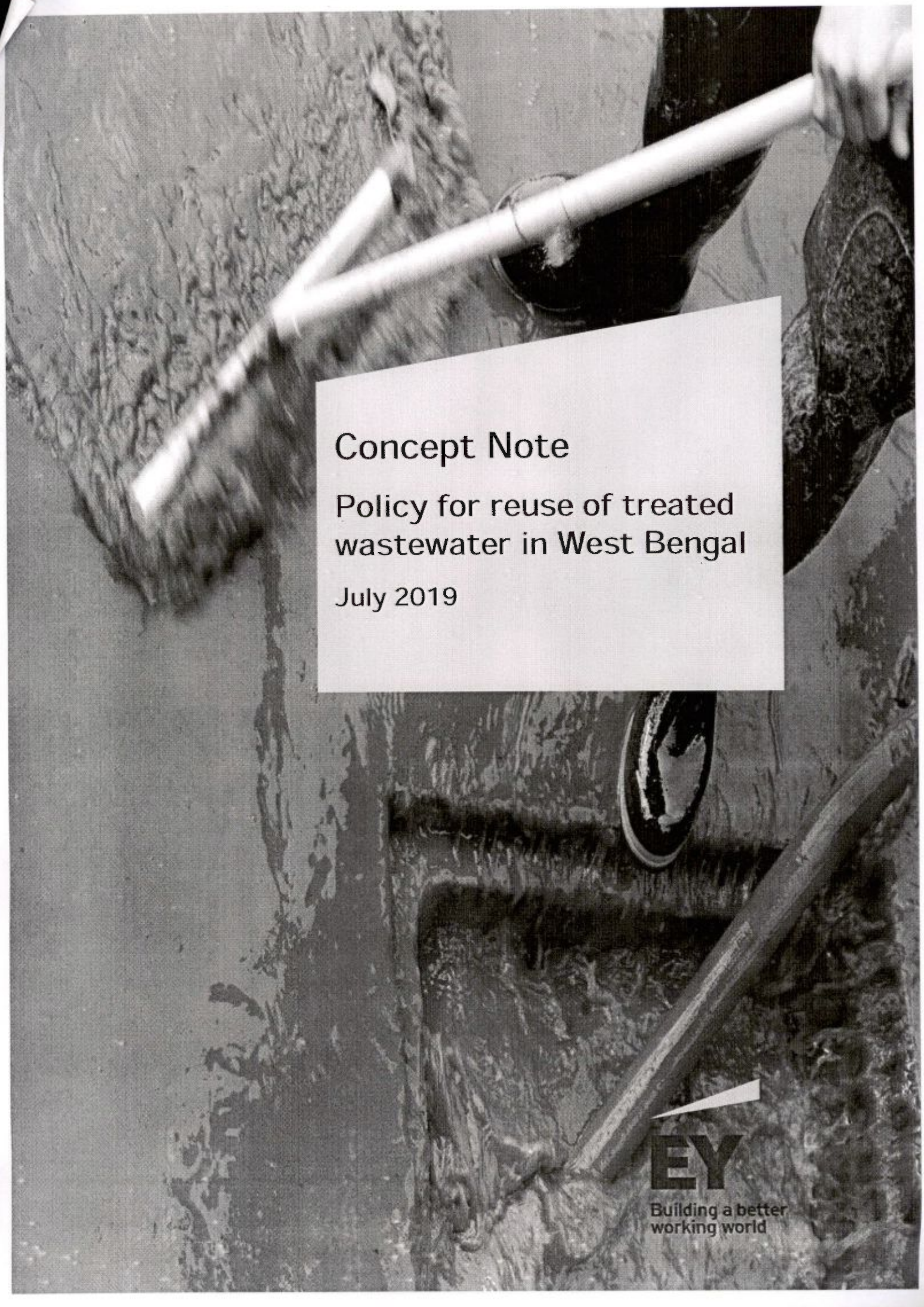


Concept Note

Policy for reuse of treated wastewater in West Bengal

July 2019

EY

Building a better working world

Table of Contents

1 Background

Urban population in India is growing at a fast-pace and has recorded a decadal growth rate of 30% as per 2011 Census. According to a survey by UN State of the World Population report in 2007, it is expected that by 2030, 40.76% of country's population will reside in urban areas and India is expected to be among top 5 nations that will lead World's urban population surge by 2050. Though urbanization leads to economic growth of the cities, it also stresses the urban infrastructure. One such pertinent issue that most of the cities are facing today is depletion in environment quality and scarce potable water resources impacting quality of life.

Water is the most essential natural resource for sustaining human life that cannot be created in a Laboratory by humans, it is hence important that every drop of water is saved, recycled and consumed to mitigate the impending crisis. This demands for innovative alternatives to fresh water and recycled / adequately treated wastewater currently presents most viable approach. In recent past, different sectors such as industries, Power plants, Agriculture, reclaiming wetlands etc. have started using treated wastewater for non-potable purposes and hence presents a viable option for substituting fresh water with treated wastewater to limit the use of fresh water for potable purposes.

One of the key challenge in closing the water loop is the slow-pace movement in wastewater sector, as it is highly driven by compliance to regulations. Further, though certain sections of society are using recycled wastewater for non-potable purposes, the concept has to gain momentum and acceptance by public at large. Majority of the people still associate *'Yuck Factor'* w.r.t. reuse of treated wastewater.

It is hence an umpteen task for the Government to consider needs of different stakeholders present in the wastewater management and recycle landscape. The advent of reuse opportunities for recycled wastewater transforms the wastewater management sector into a sector generating valuable product, i.e., safe and reliable source of water. In recent past, this sector has sparked interest from diverse sections of society including Environmentalists, Socialists, Entrepreneurs, Policy makers, Engineers and other Private agencies having a common objective to create sustainable environment through reuse of treated wastewater.

Though treating and reusing wastewater was conceptualized owing to the social concerns and environment safeguard besides meeting the water supply gap. However, with successful models of reuse of treated wastewater, it is considered as a reliable source of non-potable water that can help water scarcity issues.

Government bodies across the country are also focussing their attention to provide holistic and composite mosaic of enabling policies, technology guidance, IEC and behavioural change events/sessions, handholding support to grass root functionaries, incentives to substitute fresh water with treated wastewater and foster private participation to bridge the gaps in achieving the common objective. Reuse of treated wastewater has been considered in many urban development programs and the related policies in India. Some of these are:

- The National Urban Sanitation Policy (NUSP), 2008, promotes reuse of treated wastewater and recommends a minimum of 20% reuse of wastewater in every city

- The National Water Policy (2012) considers reuse of treated wastewater as a key component to meet environmental objectives and suggests preferential tariff to incentivise treated wastewater over freshwater.
- Power Tariff Policy (revised, 2016): The revised power tariff policy mandates thermal power plants within 50 kms of a city STP to offtake all the treated wastewater from the STP. Charges incurred in conveyance of wastewater from the STP to the power plant are eligible for pass through in the power tariff

2 Wastewater management scenario in West Bengal

Urbanization, though result in economic growth, is a proportionate increase in per-capita water consumption, stressing the existing water and wastewater infrastructure which is mostly absent or is inadequately designed to meet the current demand. Cities are especially vulnerable to water shortages because of their high concentration of population and high demand for reliable water supply to maintain pace of human and economic activity. As climate change produces variations in rainfall, these challenges would intensify. Most Indian cities are already facing severe water stress.

In 2017, Union Ministry Study revealed that only 56% households in urban area in West Bengal have access to safe drinking water, which is much below the national average of 70.06%. Similarly, out of total rural population in India without access to clean drinking water, 19% are from West Bengal. Some of the districts in West Bengal such as Purulia, Bankura, Burdwan, and parts of West Midnapore grapple with drought like situation every year. Factors such as depleting water-levels, nature of soil, lack of scientific water-preservation measures and limited government initiatives to the large-scale crisis are some of the factors for the water scarcity in the State.

Annual per-capita water availability of less than 17 lakh cubic metres is considered as water stressed condition, whereas annual per-capita water availability below 1000 cubic metres is considered as a water scarcity condition. In West Bengal, average annual per capita water availability in 2001 was around 18.2 lakh litres. This dropped to 15.4 lakh litres in the year 2011, suggesting that West Bengal is already reeling under a water stressed condition. The per-capita water availability is expected to further drop to 13.4 lakh litres in 2025 and to 11.4 lakh litres by 2050.

This demands high intensity action for the State to save the fresh water sources and limit their use mostly for potable purposes only. Hence it is critical that reuse of treated wastewater for non-potable purposes to substitute fresh water is prioritized.

2.1 Wastewater infrastructure in West Bengal

As per report from National Green Tribunal, West Bengal treats only 49% of wastewater before discharging it in the river/ canals. Table below indicates that STP treatment capacity available with Municipal Corporations in West Bengal. Of the total municipal wastewater generated, State has capacity to treat only 10% of the municipal wastewater. Majority of wastewater is discharged into the adjacent rivers / lakes / canals / ponds without any treatment. High levels of Arsenic, Iron and Salinity are some common issues that locals, relying on ground water sources, have to grapple with.

Description	Unit	Quantity
Wastewater Generated in West Bengal (Urban)	MLD	4,667
Number of STPs in West Bengal	Number	34
Total Treatment Capacity	MLD	457
Actual Utilization of STPs in West Bengal	MLD	214

Currently, State Government is focussing mostly on Kolkata city for laying infrastructure for wastewater collection and treatment. Kolkata receives 300 MGD (1360 MLD) of water supply through a distribution network of about 3000 km length, and discharges about 1100 MLD[1] wastewater in the dry season. The existing sewerage network covers a length of about 1610 km and the length of open drain is about 950 km. There are five functional STPs of which only three are functional and can treat only 12% of wastewater generated in the State during the dry season.

Name of STP	Treatment Capacity (MLD)	Actual Utilization (MLD)	Type of Technology*	Year of commissioning
Garden reach	57	57	ASP	2011
Bangur	52	52	ASP	2011
South suburban East (Keorapukur) @ Behala	45	45	AL	2009
Bhangajatin	15	0	AL	1984
Hastipur	10	0	OP	2004
TOTAL	**172**	**154**		

This indicates that there is a dire need for laying wastewater infrastructure focussing not only State capital but also other districts that are water stressed. While setting up the infrastructure, care should be taken that the treated wastewater should meet the quality standards so that it can be reused for various purposes.

2.2 Wastewater reuse scenario in Kolkata

Historically, since 1950s, East Kolkata Wetlands (EKW) have been utilizing Kolkata city's sewage for practicing aquaculture and harvesting paddy. Nearly 980 MLPD of sewage is discharged daily in EKW and in return 10,000 tonnes of fish is annually reared besides 1,500 tonnes of rice and 55,000 tonne of vegetables. However, with urbanization, significant land for wetland has been converted over time and wetland area has reduced from 11,000 Ha in 1950s to 2,500 Ha presently. In contrast, wastewater generated in the city has increased with growing urban population. There is hence a need to explore more opportunities for utilizing treated wastewater and to realize its economic potential.

[1] Source: City Sanitation Plan, Kolkata Municipal Corporation

3 Need for the Policy

Considering Water is a state subject and providing water and provision of services w.r.t. wastewater lies in gamut of local government, there is a need to regulate the sector. This demands for having a clear policy direction specifying the targets / goals, legislative, regulatory and financial measures to anchor the projects in this sector.

The policy shall help to identify and kick-start few immediately available projects having good potential for using treated wastewater for non-potable purposes and deal with the acute water stress prevailing in the State.

Objectives of the policy document are:

- Ensure adherence to prevalent guidelines for optimum treatment of wastewater to meet the prescribed quality standards
- Address ongoing water shortage for potable purposes, by substituting treated waste water for non-potable purposes
- Warrant scientific disposal of sewerage to arrest ground water pollution and reducing environment and health hazards
- Realize economic value of treated waste water and consider it as potential revenue source for the ULBs, particularly for non-potable purposes in power plants, industries, agriculture, large scale commercial and institutional complexes etc.
- Confirm environment sustainability by reducing burden on already stressed basin and aquifers and preventing their depletion by recharging them through treated waste water
- Guide cities / Local bodies in undertaking projects in this sector through creation of wastewater reuse plan, preparing detailed / technical documents, feasibility studies etc.
- Assist in identifying opportunities to collaborate with industries and other institutions for reuse of treated wastewater

Policy shall encompass following components

- Broad vision and specific targets for substituting fresh water with treated wastewater in planned manner
- Timelines for execution of infrastructure projects to achieve the targets
- Identify reuse opportunities across different sectors and prescribe quality parameters for each of these sectors separately
- Technology options for treating wastewater to achieve the prescribed quality parameters
- Coordination between different Government departments and entrust responsibilities to ensure suitable Institutional and Governance mechanisms
- Provide guidelines to local bodies for allocation and pricing of the treated wastewater
- Institutional support to encourage private sector participation during planning, designing, execution of projects, assist in project maintenance and collaborate with government for reusing the treated wastewater
- Capacity building and IEC activities to handhold grass root functionaries for project execution

4 Case studies

Reuse of reclaimed water is well established in many countries. In Windhoek, Namibia, reclaimed water is used as the main source of potable water. Globally, reclaimed water is primarily used for non-potable uses. Some local and international case studies are presented in this section.

4.1 Case 1: Singapore NEWater

Reuse of treated wastewater is popular in many water-starved cities across the globe. Singapore's success in using treated wastewater (referred to as NEWater) for industrial supply is one of the successful case and is apt for reference in Indian scenario.

Singapore has very limited sources of water within its boundaries and imports water from Malaysia. Since 1958, the country has consistently sought to improve its water security by improving rainwater harvesting and through source diversification. Reuse of treated wastewater is one of the four 'national taps', alongside desalination, rainfall and imports. NEWater contributed towards one-third of the water supplied in Singapore.

Treatment process and plants:

NEWater plants use an advanced tertiary treatment process that has three stages—microfiltration/ultrafiltration, reverse osmosis, and ultraviolet treatment. The quality of NEWater meets the standards of freshwater from the catchment lakes.

Reuse approach:

NEWater is directly supplied to industries to meet the non-potable water demand, which accounts for 55% of the total water demand. Only a small proportion of NEWater is used to augment freshwater in reservoirs for indirect potable reuse. By 2060, it is estimated that approximately 70% of water demand in Singapore will be non-domestic, and NEWater capacity would be expanded to provide for 55% of total water demand.

4.2 Case 2: Wastewater reuse in Beijing

Since 2008, Beijing has actively invested in water reuse projects and, as a result, reclaimed water accounted for approximately 22% of total water supplied in 2014. Beijing has developed a wastewater reuse network that includes many treatment plants with capacities ranging from 60 kilolitres per day (KLD) to 60 MLD. The larger plants are owned and operated by the local government.

Beijing has also taken the PPP route to develop reuse projects. However, since water tariffs are very low, these PPPs cannot be financially viable. The government has plans to improve the financial viability of reuse projects by increasing tariff in the long run, and would have to rely on capital subsidies till then for private sector participation.

Driven by resource scarcity, China is way ahead in terms of adding reuse capacity, and targets to have a combined capacity of approximately 4,370 MLD from its many reuse plants.

4.3 Case 3: Chennai Petroleum Corporation Ltd (CPCL)

Chennai does not have sufficient water sources to meet fresh water demand. Considering the water scarcity in the region and huge water demand for refinery operations, CPCL has alternative to use reclaimed water from STP to reduce its reliance on fresh water.

At present, the sewage generated in Chennai City is being treated in nine treatment plants with a total capacity of 486MLD. The Kodungaiyur STP is the largest plant (capacity: 110 MLD) and is located in the vicinity of the Manali industrial area. CWSSB supplies 23 MLD of secondary effluent from Kodungaiyur STP to Chennai Petroleum Corporation Ltd (CPCL) refinery at Manali, Chennai. The water is further treated by CPCL and reused for cooling and boiler make-up.

Financials & Commercials of the project

CPCL constructed and operates the reclamation plant at its refinery premises for treating the secondary effluent for its industrial purposes.

Revenue/ Tariff structure

- PCL pays INR 11.85/ cum for secondary effluent to CMWSSB
- CPCL procures freshwater at INR 62/ cum to CMWSSB

Risk Allocation

CPCL takes the demand and funding risk

4.4 MAHAGENCO - Nagpur Municipal Corporation

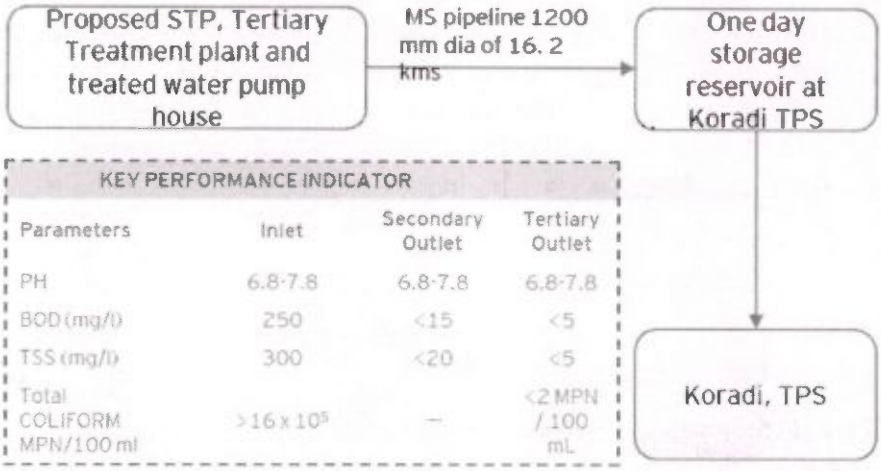
It is Wastewater Reuse Project at Nagpur Water supply for (3x660 mw) KORADI Thermal Power Plant. Expansion of the Thermal Power Plant triggered utilizing treated wastewater for its processes.

Considering the water scarcity in the Vidharbha Region and huge water demand for upcoming power plants, MAHAGENCO decided to go for a alternate unconventional source. USAID conducted a feasibility study for re-use of treated sewage from Nagpur city for its use in a Thermal Power Station, MAHAGENCO found the proposal feasible and economical. Nagpur Municipal Corporation (NMC) has received the grant of 90 Crores for establishment of 110 MLD STP under JnNURM. The project led to Saving of fresh water to the extent of 47 MM^3 per annum

Financials & Commercials of the project

- ✓ **Total Project Cost (180 Cr.)** = JnNURM Grant (90 Cr.) + MAHAGENCO Share (90 Cr.)
- ✓ **Operation and Maintenance Cost:** INR1.50 Cr/Year
- ✓ **NMC shall supply 110 MLD (+10%) sewage to MAHAGENCO @ INR 15 Cr./ year**
- ✓ **Cost of water to MAHAGENCO:** INR 3.40 per Cum
- ✓ **Cost of fresh water from irrigation department :** INR1.20 to 9.60 per Cum
- ✓ Land required for the project shall be provided by NMC

Project Layout

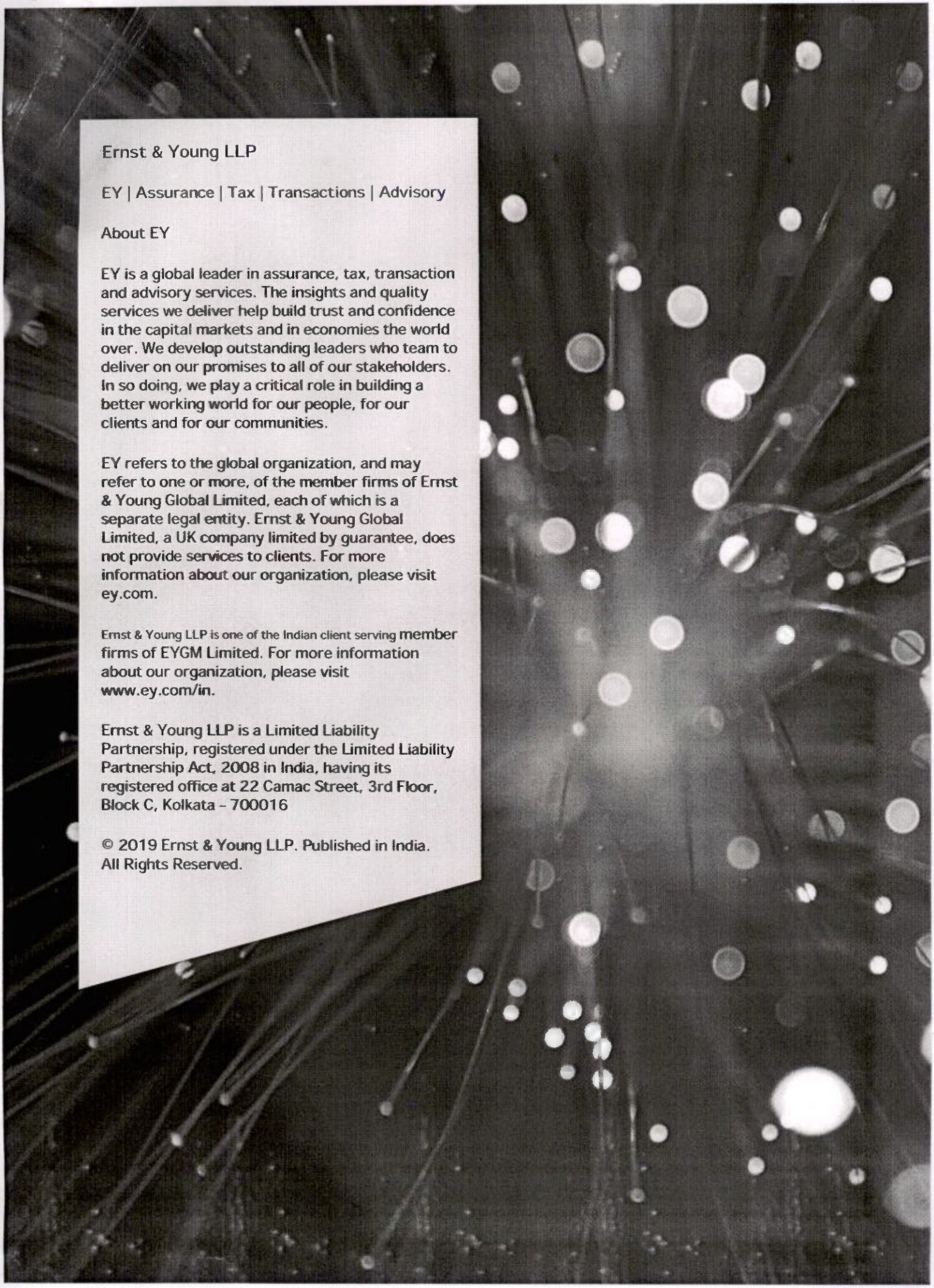


KEY PERFORMANCE INDICATOR

Parameters	Inlet	Secondary Outlet	Tertiary Outlet
PH	6.8-7.8	6.8-7.8	6.8-7.8
BOD (mg/l)	250	<15	<5
TSS (mg/l)	300	<20	<5
Total COLIFORM MPN/100 ml	$>16 \times 10^5$	–	<2 MPN /100 mL

Risk Allocation

MAHAGENCO takes the partial funding risk and complete operational and demand risk



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Sujay Mitra <sujay.mitra@gmail.com>

Concept note : Policy for treated waste water_ WB

1 message

Chaitali Mondal <Chaitali.Mondal@in.ey.com> Tue, Mar 17, 2020 at 12:36 PM
To: "santanu.mkj@gmail.com" <santanu.mkj@gmail.com>
Cc: "Sujay.mitra@gmail.com" <Sujay.mitra@gmail.com>

Sir,

As discussed yesterday at your office, I am sending you a concept note on Policy for treated waste waster for West Bengal herewith.

Please find attached.

Regards

--

Chaitali Mondal | Senior Project Consultant | TAS

EY LLP
22 Camac Street, Kolkata, West Bengal, India
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Concept Note_WW Reuse_WB_v0.2.pdf
940K

Government of West Bengal
Department of Urban Development & Municipal Affairs
Nagarayan, DF-8, Sector-1,Salt Lake, Kolkata -700 064

No. 71(1)-JS(SM)/UD&MA/2019 **Date: 05/12/2019**
UD/00/2019/03675

From: The Joint Secretary to the Govt. of West Bengal
UD&MA Department &
Additional Mission Director (MNB)

To:

The Principal Secretary,
Environment Department,
Government of West Bengal

Sub: Comprehensive Policy for Re-use of Treated Waste Water in Urban West Bengal.

Sir.

This is to inform you that the draft Comprehensive Policy for Re-use of Treated Waste Water in Urban West Bengal formulated by the Committee constituted vide Notification No. 37-JS(SM)/UD&MA/ 2019 dated 16.04.2019 communicated to you vide no.46-JS(SM)/UD&MA/2019/ UD/00/2019/03675 date : 05/12/2019 for necessary action.

After that incorporating the comments of CPCB (as received from Sri Ujjal Sen Gupta, Chief Scientist, WBPCB) and the committee members, we have prepared the revised policy document for re-use of treated waste water.

As directed I am forwarding the revised policy document submitted by the committee for your kind perusal and necessary direction.

Yours faithfully.

5.12.19.

Joint Secretary to the Govt. of West Bengal
&
Additional Mission Director (MNB)

No. 71(1)/1(3)-JS(SM)/UD&MA/2019 **Date : 05/12/2019**
UD/00/2019/03675

Copy forwarded for kind information and necessary action to:

1. Member Secretary, WBPCB
2. Director. SUDA.
3. PS to Principal Secretary, UD & MA Department.

5.12.19.

Joint Secretary to the Govt. of West Bengal
&
Additional Mission Director (MNB)

Treated Wastewater Re-use Policy
of
Urban West Bengal

December 2019

Prepared by

Urban Development & Municipal Affairs Department
Government of West Bengal

Preface

Poor sanitation and wastewater management in developing countries leads to the contamination of fresh water sources and is a major cause of water borne diseases and also affect the health of eco-systems. Around 80% of all waste water is discharged into the surface water bodies without any treatment where it creates health, environmental and climate-related hazards. Urbanization further exacerbates this challenge with increasing wastewater generation, while at the same time using more of Earth's dwindling resources. Recycling and reuse of treated wastewater is an important part of the sanitation cycle and critical in an environment with decreasing freshwater availability and increasing costs for delivering desirable quality water, often from far distance. Recovering the water, energy, nutrients and other precious materials embedded in wastewater is a key opportunity to be seized. Target 6.3 of the Sustainable Development Goals (SGD) commits governments to halving the proportion of untreated wastewater and sustainability, increasing recycling and safe reuse by 2030.

This policy document gives substantial focus to the financial and economic benefits of wastewater recycling from the perspective of public spending. The policy presents possible strategies for city and state planners in view of the sanitation situation and the role of wastewater recycling in the cities in West Bengal, and focuses on recycling at the end of sewage systems with appropriate centralized or decentralized technology solution alongwith extensive public awareness activities.

Contents

Overview

About Wastewater: At a Glance

What is Wastewater:

Wastewater can have a number of definitions (UN-Water 2015). The approach taken in this policy is a very broad definition following that outlined in the UNEP/UN-Habitat document 'Sick Water?'. Thus, Wastewater is defined as "a combination of one or more of:

- domestic effluent consisting of blackwater (excreta, urine and faecal sludge) and grey- water (kitchen and bathing wastewater);
- water from commercial establishments and institutions, including hospitals;
- industrial effluent, storm water and other urban run-off;
- agricultural, horticultural and aquaculture effluent, either dissolved or as suspended matter

Although, using this definition, the term 'wastewater' clearly encompasses domestic, commercial, industrial, agricultural components and also fecal sludge, these are sometimes covered separately in order to clarify or highlight the importance of the individual components or wastewater streams. (UN-Water, 2015).

Types of wastewater:

Wastewater comes in three main types namely Black water, Gray water and Yellow water.

Black water
This is wastewater that originates from toilet fixtures, dish washers, and food preparation sinks. It is made up of all the things that one can imagine going down the toilets, bath and sink drains. They include poop, urine, toilet paper and wipes; body cleaning liquids, anal cleansing water and so on. They are known to be highly contaminated with dissolved chemicals, particulate matter and is very pathogenic.

Gray water
This is wastewater that originates from non-toilet and food fixtures such as bathroom sinks, laundry machines, spas, bathtubs and so on. Technically it is sewage that does not contain poop or urine. Gray water is treated very differently from Black water and is usually suitable for re-use.

Yellow water
This is basically urine collected with specific channels and not contaminated with either black water or gray water.

Sources of wastewater

Domestic Sewage
This includes all wastewater generated by home dwellings, public restrooms, hotels, restaurants, motels, resorts, schools, places of worship, sports stadiums, hospitals and other health centres, apartments and the like. They all produce high volumes of wastewater.

Non-sewage
This includes water from floods (storm water), runoff (rainwater running through cracks in the ground and into gutters), water from swimming pools, water from car garages and cleaning centres including laundromats, beauty salons, commercial kitchens, energy generation plants, industries and so on.

Wastewater is also generated from agricultural facilities. Water used for cleaning in animal farms, washing harvested produce and cleaning farm equipment.

How is wastewater harmful?

In certain parts of the world, especially in developing countries, wastewater is pumped directly into the sea or into fresh water bodies without any form of treatment. In other parts of developed countries, lack of adequate wastewater treatment infrastructure, maintenance and outdated systems heavily compromise wastewater treatment efforts. The effects of this (either treated or partly treated) can be classified in the following:

Water pollution:
Fresh water bodies and marine waters, into which wastewater is discharged may be polluted and rendered unsafe for human use. Depending on what is discharged, aquatic life may be harmed too.

Water security:
There is water scarcity in many places in the world. Wastewater discharged on lands can leach into underground water tables and potentially contaminate aquifers and underground water. If discharged in freshwater bodies, it may render water sources unsuitable for use.

Ecosystem services:
All ecosystems are connected and they all ultimately depend on water. Similarly, all water (surface and underground) is connected. This means careless wastewater discharge can have some serious ripple effect. One common effect of wastewater is the eutrophication of fresh water bodies and oceans. If one part of the ecosystem chain is destroyed, it can upset its entire food chain.

Agriculture / Fisheries / Tourism:
Wastewater for irrigation may contain unsuitable chemicals and higher concentrations of nutrients needed for crops. This can result in delay and under yielding. Wastewater used for animal farming may also contain harmful things and chemicals dissolved in them. Animals may die, and there is a chance that humans that eat such animals may be harmed too. In some places, fecal sewage is discharged directly into the sea/river. The discharge contains pathogens and harmful dissolved chemicals which can affect fishing in that area. The smell and such behavior do not encourage tourism to that area.

Health of urban and rural populations:
Wastewater is a big health issue, as it carries and transports a myriad of diseases and illnesses. It is believed that about 2.2 million people die each year (globally) from diarrhoeal disease. (WHO) At least 1.8 million children under five years die every year due to water related disease, or one every 20 seconds (WHO, 2018).

What is Waste water Management?

Wastewater management is the process of taking wastewater and treating/managing it in order to reduce the contaminants to acceptable levels so as to be safe for discharge into the environment. There are effectively two basic types of wastewater treatment: centralized and decentralized. Centralized systems are large-scale systems that gather wastewater from many users for treatment at one or a number of sites, whereas decentralized systems are dealing with wastewater from individual users, or small clusters of users, at the neighborhood or small community level.

The choice between centralized or decentralized wastewater management systems will depend upon a number of different factors, but it is important that full consideration be given to both the options rather than the situation that has existed in the past where sewerage was often considered to be the only 'proper' form of urban sanitation (UN-Water, 2015).

Availability of Water in West Bengal

- West Bengal possesses 7.5% of Water Resources of India.
- Annual Per capita availability of fresh Water:

Year	Water Availability (in m^3)
1961	5177
2001	1869
2025	1341

- Availability of Surface Water is 13.29 Million hectare meters (M.ham), 40% of it is useable.
- Availability of Ground Water is 2.38 M.ham, totally useable.

Requirement of Water in West Bengal in (M.ham)

Sector	2000	2011	2025
Agriculture	5.38	7.71	10.98
Domestic	0.26	0.28	0.38
Industry	0.26	0.38	0.59
Power (Thermal)	0.31	0.00	0.00
Inland Navigation	3.63	3.63	3.63
Forestry	0.01	0.01	0.01
Ecology, Environment and Others	1.00	1.00	1.00
Total (M.ham)	10.85	13.02	16.60
* Source: State Irrigation Department			

Shortfall of Water in West Bengal

As the supply of water is naturally constrained and demand is increasing in leaps and bounds the GAP in between is extending with time.

GROWTH OF POPULATION AND DECLINING PER CAPITA WATER		
YEAR	POPULATION (In Crore)	PER CAPITA WATER (In cu.m)
1951	2.63	2574
1961	3.49	1940
1971	4.43	1528
1981	5.46	1240
1991	6.81	996
2001	8.02	844
2011	9.40	720
*** Source: State Irrigation Department**		

Water Requirement vs Supply		
YEAR	Water Requirement (M.ham)	Deficit
2001	10.85	38%
2011	13.02	48%
2025	16.60	59%
* Source: State Irrigation Department		

Main Features of Urban West Bengal

Area of West Bengal: 88752 sq. km.
Total No. of Districts: 23 nos.

Area of Statutory Towns of West Bengal: 2742.21 sq. km. (3.09% of Total Area of WB)

Total Towns:

1. 125 Statutory Urban Local Bodies having 2938 Wards
   - 7 Municipal Corporations; 115 Municipalities; 3 Notified Area Authorities
2. 782 Census Towns

Three Industrial Township Authorities – Nabadiganta Industrial Township Authority, Bantala Industrial Township Authority and Golden City Industrial Township Authority

Development Authority – 19 Nos.

Urban Growth:

- Density of Urban Population – 6798 per sq. km. (highest in India)
- 30% of the total Urban Population live in Slum Areas
- Population share in size classes of towns to total Urban Population (Census 2011):

Sl No	Category of Town	Population Range	No. of Towns	Total Population
1	Municipal Corporation		7	8591218
2	A	above 2,15,000	13	4013321
3	B	above 1,70,000 to 2,15,000	8	1548015
4	C	above 85,000 to 1,70,000	34	4010347
5	D	above 35,000 to 85,000	42	2321142
6	E	below 35,000	21	473658
	TOTAL		**125**	**20957701**

Sl No	Town Size Classes	No. of Towns	Total Population
1	I (> 1000000 population)	3 MC	6726212
2	I (> 500000 - 1000000 population)	3 MC	1698139
3	I (> 100000 - 500000 population)	1 MC & 47 Municipality	9040626
4	II (50000-99999 pop.)	33 Municipality	2334791
5	III (20000-49999 pop.)	29 Municipality & 1 Notified Area Authority	1036389
6	IV (10000-19999 pop.)	5 Municipality & 2 Notified Area Authority	112417
7	V (5000-9999 pop.)	1 Municipality	9127
	TOTAL	**125**	**20957701**

Service Level Scenario of Piped Water Supply in Urban West Bengal

Piped Water Supply				
Sl No	**Indicator**	**Service Level Benchmark**	**Present Status (Average)**	**Gap**
1	Household level coverage (%)	100%	56%	44%
2	Per capita supply of water	135 lpcd	72 lpcd	63 lpcd

Comparative Urban Growth of India and West Bengal

Sl .No.	Years	India (In Million)	West Bengal (in Million)
1	1961	78.16	8.54
2	1971	107.82	10.97
3	1981	159.46	14.45
4	1991	217.61	18.71
5	2001	285.36	22.43
6	2011	377.11	29.1
Source: 1. Census of India			

Urbanization in West Bengal

Year	Total Population (in Million)	Urban Population (in Million)	% of Urban Population
1981	54.6	14.4	26.37%
1991	68.1	18.7	27.46%
2001	80.17	22.5	28.06%
2011	91.2	29.1	31.90%

Water Demand with Projected view of next 50 years in West Bengal

Sl No	Municipality/ Corporation	Population in 2020	Rate of Growth per year	Population in 2070
1	West Bengal Urban Area	31,819,118	1.585%	69,850,157

		Ultimate Year 2070	Units	Remarks
Projected Population		69850157	Nos.	Based on population computed
Floating Population @	2.00%	1397003	Nos.	Assumed
Total Population		71247160	Nos.	
Population Served in LPCD @	135	9618366619	Lit/Day	CPHEEO Manual
Institutional & Industrial Demand @	8.00%	769469330	Lit/Day	Assumed
Fire Fighting @ 100000(Popu/1000)^0.5		26692164	Lit/Day	CPHEEO Manual
UFW @	15%	1562179217	Lit/Day	CPHEEO Manual
Total Estimated Demand		**11976707329**	Lit/Day	
Total Estimated Demand		**11976.71**	**MLD**	
Required demand for next 50 years in KMA area		**2635.00**	**MGD**	

Capacity of STP in Towns beside Ganga River

Sl.No.	Town	District	Agency Responsible for Construction and/or O & M	Installed Capacity (MLD)
1	(a)Kolkata- (b)Cossipore Chitpore (c)Graden reach	Kolkata	KMC	122.50
2	(a) Howrah (b) Kona (c) Howrah STP (d) Anupara (e) North Howrah	Howrah	KMDA	127.00
3	Ulluberia		KMDA	
4	Serampore	Hooghly	KMDA	18.90
5	Chandanagar		KMDA	22.70
6	Bhadreswar		KMDA	7.60
7	Champdani		KMDA	0.30
8	Bansberia		KMDA	0.30
9	Baidyabati		KMDA	6.00
10	Konnagar		KMDA	
11	Rishra		KMDA	
12	Uttarpara-Kotrung		KMDA	22.00
13	Hooghly-Chinsurah		KMDA	29.30
14	Panihati	North 24 Parganas	KMDA	12.00
15	Titagarh		KMDA	23.00
16	Bhatpara		KMDA	61.00
17	Baranagar		KMDA	40.00
18	Kamarhati		KMDA	
19	Garulia		KMDA	7.90
20	Naihati		KMDA	11.60
21	Halisahar		KMDA	6.50
22	Barrackpore		KMDA	24.00
23	Khardah		KMDA	3.00
24	Kanchrapara		KMDA	18.00
25	Maheshtala	South 24 Parganas	KMDA	26.00
26	Budge Budge		KMDA	9.30
27	Diamond Harbour		KMDA	0.52
28	Nabadwip	Nadia	KMDA	19.50
29	Kalyani		KMDA	21.00
30	Gayeshpur		KMDA	8.33
31	Santipur		KMDA	6.00
32	Krishnanagar		MED	
33	Chakdah		MED	
34	Ranaghat		KMDA	11.80
35	Katwa	Burdwan	KMDA	10.45
36	Haldia	Purba Mednipur	MED	
37	English Bazar	Malda	MED	
38	Murshidabad	Murshidabad	KMDA	11.96
39	Jaigunj-Ajimganj		KMDA	8.00
40	Dhulian		MED	
41	Jangipur		KMDA	13.00
42	Behrampore		KMDA	3.70
43	Raiganj	Uttar Dinajpur	MED	
44	North Barrackpore	North 24 Parganas	KMDA	14.85
			Total	**728.01**

Status of old STPs maintained

SL. No.	Location of STP	Year of Commissioning	STP Capacity	Technology Adopted	Present Functional Status	Purpose of Use of Treated Water
1.	Baidyabati	2007	6.00 MLD	Oxidation Pond	Operational	Used in pisiculture purpose
2.	Champdani	2009	1.00 MLD	Aerated Lagoon	Non-operational	-
3.	Bhadreswar	2006	7.60 MLD	Aerated Lagoon	Operational	Used in pisiculture purpose
4.	Bansberia	2009	1.00 MLD	Waste Stabilization Pond	Non-operational	-
5.	Chandannagar	1993	22.70 MLD	Bio-filter and Waste Stabilization Pond	Operational	Used in pisiculture purpose and partially for agriculture
6.	Garulia	2004	7.90 MLD	Waste Stabilization Pond	Non-operational	-
7.	Titagarh	1989	23.00 MLD	WSP, ASP and Low Cost STP	Operational	Used for agricultural purpose
8.	Seerampore	1990	18.90 MLD	Trickling Filter	Non-operational	-
9.	Uttarpara – Kotrung, Konnagar and Rishra	2007	22.00 MLD	Low Cost STP	Operational	Used for pisiculture and for agricultural purpose
10.	Panihati	1993	12.00 MLD	Low Cost STP	Non-operational	-
11.	Naihati	2009	11.56 MLD	ASP	Operational	-

Status of new STP augmented / to be augmented

SL. No.	Location of STP	STP Capacity	Expected Date of Commissioning / Already Commissioned	Technology Being Adopted	Purpose of Use of Treated Water	Remarks
1.	Kalyani	21.00 MLD	2018	Trickling Filter and Waste Stabilization Pond	Being used for pisiculture and proposed for Agriculture and Industrial use	Already Commissioned
2.	Hooghly – Chinsurah	29.30 MLD	2022	SBR	-	Tendering Stage
3.	Mahestala	30.20 MLD	2022	SBR	-	
4.	Budge Budge	9.50 MLD	2020	SBR	-	Work in Progress
5.	Baranagar – Kamarhati	60.00 MLD	2022	Trickling Filter	-	LOA Awarded
6.	Halisahar	16.00 MLD	2020	SBR	-	Work in Progress
7.	Bhatpara	60.50 MLD	2018	FBBS Technology	Partially used for pisiculture	Already Commissioned
8.	Barrackpore	24.00 MLD	2020	SBR	-	Work in Progress
9.	Kona	62.00 MLD	2022	SBR & WSP	-	LOA Awarded
10.	Arupara	65.00 MLD	2022	SBR	-	
11.	Kanchrapara	18.00 MLD	2022	Aerated Lagoon	-	In the process of finalization of tender

Industrial Waste Water Treatment

Effluent Treatment Plants (ETPs) and/or Common Effluent Treatment Plants (CETPs) are integral part of industrial wastewater management systems. A CETP caters to a number of industrial units with same of closely similar industrial processes as only in such case the CETP can be designed in respect of the treatment chemistry. ETPs are the ultimate step of wastewater treatment by any industry before discharge to the environment. It is a compulsion for any water polluting industrial unit to have a suitable ETP treating the wastewater to the required discharge standard.

Depending on two wastewater components, (1) the volume of discharge and (2) the wastewater quality, "Grossly Polluting Industries (GPI)" has been identified in the state. Such GPIs are considered to be highly water polluting industries. At present West Bengal has 46 such Industries. An account of the quantum of wastewater discharge by these industrial units is provided in table below. The wastewater discharged by these industries will be identified in the first place for further treatment and reuse in (1) the same industry, or, (2) in industries or establishments nearby. As industrial wastewater, even after treated to the prescribed discharge standard, may contain substances unsuitable for certain uses, reuse of industrial wastewater requires a level of scrutiny before specific re-use.

An industrial unit will have to submit specific application to the State Pollution Control Board about the scheme of the re-use and can initiate such activity after specific approval by the State Board. The State Government shall actively consider incentive scheme(s) for the industries willing for initiating wastewater re-use schemes.

Industrial Waste Water Discharge

An account of wastewater discharge by Grossly Polluting Industries in West Bengal		
INDUSTRY NAME	**DISTRICT**	**WASTE WATER DISCHARGE QUANTITY (M3 / Day)**
BALLAVPUR PAPER MFG.ITD	Burdwan	288
BardhamanDharmaraj Paper Mill Private Limited	Burdwan	8
Durgapur Steel Plant (DSP)	Burdwan	22390
EAST INDIA PHARMACEUTICAL WORKS LIMITED (DURGAPUR WORKS)	Burdwan	140
Krishna Tissues Private Limited	Burdwan	620
SAIL-IISCO Steel Plant	Burdwan	32700
The Durgapur Projects Limited	Burdwan	57500
Bengal Beverages Pvt. Ltd.	Hooghly	730
Berger Paints India Ltd. (BAICL Divn.)	Hooghly	80
Dankuni Coal Complex, S.E.C.L.	Hooghly	1000
Grasim Industries Limited (Unit - Aditya Birla Insulators)	Hooghly	208
ITC Limited, PSPD, Unit: Tribeni	Hooghly	14000
Kesoram Rayon - Unit of Cygnet Industries Ltd.	Hooghly	11670
Mother Dairy Calcutta	Hooghly	700
Nalco Water India Limited	Hooghly	33
PMC Rubber Chemicals India Pvt. Ltd.	Hooghly	244
BERGER PAINTS INDIA LIMITED	Howrah	72.2
PEPSICO INDIA HOLDINGS PVT. LTD. (FRITOLAY DIVISION)	Howrah	1312.4
Britannia Industries Limited	Kolkata	236
Diamond Beverages (P) Limited	Kolkata	213
Gun and Shell Factory	Kolkata	2278
Hindustan Unilever Limited	Kolkata	300
AdaniWilmar Limited	Medinipore(E)	107
Exide Industries Limited	Medinipore(E)	630
Haldia Petrochemicals Limited	Medinipore(E)	11470
Indian Oil Corporation Limited- Haldia Refinery	Medinipore(E)	6300
IVL Dhunseri Petrochem Industries Private Limited	Medinipore(E)	403
MCPI Private Limited	Medinipore(E)	30792
Ruchi Soya Industries Limited	Medinipore(E)	130
Shree Renuka Sugars Ltd	Medinipore(E)	740
Tata Chemicals Limited	Medinipore(E)	45
UPL Limited (United Phosphorus Limited)	Medinipore(E)	72
UNIGLOBAL PAPERS PVT. LTD	Medinipore(W)	210
UNITECH PAPERS MILLS PVT. LTD	Medinipore(W)	242
AB Mauri India Pvt. Ltd.	Nadia	225
Khaitan (India) Ltd.	Nadia	200
SUPREME PAPER MILLS LTD	Nadia	1230
EMAMI PAPER MILLS LTD. (UNIT-GULMOHAR)	North 24-Parganas	900
EXIDE INDUSTRIES LIMITED, SHYAMNAGAR UNIT	North 24-Parganas	1660
INDIAN PULP AND PAPER PRIVATE LIMITED	North 24-Parganas	241.25
METAL & STEEL FACTORY (ORDNANCE FACTORY, MINISTRY OF DEFENCE)	North 24-Parganas	4411
IFB AGRO INDUSTRIES LTD (Noorpur- 743368)	South 24-Parganas	1189
Kohinoor Paper & Newsprint Pvt. Ltd.	South 24-Parganas	12
UNITED BREWERIES LIMITED,KALYANI UNIT	Nadia	950
Krishna Tissues Private Limited	Burdwan	620
Nataraj Electro Casting	Burdwan	2
CETP of Bantala Leather Complex	South 24-Parganas	20000

Policy Statement

1. Preamble:

Water, food and energy securities are emerging as increasingly important and vital issues for India and the world. Most of the river basins in India and elsewhere are closing or closed and experiencing moderate to severe water shortages, brought on by the simultaneous effects of agricultural growth, industrialization and urbanization.

India and China with one third of the world's population have less than ten percent of the world's water resources. A fresh water crisis may be in the offing for two thirds of the global population within next quarter century. In addition countries like India suffer from huge spatial and temporal disparities in distribution of water with its north-eastern region receiving more than a hundred times more rainfall than its western part and that too concentrated mostly during the summer monsoons. Expanding urban population without a proportional increase in civic amenities is already putting pressure on water resource management in urban areas. By 2050, half of India's population will live in urban areas and face issues around water. These bring more into focus on the institutional arrangements and delivery mechanisms of this scarce and non-substitutable resource.

West Bengal is the most densely populated state of India at 1000 persons per square km. Its average urban density is much higher at around 7500 persons per square km. West Bengal has liberal water availability as a natural resource that supports intensive rain-fed agriculture. However the pressure on urban water resources has been increasing over some years due to increasing population, low investment in supply augmentation and dilapidating state of existing systems. It is realized that current and future fresh water demand could be met by enhancing water use efficiency and demand management.

With rapid expansion of cities and domestic water supply, quantity of wastewater is increasing in the same proportion. As per CPHEEO estimates about 70-80% of total water supplied for domestic use gets generated as wastewater. The per capita wastewater generation by the class-I cities and class-II towns, representing 72% of urban population in India, has been estimated to be around 98 lpcd while that from the National Capital Territory-Delhi alone (discharging 3,663 mld of wastewaters, 61% of which is treated) is over 220 lpcd (CPCB, 1999). As per CPCB estimates, the total wastewater generation from Class I cities (498) and Class II (410) towns in the country is around 35,558 and 2,696 MLD respectively. While, the installed sewage treatment capacity is just 11,553 and 233 MLD, respectively, thereby leading to a gap of 26,468 MLD in sewage treatment capacity. Maharashtra, Delhi, Uttar Pradesh, West Bengal and Gujarat are the major contributors of wastewater (63%; CPCB, 2007a). Further, as per the UNESCO and WWAP (2006) estimates (Van-Rooijen *et al.*, 2008), the industrial water use productivity of India (TWP, in billion constant 1995 US$ per m3) is the lowest (i.e. just 3.42) and about 1/30th of that for Japan and Republic of Korea. It is projected that by 2050, about 48.2 BCM (132 billion litres per day) of wastewaters (with a potential to meet 4.5% of the total irrigation water demand) would be generated thereby further widening this gap (Bhardwaj, 2005). Thus, overall analysis of water resources indicates that in coming years, there will be a twin edged problem to deal with reduced fresh water availability and increased wastewater generation due to increased population and industrialization.

Though wastewater reuse is endorsed in many policies and programmes, there is a lack of clear guidelines and frameworks to support the implementation of such projects. As a result, the reuse of reclaimed water for non-potable purposes continues to face challenges. The problem is further exacerbated by limited enforcement of the restriction to extract groundwater for non-potable purposes. More detailed policies and stronger enforcement is needed for wastewater reuse projects to be viable.

To address these issues in a coordinated and focused manner by the development actors, a need has been felt to articulate an uniform State Policy on treated waste water re-use with specific direction towards the reforms in planning, institutional framework, capacity building, research & development, legal & regulatory measures, financial arrangement, public-private partnership, technology upgradation, community participation and awareness. The UD & MA Department has formulated this Policy taking the note of the National Policy of Government of India.

This Policy is applicable to the interventions carried out by Urban Development & Municipal Affairs Department, Development Authorities, Urban Local Bodies and private organizations in urban areas. Other Departments and Institutions carrying out similar/related projects in urban areas are also requested to follow this Policy.

2. Statement of Intent:

The Government intends to shift his role from 'Provider' to 'Provider cum Facilitator cum Regulator' in sustainable management of water resources by way of establishing an effective system of re-use of treated wastewater by the urban citizens of West Bengal thereby reducing dependency on fresh ground/surface water resources bringing reforms in the areas of Planning, Institution, Finance, Technology and Legal & Regulation.

3. Objectives:

3.1. Immediate Objective: (2 Years)

- To assess sources of generation of wastewater and quantity of wastewater production in urban West Bengal and to create a GIS enabled MIS
- To identify bulk users of water like Industrial Clusters, Metro rail, Indian Railways, Infrastructure Projects, Construction Sectors, Agriculture, Bus Depots and Public Works Department, and quantify their potential water demand as bulk user of water.
- To assess the existing centralized and decentralized plants of wastewater treatment especially the Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs) & Common Effluent Treatment Plants (CETPs) and take appropriate measures for upgradation or expansion.
- To identify centralized and decentralized options of wastewater treatment and its application in appropriate places.
- To develop land bank for centralized wastewater treatment plants
- To develop an integrated approach in wastewater management bringing coordinated mission between several Government Departments and Private Sector.
- To develop several issue-based policies & actions and review the existing legal & regulatory measures to bring reforms in wastewater management and its re-use.
- To ensure employment opportunities in wastewater management and its re-use
- To attract investment in wastewater management with innovative financial mechanisms.
- To formulate a comprehensive plan on water resource management including wastewater management with active community participation in Urban Wastewater Treatment and its re-use in cost effective manner.

3.2. Medium Term Objective: (next 4 Years)

- To develop a comprehensive institutional arrangement in all levels either through new establishment of institution or re-orienting institutions responsible for proper planning, implementation, monitoring, conflict resolution and grievance redressal of wastewater treatment & its re-use with appropriate management system, and leveraging awareness about green habit and collective behavioural change amongst all citizens.
- To implement the comprehensive plan on water resource management including wastewater management in urban West Bengal in phased manner subject to availability of finance.
- To establish an appropriate system of operation and maintenance of the wastewater treatment infrastructure through active involvement of the citizens.

3.3. Long Term Objective: (next 4 Years)

- Planned wastewater treatment infrastructure and its re-use are fully functional and maintained in each city.
- Reduce pressure on potable water (fresh ground and surface water) vis a vis reduce pressure on wastewater treatment facilities.

4. Key issues:

- Wastewater management happening in piecemeal manner.

- Lack of awareness among all stakeholders in treatment and disposal of wastewater: As a result, there is insufficient focus on ensuring adequate coverage of network sewerage, and connections to the same; or on decentralised options, where network sewerage may not be viable; and on the health hazards for use of untreated wastewater in agriculture.

- Viability of urban wastewater treatment facilities: Lack of revenue generation from sanitation services in urban centres and/or fiscal transfers for the same are inadequate to ensure operation and maintenance of wastewater treatment plants to required standards. Consequentially, secondarily treated wastewater often does not meet regulatory standards, and is unfit for reuse.

- Lack of clear guidelines and framework: While wastewater reuse finds mention in several policies and programmes, there is an absence of a clear framework to support implementation of projects in a manner that aligns stakeholder interests and priorities, and is operationally sustainable

- Institutional coordination: Water plays a significant role in several sectors, including urban, agriculture, industries and power. There is a need for a platform for interaction and coordination among sectoral departments and other concerned stakeholders to facilitate greater synergies and collaboration towards efficient resource use.

5. Alignment with International/ National Policies and Frameworks

Several policy and guideline documents in India recognized the concept of waste water re-use, and the need to include the same in water supply management programs. Specifically, this policy aligns with the following national and international agenda:

- UN Sustainable Development Goals: The Sustainable Development Goals (SDGs) are focused, among other areas, on environmental protection and prosperity creation. In particular, the policy aligns with the following SDGs: SDG 3: Good Health and Well-Being; SDG 6: Clean Water and Sanitation; SDG 8: Decent Work and Economic Growth; SDG 11: Sustainable Cities and Communities.

- National Water Policy 2012: The National Water Policy 2012 promotes and incentivizes the reuse of wastewater, 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 incentivized 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.

- National Service Level Benchmarks; National Urban Sanitation Policy (NUSP): The National Service Level Benchmarks, instituted by the Ministry of Housing & Urban Affairs, Government of India, establish a 20% target for reuse of urban wastewater generated.

- Power Tariff Policy (revised, 2016): The revised power tariff policy mandates thermal power plants within 50 kms of a city STP to off-take all the treated wastewater from the STP. Charges incurred in conveyance of wastewater from the STP to the power plant are eligible for pass through in the power tariff.

- *Atal* Mission for Rejuvenation & Urban Transformation (AMRUT): Following the policy guidelines implementation of wastewater reuse infrastructure solutions in selected towns and cities has been taken up.

6. Policy Actions:

6.1. Institutional Set up for Implementation, Monitoring and Management:

- State Level High Powered Committee should be constituted under the Chairmanship of the Chief Secretary to Government of West Bengal alongwith the other members – the Additional Chief Secretary/Principal Secretary/Secretary from the Departments of Health & Family Welfare, Environment, PHED, MSME, Water Investigation, Irrigation & Water Ways, UD & MA, P&RD and Commerce & Industry, for overall supervision, monitoring and policy advice.
- A State Level Steering Committee should be constituted under the chairmanship of Principal Secretary/Secretary, UD & MA Department alongwith the representatives of Health & Family Welfare, Environment, WBPCB, PHED, P&RD, MSME, Water Investigation, Irrigation & Water Ways, UD & MA and Commerce & Industry, for supervising the regular implementation and monitoring of wastewater treatment and its use.
- Urban Development & Municipal Affairs Department should act as Nodal Department for implementation of Treated Wastewater Re-use Policy and its action plan.
- State Urban Development Agency under UD & MA Department should act as Nodal Agency for implementation of Treated Wastewater Re-use Policy and its action plan.
- A State Level Waste Water Management Cell with sufficient experts should be established at SUDA for day to day monitoring and technical advisory.
- Technical support in implementation should be provided by Municipal Engineering Directorate. If required, professional technical agency may be engaged.
- The primary responsibility of Urban Local Body is to aware the citizen and industries towards treatment of wastewater and its reuse implementing all legal provisions, even imposition of fine for non treatment. In this connection, ULBs will get strong support from WBPCB.
- The Development Authorities/Unnayan Parishads should be responsible for implementation and O&M of large Sewage Treatment Plants, whereas the Urban Local Bodies should be responsible for implementation and O&M of small Sewage Treatment Plants and decentralized wastewater treatment plants.
- The Urban Local Bodies should promote establishment of decentralized wastewater treatment plants and rain water harvesting technologies encouraging the citizen through incentives.
- ULBs and Development Authorities should constitute Task Force for implementation and monitoring of treatment of wastewater & its use in their jurisdiction.
- Requirement of manpower resource gap in ULBs/Development Authorities should be addressed by way of filling up the vacant posts or engaging outsourced agency.

6.2. Development and Maintenance of Information Base and planning:

A Comprehensive Database Development and appropriate Management Information System utilizing GIS platform should be established for regular assessment of water demand, wastewater generation and reuse of treated wastewater in several sectors and mapping the requirement/location of centralized and decentralized treatment plants. For this following steps should be adopted:

- Develop coordination between UD & MA Department, Environment Department, PHED and Water Resource Investigation & Development Department
- Develop coordinated information sharing mechanism between water promotion departments like UD&MA, PHED and Water Resource Investigation & Development Department, and ULBs/Development Authorities
- Develop GIS enabled Management Information System for the cities.
    i) Preparation of Geo-referenced City base Map
    ii) Conducting Technical Surveys like Plane Table, Contour Survey
    iii) Conducting Study on 'as is' situation of underground water, surface water, water lines, sewer lines etc.
    iv) Conducting Socio-Economic Survey and Development of Management Information System

v) Integration of Spatial Data with the information of abovementioned surveys/studies to create GIS enabled MIS.
vi) Establishment of Central Data Monitoring Centre

- Develop coordination between UD & MA Department and Land & Land Reforms Department for updation of Land Records of the cities and development of Land Bank for plants.
- Provision of manpower & development of physical infrastructure for maintaining database development & management system in the concerned Departments especially in UD & MA Department, Development Authorities, Unnayan Parishads, and Urban Local Bodies.
- Preparation of Urban Water Resource Management Plan alongwith Wastewater Resource Management Plan by each ULB: Traditionally, water authorities have managed their water supply, sewerage and storm water drainage systems as separate entities. Integrated urban water resource planning is a structured planning process to evaluate concurrently the opportunities to improve the management of water, sewerage and drainage services within an urban area in ways which are consistent with broader catchment and river management objectives. Catchment management impacts directly and indirectly on all three components of the urban water cycle, having effects on drinking water quality, wastewater treatment and storm water management.
- Each waste water treatment plant should have a physical and financial pre feasibility study alongwith environmental impact assessment
- Planning for establishment of water testing laboratory in affordable location regionally should be developed.
- Each ULB/implementing organization should develop a plan for commercialization/marketing of treated waste water involving citizen and private actors.
- DPR of STP should include effective plan for reuse of treated water, long term operation & maintenance and commercialization i.e. pricing of treated water, and the DPR implementing agency should ensure that.
- Management of STPs should be effectively planned involving user groups.
- Management of ETPs/CETPs should be efficiently monitored by ULB/DA/WBPCB on regular interval and in planning of ETP/CEPT establishment by the industry, mandatory provisions should be there to include the purpose of use of treated water.
- Local or regional storage facility of treated waste water and network plan for supply for reuse shall be developed through a systematic study.

6.3. Comprehensive Land Use Planning:

New Land Use Development and Control Plan for West Bengal specifically for the Statutory Towns, other Census Towns and upcoming Growth Centres are very much required for systematic planning of wastewater treatment plants both for centralized and decentralized plants.

6.4. Legislation and Guidance Documents to follow:

- Environment (Protection) Act, 1986
- The Environment (Protection) rules,1986
- The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006
- Water Bodies Conservation Act
- The East Kolkata Wetlands (Conservation and Management) Act, 2006/2008
- The West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005/2006
- Manual on Sewerage and Sewage Treatment Systems, 2013 of CPHEEO
- The water (Prevention and control of pollution) Act,1974
- The water (Prevention and control of pollution) cess, Act,1974
- The water (Prevention and control of pollution) Amended rules, 2011
- The water (Prevention and control of pollution) cess rules, 1978
- The water (Prevention and control of pollution) Rules, 1975
- National Urban Sanitation Policy 2008
- National Water Policy 2012
- West Bengal Municipal Act and Municipal Corporation Acts

- Quality standards suggested by Central Pollution Control Board and West Bengal Pollution Control Board.
- Standards set by Bureau of Indian Standards (BIS)
- Effluent Quality guidelines for health protection measures in aquaculture use of waste water
- Quality guidelines for health protection in using human wastes for aquaculture.
- Service Level Benchmarks Fixed By Ministry of Urban Development

6.5. Legal Issues:

- Imposition of legal provision to the respective stakeholders for installation of STP/ETP/CETP.
- The legal rights over the sale and revenue issues of reclaimed water is an emerging issue and being addressed by the State Government separately.
- ULB/Industry should reuse, recycle, & resale the effluents, sewage, septage water to the end users within or outside the jurisdiction of the ULB.
- West Bengal Municipal and Municipal Corporations Acts should be amended incorporating the provision for treatment of waste water in centralized & decentralized manner and reuse of the same.
- Ground water extortion shall be mandatorily prohibited, especially for agriculture, industry & construction sectors, and instead of that use of surface water and treated waste water should be imposed.
- Mandatory provisions shall be made for bulk user of water like Fire Brigade, Industrial Clusters, Metro rail, Indian Railways, road wash, Infrastructure Projects, Construction Sectors, Agriculture & Agriculture Extension sectors, Bus Depots and Public Works Department to use treated waste water.
- Imposition of fine on the Industries for not establishing Effluent Treatment Plant/Common Effluent Treatment Plant and non reuse of that water.
- State level treated waste water specifications and standards shall be amended (to be encouraged to adopt as per IS and ISO standards) to include and ensure a safe reuse and to produce high economic return products.

6.6. Technology Options for Wastewater Treatment:

The coverage of waste water treatment should be the application of appropriate waste water treatment technologies in both the centralized and decentralized models having low cost & user friendly to operate; both in capital and in operation & maintenance. The centralized models should have commercial value of cost recovery.

Technological options for waste water treatment plants should be based on treatment standard, quantum of sewage inflow, BOD level, location of plants or utilization of recycled waste water etc., details of the design considerations and operating requirements for a variety of technologies suitable under different conditions has been explained in Chapter 7 of part A of Manual on Sewerage and Sewage Treatment Systems (2013) of CPHEEO.

It shall be ensured that old STPs should be upgraded and new STPs confirm to such standards so as to enable utilization of treated waste water directly by the users as far as possible.

Effluent Treatment Plants and Common Effluent Treatment Plants of Industries should confirm to such standards so as to enable utilization of treated waste water directly by them or other users as far as possible.

Decentralized wastewater treatment models should be showcased before the citizen in several public places like parks etc. and should be promoted for bulk waste generators.

Accessible and affordable water quality testing arrangement should be in place locally or regionally.

The developers should use innovative/conventional/generic technologies developed by IITs/NEERI and other Institute of repute while implementing the projects.

The choice of technology should have low requirement of space, power and efficiency.

For each project, conducting environmental impact assessment and social impact assessment are mandatory, alongwith technical and financial feasibility analysis.

6.7. Technology Reforms:

Government intends to propagate and extend new cost-effective, energy efficient and eco-friendly technologies. For this following issues should be considered.

- Promote Research & Development relating to alternate treatment technologies as well as energy conservation practices involving Technological Institutes/Universities/ Science & Technology Department of West Bengal
- Technological Institutes/Universities/ Science & Technology Department of West Bengal, shall be requested to develop economically viable wastewater treatment decentralized models.
- Technological Innovation shall be worked out for protecting flora & fauna and also human settlements from man-made and different kinds of natural & man-made disaster.
- Government would facilitate the creation of quality testing facilities for water across the State for ensuring quality control. The existing facilities in technological institutions would also be utilized.

6.8. R&D for Technology and its Commercialization:

A technology fund shall be set up under UD & MA Department in order to Research & Development (R&D) for appropriate cost effective and geographically suitable technologies for wastewater treatment. This shall also include identification and innovation of proper models. Products developed through this R&D will be commercialized through supermarket, retail outlet, mart, urban technology parks etc.

6.9. Reuse of Treated Water:

Wastewater is a huge resource that should be harnessed properly, it can bring a lot of health and economic benefits, increase food production, enhance fishing, tourism, rural and urban livelihoods. Following areas of reuse of treated water should be followed:

- Irrigation and Agriculture: Storm water, urban runoff and effluent from animal farms can be captured for irrigation and other farming needs. This kind of wastewater is usually high in nutrients (nitrogen, phosphorus, potassium, micronutrient and organic matter). It saves fertilizer cost and also preserves surface and underground water that they would have otherwise used. The sludge from treatment sites can be used in composting sites and sent to agricultural fields.
- Energy and Construction: The waste materials (sludge) collected from a treatment plant can be biodegraded in a controlled environment and then combusted (burnt at high temperatures) to release Methane (A gas similar to natural gas). This can be used in boilers at homes and in buildings, as well as for cooking and heating purposes. This digester kind of biodegrading can contain contaminants and so the process has to be done properly. The sludge from treatment plants can also be combusted to produce electricity.
- There are different types of sludge. Sludge could be fecal (from human and animal poop flushed down the drains) and regular sludge, from rubbish and garbage that get into drains and sewage systems. Fecal sludge is high in contaminants and must be treated well before discharge.
- Water used in the kitchen can be collected and used to gardens and lawns. A couple of gallons each day means a significant saving on water by the end of the year. Families can also reduce the amount of wastewater they produce by using of bathrooms.
- Community Latrines and Toilets washing, road cleaning, construction activities, pisciculture, Car Washing, maintenance of parks gardens & developing urban landscaping, rejuvenation of ponds, lakes, rivers, and emergency purpose for fire brigade
- Rainwater Harvesting: It should be mandatory to reuse the rain water in sanitary activities and groundwater recharging.
- Industries should reuse their treated water and sludge and minerals to be sold out for appropriate use. Further industries within 30 km of a Sewage Treatment Plant should use treated water in place of fresh surface/ground water.

- Bulk users of water like Fire Brigade, Industrial Clusters, Metro rail, Indian Railways, road wash, Infrastructure Projects, Construction Sectors, Agriculture & Agriculture Extension sectors, Bus Depots and Public Works Department should use treated waste water.
- The excess amount of treated waste water may be used for ground water recharging.

Inspite of these, Government intends the following:

- Commerce & Industry Department should make a voluntary target for treated wastewater to comprise 20% of the total state-wide industrial water use by 2020
- In compliance with the Government of India's recently revised Power Tariff Policy (2016), Department of Power, Government of West Bengal should coordinate partnerships of thermal power plants with urban centres within 50 km radius for off-take of all Wastewater treatment available; and facilitate operational sustainability of wastewater treatment plants

6.10. Awareness Generation:

Government intends to promote awareness among all the stakeholders for achieving the goal of 'Re-use of treated wastewater'. For the said purpose, Government is directing the development actors to promote the awareness considering the following issues.

- Awareness should be generated regarding different Government Programmes to reach & sustain the benefit upto the end beneficiary.
- Awareness should be generated regarding several Policies, Acts and Laws related to Water resource and wastewater management & reuse.
- Awareness should be generated regarding Environment Protection.
- Awareness should be generated widely on good quality and cost effective centralized & decentralized technologies of wastewater management systems.
- Awareness should be generated for providing service charges, user fee and fine
- Awareness should be generated regarding maintenance of created assets and also for developing environment friendly & hygienic city
- Multiple channels like media (social, print, broad cast etc.), advertising, flyers, brochures, booklets, road shows, rallies, public addressing, etc. should be used.
- Techniques for Community Mobilization to be adopted
    i) Involving community in their own development process
    ii) Growing interest of Community through Cultural & Healthy Recreational facility
    iii) Educating community on Human Rights
    iv) Preparing IEC materials according to community need
    v) Display Programme, Activity & Achievement Charter
    vi) Display success story in different places
    vii) Disseminating/ Displaying Literal & Visual Documentation
    viii) Fair
    ix) Involving Media.
- A system of incentives and penalties should be devised to encourage greater participation among residents, compliance by service providers and better performance of ULBs.
- Reward system may be developed for high performing ULBs/citizens.
- Government shall issue appropriate guideline for community mobilization and awareness generation.

6.11. Capacity Building and Training:

Capacity building is crucial in achieving and sustaining wastewater management and its use. Focus on capacity building, exposure visit and training of concerned staffs of State/Regional/District level agencies/departments, ULB level officials and elected representatives, Community based organizations and other stakeholders shall be made.

i) Capacity building of the personnel should be coordinated by ILGUS involving the State Training Agencies, Institutes of Private & Public Bodies and Technology Universities.
ii) Specialist institutions shall also be involved so that the knowledge development on newer approaches and technologies is quickly made available.
iii) The State Agencies/ULBs/Private Actors shall take assistance from National and State level resource organizations in consolidating and applying the existing and new knowledge in a 'learning by doing' framework and building capacities of a range of personnel from different kind of backgrounds.
iv) State shall give an effort to create new posts and fill up the vacant posts for the promotion of these activities.
v) State shall give an effort to develop institutional infrastructure of all the related State / District / Regional / Sub-Division / ULB level Departments / Agencies / Resource Centres to promote wastewater treatment and its reuse.

Capacity building will comprise:

- Bulk training/workshop/exposure visit for a range of municipal and other stakeholder personnel - right from start of the campaign in the ULB.
- Differentiated and specialized training on a demand-basis to personnel over the period of the Plan implementation.
- For Technical assistance, the State shall arrange for bulk and specialised training of State/Regional/District/ULB level personnel, assisting State Agencies/ULBs by procuring and deploying/ managing service providers (study consultants and NGOs, technical resource agencies), and providing coordination support to city-wide communications, planning and implementation management.

6.12. Monitoring and Evaluation:

- To establish the strong monitoring and evaluation system involving community, State shall endeavour to engage independent/ external Monitoring & Evaluation Agency for Third Party Quality Monitoring and time to time evaluation of the projects/progress parallel with the abovementioned monitoring mechanism.
- West Bengal Pollution Control Board shall monitor the water quality of the treated plants (centralized or decentralized) to ensure compliance with quality standards required for different reuse categories.
- An effective Grievance Redressal mechanism should be developed at State/ULB and Development Authority level.
- State shall also institutionalize Social Audit System to involve community in monitoring & evaluation system.

6.13. Welfare Measures:

At the time of implementing this policy, large financial investment will be observed, which will create large employment opportunity for different classes of people and will provide sufficient water to all sections of the society. Realizing the fact Government intends to imply the welfare measures particularly for the poor. They will get an opportunity of getting employment in this sector. To provide benefit to the poor Government shall take the following measures.

- Training infrastructure shall be developed for skill development of the workers to be engaged in this Sector.
- With increasing growth in urban sector, different kinds of employment opportunities will come up for the poor (for both male and female) that should be promoted with the help of several livelihood promotion departments and private agencies. Their skills shall be developed providing training to them (after market assessment on soft skill, security guard, computer operation, repair etc.) and loans shall be provided from different Government Programmes for entrepreneurship development.

- National Skill Development Mission should be dovetailed for skill development in this sector.
- Several welfare measures for them like support for house construction, education for their children, provident fund, coverage under Health & Life Insurance, social security schemes etc. shall be implemented converging development programme of several departments.

6.14. Involvement of NGO/Private Sector:

Government shall encourage the development actors to engage NGO/Private Agency in the following areas for promotion of waste water treatment and its reuse

- Capacity Strengthening of ULB & Community Level Staffs
- Planning
- Research & Development
- Piloting innovative projects
- Community Mobilization
- Mapping Job Potentiality
- Private Public Partnership Projects
- Operation & Maintenance
- Facilitating in Social Audit
- Quality Assurance
- Evaluation

6.15. Source of Funding:

In this rapid urbanization stage, to reuse of treated waste water in Urban West Bengal, Government wants to develop some innovative financial instruments to meet up the demand for investment. Financing should be arranged in following ways.

- Central and State Finance Commission Funds
- State Budget for this purpose
- Available Programme funds
- Leveraging similar fund of several Departments
- Pooled Fund of West Bengal Municipal Development Fund Trust as loan
- Externally Aided Funds
- Provide incentives to the financial institutions, Micro finance institutions, mutual funds, corporate sectors, trusts and foreign institutional investors for investing in treatment of wastewater.
- Promoting well designated Public-Private Partnership
- Inviting Corporate Social Responsibility
- Inviting Foreign Direct Investment developing a mechanism for direct investment from Non Resident Indians and Persons of Indian Origin.
- Imposing service charge on wastewater treatment
- Imposing penalty on ULB/Industry for non treatment of waste water and not developing provision for reuse of that water
- Imposing user charge on treated wastewater use and also commercializing the use of treated water i.e. revenue generation from selling of treated water.

6.16. Targeted Timeline:

- To reach 50% coverage of collection of sewage and its treatment as per prescribed standards in all ULBs by 2023
- To reach 75% coverage of collection of sewage and its treatment as per prescribed standards in all ULBs by 2025
- To reach 100% coverage of collection of sewage and its treatment as per prescribed standards in all ULBs by 2029
- To reuse 25% of treated wastewater within 2022 for non potable/other purpose

- To reuse 50% of treated wastewater within 2025 for non potable/other purpose
- To reuse 80% of treated wastewater within 2030 for non potable/other purpose

6.17. Expected outcome of this Policy:

- New social and economic opportunities and avenues emerge where wastewater is recycled and reused based on cost recovery and profit generating business models.
- Augmented capacities across institutions (State & ULB level) that could possibly be replicated in other sectors.

6.18. Interpretation and Amendment:

- Any issue or doubt regarding this policy shall be referred to Department of UD & MA, GoWB whose decision will be final and binding on all concerned.
- Department of UD & MA, GoWB may from time to time amend the provisions as contained in this policy as considered necessary.
- Department of UD & MA, GoWB shall have the power to issue guidelines and instructions from time to time to operationalise this policy.

Government of West Bengal
Department of Urban Development & Municipal Affairs
Nagarayan, DF-8, Sector-1,Salt Lake, Kolkata -700 064

No. 71-JS(SM)/UD&MA/2019 **Date : 05/12/2019**
UD/00/2019/03675

From: The Joint Secretary to the Govt. of West Bengal
UD&MA Department &
Additional Mission Director (MNB).

To : The Principal Secretary to the Govt. of West Bengal
Environment Department.

Sub: Comprehensive Policy and Action Plan for Re-use of Treated Waste Water in Urban West Bengal.

Sir.

This is to inform you that the draft Comprehensive Policy and Action Plan for Re-use of Treated Waste Water in Urban West Bengal formulated by the Committee constituted vide Notification No. 37-JS(SM)/UD&MA/ 2019 dated 16.04.2019 communicated to you vide no. 46-JS(SM)/UD&MA/2019 (UD/00/2019/03675) dated 28/06/2019 for necessary action.

After that incorporating the comments of CPCB (as received from Sri Ujjal Sen Gupta, Chief Scientist, WBPCB) and the committee members, we have prepared the revised policy document and the Action Plan for re-use of treated waste water.

As directed I am forwarding the revised policy document and the action plan submitted by the committee for your kind perusal and necessary direction.

Yours faithfully,

5.12.19.

Joint Secretary to the Govt. of West Bengal
&
Additional Mission Director (MNB)

No. 71/1(3)-JS(SM)/UD&MA/2019 **Date : 05/12/2019**
UD/00/2019/03675

Copy forwarded for kind information and necessary action to:

1. Member Secretary, WBPCB
2. Director, SUDA.
3. PS to Principal Secretary, UD & MA Department.

5.12.19.

Joint Secretary to the Govt. of West Bengal
&
Additional Mission Director (MNB)

Action Plan to ensure utilisation of treated waste water to reduce pressure on the ground water resources

Sl No.	Action Points	Responsible Authority	Timeline
	Institutional Setup		
1	Gazette Notification of Treated Waste Water Re-use Policy of Urban West Bengal	UD & MA Deptt./CMO/Finance Deptt/State Cabinet	Jan-20
2	Constitution of State level High Powered Committee for overall supervision, monitoring and policy advice	UD & MA Deptt. & CMO	Jan-20
3	Constitution of State Level Steering Committee for supervising the regular implementation and monitoring of wastewater treatment and its use.	UD & MA Deptt. & CMO	Jan-20
4	Issuing notification declaring UD&MA Department as Nodal Department for implementation of Treated Wastewater Re-use Policy and its action plan	CMO	Jan-20
5	Issuing notification declaring State Urban Development Agency (SUDA) as Nodal Agency for implementation of Treated Wastewater Re-use Policy and its action plan	UD & MA Deptt.	Jan-20
6	A State Level Waste Water Management Cell with sufficient experts to be established at SUDA for day to day monitoring and technical advisory	UD & MA Deptt.	Mar-20
7	Issuing operational Guideline for Installation and O&M for several capacities of sewaage treatment plants.	UD & MA Deptt/ SUDA/ MED	Mar-20
8	Constitution of Task Force at ULBs and Development Authorities for implementation and monitoring of treatment of wastewater & its use in their jurisdiction.	DAs / ULBs	Mar-20
	Feasibility syudy and planning		
9	Micro Planning organizations to be engaged for 1. assessing as is situation of Water Genaratio, Water Use, Waste Water Generation including sources, Assessment of pollutants/ BOD level, 2. Identification of Water user and waste water generatos like household, commercial establishments and bulk generators etc. 3. Identification of local regional storage facility of treated waste water and network plan for supply for reuse shall be developed through a systematic study 4.Feasibility study (Techno socio financial study) with social impact assement & environmental impact assessment for establishment of STPs/ ETPs/ CETPs and also of old ones. 5. Land use planning for required land identification. 6. Assessment of manpower requirement. All these should be made after field verification and analyzing legal provisions.	UD & MA Deptt/ SUDA	To be engeged by April-2020 and complete the study by September-2020
10	Integration of treated water management with urban water resource management plan.	UD & MA Deptt/ SUDA	Sep-20
11	As per study takeup action on old STPs/ ETPs/ CETPs.	MED/DA/ Respective authorities	Dec-21
12	As per study takeup action on completion of work of ongoing construction of STPs/ ETPs/ CETPs.	MED/DA/ Respective authorities	Dec-21
13	As per study takeup action on installation of new STPs/ ETPs/ CETPs phase wise.	MED/DA/ Respective authorities	Starting from Dec-20 to Dec-29 in phased manner
14	As per study takeup action on establishment of local / regional/ storage facility for treated waste water and establishment of network for reaching to users and comercialization for cost recovery phase wise.	MED/DA/ Respective authorities	Starting from Dec-20 to Dec-27 in phased manner
15	As per study establishment of centralized or de-centralized plan for ground water recharging from treated waste water (whereever required) phase wise.	MED/DA/ Respective authorities	Starting from Dec-20 to Dec-25 in phased manner
16	Preparation of action plan for implementation of treated wastewater (industrial effluent) in specified industries.	WBPCB / MSME / Industry Department	Sep-20
	Legal provisions		
	Municipal/ Other Act ammendment		

Sl No.	Action Points	Responsible Authority	Timeline
17	Imposition of legal provision to the respective stakeholders for installation of STP/ETP/CETP. The legal rights over the sale and revenue issues of reclaimed water is an emerging issue and being addressed by the State Government separately. ULB/Industry should reuse, recycle, & resale the effluents, sewage, septage water to the end users within or outside the jurisdiction of the ULB. West Bengal Municipal and Municipal Corporations Acts should be amended incorporating the provision for treatment of waste water in centralized & decentralized manner and reuse of the same. Ground water extortion shall be mandatorily prohibited, especially for agriculture, industry & construction sectors, and instead of that use of surface water and treated waste water should be imposed. Mandatory provisions shall be made for bulk user of water like Fire Brigade, Industrial Clusters, Metro rail, Indian Railways, road wash, Infrastructure Projects, Construction Sectors, Agriculture & Agriculture Extension sectors, Bus Depots and Public Works Department to use treated waste water. Imposition of fine on the Industries for not establishing Effluent Treatment Plant/Common Effluent Treatment Plant and non reuse of that water. State level treated waste water specifications and standards shall be amended (to be encouraged to adopt as per IS and ISO standards) to include and ensure a safe reuse and to produce high economic return products.	UD & MA Deptt/ SUDA	Dec-20
	Technology		
18	Establishment of regional water testing laboratory and certification.	UD & MA Deptt/ Environment Deptt./ Finance Deptt.	Dec-21
19	Identification of several centralized and de-centralized model for STP/ ETP/ CETP.	UD & MA Deptt/ Environment Deptt./ Dptt. Of Science & Technology/ WBPCB	By Dec-2021 and to be continued
20	Development of Technology fund at UD&MA Department for R&D purpose and establishment of technology park.	UD & MA Deptt/ Finance Deptt./ Environment Deptt./ Dptt. Of Science & Technology/ WBPCB	Dec-21
	Awareness generation		
21	Engagement of expert agency for designing different kinds of IEC materials and providing advisory support for implementation of IEC and public awareness activities.	UD & MA Deptt/ SUDA	By April-2020 and to be continued
22	Generation of awareness among citizen and different stake holders to be started as per Clause No. 6.9 & 6.10 of Treated Wastewater Re-use Policy of Urban West Bengal.	UD & MA Deptt/ SUDA/ DA/ ULB	By April-2020 and to be continued
23	**Capacity building**		
24	Engagement of Capacity Building agency for arrangement of expouser visit and tranning for different stake holders as detailed in Clause No. 6.11 of Treated Wastewater Re-use Policy of Urban West Bengal.	UD & MA Deptt/ SUDA	By April-2020 and to be continued
25	Capacity building activities started alongwith preparation of several training modules and identification of expouser spots.	UD & MA Deptt/ SUDA	By April-2020 and to be continued
	Monitoring and evaluation		
26	Monitoring and evaluation State level High Powered Committee will establish a monitoring and evaluation system for treated waste water management.	UD & MA Deptt. & CMO	Dec-20
27	Establishment of grievance redrasal mechanism at State/ ULB/ DA.	UD & MA Deptt/ SUDA	July-21
28	Engagement third party quality monitoring agency for time to time evaluation of the projects.	UD & MA Deptt/ SUDA	Dec-20

Sl No.	Action Points	Responsible Authority	Timeline
29	Establishment of social audit system for monitoring and engagement of social audit agency.	UD & MA Deptt/ SUDA	Dec-20
30	Inclusion and regular updation of all information in this relation and reporting format for success of such projects in the departmental website.	UD & MA Deptt/ SUDA	Apr-20
	Welfare measors		
31	Introduction of welfare measors for different classes of people to be employed in these projects.	UD & MA Deptt/ SUDA/ Labour Deptt.	Starting from Sec-20
	Funds		
32	Source of fund to be evolved for these huge investment.	UD & MA Deptt/ Finance Deptt.	Dec-20

Treated Wastewater Re-use Policy
of
Urban West Bengal

December 2019

Prepared by

Urban Development & Municipal Affairs Department
Government of West Bengal

Preface

Poor sanitation and wastewater management in developing countries leads to the contamination of fresh water sources and is a major cause of water borne diseases and also affect the health of eco-systems. Around 80% of all waste water is discharged into the surface water bodies without any treatment where it creates health, environmental and climate-related hazards. Urbanization further exacerbates this challenge with increasing wastewater generation, while at the same time using more of Earth's dwindling resources. Recycling and reuse of treated wastewater is an important part of the sanitation cycle and critical in an environment with decreasing freshwater availability and increasing costs for delivering desirable quality water, often from far distance. Recovering the water, energy, nutrients and other precious materials embedded in wastewater is a key opportunity to be seized. Target 6.3 of the Sustainable Development Goals (SGD) commits governments to halving the proportion of untreated wastewater and sustainability, increasing recycling and safe reuse by 2030.

This policy document gives substantial focus to the financial and economic benefits of wastewater recycling from the perspective of public spending. The policy presents possible strategies for city and state planners in view of the sanitation situation and the role of wastewater recycling in the cities in West Bengal, and focuses on recycling at the end of sewage systems with appropriate centralized or decentralized technology solution alongwith extensive public awareness activities.

Contents

Overview

About Wastewater: At a Glance

What is Wastewater:

Wastewater can have a number of definitions (UN-Water 2015). The approach taken in this policy is a very broad definition following that outlined in the UNEP/UN-Habitat document 'Sick Water?'. Thus, Wastewater is defined as "a combination of one or more of:

- domestic effluent consisting of blackwater (excreta, urine and faecal sludge) and grey- water (kitchen and bathing wastewater);
- water from commercial establishments and institutions, including hospitals;
- industrial effluent, storm water and other urban run-off;
- agricultural, horticultural and aquaculture effluent, either dissolved or as suspended matter

Although, using this definition, the term 'wastewater' clearly encompasses domestic, commercial, industrial, agricultural components and also fecal sludge, these are sometimes covered separately in order to clarify or highlight the importance of the individual components or wastewater streams. (UN-Water, 2015).

Types of wastewater:

Wastewater comes in three main types namely Black water, Gray water and Yellow water.

Black water
This is wastewater that originates from toilet fixtures, dish washers, and food preparation sinks. It is made up of all the things that one can imagine going down the toilets, bath and sink drains. They include poop, urine, toilet paper and wipes; body cleaning liquids, anal cleansing water and so on. They are known to be highly contaminated with dissolved chemicals, particulate matter and is very pathogenic.

Gray water
This is wastewater that originates from non-toilet and food fixtures such as bathroom sinks, laundry machines, spas, bathtubs and so on. Technically it is sewage that does not contain poop or urine. Gray water is treated very differently from Black water and is usually suitable for re-use.

Yellow water
This is basically urine collected with specific channels and not contaminated with either black water or gray water.

Sources of wastewater

Domestic Sewage
This includes all wastewater generated by home dwellings, public restrooms, hotels, restaurants, motels, resorts, schools, places of worship, sports stadiums, hospitals and other health centres, apartments and the like. They all produce high volumes of wastewater.

Non-sewage
This includes water from floods (storm water), runoff (rainwater running through cracks in the ground and into gutters), water from swimming pools, water from car garages and cleaning centres including laundromats, beauty salons, commercial kitchens, energy generation plants, industries and so on.

Wastewater is also generated from agricultural facilities. Water used for cleaning in animal farms, washing harvested produce and cleaning farm equipment.

How is wastewater harmful?

In certain parts of the world, especially in developing countries, wastewater is pumped directly into the sea or into fresh water bodies without any form of treatment. In other parts of developed countries, lack of adequate wastewater treatment infrastructure, maintenance and outdated systems heavily compromise wastewater treatment efforts. The effects of this (either treated or partly treated) can be classified in the following:

Water pollution:
Fresh water bodies and marine waters, into which wastewater is discharged may be polluted and rendered unsafe for human use. Depending on what is discharged, aquatic life may be harmed too.

Water security:
There is water scarcity in many places in the world. Wastewater discharged on lands can leach into underground water tables and potentially contaminate aquifers and underground water. If discharged in freshwater bodies, it may render water sources unsuitable for use.

Ecosystem services:
All ecosystems are connected and they all ultimately depend on water. Similarly, all water (surface and underground) is connected. This means careless wastewater discharge can have some serious ripple effect. One common effect of wastewater is the eutrophication of fresh water bodies and oceans. If one part of the ecosystem chain is destroyed, it can upset its entire food chain.

Agriculture / Fisheries / Tourism:
Wastewater for irrigation may contain unsuitable chemicals and higher concentrations of nutrients needed for crops. This can result in delay and under yielding. Wastewater used for animal farming may also contain harmful things and chemicals dissolved in them. Animals may die, and there is a chance that humans that eat such animals may be harmed too. In some places, fecal sewage is discharged directly into the sea/river. The discharge contains pathogens and harmful dissolved chemicals which can affect fishing in that area. The smell and such behavior do not encourage tourism to that area.

Health of urban and rural populations:
Wastewater is a big health issue, as it carries and transports a myriad of diseases and illnesses. It is believed that about 2.2 million people die each year (globally) from diarrhoeal disease. (WHO) At least 1.8 million children under five years die every year due to water related disease, or one every 20 seconds (WHO, 2018).

What is Waste water Management?

Wastewater management is the process of taking wastewater and treating/managing it in order to reduce the contaminants to acceptable levels so as to be safe for discharge into the environment. There are effectively two basic types of wastewater treatment: centralized and decentralized. Centralized systems are large-scale systems that gather wastewater from many users for treatment at one or a number of sites, whereas decentralized systems are dealing with wastewater from individual users, or small clusters of users, at the neighborhood or small community level.

The choice between centralized or decentralized wastewater management systems will depend upon a number of different factors, but it is important that full consideration be given to both the options rather than the situation that has existed in the past where sewerage was often considered to be the only 'proper' form of urban sanitation (UN-Water, 2015).

Availability of Water in West Bengal

- West Bengal possesses 7.5% of Water Resources of India.
- Annual Per capita availability of fresh Water:

Year	Water Availability (in m^3)
1961	5177
2001	1869
2025	1341

- Availability of Surface Water is 13.29 Million hectare meters (M.ham), 40% of it is useable.
- Availability of Ground Water is 2.38 M.ham, totally useable.

Requirement of Water in West Bengal in (M.ham)

Sector	2000	2011	2025
Agriculture	5.38	7.71	10.98
Domestic	0.26	0.28	0.38
Industry	0.26	0.38	0.59
Power (Thermal)	0.31	0.00	0.00
Inland Navigation	3.63	3.63	3.63
Forestry	0.01	0.01	0.01
Ecology, Environment and Others	1.00	1.00	1.00
Total (M.ham)	10.85	13.02	16.60
* Source: State Irrigation Department			

Shortfall of Water in West Bengal

As the supply of water is naturally constrained and demand is increasing in leaps and bounds the GAP in between is extending with time.

GROWTH OF POPULATION AND DECLINING PER CAPITA WATER		
YEAR	POPULATION (in Crore)	PER CAPITA WATER (in cu.m)
1951	2.63	2574
1961	3.49	1940
1971	4.43	1528
1981	5.46	1240
1991	6.81	996
2001	8.02	844
2011	9.40	720
* Source: State Irrigation Department		

Water Requirement vs Supply		
YEAR	Water Requirement (M.ham)	Deficit
2001	10.85	38%
2011	13.02	48%
2025	16.60	59%
* Source: State Irrigation Department		

Main Features of Urban West Bengal

Area of West Bengal: 88752 sq. km.
Total No. of Districts: 23 nos.

Area of Statutory Towns of West Bengal: 2742.21 sq. km. (3.09% of Total Area of WB)

Total Towns:

1. 125 Statutory Urban Local Bodies having 2938 Wards
   - 7 Municipal Corporations; 115 Municipalities; 3 Notified Area Authorities
2. 782 Census Towns

Three Industrial Township Authorities – Nabadiganta Industrial Township Authority, Bantala Industrial Township Authority and Golden City Industrial Township Authority

Development Authority – 19 Nos.

Urban Growth:

- Density of Urban Population – 6798 per sq. km. (highest in India)
- 30% of the total Urban Population live in Slum Areas
- Population share in size classes of towns to total Urban Population (Census 2011):

Sl No	Category of Town	Population Range	No. of Towns	Total Population
1	Municipal Corporation		7	8591218
2	A	above 2,15,000	13	4013321
3	B	above 1,70,000 to 2,15,000	8	1548015
4	C	above 85,000 to 1,70,000	34	4010347
5	D	above 35,000 to 85,000	42	2321142
6	E	below 35,000	21	473658
	TOTAL		**125**	**20957701**

Sl No	Town Size Classes	No. of Towns	Total Population
1	I (> 1000000 population)	3 MC	6726212
2	I (> 500000 - 1000000 population)	3 MC	1698139
3	I (> 100000 - 500000 population)	1 MC & 47 Municipality	9040626
4	II (50000-99999 pop.)	33 Municipality	2334791
5	III (20000-49999 pop.)	29 Municipality & 1 Notified Area Authority	1036389
6	IV (10000-19999 pop.)	5 Municipality & 2 Notified Area Authority	112417
7	V (5000-9999 pop.)	1 Municipality	9127
	TOTAL	**125**	**20957701**

Service Level Scenario of Piped Water Supply in Urban West Bengal

Piped Water Supply				
Sl No	Indicator	Service Level Benchmark	Present Status (Average)	Gap
1	Household level coverage (%)	100%	56%	44%
2	Per capita supply of water	135 lpcd	72 lpcd	63 lpcd

Comparative Urban Growth of India and West Bengal

Sl .No.	Years	India (In Million)	West Bengal (in Million)
1	1961	78.16	8.54
2	1971	107.82	10.97
3	1981	159.46	14.45
4	1991	217.61	18.71
5	2001	285.36	22.43
6	2011	377.11	29.1
Source: 1. Census of India			

Urbanization in West Bengal

Year	Total Population (in Million)	Urban Population (in Million)	% of Urban Population
1981	54.6	14.4	26.37%
1991	68.1	18.7	27.46%
2001	80.17	22.5	28.06%
2011	91.2	29.1	31.90%

Water Demand with Projected view of next 50 years in West Bengal

Sl No	Municipality/ Corporation	Population in 2020	Rate of Growth per year	Population in 2070
1	West Bengal Urban Area	31,819,118	1.585%	69,850,157

		Ultimate Year 2070	Units	Remarks
Projected Population		69850157	Nos.	Based on population computed
Floating Population @	2.00%	1397003	Nos.	Assumed
Total Population		71247160	Nos.	
Population Served in LPCD @	135	9618366619	Lit/Day	CPHEEO Manual
Institutional & Industrial Demand @	8.00%	769469330	Lit/Day	Assumed
Fire Fighting @ 100000(Popu/1000)^0.5		26692164	Lit/Day	CPHEEO Manual
UFW @	15%	1562179217	Lit/Day	CPHEEO Manual
Total Estimated Demand		**11976707329**	Lit/Day	
Total Estimated Demand		**11976.71**	**MLD**	
Required demand for next 50 years in KMA area		**2635.00**	**MGD**	

Capacity of STP in Towns beside Ganga River

Sl.No.	Town	District	Agency Responsible for Construction and/or O & M	Installed Capacity (MLD)
1	(a)Kolkata- (b)Cossipore Chitpore (c)Graden reach	Kolkata	KMC	122.50
2	(a) Howrah (b) Kona (c) Howrah STP (d) Anupara (e) North Howrah	Howrah	KMDA	127.00
3	Ulluberia		KMDA	
4	Serampore	Hooghly	KMDA	18.90
5	Chandanagar		KMDA	22.70
6	Bhadreswar		KMDA	7.60
7	Champdani		KMDA	0.30
8	Bansberia		KMDA	0.30
9	Baidyabati		KMDA	6.00
10	Konnagar		KMDA	
11	Rishra		KMDA	
12	Uttarpara-Kotrung		KMDA	22.00
13	Hooghly-Chinsurah		KMDA	29.30
14	Panihati	North 24 Parganas	KMDA	12.00
15	Titagarh		KMDA	23.00
16	Bhatpara		KMDA	61.00
17	Baranagar		KMDA	40.00
18	Kamarhati		KMDA	
19	Garulia		KMDA	7.90
20	Naihati		KMDA	11.60
21	Halisahar		KMDA	6.50
22	Barrackpore		KMDA	24.00
23	Khardah		KMDA	3.00
24	Kanchrapara		KMDA	18.00
25	Maheshtala	South 24 Parganas	KMDA	26.00
26	Budge Budge		KMDA	9.30
27	Diamond Harbour		KMDA	0.52
28	Nabadwip	Nadia	KMDA	19.50
29	Kalyani		KMDA	21.00
30	Gayeshpur		KMDA	8.33
31	Santipur		KMDA	6.00
32	Krishnanagar		MED	
33	Chakdah		MED	
34	Ranaghat		KMDA	11.80
35	Katwa	Burdwan	KMDA	10.45
36	Haldia	Purba Mednipur	MED	
37	English Bazar	Malda	MED	
38	Murshidabad	Murshidabad	KMDA	11.96
39	Jaigunj-Ajimganj		KMDA	8.00
40	Dhulian		MED	
41	Jangipur		KMDA	13.00
42	Behrampore		KMDA	3.70
43	Raiganj	Uttar Dinajpur	MED	
44	North Barrackpore	North 24 Parganas	KMDA	14.85
			Total	**728.01**

Status of old STPs maintained

SL. No.	Location of STP	Year of Commissioning	STP Capacity	Technology Adopted	Present Functional Status	Purpose of Use of Treated Water
1.	Baidyabati	2007	6.00 MLD	Oxidation Pond	Operational	Used in pisiculture purpose
2.	Champdani	2009	1.00 MLD	Aerated Lagoon	Non-operational	-
3.	Bhadreswar	2006	7.60 MLD	Aerated Lagoon	Operational	Used in pisiculture purpose
4.	Bansberia	2009	1.00 MLD	Waste Stabilization Pond	Non-operational	-
5.	Chandannagar	1993	22.70 MLD	Bio-filter and Waste Stabilization Pond	Operational	Used in pisiculture purpose and partially for agriculture
6.	Garulia	2004	7.90 MLD	Waste Stabilization Pond	Non-operational	-
7.	Titagarh	1989	23.00 MLD	WSP, ASP and Low Cost STP	Operational	Used for agricultural purpose
8.	Seerampore	1990	18.90 MLD	Trickling Filter	Non-operational	-
9.	Uttarpara – Kotrung, Konnagar and Rishra	2007	22.00 MLD	Low Cost STP	Operational	Used for pisiculture and for agricultural purpose
10.	Panihati	1993	12.00 MLD	Low Cost STP	Non-operational	-
11.	Naihati	2009	11.56 MLD	ASP	Operational	-

Status of new STP augmented / to be augmented

SL. No.	Location of STP	STP Capacity	Expected Date of Commissioning / Already Commissioned	Technology Being Adopted	Purpose of Use of Treated Water	Remarks
1.	Kalyani	21.00 MLD	2018	Trickling Filter and Waste Stabilization Pond	Being used for pisiculture and proposed for Agriculture and Industrial use	Already Commissioned
2.	Hooghly – Chinsurah	29.30 MLD	2022	SBR	-	Tendering Stage
3.	Mahestala	30.20 MLD	2022	SBR	-	
4.	Budge Budge	9.50 MLD	2020	SBR	-	Work in Progress
5.	Baranagar – Kamarhati	60.00 MLD	2022	Trickling Filter	-	LOA Awarded
6.	Halisahar	16.00 MLD	2020	SBR	-	Work in Progress
7.	Bhatpara	60.50 MLD	2018	FBBS Technology	Partially used for pisiculture	Already Commissioned
8.	Barrackpore	24.00 MLD	2020	SBR	-	Work in Progress
9.	Kona	62.00 MLD	2022	SBR & WSP	-	LOA Awarded
10.	Arupara	65.00 MLD	2022	SBR	-	
11.	Kanchrapara	18.00 MLD	2022	Aerated Lagoon	-	In the process of finalization of tender

Industrial Waste Water Treatment

Effluent Treatment Plants (ETPs) and/or Common Effluent Treatment Plants (CETPs) are integral part of industrial wastewater management systems. A CETP caters to a number of industrial units with same of closely similar industrial processes as only in such case the CETP can be designed in respect of the treatment chemistry. ETPs are the ultimate step of wastewater treatment by any industry before discharge to the environment. It is a compulsion for any water polluting industrial unit to have a suitable ETP treating the wastewater to the required discharge standard.

Depending on two wastewater components, (1) the volume of discharge and (2) the wastewater quality, "Grossly Polluting Industries (GPI)" has been identified in the state. Such GPIs are considered to be highly water polluting industries. At present West Bengal has 46 such Industries. An account of the quantum of wastewater discharge by these industrial units is provided in table below. The wastewater discharged by these industries will be identified in the first place for further treatment and reuse in (1) the same industry, or, (2) in industries or establishments nearby. As industrial wastewater, even after treated to the prescribed discharge standard, may contain substances unsuitable for certain uses, reuse of industrial wastewater requires a level of scrutiny before specific re-use.

An industrial unit will have to submit specific application to the State Pollution Control Board about the scheme of the re-use and can initiate such activity after specific approval by the State Board. The State Government shall actively consider incentive scheme(s) for the industries willing for initiating wastewater re-use schemes.

Industrial Waste Water Discharge

An account of wastewater discharge by Grossly Polluting Industries in West Bengal		
INDUSTRY NAME	**DISTRICT**	**WASTE WATER DISCHARGE QUANTITY (M3 / Day)**
BALLAVPUR PAPER MFG.ITD	Burdwan	288
BardhamanDharmaraj Paper Mill Private Limited	Burdwan	8
Durgapur Steel Plant (DSP)	Burdwan	22390
EAST INDIA PHARMACEUTICAL WORKS LIMITED (DURGAPUR WORKS)	Burdwan	140
Krishna Tissues Private Limited	Burdwan	620
SAIL-IISCO Steel Plant	Burdwan	32700
The Durgapur Projects Limited	Burdwan	57500
Bengal Beverages Pvt. Ltd.	Hooghly	730
Berger Paints India Ltd. (BAICL Divn.)	Hooghly	80
Dankuni Coal Complex, S.E.C.L.	Hooghly	1000
Grasim Industries Limited (Unit - Aditya Birla Insulators)	Hooghly	208
ITC Limited, PSPD, Unit: Tribeni	Hooghly	14000
Kesoram Rayon - Unit of Cygnet Industries Ltd.	Hooghly	11670
Mother Dairy Calcutta	Hooghly	700
Nalco Water India Limited	Hooghly	33
PMC Rubber Chemicals India Pvt. Ltd.	Hooghly	244
BERGER PAINTS INDIA LIMITED	Howrah	72.2
PEPSICO INDIA HOLDINGS PVT. LTD. (FRITOLAY DIVISION)	Howrah	1312.4
Britannia Industries Limited	Kolkata	236
Diamond Beverages (P) Limited	Kolkata	213
Gun and Shell Factory	Kolkata	2278
Hindustan Unilever Limited	Kolkata	300
AdaniWilmar Limited	Medinipore(E)	107
Exide Industries Limited	Medinipore(E)	630
Haldia Petrochemicals Limited	Medinipore(E)	11470
Indian Oil Corporation Limited- Haldia Refinery	Medinipore(E)	6300
IVL Dhunseri Petrochem Industries Private Limited	Medinipore(E)	403
MCPI Private Limited	Medinipore(E)	30792
Ruchi Soya Industries Limited	Medinipore(E)	130
Shree Renuka Sugars Ltd	Medinipore(E)	740
Tata Chemicals Limited	Medinipore(E)	45
UPL Limited (United Phosphorus Limited)	Medinipore(E)	72
UNIGLOBAL PAPERS PVT. LTD	Medinipore(W)	210
UNITECH PAPERS MILLS PVT. LTD	Medinipore(W)	242
AB Mauri India Pvt. Ltd.	Nadia	225
Khaitan (India) Ltd.	Nadia	200
SUPREME PAPER MILLS LTD	Nadia	1230
EMAMI PAPER MILLS LTD. (UNIT-GULMOHAR)	North 24-Parganas	900
EXIDE INDUSTRIES LIMITED, SHYAMNAGAR UNIT	North 24-Parganas	1660
INDIAN PULP AND PAPER PRIVATE LIMITED	North 24-Parganas	241.25
METAL & STEEL FACTORY (ORDNANCE FACTORY, MINISTRY OF DEFENCE)	North 24-Parganas	4411
IFB AGRO INDUSTRIES LTD (Noorpur- 743368)	South 24-Parganas	1189
Kohinoor Paper & Newsprint Pvt. Ltd.	South 24-Parganas	12
UNITED BREWERIES LIMITED,KALYANI UNIT	Nadia	950
Krishna Tissues Private Limited	Burdwan	620
Nataraj Electro Casting	Burdwan	2
CETP of Bantala Leather Complex	South 24-Parganas	20000

Policy Statement

1. Preamble:

Water, food and energy securities are emerging as increasingly important and vital issues for India and the world. Most of the river basins in India and elsewhere are closing or closed and experiencing moderate to severe water shortages, brought on by the simultaneous effects of agricultural growth, industrialization and urbanization.

India and China with one third of the world's population have less than ten percent of the world's water resources. A fresh water crisis may be in the offing for two thirds of the global population within next quarter century. In addition countries like India suffer from huge spatial and temporal disparities in distribution of water with its north-eastern region receiving more than a hundred times more rainfall than its western part and that too concentrated mostly during the summer monsoons. Expanding urban population without a proportional increase in civic amenities is already putting pressure on water resource management in urban areas. By 2050, half of India's population will live in urban areas and face issues around water. These bring more into focus on the institutional arrangements and delivery mechanisms of this scarce and non-substitutable resource.

West Bengal is the most densely populated state of India at 1000 persons per square km. Its average urban density is much higher at around 7500 persons per square km. West Bengal has liberal water availability as a natural resource that supports intensive rain-fed agriculture. However the pressure on urban water resources has been increasing over some years due to increasing population, low investment in supply augmentation and dilapidating state of existing systems. It is realized that current and future fresh water demand could be met by enhancing water use efficiency and demand management.

With rapid expansion of cities and domestic water supply, quantity of wastewater is increasing in the same proportion. As per CPHEEO estimates about 70-80% of total water supplied for domestic use gets generated as wastewater. The per capita wastewater generation by the class-I cities and class-II towns, representing 72% of urban population in India, has been estimated to be around 98 lpcd while that from the National Capital Territory-Delhi alone (discharging 3,663 mld of wastewaters, 61% of which is treated) is over 220 lpcd (CPCB, 1999). As per CPCB estimates, the total wastewater generation from Class I cities (498) and Class II (410) towns in the country is around 35,558 and 2,696 MLD respectively. While, the installed sewage treatment capacity is just 11,553 and 233 MLD, respectively, thereby leading to a gap of 26,468 MLD in sewage treatment capacity. Maharashtra, Delhi, Uttar Pradesh, West Bengal and Gujarat are the major contributors of wastewater (63%; CPCB, 2007a). Further, as per the UNESCO and WWAP (2006) estimates (Van-Rooijen *et al.*, 2008), the industrial water use productivity of India (TWP, in billion constant 1995 US$ per m3) is the lowest (i.e. just 3.42) and about 1/30th of that for Japan and Republic of Korea. It is projected that by 2050, about 48.2 BCM (132 billion litres per day) of wastewaters (with a potential to meet 4.5% of the total irrigation water demand) would be generated thereby further widening this gap (Bhardwaj, 2005). Thus, overall analysis of water resources indicates that in coming years, there will be a twin edged problem to deal with reduced fresh water availability and increased wastewater generation due to increased population and industrialization.

Though wastewater reuse is endorsed in many policies and programmes, there is a lack of clear guidelines and frameworks to support the implementation of such projects. As a result, the reuse of reclaimed water for non-potable purposes continues to face challenges. The problem is further exacerbated by limited enforcement of the restriction to extract groundwater for non-potable purposes. More detailed policies and stronger enforcement is needed for wastewater reuse projects to be viable.

To address these issues in a coordinated and focused manner by the development actors, a need has been felt to articulate an uniform State Policy on treated waste water re-use with specific direction towards the reforms in planning, institutional framework, capacity building, research & development, legal & regulatory measures, financial arrangement, public-private partnership, technology upgradation, community participation and awareness. The UD & MA Department has formulated this Policy taking the note of the National Policy of Government of India.

This Policy is applicable to the interventions carried out by Urban Development & Municipal Affairs Department, Development Authorities, Urban Local Bodies and private organizations in urban areas. Other Departments and Institutions carrying out similar/related projects in urban areas are also requested to follow this Policy.

2. Statement of Intent:

The Government intends to shift his role from 'Provider' to 'Provider cum Facilitator cum Regulator' in sustainable management of water resources by way of establishing an effective system of re-use of treated wastewater by the urban citizens of West Bengal thereby reducing dependency on fresh ground/surface water resources bringing reforms in the areas of Planning, Institution, Finance, Technology and Legal & Regulation.

3. Objectives:

3.1. Immediate Objective: (2 Years)

- To assess sources of generation of wastewater and quantity of wastewater production in urban West Bengal and to create a GIS enabled MIS
- To identify bulk users of water like Industrial Clusters, Metro rail, Indian Railways, Infrastructure Projects, Construction Sectors, Agriculture, Bus Depots and Public Works Department, and quantify their potential water demand as bulk user of water.
- To assess the existing centralized and decentralized plants of wastewater treatment especially the Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs) & Common Effluent Treatment Plants (CETPs) and take appropriate measures for upgradation or expansion.
- To identify centralized and decentralized options of wastewater treatment and its application in appropriate places.
- To develop land bank for centralized wastewater treatment plants
- To develop an integrated approach in wastewater management bringing coordinated mission between several Government Departments and Private Sector.
- To develop several issue-based policies & actions and review the existing legal & regulatory measures to bring reforms in wastewater management and its re-use.
- To ensure employment opportunities in wastewater management and its re-use
- To attract investment in wastewater management with innovative financial mechanisms.
- To formulate a comprehensive plan on water resource management including wastewater management with active community participation in Urban Wastewater Treatment and its re-use in cost effective manner.

3.2. Medium Term Objective: (next 4 Years)

- To develop a comprehensive institutional arrangement in all levels either through new establishment of institution or re-orienting institutions responsible for proper planning, implementation, monitoring, conflict resolution and grievance redressal of wastewater treatment & its re-use with appropriate management system, and leveraging awareness about green habit and collective behavioural change amongst all citizens.
- To implement the comprehensive plan on water resource management including wastewater management in urban West Bengal in phased manner subject to availability of finance.
- To establish an appropriate system of operation and maintenance of the wastewater treatment infrastructure through active involvement of the citizens.

3.3. Long Term Objective: (next 4 Years)

- Planned wastewater treatment infrastructure and its re-use are fully functional and maintained in each city.
- Reduce pressure on potable water (fresh ground and surface water) vis a vis reduce pressure on wastewater treatment facilities.

4. Key issues:

- Wastewater management happening in piecemeal manner.

- Lack of awareness among all stakeholders in treatment and disposal of wastewater: As a result, there is insufficient focus on ensuring adequate coverage of network sewerage, and connections to the same; or on decentralised options, where network sewerage may not be viable; and on the health hazards for use of untreated wastewater in agriculture.

- Viability of urban wastewater treatment facilities: Lack of revenue generation from sanitation services in urban centres and/or fiscal transfers for the same are inadequate to ensure operation and maintenance of wastewater treatment plants to required standards. Consequentially, secondarily treated wastewater often does not meet regulatory standards, and is unfit for reuse.

- Lack of clear guidelines and framework: While wastewater reuse finds mention in several policies and programmes, there is an absence of a clear framework to support implementation of projects in a manner that aligns stakeholder interests and priorities, and is operationally sustainable

- Institutional coordination: Water plays a significant role in several sectors, including urban, agriculture, industries and power. There is a need for a platform for interaction and coordination among sectoral departments and other concerned stakeholders to facilitate greater synergies and collaboration towards efficient resource use.

5. Alignment with International/ National Policies and Frameworks

Several policy and guideline documents in India recognized the concept of waste water re-use, and the need to include the same in water supply management programs. Specifically, this policy aligns with the following national and international agenda:

- UN Sustainable Development Goals: The Sustainable Development Goals (SDGs) are focused, among other areas, on environmental protection and prosperity creation. In particular, the policy aligns with the following SDGs: SDG 3: Good Health and Well-Being; SDG 6: Clean Water and Sanitation; SDG 8: Decent Work and Economic Growth; SDG 11: Sustainable Cities and Communities.

- National Water Policy 2012: The National Water Policy 2012 promotes and incentivizes the reuse of wastewater, 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 incentivized 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.

- National Service Level Benchmarks; National Urban Sanitation Policy (NUSP): The National Service Level Benchmarks, instituted by the Ministry of Housing & Urban Affairs, Government of India, establish a 20% target for reuse of urban wastewater generated.

- Power Tariff Policy (revised, 2016): The revised power tariff policy mandates thermal power plants within 50 kms of a city STP to off-take all the treated wastewater from the STP. Charges incurred in conveyance of wastewater from the STP to the power plant are eligible for pass through in the power tariff.

- *Atal* Mission for Rejuvenation & Urban Transformation (AMRUT): Following the policy guidelines implementation of wastewater reuse infrastructure solutions in selected towns and cities has been taken up.

6. Policy Actions:

6.1. Institutional Set up for Implementation, Monitoring and Management:

- State Level High Powered Committee should be constituted under the Chairmanship of the Chief Secretary to Government of West Bengal alongwith the other members – the Additional Chief Secretary/Principal Secretary/Secretary from the Departments of Health & Family Welfare, Environment, PHED, MSME, Water Investigation, Irrigation & Water Ways, UD & MA, P&RD and Commerce & Industry, for overall supervision, monitoring and policy advice.
- A State Level Steering Committee should be constituted under the chairmanship of Principal Secretary/Secretary, UD & MA Department alongwith the representatives of Health & Family Welfare, Environment, WBPCB, PHED, P&RD, MSME, Water Investigation, Irrigation & Water Ways, UD & MA and Commerce & Industry, for supervising the regular implementation and monitoring of wastewater treatment and its use.
- Urban Development & Municipal Affairs Department should act as Nodal Department for implementation of Treated Wastewater Re-use Policy and its action plan.
- State Urban Development Agency under UD & MA Department should act as Nodal Agency for implementation of Treated Wastewater Re-use Policy and its action plan.
- A State Level Waste Water Management Cell with sufficient experts should be established at SUDA for day to day monitoring and technical advisory.
- Technical support in implementation should be provided by Municipal Engineering Directorate. If required, professional technical agency may be engaged.
- The primary responsibility of Urban Local Body is to aware the citizen and industries towards treatment of wastewater and its reuse implementing all legal provisions, even imposition of fine for non treatment. In this connection, ULBs will get strong support from WBPCB.
- The Development Authorities/Unnayan Parishads should be responsible for implementation and O&M of large Sewage Treatment Plants, whereas the Urban Local Bodies should be responsible for implementation and O&M of small Sewage Treatment Plants and decentralized wastewater treatment plants.
- The Urban Local Bodies should promote establishment of decentralized wastewater treatment plants and rain water harvesting technologies encouraging the citizen through incentives.
- ULBs and Development Authorities should constitute Task Force for implementation and monitoring of treatment of wastewater & its use in their jurisdiction.
- Requirement of manpower resource gap in ULBs/Development Authorities should be addressed by way of filling up the vacant posts or engaging outsourced agency.

6.2. Development and Maintenance of Information Base and planning:

A Comprehensive Database Development and appropriate Management Information System utilizing GIS platform should be established for regular assessment of water demand, wastewater generation and reuse of treated wastewater in several sectors and mapping the requirement/location of centralized and decentralized treatment plants. For this following steps should be adopted:

- Develop coordination between UD & MA Department, Environment Department, PHED and Water Resource Investigation & Development Department
- Develop coordinated information sharing mechanism between water promotion departments like UD&MA, PHED and Water Resource Investigation & Development Department, and ULBs/Development Authorities
- Develop GIS enabled Management Information System for the cities.
    i) Preparation of Geo-referenced City base Map
    ii) Conducting Technical Surveys like Plane Table, Contour Survey
    iii) Conducting Study on 'as is' situation of underground water, surface water, water lines, sewer lines etc.
    iv) Conducting Socio-Economic Survey and Development of Management Information System

v) Integration of Spatial Data with the information of abovementioned surveys/studies to create GIS enabled MIS.
vi) Establishment of Central Data Monitoring Centre

- Develop coordination between UD & MA Department and Land & Land Reforms Department for updation of Land Records of the cities and development of Land Bank for plants.
- Provision of manpower & development of physical infrastructure for maintaining database development & management system in the concerned Departments especially in UD & MA Department, Development Authorities, Unnayan Parishads, and Urban Local Bodies.
- Preparation of Urban Water Resource Management Plan alongwith Wastewater Resource Management Plan by each ULB: Traditionally, water authorities have managed their water supply, sewerage and storm water drainage systems as separate entities. Integrated urban water resource planning is a structured planning process to evaluate concurrently the opportunities to improve the management of water, sewerage and drainage services within an urban area in ways which are consistent with broader catchment and river management objectives. Catchment management impacts directly and indirectly on all three components of the urban water cycle, having effects on drinking water quality, wastewater treatment and storm water management.
- Each waste water treatment plant should have a physical and financial pre feasibility study alongwith environmental impact assessment
- Planning for establishment of water testing laboratory in affordable location regionally should be developed.
- Each ULB/implementing organization should develop a plan for commercialization/marketing of treated waste water involving citizen and private actors.
- DPR of STP should include effective plan for reuse of treated water, long term operation & maintenance and commercialization i.e. pricing of treated water, and the DPR implementing agency should ensure that.
- Management of STPs should be effectively planned involving user groups.
- Management of ETPs/CETPs should be efficiently monitored by ULB/DA/WBPCB on regular interval and in planning of ETP/CEPT establishment by the industry, mandatory provisions should be there to include the purpose of use of treated water.
- Local or regional storage facility of treated waste water and network plan for supply for reuse shall be developed through a systematic study.

6.3. Comprehensive Land Use Planning:

New Land Use Development and Control Plan for West Bengal specifically for the Statutory Towns, other Census Towns and upcoming Growth Centres are very much required for systematic planning of wastewater treatment plants both for centralized and decentralized plants.

6.4. Legislation and Guidance Documents to follow:

- Environment (Protection) Act, 1986
- The Environment (Protection) rules,1986
- The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006
- Water Bodies Conservation Act
- The East Kolkata Wetlands (Conservation and Management) Act, 2006/2008
- The West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005/2006
- Manual on Sewerage and Sewage Treatment Systems, 2013 of CPHEEO
- The water (Prevention and control of pollution) Act,1974
- The water (Prevention and control of pollution) cess, Act,1974
- The water (Prevention and control of pollution) Amended rules, 2011
- The water (Prevention and control of pollution) cess rules, 1978
- The water (Prevention and control of pollution) Rules, 1975
- National Urban Sanitation Policy 2008
- National Water Policy 2012
- West Bengal Municipal Act and Municipal Corporation Acts

- Quality standards suggested by Central Pollution Control Board and West Bengal Pollution Control Board.
- Standards set by Bureau of Indian Standards (BIS)
- Effluent Quality guidelines for health protection measures in aquaculture use of waste water
- Quality guidelines for health protection in using human wastes for aquaculture.
- Service Level Benchmarks Fixed By Ministry of Urban Development

6.5. Legal Issues:

- Imposition of legal provision to the respective stakeholders for installation of STP/ETP/CETP.
- The legal rights over the sale and revenue issues of reclaimed water is an emerging issue and being addressed by the State Government separately.
- ULB/Industry should reuse, recycle, & resale the effluents, sewage, septage water to the end users within or outside the jurisdiction of the ULB.
- West Bengal Municipal and Municipal Corporations Acts should be amended incorporating the provision for treatment of waste water in centralized & decentralized manner and reuse of the same.
- Ground water extortion shall be mandatorily prohibited, especially for agriculture, industry & construction sectors, and instead of that use of surface water and treated waste water should be imposed.
- Mandatory provisions shall be made for bulk user of water like Fire Brigade, Industrial Clusters, Metro rail, Indian Railways, road wash, Infrastructure Projects, Construction Sectors, Agriculture & Agriculture Extension sectors, Bus Depots and Public Works Department to use treated waste water.
- Imposition of fine on the Industries for not establishing Effluent Treatment Plant/Common Effluent Treatment Plant and non reuse of that water.
- State level treated waste water specifications and standards shall be amended (to be encouraged to adopt as per IS and ISO standards) to include and ensure a safe reuse and to produce high economic return products.

6.6. Technology Options for Wastewater Treatment:

The coverage of waste water treatment should be the application of appropriate waste water treatment technologies in both the centralized and decentralized models having low cost & user friendly to operate; both in capital and in operation & maintenance. The centralized models should have commercial value of cost recovery.

Technological options for waste water treatment plants should be based on treatment standard, quantum of sewage inflow, BOD level, location of plants or utilization of recycled waste water etc., details of the design considerations and operating requirements for a variety of technologies suitable under different conditions has been explained in Chapter 7 of part A of Manual on Sewerage and Sewage Treatment Systems (2013) of CPHEEO.

It shall be ensured that old STPs should be upgraded and new STPs confirm to such standards so as to enable utilization of treated waste water directly by the users as far as possible.

Effluent Treatment Plants and Common Effluent Treatment Plants of Industries should confirm to such standards so as to enable utilization of treated waste water directly by them or other users as far as possible.

Decentralized wastewater treatment models should be showcased before the citizen in several public places like parks etc. and should be promoted for bulk waste generators.

Accessible and affordable water quality testing arrangement should be in place locally or regionally.

The developers should use innovative/conventional/generic technologies developed by IITs/NEERI and other Institute of repute while implementing the projects.

The choice of technology should have low requirement of space, power and efficiency.

For each project, conducting environmental impact assessment and social impact assessment are mandatory, alongwith technical and financial feasibility analysis.

6.7. Technology Reforms:

Government intends to propagate and extend new cost-effective, energy efficient and eco-friendly technologies. For this following issues should be considered.

- Promote Research & Development relating to alternate treatment technologies as well as energy conservation practices involving Technological Institutes/Universities/ Science & Technology Department of West Bengal
- Technological Institutes/Universities/ Science & Technology Department of West Bengal, shall be requested to develop economically viable wastewater treatment decentralized models.
- Technological Innovation shall be worked out for protecting flora & fauna and also human settlements from man-made and different kinds of natural & man-made disaster.
- Government would facilitate the creation of quality testing facilities for water across the State for ensuring quality control. The existing facilities in technological institutions would also be utilized.

6.8. R&D for Technology and its Commercialization:

A technology fund shall be set up under UD & MA Department in order to Research & Development (R&D) for appropriate cost effective and geographically suitable technologies for wastewater treatment. This shall also include identification and innovation of proper models. Products developed through this R&D will be commercialized through supermarket, retail outlet, mart, urban technology parks etc.

6.9. Reuse of Treated Water:

Wastewater is a huge resource that should be harnessed properly, it can bring a lot of health and economic benefits, increase food production, enhance fishing, tourism, rural and urban livelihoods. Following areas of reuse of treated water should be followed:

- Irrigation and Agriculture: Storm water, urban runoff and effluent from animal farms can be captured for irrigation and other farming needs. This kind of wastewater is usually high in nutrients (nitrogen, phosphorus, potassium, micronutrient and organic matter). It saves fertilizer cost and also preserves surface and underground water that they would have otherwise used. The sludge from treatment sites can be used in composting sites and sent to agricultural fields.
- Energy and Construction: The waste materials (sludge) collected from a treatment plant can be biodegraded in a controlled environment and then combusted (burnt at high temperatures) to release Methane (A gas similar to natural gas). This can be used in boilers at homes and in buildings, as well as for cooking and heating purposes. This digester kind of biodegrading can contain contaminants and so the process has to be done properly. The sludge from treatment plants can also be combusted to produce electricity.
- There are different types of sludge. Sludge could be fecal (from human and animal poop flushed down the drains) and regular sludge, from rubbish and garbage that get into drains and sewage systems. Fecal sludge is high in contaminants and must be treated well before discharge.
- Water used in the kitchen can be collected and used to gardens and lawns. A couple of gallons each day means a significant saving on water by the end of the year. Families can also reduce the amount of wastewater they produce by using of bathrooms.
- Community Latrines and Toilets washing, road cleaning, construction activities, pisciculture, Car Washing, maintenance of parks gardens & developing urban landscaping, rejuvenation of ponds, lakes, rivers, and emergency purpose for fire brigade
- Rainwater Harvesting: It should be mandatory to reuse the rain water in sanitary activities and groundwater recharging.
- Industries should reuse their treated water and sludge and minerals to be sold out for appropriate use. Further industries within 30 km of a Sewage Treatment Plant should use treated water in place of fresh surface/ground water.

- Bulk users of water like Fire Brigade, Industrial Clusters, Metro rail, Indian Railways, road wash, Infrastructure Projects, Construction Sectors, Agriculture & Agriculture Extension sectors, Bus Depots and Public Works Department should use treated waste water.
- The excess amount of treated waste water may be used for ground water recharging.

Inspite of these, Government intends the following:

- Commerce & Industry Department should make a voluntary target for treated wastewater to comprise 20% of the total state-wide industrial water use by 2020
- In compliance with the Government of India's recently revised Power Tariff Policy (2016), Department of Power, Government of West Bengal should coordinate partnerships of thermal power plants with urban centres within 50 km radius for off-take of all Wastewater treatment available; and facilitate operational sustainability of wastewater treatment plants

6.10. Awareness Generation:

Government intends to promote awareness among all the stakeholders for achieving the goal of 'Re-use of treated wastewater'. For the said purpose, Government is directing the development actors to promote the awareness considering the following issues.

- Awareness should be generated regarding different Government Programmes to reach & sustain the benefit upto the end beneficiary.
- Awareness should be generated regarding several Policies, Acts and Laws related to Water resource and wastewater management & reuse.
- Awareness should be generated regarding Environment Protection.
- Awareness should be generated widely on good quality and cost effective centralized & decentralized technologies of wastewater management systems.
- Awareness should be generated for providing service charges, user fee and fine
- Awareness should be generated regarding maintenance of created assets and also for developing environment friendly & hygienic city
- Multiple channels like media (social, print, broad cast etc.), advertising, flyers, brochures, booklets, road shows, rallies, public addressing, etc. should be used.
- Techniques for Community Mobilization to be adopted
    i) Involving community in their own development process
    ii) Growing interest of Community through Cultural & Healthy Recreational facility
    iii) Educating community on Human Rights
    iv) Preparing IEC materials according to community need
    v) Display Programme, Activity & Achievement Charter
    vi) Display success story in different places
    vii) Disseminating/ Displaying Literal & Visual Documentation
    viii) Fair
    ix) Involving Media.
- A system of incentives and penalties should be devised to encourage greater participation among residents, compliance by service providers and better performance of ULBs.
- Reward system may be developed for high performing ULBs/citizens.
- Government shall issue appropriate guideline for community mobilization and awareness generation.

6.11. Capacity Building and Training:

Capacity building is crucial in achieving and sustaining wastewater management and its use. Focus on capacity building, exposure visit and training of concerned staffs of State/Regional/District level agencies/departments, ULB level officials and elected representatives, Community based organizations and other stakeholders shall be made.

i) Capacity building of the personnel should be coordinated by ILGUS involving the State Training Agencies, Institutes of Private & Public Bodies and Technology Universities.
ii) Specialist institutions shall also be involved so that the knowledge development on newer approaches and technologies is quickly made available.
iii) The State Agencies/ULBs/Private Actors shall take assistance from National and State level resource organizations in consolidating and applying the existing and new knowledge in a 'learning by doing' framework and building capacities of a range of personnel from different kind of backgrounds.
iv) State shall give an effort to create new posts and fill up the vacant posts for the promotion of these activities.
v) State shall give an effort to develop institutional infrastructure of all the related State / District / Regional / Sub-Division / ULB level Departments / Agencies / Resource Centres to promote wastewater treatment and its reuse.

Capacity building will comprise:

- Bulk training/workshop/exposure visit for a range of municipal and other stakeholder personnel - right from start of the campaign in the ULB.
- Differentiated and specialized training on a demand-basis to personnel over the period of the Plan implementation.
- For Technical assistance, the State shall arrange for bulk and specialised training of State/Regional/District/ULB level personnel, assisting State Agencies/ULBs by procuring and deploying/ managing service providers (study consultants and NGOs, technical resource agencies), and providing coordination support to city-wide communications, planning and implementation management.

6.12. Monitoring and Evaluation:

- To establish the strong monitoring and evaluation system involving community, State shall endeavour to engage independent/ external Monitoring & Evaluation Agency for Third Party Quality Monitoring and time to time evaluation of the projects/progress parallel with the abovementioned monitoring mechanism.
- West Bengal Pollution Control Board shall monitor the water quality of the treated plants (centralized or decentralized) to ensure compliance with quality standards required for different reuse categories.
- An effective Grievance Redressal mechanism should be developed at State/ULB and Development Authority level.
- State shall also institutionalize Social Audit System to involve community in monitoring & evaluation system.

6.13. Welfare Measures:

At the time of implementing this policy, large financial investment will be observed, which will create large employment opportunity for different classes of people and will provide sufficient water to all sections of the society. Realizing the fact Government intends to imply the welfare measures particularly for the poor. They will get an opportunity of getting employment in this sector. To provide benefit to the poor Government shall take the following measures.

- Training infrastructure shall be developed for skill development of the workers to be engaged in this Sector.
- With increasing growth in urban sector, different kinds of employment opportunities will come up for the poor (for both male and female) that should be promoted with the help of several livelihood promotion departments and private agencies. Their skills shall be developed providing training to them (after market assessment on soft skill, security guard, computer operation, repair etc.) and loans shall be provided from different Government Programmes for entrepreneurship development.

- National Skill Development Mission should be dovetailed for skill development in this sector.
- Several welfare measures for them like support for house construction, education for their children, provident fund, coverage under Health & Life Insurance, social security schemes etc. shall be implemented converging development programme of several departments.

6.14. Involvement of NGO/Private Sector:

Government shall encourage the development actors to engage NGO/Private Agency in the following areas for promotion of waste water treatment and its reuse

- Capacity Strengthening of ULB & Community Level Staffs
- Planning
- Research & Development
- Piloting innovative projects
- Community Mobilization
- Mapping Job Potentiality
- Private Public Partnership Projects
- Operation & Maintenance
- Facilitating in Social Audit
- Quality Assurance
- Evaluation

6.15. Source of Funding:

In this rapid urbanization stage, to reuse of treated waste water in Urban West Bengal, Government wants to develop some innovative financial instruments to meet up the demand for investment. Financing should be arranged in following ways.

- Central and State Finance Commission Funds
- State Budget for this purpose
- Available Programme funds
- Leveraging similar fund of several Departments
- Pooled Fund of West Bengal Municipal Development Fund Trust as loan
- Externally Aided Funds
- Provide incentives to the financial institutions, Micro finance institutions, mutual funds, corporate sectors, trusts and foreign institutional investors for investing in treatment of wastewater.
- Promoting well designated Public-Private Partnership
- Inviting Corporate Social Responsibility
- Inviting Foreign Direct Investment developing a mechanism for direct investment from Non Resident Indians and Persons of Indian Origin.
- Imposing service charge on wastewater treatment
- Imposing penalty on ULB/Industry for non treatment of waste water and not developing provision for reuse of that water
- Imposing user charge on treated wastewater use and also commercializing the use of treated water i.e. revenue generation from selling of treated water.

6.16. Targeted Timeline:

- To reach 50% coverage of collection of sewage and its treatment as per prescribed standards in all ULBs by 2023
- To reach 75% coverage of collection of sewage and its treatment as per prescribed standards in all ULBs by 2025
- To reach 100% coverage of collection of sewage and its treatment as per prescribed standards in all ULBs by 2029
- To reuse 25% of treated wastewater within 2022 for non potable/other purpose

- To reuse 50% of treated wastewater within 2025 for non potable/other purpose
- To reuse 80% of treated wastewater within 2030 for non potable/other purpose

6.17. Expected outcome of this Policy:

- New social and economic opportunities and avenues emerge where wastewater is recycled and reused based on cost recovery and profit generating business models.
- Augmented capacities across institutions (State & ULB level) that could possibly be replicated in other sectors.

6.18. Interpretation and Amendment:

- Any issue or doubt regarding this policy shall be referred to Department of UD & MA, GoWB whose decision will be final and binding on all concerned.
- Department of UD & MA, GoWB may from time to time amend the provisions as contained in this policy as considered necessary.
- Department of UD & MA, GoWB shall have the power to issue guidelines and instructions from time to time to operationalise this policy.

Government of West Bengal
Department of Urban Development & Municipal Affairs
Nagarayan, DF-8, Sector-1,Salt Lake, Kolkata -700 064

No. -JS(SM)/UD&MA/2019 **Date : 05/12/2019**
UD/00/2019/03675

From: The Joint Secretary to the Govt. of West Bengal
UD&MA Department &
Additional Mission Director (MNB)

To:

The Principal Secretary,
Environment Department,
Government of West Bengal

Sub: Comprehensive Policy and Action Plan for Re-use of Treated Waste Water in Urban West Bengal.

Sir.

This is to inform you that the draft Comprehensive Policy and Action Plan for Re-use of Treated Waste Water in Urban West Bengal formulated by the Committee constituted vide Notification No. 37-JS(SM)/UD&MA/ 2019 dated 16.04.2019 communicated to you vide no.46-JS(SM)/UD&MA/2019/ UD/00/2019/03675 date : 05/12/2019 for necessary action.

After that incorporating the comments of CPCB (as received from Sri Ujjal Sen Gupta, Chief Scientist, WBPCB) and the committee members, we have prepared the revised policy document and the Action Plan for re-use of treated waste water.

As directed I am forwarding the revised policy document and the action plan submitted by the committee for your kind perusal and necessary direction.

Yours faithfully.

Joint Secretary to the Govt. of West Bengal
&
Additional Mission Director (MNB)

No. -JS(SM)/UD&MA/2019 **Date : 05/12/2019**
UD/00/2019/03675

Copy forwarded for kind information and necessary action to:

1. Member Secretary, WBPCB
2. Director. SUDA.
3. PS to Principal Secretary, UD & MA Department.

Joint Secretary to the Govt. of West Bengal
&
Additional Mission Director (MNB)

Action Plan to ensure utilisation of treated waste water to reduce pressure on the ground water resources

Sl No.	Action Points	Responsible Authority	Timeline
	Institutional Setup		
1	Gazette Notification of Treated Waste Water Re-use Policy of Urban West Bengal	UD & MA Deptt./CMO/Finance Deptt/State Cabinet	Jan-20
2	Constitution of State level High Powered Committee for overall supervision, monitoring and policy advice	UD & MA Deptt. & CMO	Jan-20
3	Constitution of State Level Steering Committee for supervising the regular implementation and monitoring of wastewater treatment and its use.	UD & MA Deptt. & CMO	Jan-20
4	Issuing notification declaring UD&MA Department as Nodal Department for implementation of Treated Wastewater Re-use Policy and its action plan	CMO	Jan-20
5	Issuing notification declaring State Urban Development Agency (SUDA) as Nodal Agency for implementation of Treated Wastewater Re-use Policy and its action plan	UD & MA Deptt.	Jan-20
6	A State Level Waste Water Management Cell with sufficient experts to be established at SUDA for day to day monitoring and technical advisory	UD & MA Deptt.	Mar-20
7	Issuing operational Guideline for Installation and O&M for several capacities of sewaage treatment plants.	UD & MA Deptt/ SUDA/ MED	Mar-20
8	Constitution of Task Force at ULBs and Development Authorities for implementation and monitoring of treatment of wastewater & its use in their jurisdiction.	DAs / ULBs	Mar-20
	Feasibility syudy and planning		
9	Micro Planning organizations to be engaged for 1. assessing as is situation of Water Genaratio, Water Use, Waste Water Generation including sources, Assessment of pollutants/ BOD level, 2. Identification of Water user and waste water generatos like household, commercial establishments and bulk generators etc. 3. Identification of local regional storage facility of treated waste water and network plan for supply for reuse shall be developed through a systematic study 4.Feasibility study (Techno socio financial study) with social impact assement & environmental impact assessment for establishment of STPs/ ETPs/ CETPs and also of old ones. 5. Land use planning for required land identification. 6. Assessment of manpower requirement. All these should be made after field verification and analyzing legal provisions.	UD & MA Deptt/ SUDA	To be engeged by April-2020 and complete the study by September-2020
10	Integration of treated water management with urban water resource management plan.	UD & MA Deptt/ SUDA	Sep-20
11	As per study takeup action on old STPs/ ETPs/ CETPs.	MED/DA/ Respective authorities	Dec-21
12	As per study takeup action on completion of work of ongoing construction of STPs/ ETPs/ CETPs.	MED/DA/ Respective authorities	Dec-21
13	As per study takeup action on installation of new STPs/ ETPs/ CETPs phase wise.	MED/DA/ Respective authorities	Starting from Dec-20 to Dec-29 in phased manner
14	As per study takeup action on establishment of local / regional/ storage facility for treated waste water and establishment of network for reaching to users and comercialization for cost recovery phase wise.	MED/DA/ Respective authorities	Starting from Dec-20 to Dec-27 in phased manner
15	As per study establishment of centralized or de-centralized plan for ground water recharging from treated waste water (whereever required) phase wise.	MED/DA/ Respective authorities	Starting from Dec-20 to Dec-25 in phased manner
16	Preparation of action plan for implementation of treated wastewater (industrial effluent) in specified industries.	WBPCB / MSME / Industry Department	Sep-20
	Legal provisions		

Sl No.	Action Points	Responsible Authority	Timeline
	Municipal/ Other Act ammendment		
17	Imposition of legal provision to the respective stakeholders for installation of STP/ETP/CETP. The legal rights over the sale and revenue issues of reclaimed water is an emerging issue and being addressed by the State Government separately. ULB/Industry should reuse, recycle, & resale the effluents, sewage, septage water to the end users within or outside the jurisdiction of the ULB. West Bengal Municipal and Municipal Corporations Acts should be amended incorporating the provision for treatment of waste water in centralized & decentralized manner and reuse of the same. Ground water extortion shall be mandatorily prohibited, especially for agriculture, industry & construction sectors, and instead of that use of surface water and treated waste water should be imposed. Mandatory provisions shall be made for bulk user of water like Fire Brigade, Industrial Clusters, Metro rail, Indian Railways, road wash, Infrastructure Projects, Construction Sectors, Agriculture & Agriculture Extension sectors, Bus Depots and Public Works Department to use treated waste water. Imposition of fine on the Industries for not establishing Effluent Treatment Plant/Common Effluent Treatment Plant and non reuse of that water. State level treated waste water specifications and standards shall be amended (to be encouraged to adopt as per IS and ISO standards) to include and ensure a safe reuse and to produce high economic return products.	UD & MA Deptt/ SUDA	Dec-20
	Technology		
18	Establishment of regional water testing laboratory and certification.	UD & MA Deptt/ Environment Deptt./ Finance Deptt.	Dec-21
19	Identification of several centralized and de-centralized model for STP/ ETP/ CETP.	UD & MA Deptt/ Environment Deptt./ Dptt. Of Science & Technology/ WBPCB	By Dec-2021 and to be continued
20	Development of Technology fund at UD&MA Department for R&D purpose and establishment of technology park.	UD & MA Deptt/ Finance Deptt./ Environment Deptt./ Dptt. Of Science & Technology/ WBPCB	Dec-21
	Awareness generation		
21	Engagement of expert agency for designing different kinds of IEC materials and providing advisory support for implementation of IEC and public awareness activities.	UD & MA Deptt/ SUDA	By April-2020 and to be continued
22	Generation of awareness among citizen and different stake holders to be started as per Clause No. 6.9 & 6.10 of Treated Wastewater Re-use Policy of Urban West Bengal.	UD & MA Deptt/ SUDA/ DA/ ULB	By April-2020 and to be continued
23	**Capacity building**		
24	Engagement of Capacity Building agency for arrangement of expouser visit and tranning for different stake holders as detailed in Clause No. 6.11 of Treated Wastewater Re-use Policy of Urban West Bengal.	UD & MA Deptt/ SUDA	By April-2020 and to be continued
25	Capacity building activities started alongwith preparation of several training modules and identification of expouser spots.	UD & MA Deptt/ SUDA	By April-2020 and to be continued
	Monitoring and evaluation		
26	Monitoring and evaluation State level High Powered Committee will establish a monitoring and evaluation system for treated waste water management.	UD & MA Deptt. & CMO	Dec-20
27	Establishment of grievance redrasal mechanism at State/ ULB/ DA.	UD & MA Deptt/ SUDA	July-21

Sl No.	Action Points	Responsible Authority	Timeline
28	Engagement third party quality monitoring agency for time to time evaluation of the projects.	UD & MA Deptt/ SUDA	Dec-20
29	Establishment of social audit system for monitoring and engagement of social audit agency.	UD & MA Deptt/ SUDA	Dec-20
30	Inclusion and regular updation of all information in this relation and reporting format for success of such projects in the departmental website.	UD & MA Deptt/ SUDA	Apr-20
	Welfare measors		
31	Introduction of welfare measors for different classes of people to be employed in these projects.	UD & MA Deptt/ SUDA/ Labour Deptt.	Starting from Sec-20
	Funds		
32	Source of fund to be evolved for these huge investment.	UD & MA Deptt/ Finance Deptt.	Dec-20

Treated Wastewater Re-use Policy
of
Urban West Bengal

November 2019

Prepared by

Urban Development & Municipal Affairs Department
Government of West Bengal

Preface

Poor sanitation and wastewater management in developing countries leads to the contamination of fresh water sources and is a major cause of water borne diseases and also affect the health of eco-systems. Around 80% of all waste water is discharged into the surface water bodies without any treatment where it creates health, environmental and climate-related hazards. Urbanization further exacerbates this challenge with increasing wastewater generation, while at the same time using more of Earth's dwindling resources. Recycling and reuse of treated wastewater is an important part of the sanitation cycle and critical in an environment with decreasing freshwater availability and increasing costs for delivering desirable quality water, often from far distance. Recovering the water, energy, nutrients and other precious materials embedded in wastewater is a key opportunity to be seized. Target 6.3 of the Sustainable Development Goals (SGD) commits governments to halving the proportion of untreated wastewater and sustainability, increasing recycling and safe reuse by 2030.

This policy document gives substantial focus to the financial and economic benefits of wastewater recycling from the perspective of public spending. The policy presents possible strategies for city and state planners in view of the sanitation situation and the role of wastewater recycling in the cities in West Bengal, and focuses on recycling at the end of sewage systems with appropriate centralized or decentralized technology solution alongwith extensive public awareness activities.

Contents

Overview

About Wastewater: At a Glance

What is Wastewater:

Wastewater can have a number of definitions (UN-Water 2015). The approach taken in this policy is a very broad definition following that outlined in the UNEP/UN-Habitat document 'Sick Water?'. Thus, Wastewater is defined as "a combination of one or more of:

- domestic effluent consisting of blackwater (excreta, urine and faecal sludge) and grey- water (kitchen and bathing wastewater);
- water from commercial establishments and institutions, including hospitals;
- industrial effluent, storm water and other urban run-off;
- agricultural, horticultural and aquaculture effluent, either dissolved or as suspended matter

Although, using this definition, the term 'wastewater' clearly encompasses domestic, commercial, industrial, agricultural components and also fecal sludge, these are sometimes covered separately in order to clarify or highlight the importance of the individual components or wastewater streams. (UN-Water, 2015).

Types of wastewater:

Wastewater comes in three main types namely Black water, Gray water and Yellow water.

Black water
This is wastewater that originates from toilet fixtures, dish washers, and food preparation sinks. It is made up of all the things that one can imagine going down the toilets, bath and sink drains. They include poop, urine, toilet paper and wipes; body cleaning liquids, anal cleansing water and so on. They are known to be highly contaminated with dissolved chemicals, particulate matter and is very pathogenic.

Gray water
This is wastewater that originates from non-toilet and food fixtures such as bathroom sinks, laundry machines, spas, bathtubs and so on. Technically it is sewage that does not contain poop or urine. Gray water is treated very differently from Black water and is usually suitable for re-use.

Yellow water
This is basically urine collected with specific channels and not contaminated with either black water or gray water.

Sources of wastewater

Domestic Sewage
This includes all wastewater generated by home dwellings, public restrooms, hotels, restaurants, motels, resorts, schools, places of worship, sports stadiums, hospitals and other health centres, apartments and the like. They all produce high volumes of wastewater.

Non-sewage
This includes water from floods (storm water), runoff (rainwater running through cracks in the ground and into gutters), water from swimming pools, water from car garages and cleaning centres including laundromats, beauty salons, commercial kitchens, energy generation plants, industries and so on.

Wastewater is also generated from agricultural facilities. Water used for cleaning in animal farms, washing harvested produce and cleaning farm equipment.

How is wastewater harmful?

In certain parts of the world, especially in developing countries, wastewater is pumped directly into the sea or into fresh water bodies without any form of treatment. In other parts of developed countries, lack of adequate wastewater treatment infrastructure, maintenance and outdated systems heavily compromise wastewater treatment efforts. The effects of this (either treated or partly treated) can be classified in the following:

Water pollution:
Fresh water bodies and marine waters, into which wastewater is discharged may be polluted and rendered unsafe for human use. Depending on what is discharged, aquatic life may be harmed too.

Water security:
There is water scarcity in many places in the world. Wastewater discharged on lands can leach into underground water tables and potentially contaminate aquifers and underground water. If discharged in freshwater bodies, it may render water sources unsuitable for use.

Ecosystem services:
All ecosystems are connected and they all ultimately depend on water. Similarly, all water (surface and underground) is connected. This means careless wastewater discharge can have some serious ripple effect. One common effect of wastewater is the eutrophication of fresh water bodies and oceans. If one part of the ecosystem chain is destroyed, it can upset its entire food chain.

Agriculture / Fisheries / Tourism:
Wastewater for irrigation may contain unsuitable chemicals and higher concentrations of nutrients needed for crops. This can result in delay and under yielding. Wastewater used for animal farming may also contain harmful things and chemicals dissolved in them. Animals may die, and there is a chance that humans that eat such animals may be harmed too. In some places, fecal sewage is discharged directly into the sea/river. The discharge contains pathogens and harmful dissolved chemicals which can affect fishing in that area. The smell and such behavior do not encourage tourism to that area.

Health of urban and rural populations:
Wastewater is a big health issue, as it carries and transports a myriad of diseases and illnesses. It is believed that about 2.2 million people die each year (globally) from diarrhoeal disease. (WHO) At least 1.8 million children under five years die every year due to water related disease, or one every 20 seconds (WHO, 2018).

What is Waste water Management?

Wastewater management is the process of taking wastewater and treating/managing it in order to reduce the contaminants to acceptable levels so as to be safe for discharge into the environment. There are effectively two basic types of wastewater treatment: centralized and decentralized. Centralized systems are large-scale systems that gather wastewater from many users for treatment at one or a number of sites, whereas decentralized systems are dealing with wastewater from individual users, or small clusters of users, at the neighborhood or small community level.

The choice between centralized or decentralized wastewater management systems will depend upon a number of different factors, but it is important that full consideration be given to both the options rather than the situation that has existed in the past where sewerage was often considered to be the only 'proper' form of urban sanitation (UN-Water, 2015).

Availability of Water in West Bengal

- West Bengal possesses 7.5% of Water Resources of India.
- Annual Per capita availability of fresh Water:

Year	Water Availability (in m^3)
1961	5177
2001	1869
2025	1341

- Availability of Surface Water is 13.29 Million hectare meters (M.ham), 40% of it is useable.
- Availability of Ground Water is 2.38 M.ham, totally useable.

Requirement of Water in West Bengal in (M.ham)

Sector	2000	2011	2025
Agriculture	5.38	7.71	10.98
Domestic	0.26	0.28	0.38
Industry	0.26	0.38	0.59
Power (Thermal)	0.31	0.00	0.00
Inland Navigation	3.63	3.63	3.63
Forestry	0.01	0.01	0.01
Ecology, Environment and Others	1.00	1.00	1.00
Total (M.ham)	10.85	13.02	16.60
* Source: State Irrigation Department			

Shortfall of Water in West Bengal

As the supply of water is naturally constrained and demand is increasing in leaps and bounds the GAP in between is extending with time.

GROWTH OF POPULATION AND DECLINING PER CAPITA WATER		
YEAR	POPULATION (in Crore)	PER CAPITA WATER (in cu.m)
1951	2.63	2574
1961	3.49	1940
1971	4.43	1528
1981	5.46	1240
1991	6.81	996
2001	8.02	844
2011	9.40	720
*** Source: State Irrigation Department**		

Water Requirement vs Supply		
YEAR	Water Requirement (M.ham)	Deficit
2001	10.85	38%
2011	13.02	48%
2025	16.60	59%
* Source: State Irrigation Department		

Main Features of Urban West Bengal

Area of West Bengal: 88752 sq. km.
Total No. of Districts: 23 nos.

Area of Statutory Towns of West Bengal: 2742.21 sq. km. (3.09% of Total Area of WB)

Total Towns:

1. 125 Statutory Urban Local Bodies having 2938 Wards
   - 7 Municipal Corporations; 115 Municipalities; 3 Notified Area Authorities
2. 782 Census Towns

Three Industrial Township Authorities – Nabadiganta Industrial Township Authority, Bantala Industrial Township Authority and Golden City Industrial Township Authority

Development Authority – 19 Nos.

Urban Growth:

- Density of Urban Population – 6798 per sq. km. (highest in India)
- 30% of the total Urban Population live in Slum Areas
- Population share in size classes of towns to total Urban Population (Census 2011):

Sl No	Category of Town	Population Range	No. of Towns	Total Population
1	Municipal Corporation		7	8591218
2	A	above 2,15,000	13	4013321
3	B	above 1,70,000 to 2,15,000	8	1548015
4	C	above 85,000 to 1,70,000	34	4010347
5	D	above 35,000 to 85,000	42	2321142
6	E	below 35,000	21	473658
	TOTAL		**125**	**20957701**

Sl No	Town Size Classes	No. of Towns	Total Population
1	I (> 1000000 population)	3 MC	6726212
2	I (> 500000 - 1000000 population)	3 MC	1698139
3	I (> 100000 - 500000 population)	1 MC & 47 Municipality	9040626
4	II (50000-99999 pop.)	33 Municipality	2334791
5	III (20000-49999 pop.)	29 Municipality & 1 Notified Area Authority	1036389
6	IV (10000-19999 pop.)	5 Municipality & 2 Notified Area Authority	112417
7	V (5000-9999 pop.)	1 Municipality	9127
	TOTAL	**125**	**20957701**

Service Level Scenario of Piped Water Supply in Urban West Bengal

Piped Water Supply				
Sl No	**Indicator**	**Service Level Benchmark**	**Present Status (Average)**	**Gap**
1	Household level coverage (%)	100%	56%	44%
2	Per capita supply of water	135 lpcd	72 lpcd	63 lpcd

Comparative Urban Growth of India and West Bengal

Sl .No.	Years	India (In Million)	West Bengal (in Million)
1	1961	78.16	8.54
2	1971	107.82	10.97
3	1981	159.46	14.45
4	1991	217.61	18.71
5	2001	285.36	22.43
6	2011	377.11	29.1
Source: 1. Census of India			

Urbanization in West Bengal

Year	Total Population (in Million)	Urban Population (in Million)	% of Urban Population
1981	54.6	14.4	26.37%
1991	68.1	18.7	27.46%
2001	80.17	22.5	28.06%
2011	91.2	29.1	31.90%

Water Demand with Projected view of next 50 years in West Bengal

Sl No	Municipality/ Corporation	Population in 2020	Rate of Growth per year	Population in 2070
1	West Bengal Urban Area	31,819,118	1.585%	69,850,157

		Ultimate Year 2070	Units	Remarks
Projected Population		69850157	Nos.	Based on population computed
Floating Population @	2.00%	1397003	Nos.	Assumed
Total Population		71247160	Nos.	
Population Served in LPCD @	135	9618366619	Lit/Day	CPHEEO Manual
Institutional & Industrial Demand @	8.00%	769469330	Lit/Day	Assumed
Fire Fighting @ 100000(Popu/1000)^0.5		26692164	Lit/Day	CPHEEO Manual
UFW @	15%	1562179217	Lit/Day	CPHEEO Manual
Total Estimated Demand		**11976707329**	Lit/Day	
Total Estimated Demand		**11976.71**	**MLD**	
Required demand for next 50 years in KMA area		**2635.00**	**MGD**	

Capacity of STP in Towns beside Ganga River

Sl.No.	Town	District	Agency Responsible for Construction and/or O & M	Installed Capacity (MLD)
1	(a)Kolkata- (b)Cossipore Chitpore (c)Graden reach	Kolkata	KMC	122.50
2	(a) Howrah (b) Kona (c) Howrah STP (d) Anupara (e) North Howrah	Howrah	KMDA	127.00
3	Ulluberia		KMDA	
4	Serampore	Hooghly	KMDA	18.90
5	Chandanagar		KMDA	22.70
6	Bhadreswar		KMDA	7.60
7	Champdani		KMDA	0.30
8	Bansberia		KMDA	0.30
9	Baidyabati		KMDA	6.00
10	Konnagar		KMDA	
11	Rishra		KMDA	
12	Uttarpara-Kotrung		KMDA	22.00
13	Hooghly-Chinsurah		KMDA	29.30
14	Panihati	North 24 Parganas	KMDA	12.00
15	Titagarh		KMDA	23.00
16	Bhatpara		KMDA	61.00
17	Baranagar		KMDA	40.00
18	Kamarhati		KMDA	
19	Garulia		KMDA	7.90
20	Naihati		KMDA	11.60
21	Halisahar		KMDA	6.50
22	Barrackpore		KMDA	24.00
23	Khardah		KMDA	3.00
24	Kanchrapara		KMDA	18.00
25	Maheshtala	South 24 Parganas	KMDA	26.00
26	Budge Budge		KMDA	9.30
27	Diamond Harbour		KMDA	0.52
28	Nabadwip	Nadia	KMDA	19.50
29	Kalyani		KMDA	21.00
30	Gayeshpur		KMDA	8.33
31	Santipur		KMDA	6.00
32	Krishnanagar		MED	
33	Chakdah		MED	
34	Ranaghat		KMDA	11.80
35	Katwa	Burdwan	KMDA	10.45
36	Haldia	Purba Mednipur	MED	
37	English Bazar	Malda	MED	
38	Murshidabad	Murshidabad	KMDA	11.96
39	Jaigunj-Ajimganj		KMDA	8.00
40	Dhulian		MED	
41	Jangipur		KMDA	13.00
42	Behrampore		KMDA	3.70
43	Raiganj	Uttar Dinajpur	MED	
44	North Barrackpore	North 24 Parganas	KMDA	14.85
			Total	**728.01**

Status of old STPs maintained

SL. No.	Location of STP	Year of Commissioning	STP Capacity	Technology Adopted	Present Functional Status	Purpose of Use of Treated Water
1.	Baidyabati	2007	6.00 MLD	Oxidation Pond	Operational	Used in pisiculture purpose
2.	Champdani	2009	1.00 MLD	Aerated Lagoon	Non-operational	-
3.	Bhadreswar	2006	7.60 MLD	Aerated Lagoon	Operational	Used in pisiculture purpose
4.	Bansberia	2009	1.00 MLD	Waste Stabilization Pond	Non-operational	-
5.	Chandannagar	1993	22.70 MLD	Bio-filter and Waste Stabilization Pond	Operational	Used in pisiculture purpose and partially for agriculture
6.	Garulia	2004	7.90 MLD	Waste Stabilization Pond	Non-operational	-
7.	Titagarh	1989	23.00 MLD	WSP, ASP and Low Cost STP	Operational	Used for agricultural purpose
8.	Seerampore	1990	18.90 MLD	Trickling Filter	Non-operational	-
9.	Uttarpara – Kotrung, Konnagar and Rishra	2007	22.00 MLD	Low Cost STP	Operational	Used for pisiculture and for agricultural purpose
10.	Panihati	1993	12.00 MLD	Low Cost STP	Non-operational	-
11.	Naihati	2009	11.56 MLD	ASP	Operational	-

Status of new STP augmented / to be augmented

SL. No.	Location of STP	STP Capacity	Expected Date of Commissioning / Already Commissioned	Technology Being Adopted	Purpose of Use of Treated Water	Remarks
1.	Kalyani	21.00 MLD	2018	Trickling Filter and Waste Stabilization Pond	Being used for pisiculture and proposed for Agriculture and Industrial use	Already Commissioned
2.	Hooghly – Chinsurah	29.30 MLD	2022	SBR	-	Tendering Stage
3.	Mahestala	30.20 MLD	2022	SBR	-	
4.	Budge Budge	9.50 MLD	2020	SBR	-	Work in Progress
5.	Baranagar – Kamarhati	60.00 MLD	2022	Trickling Filter	-	LOA Awarded
6.	Halisahar	16.00 MLD	2020	SBR	-	Work in Progress
7.	Bhatpara	60.50 MLD	2018	FBBS Technology	Partially used for pisiculture	Already Commissioned
8.	Barrackpore	24.00 MLD	2020	SBR	-	Work in Progress
9.	Kona	62.00 MLD	2022	SBR & WSP	-	LOA Awarded
10.	Arupara	65.00 MLD	2022	SBR	-	
11.	Kanchrapara	18.00 MLD	2022	Aerated Lagoon	-	In the process of finalization of tender

Industrial Waste Water Treatment

Effluent Treatment Plants (ETPs) and/or Common Effluent Treatment Plants (CETPs) are integral part of industrial wastewater management systems. A CETP caters to a number of industrial units with same of closely similar industrial processes as only in such case the CETP can be designed in respect of the treatment chemistry. ETPs are the ultimate step of wastewater treatment by any industry before discharge to the environment. It is a compulsion for any water polluting industrial unit to have a suitable ETP treating the wastewater to the required discharge standard.

Depending on two wastewater components, (1) the volume of discharge and (2) the wastewater quality, "Grossly Polluting Industries (GPI)" has been identified in the state. Such GPIs are considered to be highly water polluting industries. At present West Bengal has 46 such Industries. An account of the quantum of wastewater discharge by these industrial units is provided in table below. The wastewater discharged by these industries will be identified in the first place for further treatment and reuse in (1) the same industry, or, (2) in industries or establishments nearby. As industrial wastewater, even after treated to the prescribed discharge standard, may contain substances unsuitable for certain uses, reuse of industrial wastewater requires a level of scrutiny before specific re-use.

An industrial unit will have to submit specific application to the State Pollution Control Board about the scheme of the re-use and can initiate such activity after specific approval by the State Board. The State Government shall actively consider incentive scheme(s) for the industries willing for initiating wastewater re-use schemes.

Industrial Waste Water Discharge

An account of wastewater discharge by Grossly Polluting Industries in West Bengal		
INDUSTRY NAME	**DISTRICT**	**WASTE WATER DISCHARGE QUANTITY (M3 / Day)**
BALLAVPUR PAPER MFG.ITD	Burdwan	288
BardhamanDharmaraj Paper Mill Private Limited	Burdwan	8
Durgapur Steel Plant (DSP)	Burdwan	22390
EAST INDIA PHARMACEUTICAL WORKS LIMITED (DURGAPUR WORKS)	Burdwan	140
Krishna Tissues Private Limited	Burdwan	620
SAIL-IISCO Steel Plant	Burdwan	32700
The Durgapur Projects Limited	Burdwan	57500
Bengal Beverages Pvt. Ltd.	Hooghly	730
Berger Paints India Ltd. (BAICL Divn.)	Hooghly	80
Dankuni Coal Complex, S.E.C.L.	Hooghly	1000
Grasim Industries Limited (Unit - Aditya Birla Insulators)	Hooghly	208
ITC Limited, PSPD, Unit: Tribeni	Hooghly	14000
Kesoram Rayon - Unit of Cygnet Industries Ltd.	Hooghly	11670
Mother Dairy Calcutta	Hooghly	700
Nalco Water India Limited	Hooghly	33
PMC Rubber Chemicals India Pvt. Ltd.	Hooghly	244
BERGER PAINTS INDIA LIMITED	Howrah	72.2
PEPSICO INDIA HOLDINGS PVT. LTD. (FRITOLAY DIVISION)	Howrah	1312.4
Britannia Industries Limited	Kolkata	236
Diamond Beverages (P) Limited	Kolkata	213
Gun and Shell Factory	Kolkata	2278
Hindustan Unilever Limited	Kolkata	300
AdaniWilmar Limited	Medinipore(E)	107
Exide Industries Limited	Medinipore(E)	630
Haldia Petrochemicals Limited	Medinipore(E)	11470
Indian Oil Corporation Limited- Haldia Refinery	Medinipore(E)	6300
IVL Dhunseri Petrochem Industries Private Limited	Medinipore(E)	403
MCPI Private Limited	Medinipore(E)	30792
Ruchi Soya Industries Limited	Medinipore(E)	130
Shree Renuka Sugars Ltd	Medinipore(E)	740
Tata Chemicals Limited	Medinipore(E)	45
UPL Limited (United Phosphorus Limited)	Medinipore(E)	72
UNIGLOBAL PAPERS PVT. LTD	Medinipore(W)	210
UNITECH PAPERS MILLS PVT. LTD	Medinipore(W)	242
AB Mauri India Pvt. Ltd.	Nadia	225
Khaitan (India) Ltd.	Nadia	200
SUPREME PAPER MILLS LTD	Nadia	1230
EMAMI PAPER MILLS LTD. (UNIT-GULMOHAR)	North 24-Parganas	900
EXIDE INDUSTRIES LIMITED, SHYAMNAGAR UNIT	North 24-Parganas	1660
INDIAN PULP AND PAPER PRIVATE LIMITED	North 24-Parganas	241.25
METAL & STEEL FACTORY (ORDNANCE FACTORY, MINISTRY OF DEFENCE)	North 24-Parganas	4411
IFB AGRO INDUSTRIES LTD (Noorpur- 743368)	South 24-Parganas	1189
Kohinoor Paper & Newsprint Pvt. Ltd.	South 24-Parganas	12
UNITED BREWERIES LIMITED,KALYANI UNIT	Nadia	950
Krishna Tissues Private Limited	Burdwan	620
Nataraj Electro Casting	Burdwan	2
CETP of Bantala Leather Complex	South 24-Parganas	20000

Policy Statement

1. Preamble:

Water, food and energy securities are emerging as increasingly important and vital issues for India and the world. Most of the river basins in India and elsewhere are closing or closed and experiencing moderate to severe water shortages, brought on by the simultaneous effects of agricultural growth, industrialization and urbanization.

India and China with one third of the world's population have less than ten percent of the world's water resources. A fresh water crisis may be in the offing for two thirds of the global population within next quarter century. In addition countries like India suffer from huge spatial and temporal disparities in distribution of water with its north-eastern region receiving more than a hundred times more rainfall than its western part and that too concentrated mostly during the summer monsoons. Expanding urban population without a proportional increase in civic amenities is already putting pressure on water resource management in urban areas. By 2050, half of India's population will live in urban areas and face issues around water. These bring more into focus on the institutional arrangements and delivery mechanisms of this scarce and non-substitutable resource.

West Bengal is the most densely populated state of India at 1000 persons per square km. Its average urban density is much higher at around 7500 persons per square km. West Bengal has liberal water availability as a natural resource that supports intensive rain-fed agriculture. However the pressure on urban water resources has been increasing over some years due to increasing population, low investment in supply augmentation and dilapidating state of existing systems. It is realized that current and future fresh water demand could be met by enhancing water use efficiency and demand management.

With rapid expansion of cities and domestic water supply, quantity of wastewater is increasing in the same proportion. As per CPHEEO estimates about 70-80% of total water supplied for domestic use gets generated as wastewater. The per capita wastewater generation by the class-I cities and class-II towns, representing 72% of urban population in India, has been estimated to be around 98 lpcd while that from the National Capital Territory-Delhi alone (discharging 3,663 mld of wastewaters, 61% of which is treated) is over 220 lpcd (CPCB, 1999). As per CPCB estimates, the total wastewater generation from Class I cities (498) and Class II (410) towns in the country is around 35,558 and 2,696 MLD respectively. While, the installed sewage treatment capacity is just 11,553 and 233 MLD, respectively, thereby leading to a gap of 26,468 MLD in sewage treatment capacity. Maharashtra, Delhi, Uttar Pradesh, West Bengal and Gujarat are the major contributors of wastewater (63%; CPCB, 2007a). Further, as per the UNESCO and WWAP (2006) estimates (Van-Rooijen *et al.*, 2008), the industrial water use productivity of India (TWP, in billion constant 1995 US$ per m3) is the lowest (i.e. just 3.42) and about 1/30th of that for Japan and Republic of Korea. It is projected that by 2050, about 48.2 BCM (132 billion litres per day) of wastewaters (with a potential to meet 4.5% of the total irrigation water demand) would be generated thereby further widening this gap (Bhardwaj, 2005). Thus, overall analysis of water resources indicates that in coming years, there will be a twin edged problem to deal with reduced fresh water availability and increased wastewater generation due to increased population and industrialization.

Though wastewater reuse is endorsed in many policies and programmes, there is a lack of clear guidelines and frameworks to support the implementation of such projects. As a result, the reuse of reclaimed water for non-potable purposes continues to face challenges. The problem is further exacerbated by limited enforcement of the restriction to extract groundwater for non-potable purposes. More detailed policies and stronger enforcement is needed for wastewater reuse projects to be viable.

To address these issues in a coordinated and focused manner by the development actors, a need has been felt to articulate an uniform State Policy on treated waste water re-use with specific direction towards the reforms in planning, institutional framework, capacity building, research & development, legal & regulatory measures, financial arrangement, public-private partnership, technology upgradation, community participation and awareness. The UD & MA Department has formulated this Policy taking the note of the National Policy of Government of India.

This Policy is applicable to the interventions carried out by Urban Development & Municipal Affairs Department, Development Authorities, Urban Local Bodies and private organizations in urban areas. Other Departments and Institutions carrying out similar/related projects in urban areas are also requested to follow this Policy.

2. Statement of Intent:

The Government intends to shift his role from 'Provider' to 'Provider cum Facilitator cum Regulator' in sustainable management of water resources by way of establishing an effective system of re-use of treated wastewater by the urban citizens of West Bengal thereby reducing dependency on fresh ground/surface water resources bringing reforms in the areas of Planning, Institution, Finance, Technology and Legal & Regulation.

3. Objectives:

3.1. Immediate Objective: (2 Years)

- To assess sources of generation of wastewater and quantity of wastewater production in urban West Bengal and to create a GIS enabled MIS
- To identify bulk users of water like Industrial Clusters, Metro rail, Indian Railways, Infrastructure Projects, Construction Sectors, Agriculture, Bus Depots and Public Works Department, and quantify their potential water demand as bulk user of water.
- To assess the existing centralized and decentralized plants of wastewater treatment especially the Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs) & Common Effluent Treatment Plants (CETPs) and take appropriate measures for upgradation or expansion.
- To identify centralized and decentralized options of wastewater treatment and its application in appropriate places.
- To develop land bank for centralized wastewater treatment plants
- To develop an integrated approach in wastewater management bringing coordinated mission between several Government Departments and Private Sector.
- To develop several issue-based policies & actions and review the existing legal & regulatory measures to bring reforms in wastewater management and its re-use.
- To ensure employment opportunities in wastewater management and its re-use
- To attract investment in wastewater management with innovative financial mechanisms.
- To formulate a comprehensive plan on water resource management including wastewater management with active community participation in Urban Wastewater Treatment and its re-use in cost effective manner.

3.2. Medium Term Objective: (next 4 Years)

- To develop a comprehensive institutional arrangement in all levels either through new establishment of institution or re-orienting institutions responsible for proper planning, implementation, monitoring, conflict resolution and grievance redressal of wastewater treatment & its re-use with appropriate management system, and leveraging awareness about green habit and collective behavioural change amongst all citizens.
- To implement the comprehensive plan on water resource management including wastewater management in urban West Bengal in phased manner subject to availability of finance.
- To establish an appropriate system of operation and maintenance of the wastewater treatment infrastructure through active involvement of the citizens.

3.3. Long Term Objective: (next 4 Years)

- Planned wastewater treatment infrastructure and its re-use are fully functional and maintained in each city.
- Reduce pressure on potable water (fresh ground and surface water) vis a vis reduce pressure on wastewater treatment facilities.

4. Key issues:

- Wastewater management happening in piecemeal manner.

- Lack of awareness among all stakeholders in treatment and disposal of wastewater: As a result, there is insufficient focus on ensuring adequate coverage of network sewerage, and connections to the same; or on decentralised options, where network sewerage may not be viable; and on the health hazards for use of untreated wastewater in agriculture.

- Viability of urban wastewater treatment facilities: Lack of revenue generation from sanitation services in urban centres and/or fiscal transfers for the same are inadequate to ensure operation and maintenance of wastewater treatment plants to required standards. Consequentially, secondarily treated wastewater often does not meet regulatory standards, and is unfit for reuse.

- Lack of clear guidelines and framework: While wastewater reuse finds mention in several policies and programmes, there is an absence of a clear framework to support implementation of projects in a manner that aligns stakeholder interests and priorities, and is operationally sustainable

- Institutional coordination: Water plays a significant role in several sectors, including urban, agriculture, industries and power. There is a need for a platform for interaction and coordination among sectoral departments and other concerned stakeholders to facilitate greater synergies and collaboration towards efficient resource use.

5. Alignment with International/ National Policies and Frameworks

Several policy and guideline documents in India recognized the concept of waste water re-use, and the need to include the same in water supply management programs. Specifically, this policy aligns with the following national and international agenda:

- UN Sustainable Development Goals: The Sustainable Development Goals (SDGs) are focused, among other areas, on environmental protection and prosperity creation. In particular, the policy aligns with the following SDGs: SDG 3: Good Health and Well-Being; SDG 6: Clean Water and Sanitation; SDG 8: Decent Work and Economic Growth; SDG 11: Sustainable Cities and Communities.

- National Water Policy 2012: The National Water Policy 2012 promotes and incentivizes the reuse of wastewater, 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 incentivized 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.

- National Service Level Benchmarks; National Urban Sanitation Policy (NUSP): The National Service Level Benchmarks, instituted by the Ministry of Housing & Urban Affairs, Government of India, establish a 20% target for reuse of urban wastewater generated.

- Power Tariff Policy (revised, 2016): The revised power tariff policy mandates thermal power plants within 50 kms of a city STP to off-take all the treated wastewater from the STP. Charges incurred in conveyance of wastewater from the STP to the power plant are eligible for pass through in the power tariff.

- *Atal* Mission for Rejuvenation & Urban Transformation (AMRUT): Following the policy guidelines implementation of wastewater reuse infrastructure solutions in selected towns and cities has been taken up.

6. Policy Actions:

6.1. Institutional Set up for Implementation, Monitoring and Management:

- State Level High Powered Committee should be constituted under the Chairmanship of the Chief Secretary to Government of West Bengal alongwith the other members – the Additional Chief Secretary/Principal Secretary/Secretary from the Departments of Health & Family Welfare, Environment, PHED, MSME, Water Investigation, Irrigation & Water Ways, UD & MA, P&RD and Commerce & Industry, for overall supervision, monitoring and policy advice.
- A State Level Steering Committee should be constituted under the chairmanship of Principal Secretary/Secretary, UD & MA Department alongwith the representatives of Health & Family Welfare, Environment, WBPCB, PHED, P&RD, MSME, Water Investigation, Irrigation & Water Ways, UD & MA and Commerce & Industry, for supervising the regular implementation and monitoring of wastewater treatment and its use.
- Urban Development & Municipal Affairs Department should act as Nodal Department for implementation of Treated Wastewater Re-use Policy and its action plan.
- State Urban Development Agency under UD & MA Department should act as Nodal Agency for implementation of Treated Wastewater Re-use Policy and its action plan.
- A State Level Waste Water Management Cell with sufficient experts should be established at SUDA for day to day monitoring and technical advisory.
- Technical support in implementation should be provided by Municipal Engineering Directorate. If required, professional technical agency may be engaged.
- The primary responsibility of Urban Local Body is to aware the citizen and industries towards treatment of wastewater and its reuse implementing all legal provisions, even imposition of fine for non treatment. In this connection, ULBs will get strong support from WBPCB.
- The Development Authorities/Unnayan Parishads should be responsible for implementation and O&M of large Sewage Treatment Plants, whereas the Urban Local Bodies should be responsible for implementation and O&M of small Sewage Treatment Plants and decentralized wastewater treatment plants.
- The Urban Local Bodies should promote establishment of decentralized wastewater treatment plants and rain water harvesting technologies encouraging the citizen through incentives.
- ULBs and Development Authorities should constitute Task Force for implementation and monitoring of treatment of wastewater & its use in their jurisdiction.
- Requirement of manpower resource gap in ULBs/Development Authorities should be addressed by way of filling up the vacant posts or engaging outsourced agency.

6.2. Development and Maintenance of Information Base and planning:

A Comprehensive Database Development and appropriate Management Information System utilizing GIS platform should be established for regular assessment of water demand, wastewater generation and reuse of treated wastewater in several sectors and mapping the requirement/location of centralized and decentralized treatment plants. For this following steps should be adopted:

- Develop coordination between UD & MA Department, Environment Department, PHED and Water Resource Investigation & Development Department
- Develop coordinated information sharing mechanism between water promotion departments like UD&MA, PHED and Water Resource Investigation & Development Department, and ULBs/Development Authorities
- Develop GIS enabled Management Information System for the cities.
    i) Preparation of Geo-referenced City base Map
    ii) Conducting Technical Surveys like Plane Table, Contour Survey
    iii) Conducting Study on 'as is' situation of underground water, surface water, water lines, sewer lines etc.
    iv) Conducting Socio-Economic Survey and Development of Management Information System

v) Integration of Spatial Data with the information of abovementioned surveys/studies to create GIS enabled MIS.
vi) Establishment of Central Data Monitoring Centre

- Develop coordination between UD & MA Department and Land & Land Reforms Department for updation of Land Records of the cities and development of Land Bank for plants.
- Provision of manpower & development of physical infrastructure for maintaining database development & management system in the concerned Departments especially in UD & MA Department, Development Authorities, Unnayan Parishads, and Urban Local Bodies.
- Preparation of Urban Water Resource Management Plan alongwith Wastewater Resource Management Plan by each ULB: Traditionally, water authorities have managed their water supply, sewerage and storm water drainage systems as separate entities. Integrated urban water resource planning is a structured planning process to evaluate concurrently the opportunities to improve the management of water, sewerage and drainage services within an urban area in ways which are consistent with broader catchment and river management objectives. Catchment management impacts directly and indirectly on all three components of the urban water cycle, having effects on drinking water quality, wastewater treatment and storm water management.
- Each waste water treatment plant should have a physical and financial pre feasibility study alongwith environmental impact assessment
- Planning for establishment of water testing laboratory in affordable location regionally should be developed.
- Each ULB/implementing organization should develop a plan for commercialization/marketing of treated waste water involving citizen and private actors.
- DPR of STP should include effective plan for reuse of treated water, long term operation & maintenance and commercialization i.e. pricing of treated water, and the DPR implementing agency should ensure that.
- Management of STPs should be effectively planned involving user groups.
- Management of ETPs/CETPs should be efficiently monitored by ULB/DA/WBPCB on regular interval and in planning of ETP/CEPT establishment by the industry, mandatory provisions should be there to include the purpose of use of treated water.
- Local or regional storage facility of treated waste water and network plan for supply for reuse shall be developed through a systematic study.

6.3. Comprehensive Land Use Planning:

New Land Use Development and Control Plan for West Bengal specifically for the Statutory Towns, other Census Towns and upcoming Growth Centres are very much required for systematic planning of wastewater treatment plants both for centralized and decentralized plants.

6.4. Legislation and Guidance Documents to follow:

- Environment (Protection) Act, 1986
- The Environment (Protection) rules,1986
- The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006
- Water Bodies Conservation Act
- The East Kolkata Wetlands (Conservation and Management) Act, 2006/2008
- The West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005/2006
- Manual on Sewerage and Sewage Treatment Systems, 2013 of CPHEEO
- The water (Prevention and control of pollution) Act,1974
- The water (Prevention and control of pollution) cess, Act,1974
- The water (Prevention and control of pollution) Amended rules, 2011
- The water (Prevention and control of pollution) cess rules, 1978
- The water (Prevention and control of pollution) Rules, 1975
- National Urban Sanitation Policy 2008
- National Water Policy 2012
- West Bengal Municipal Act and Municipal Corporation Acts

- Quality standards suggested by Central Pollution Control Board and West Bengal Pollution Control Board.
- Standards set by Bureau of Indian Standards (BIS)
- Effluent Quality guidelines for health protection measures in aquaculture use of waste water
- Quality guidelines for health protection in using human wastes for aquaculture.
- Service Level Benchmarks Fixed By Ministry of Urban Development

6.5. Legal Issues:

- Imposition of legal provision to the respective stakeholders for installation of STP/ETP/CETP.
- The legal rights over the sale and revenue issues of reclaimed water is an emerging issue and being addressed by the State Government separately.
- ULB/Industry should reuse, recycle, & resale the effluents, sewage, septage water to the end users within or outside the jurisdiction of the ULB.
- West Bengal Municipal and Municipal Corporations Acts should be amended incorporating the provision for treatment of waste water in centralized & decentralized manner and reuse of the same.
- Ground water extortion shall be mandatorily prohibited, especially for agriculture, industry & construction sectors, and instead of that use of surface water and treated waste water should be imposed.
- Mandatory provisions shall be made for bulk user of water like Fire Brigade, Industrial Clusters, Metro rail, Indian Railways, road wash, Infrastructure Projects, Construction Sectors, Agriculture & Agriculture Extension sectors, Bus Depots and Public Works Department to use treated waste water.
- Imposition of fine on the Industries for not establishing Effluent Treatment Plant/Common Effluent Treatment Plant and non reuse of that water.
- State level treated waste water specifications and standards shall be amended (to be encouraged to adopt as per IS and ISO standards) to include and ensure a safe reuse and to produce high economic return products.

6.6. Technology Options for Wastewater Treatment:

The coverage of waste water treatment should be the application of appropriate waste water treatment technologies in both the centralized and decentralized models having low cost & user friendly to operate; both in capital and in operation & maintenance. The centralized models should have commercial value of cost recovery.

Technological options for waste water treatment plants should be based on treatment standard, quantum of sewage inflow, BOD level, location of plants or utilization of recycled waste water etc., details of the design considerations and operating requirements for a variety of technologies suitable under different conditions has been explained in Chapter 7 of part A of Manual on Sewerage and Sewage Treatment Systems (2013) of CPHEEO.

It shall be ensured that old STPs should be upgraded and new STPs confirm to such standards so as to enable utilization of treated waste water directly by the users as far as possible.

Effluent Treatment Plants and Common Effluent Treatment Plants of Industries should confirm to such standards so as to enable utilization of treated waste water directly by them or other users as far as possible.

Decentralized wastewater treatment models should be showcased before the citizen in several public places like parks etc. and should be promoted for bulk waste generators.

Accessible and affordable water quality testing arrangement should be in place locally or regionally.

The developers should use innovative/conventional/generic technologies developed by IITs/NEERI and other Institute of repute while implementing the projects.

The choice of technology should have low requirement of space, power and efficiency.

For each project, conducting environmental impact assessment and social impact assessment are mandatory, alongwith technical and financial feasibility analysis.

6.7. Technology Reforms:

Government intends to propagate and extend new cost-effective, energy efficient and eco-friendly technologies. For this following issues should be considered.

- Promote Research & Development relating to alternate treatment technologies as well as energy conservation practices involving Technological Institutes/Universities/ Science & Technology Department of West Bengal
- Technological Institutes/Universities/ Science & Technology Department of West Bengal, shall be requested to develop economically viable wastewater treatment decentralized models.
- Technological Innovation shall be worked out for protecting flora & fauna and also human settlements from man-made and different kinds of natural & man-made disaster.
- Government would facilitate the creation of quality testing facilities for water across the State for ensuring quality control. The existing facilities in technological institutions would also be utilized.

6.8. R&D for Technology and its Commercialization:

A technology fund shall be set up under UD & MA Department in order to Research & Development (R&D) for appropriate cost effective and geographically suitable technologies for wastewater treatment. This shall also include identification and innovation of proper models. Products developed through this R&D will be commercialized through supermarket, retail outlet, mart, urban technology parks etc.

6.9. Reuse of Treated Water:

Wastewater is a huge resource that should be harnessed properly, it can bring a lot of health and economic benefits, increase food production, enhance fishing, tourism, rural and urban livelihoods. Following areas of reuse of treated water should be followed:

- Irrigation and Agriculture: Storm water, urban runoff and effluent from animal farms can be captured for irrigation and other farming needs. This kind of wastewater is usually high in nutrients (nitrogen, phosphorus, potassium, micronutrient and organic matter). It saves fertilizer cost and also preserves surface and underground water that they would have otherwise used. The sludge from treatment sites can be used in composting sites and sent to agricultural fields.
- Energy and Construction: The waste materials (sludge) collected from a treatment plant can be biodegraded in a controlled environment and then combusted (burnt at high temperatures) to release Methane (A gas similar to natural gas). This can be used in boilers at homes and in buildings, as well as for cooking and heating purposes. This digester kind of biodegrading can contain contaminants and so the process has to be done properly. The sludge from treatment plants can also be combusted to produce electricity.
- There are different types of sludge. Sludge could be fecal (from human and animal poop flushed down the drains) and regular sludge, from rubbish and garbage that get into drains and sewage systems. Fecal sludge is high in contaminants and must be treated well before discharge.
- Water used in the kitchen can be collected and used to gardens and lawns. A couple of gallons each day means a significant saving on water by the end of the year. Families can also reduce the amount of wastewater they produce by using of bathrooms.
- Community Latrines and Toilets washing, road cleaning, construction activities, pisciculture, Car Washing, maintenance of parks gardens & developing urban landscaping, rejuvenation of ponds, lakes, rivers, and emergency purpose for fire brigade
- Rainwater Harvesting: It should be mandatory to reuse the rain water in sanitary activities and groundwater recharging.
- Industries should reuse their treated water and sludge and minerals to be sold out for appropriate use. Further industries within 30 km of a Sewage Treatment Plant should use treated water in place of fresh surface/ground water.

- Bulk users of water like Fire Brigade, Industrial Clusters, Metro rail, Indian Railways, road wash, Infrastructure Projects, Construction Sectors, Agriculture & Agriculture Extension sectors, Bus Depots and Public Works Department should use treated waste water.
- The excess amount of treated waste water may be used for ground water recharging.

Inspite of these, Government intends the following:

- Commerce & Industry Department should make a voluntary target for treated wastewater to comprise 20% of the total state-wide industrial water use by 2020
- In compliance with the Government of India's recently revised Power Tariff Policy (2016), Department of Power, Government of West Bengal should coordinate partnerships of thermal power plants with urban centres within 50 km radius for off-take of all Wastewater treatment available; and facilitate operational sustainability of wastewater treatment plants

6.10. Awareness Generation:

Government intends to promote awareness among all the stakeholders for achieving the goal of 'Re-use of treated wastewater'. For the said purpose, Government is directing the development actors to promote the awareness considering the following issues.

- Awareness should be generated regarding different Government Programmes to reach & sustain the benefit upto the end beneficiary.
- Awareness should be generated regarding several Policies, Acts and Laws related to Water resource and wastewater management & reuse.
- Awareness should be generated regarding Environment Protection.
- Awareness should be generated widely on good quality and cost effective centralized & decentralized technologies of wastewater management systems.
- Awareness should be generated for providing service charges, user fee and fine
- Awareness should be generated regarding maintenance of created assets and also for developing environment friendly & hygienic city
- Multiple channels like media (social, print, broad cast etc.), advertising, flyers, brochures, booklets, road shows, rallies, public addressing, etc. should be used.
- Techniques for Community Mobilization to be adopted
    i) Involving community in their own development process
    ii) Growing interest of Community through Cultural & Healthy Recreational facility
    iii) Educating community on Human Rights
    iv) Preparing IEC materials according to community need
    v) Display Programme, Activity & Achievement Charter
    vi) Display success story in different places
    vii) Disseminating/ Displaying Literal & Visual Documentation
    viii) Fair
    ix) Involving Media.
- A system of incentives and penalties should be devised to encourage greater participation among residents, compliance by service providers and better performance of ULBs.
- Reward system may be developed for high performing ULBs/citizens.
- Government shall issue appropriate guideline for community mobilization and awareness generation.

6.11. Capacity Building and Training:

Capacity building is crucial in achieving and sustaining wastewater management and its use. Focus on capacity building, exposure visit and training of concerned staffs of State/Regional/District level agencies/departments, ULB level officials and elected representatives, Community based organizations and other stakeholders shall be made.

i) Capacity building of the personnel should be coordinated by ILGUS involving the State Training Agencies, Institutes of Private & Public Bodies and Technology Universities.
ii) Specialist institutions shall also be involved so that the knowledge development on newer approaches and technologies is quickly made available.
iii) The State Agencies/ULBs/Private Actors shall take assistance from National and State level resource organizations in consolidating and applying the existing and new knowledge in a 'learning by doing' framework and building capacities of a range of personnel from different kind of backgrounds.
iv) State shall give an effort to create new posts and fill up the vacant posts for the promotion of these activities.
v) State shall give an effort to develop institutional infrastructure of all the related State / District / Regional / Sub-Division / ULB level Departments / Agencies / Resource Centres to promote wastewater treatment and its reuse.

Capacity building will comprise:

- Bulk training/workshop/exposure visit for a range of municipal and other stakeholder personnel - right from start of the campaign in the ULB.
- Differentiated and specialized training on a demand-basis to personnel over the period of the Plan implementation.
- For Technical assistance, the State shall arrange for bulk and specialised training of State/Regional/District/ULB level personnel, assisting State Agencies/ULBs by procuring and deploying/ managing service providers (study consultants and NGOs, technical resource agencies), and providing coordination support to city-wide communications, planning and implementation management.

6.12. Monitoring and Evaluation:

- To establish the strong monitoring and evaluation system involving community, State shall endeavour to engage independent/ external Monitoring & Evaluation Agency for Third Party Quality Monitoring and time to time evaluation of the projects/progress parallel with the abovementioned monitoring mechanism.
- West Bengal Pollution Control Board shall monitor the water quality of the treated plants (centralized or decentralized) to ensure compliance with quality standards required for different reuse categories.
- An effective Grievance Redressal mechanism should be developed at State/ULB and Development Authority level.
- State shall also institutionalize Social Audit System to involve community in monitoring & evaluation system.

6.13. Welfare Measures:

At the time of implementing this policy, large financial investment will be observed, which will create large employment opportunity for different classes of people and will provide sufficient water to all sections of the society. Realizing the fact Government intends to imply the welfare measures particularly for the poor. They will get an opportunity of getting employment in this sector. To provide benefit to the poor Government shall take the following measures.

- Training infrastructure shall be developed for skill development of the workers to be engaged in this Sector.
- With increasing growth in urban sector, different kinds of employment opportunities will come up for the poor (for both male and female) that should be promoted with the help of several livelihood promotion departments and private agencies. Their skills shall be developed providing training to them (after market assessment on soft skill, security guard, computer operation, repair etc.) and loans shall be provided from different Government Programmes for entrepreneurship development.