce water pollution in affordable and distributed way. The proposal for setting up of CEPT's by such industries is to be submitted by the CEPT Association to the respective State Pollution Control Board. SPCB in turn after examining the proposal and obtaining permission from the state government for its contribution will give recommendations to the Ministry of Environment and Forests for further considerations. The Ministry through a Screening Committee examines the proposal for releasing funds for the approved projects. CEPT Company meets the remaining cost by equity contribution by the industries and loans from financial institutions. However, there are several problems associated with planning and management of CETPs with regards to the technical, business/financial and operational aspects. Considering the important role of CETPs and their contribution to sustainable economy, sector is witnessing major growth due to increasing government support and private participation.

### **CETP Business Model**

□Pattern of Financial Assistance and other related criteria

1. State subsidy–25% of the total project cost;
2. Central subsidy–25% of the total project cost;
3. Entrepreneurs contribution–20% of the total project cost;
4. Loan from financial institutions–30%of the total project cost

### **CETP [Common Effluent Treatment Plant] in Gujarat**

There are total 33 CETPs in Gujarat in operational status and 8 are in proposed status. Out of 33 operating CETPs, 9 CETPs are for treating effluent generated from textile sectors, 2 for electroplating sector while rest are for chemical and other allied industries. The total capacity of 33 operational CETPs of Gujarat is 574.93 MLD. Gujarat government is considering increasing desalination installed capacity to 300 MLD by 2018 and is estimated to reach around 1500 MLD by 2030. The total no of effluent treatment plants installed and commissioned up to 31 March 2015 is 8709.

### **Government Initiatives**

Gujarat is the first state to address the waste issue and brought treatment, stabilization and disposal facility for cluster of industries.

- Out of total 27 common treatment, stabilization and disposal facility in the country 9 are in Gujarat out of which 6 are in operational condition.
- Gujarat has signed MoUs for setting up of waste water recycling plants in five major cities – Gandhinagar, Ahmedabad, Vadodara, Bharuch and Surat.
- Gujarat government has also proposed tax breaks for industries that save water and environmental concerns.

### **Challenges in CEPTs**

Setting up of CEPTs is also with lot of challenges as it requires large amount of capital investments and working capital for operation and maintenance. Majority of time equipments installed do not work consistently up to the prescribed standards and regulatory norms. Installed plants are unable to bear increasing load and new pollutants. Also water reuse is negligible in industries. In their existing state, most water treatment plants are obsolete and are in need of newer technology and capacity expansion. Improper technology is used for recycling. There are no separate treatment units for hazardous and toxic effluents. Also innovations are required in existing technology for better performance of CEPTs. Some of the sludge is dangerous to discharge on land requires technology with minimum generation of sludge.

### **Opportunities in CEPTs**

- Efficient use and reuse of water
- Developing energy efficient technology
- Utilize waste for construction activities

- Development of low cost and waste water specific equipments
- Develop zero liquid discharge schemes

### Retrofitting

Retrofit or upgradation of existing waste water treatment plants can solve the problems of increased capacity as well as need for improved quality. It requires less capital as compared to building a new plant. Also increases the life span and optimise the working of the existing plant.

### Incentives from Government of Gujarat

- Gujarat government is also promoting water treatment because of environmental concerns. The use of solar photo voltaic power in the process would further reduce the operation cost.
- Financial assistance for skill development centres, for technology acquisition and also for supporting energy and water conservation as well as for environmental compliance.
- Tax holidays: The benefits of tax holidays as provided under Section 80 (I) (A) of the Income Tax Act for development, operation and maintenance of power plants, airports, ports, waste management facilities, water treatment plants, etc. is available to the developer.

### CONCLUSION

Gujarat is a progressive state. It is looking forward to a sustained economic development of state. For a better quality of life for its citizens, Government of Gujarat is committed to take steps for environmental protection and particularly saving its water resources and water reuse and recycling. Individual and common waste treatments are efforts in this direction taken way back in 1980s and 1990s. Further Gujarat is developing water treatment plants of different capacity in Regional

water supply scheme of Gujarat water supply & sewerage board at locations like Kachchh, Saurashtra, North Gujarat and South Gujarat. More organised and controlled disposal of effluent and industrial solid waste as per GPCB norms will benefit natural water bodies of Gujarat.

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## APPENDIX

**Table: 1 Expected Water Demand in Gujarat (in bcm)**

2010	35
2050	57

Department of Water Supply, Govt. of Gujarat

**Table: 2 Per capita availability of water in Gujarat (in bcm/annum)**

2001	1.1
2011	0.8
2015	0.7
2025	0.6

Department of Water Supply, Govt. of Gujarat

**Table 3 State wise Operational CEPTs in India**

Sr. No.	State	No. Of CEPT	Flow, MLD
1	Andhra Pradesh	3	12.75
2	Delhi	15	133.2
3	Gujarat	28	500.35
4	Himachal Pradesh	4	1.1
5	Haryana	1	1.3
6	Karnataka	9	-
7	Madhya Pradesh	3	0.9
8	Maharashtra	23	173.35
9	Punjab	4	57.7
10	Rajasthan	2	71.15
11	Tamil Nadu	36	44.4
12	Uttar Pradesh	2	70
Total		130	1066.20

Source: Central Pollution Control Board, Maharashtra Pollution Control Board, Karnataka Pollution Control Board, Gujarat Pollution Control Board.

**Table:4 Operational CEPTs of Gujarat (As on March 2016)**

Sr. No	Name and Address of CEPT	Capacity (MLD)	No. Of Members	Status
1	The Green Environment Services Co-Op.Society Ltd. 244-251, Phase II, GIDC Vatva , Ahmadabad	16	673	Operational
2	Odhav Enviro Project Ltd., 25, GIDC Odhav, Ahmedabad	1.6	56	Operational
3	Gujarat Vepari Maha Mandal Sahkari Udhhyogik Vasahat Ltd., 181, GVMMS Industrial Estate, Odhav, Ahmedabad	1	264	Operational
4	Odhav Green Enviro Project Association,394, GIDC Odhav, Ahmedabad	1	2	Operational
5	Naroda Enviro Projects Ltd.,512-515, Phase I, GIDC Naroda, Ahmedabad	3	255	Operational
6	Narol Dyestuff Enviro Society, 1083 Near Vishal Textile Mill, B/h Narol-Court, Narol, Ahmedabad	0.1	20	Operational
7	Sanand Eco Projects Ltd. (Incineration system), S. No. 172 Ajanta Industrial Estate, Iyara – Sanand Dist:Ahmedabad	0.1	55	Operational
8	Tata Motors Ltd Vendors Park, Sanad, Dist Ahmedabad	1.5	27	Operational
9	Zydus Infrastructure Pvt.Ltd, Changodar, District Ahmedabad	0.75	11	Operational

10	Bavla Eco Project. Sr No: 1440/P, Opp : Ganpati Boil Centre Ta. BavlaDist : Ahmedabad.	1	14	Operational
11	Vinayak Jal Sudhikaran Sahakari Mandali Ltd. Soc. Ltd. C/o, Tirupati Agro Ind. At Bavla. Dist : Ahmedabad.	1.5	20	Operational
12	Nandesari Industrial Association (CETP) 153/A, GIDC Nandesari District Vadodara	6.8	119	Operational
13	Enviro Infrastructure Co. Ltd. ECP Canal road, Umraya, Ta. Padra District Vadodara	4.5	96	Operational
14	Enviro Technology Ltd., 2413/2414, GIDC Estate, Ankleshwar, District Bharuch	1.8	271	Operational
15	Narmda Clean Tech Ltd., (Bharuch Eco-Aqua Infrastructure Ltd.)(BEAIL), Ankleshwar	60	1060	Operational
16	Panoli Enviro Technology Ltd. 619, GIDC Estate, Panoli, District Bharuch	1	114	Operational
17	Globe Enviro Care Ltd. [chemical units], PP 1, Off road no. 2, B/h Kay Tex Mills,(GECL GIDC Estate, Sachin – Surat	0.5	45	Operational
18	Sachin Enviro Infra Ltd., (SEIL)[process houses]P/2, GIDC Sachin Dist. Surat	50	70	Operational
19	Palsana Enviro Protection Ltd.,(PEPL)Blok No-527-527Vill-UmbhelTa-Kamrej Dist-Surat	100	127	Operational
20	Pandesara Infrastructure Ltd., GIDC – Surat	100	127	Operational
21	Gujarat Eco textile park Pvt ltd, S.No 479,480, village Baleshwar, Ta. Palsana Dist. Surat	60	38	Operational
22	Fairdeal Textile Parks Pvt,Ltd, Surat	2.25	5	Operational
23	New Palsana Industrial Co. Op. Society Ltd., Plot 2, Block 194 B, Baleshwar, Ta. Palsana Dist. Surat	45	24	Operational
24	Vapi Green Enviro Ltd. 4807, Phase IV, GIDC Vapi, District Valsad	55	697	Operational
25	Gujarat Industrial Development Corporation (Old name: Sarigam Industrial waste Efluent Co Ltd) GIDC, Sarigam, Dist Valsad	12.5	147	Operational
26	Veraval Industries Association Plot No-41-42-43,GIDC Veraval District Junagadh	5	75	Operational
27	Bhatgam Washing Ghat Suddhikaran Yojana Pvt. Ltd., Bhatgam,Rajkot	30	200	Operational
28	Jetpur Dyeing & Printing Association Kankiya Plot, Jetpur, District Rajkot	10	1173	Operational
29	Shri Dhareshwar GIDC Vistar Association, Nr. Dhareshwar Temple, National Highway, Navagadh, Rajkot	0.09	26	Operational
30	Jay Khodiyar Enviro-Technologies Pvt. Ltd., Kalipat, Bhavnagar road, Rajkot	0.025	225	Operational
31	Rajkot Electroplating Association, Rajkot Shapar (Veraval), Ta: Kotadasangani Dist. Rajkot	0.01	20	Operational
32	Kalol GIDC Industries Association 65/66, GIDC Estate Kalol, District Gandhinagar	0.4	34	Operational
33	MPSEZ Utilities (P) Limited ,Mundra, Kutch	2.5	2	Operational
Total		574.925	6092	

**Table:5 Proposed CEPTs of Gujarat**

Sr. No.	Name and address of CEPT	Capacity (MLD)	No. Of Members	Status
1	Jamnagar Electroplaters Association, Jamnagar	0.4	138	CETP has obtained TOR, Public Hearing is to be Conducted
2	Narol Textile Infrastructure & Enviro Management, 34/P, Nr. Animal Foundation, Gyaspur, Dist. Ahmedabad.	100	118	Ready for Commissioning
3	Ahmedabad Hand Screen Printing Association, Danilimda, Ahmedabad (In co-ordination with AMC)	30	700	Applied for EC
4	CETP for Washing Ghat, Derdi Road, Jetpur, Dist. Rajkot	20	200	Obtained CTE
5	Hojiwala Infrastructure Ltd. Sachin, Surat	20	-	CTE Granted, EC Pending
6	Kejriwal Integrated Textile Park Pvt. Ltd. Palasana, Surat	25	-	CTE Granted, EC Pending
7	Shahlon Envirocare Pvt. Ltd. , Surat	20	-	CTE Granted, EC Pending
8	CETP of Dahej Industrial Estate	40	-	Proposed
	Total	255.4	1156	

Source: Gujarat Pollution Control Board