

# URBAN WASTE WATER TREATMENT (RECYCLE REUSE & DISPOSAL) POLICY



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Urban Development Department,  
Government of Uttar Pradesh



## PREAMBLE

Water stress has become a perennial concern in most Indian cities. Water is a critical source for economic and social development of a region, the water source is getting depleted day by day due to Population growth, change of climate, lack of rain unnecessary use of groundwater. The use of domestic water demand is increasing day by day, so in this scenario, the reuse of treated wastewater helps us to minimize the dependency on fresh water, result in saving freshwater.

The Uttar Pradesh State is implementing center schemes such as (AMRUT) Atal Mission for Rejuvenation and urban Transformation, Swachh Bharat Mission (SBM), Smart city Mission. This policy has framed guidelines for the treatment of wastewater and its optimum reuse. This policy also enumerates the standards, regulations and quality assurance by legislation and institutional arrangements and emphasizes on public awareness, human resource development and research and development by establishing "State Water and Waste Water Training Center" at the state level.

The policy will improve the collection of treated wastewater and reuse of it and earmarks priority issues of Government of Uttar Pradesh along with the service level benchmarks and implementation plans for critical indicators like coverage of toilets and sewage network services, collection efficiency, extent of reuse and recycling of sewage and efficiency of redresses of customer complaints. It also provides information and suggestions on the sewage system, treatment, sludge disposal, Septage collection and treatment, operation and maintenance, choices of reuse of treated wastewater for industrial purpose.



## ABBREVIATIONS

ASP	Activated Sludge Process
BOD	Bio Chemical Oxygen Demand
CAD	Computer-aided Design
CETP	Common Treatment Effluent Plant
CII	Confederation of Indian Industries
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environment Organisation
C.S.	Chemical Sludge
CSER	Corporate Social and Environmental Responsibility
CSP	City Sanitation Plan
CSS	Centralize Sewerage System
DO	Dissolved Oxygen
DPR	Detailed Project Report
DWMS	Decentralize Wastewater Management system
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
MLD	Million Liter per Day
NEERI	National Environmental Engineering Research Institute
PPP	Public-private Partnership
RCUES	Regional center for Urban and Environmental Studies
SHPC	State level high power committee
STC	State level technical committee
UGD	Under Ground drainage
ULB	Urban local body
UPIDC	Uttar Pradesh Industrial Development Authority



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# 1. INTRODUCTION

Uttar Pradesh is the most populous State of India with a total population of 19.96 crores as per Census, 2011. There are 654 ULBs in Uttar Pradesh out of which 17 are a municipal corporation, 199 are municipal council, and 438 are Nagar Panchayats. As per census 2011, the total Population of the urban area is 4.45 crore. There has been a net addition of about 1.09 crore persons in the urban areas during 2001-2011. Thus, about 16.50% of the total population and 11.80% of the urban population of India reside in Uttar Pradesh. There are 654 statutory towns exist in Uttar Pradesh. Percentage of the urban population to total population of the State stands at 22.28 as per 2011 Census whereas, this percentage was 20.78 in 2001. Thus, an increase of 1.50 percentage points has been recorded in the urban population during 2001-2011.

However, in India according to the urban population, Maharashtra is on number 1 and U.P is on number 2. The decadal growth of urban population during 2001-2011 has been 28.82 per cent as against 31.80 per cent during 1991-2001. By 2021 the urban population of the State is estimated to be 6.67 crores which would mean an increase of 2.22 crore as against 1.09 crore during 2001-2011. Although, Uttar Pradesh has the largest urban system in the country with 654 municipalities, the trend of urban population growth shows that large towns especially class-I towns are relatively growing faster which is discernible from the fact that class-I towns consisted of 33.71% of urban population in 1951 which increased to 60% in 2011. Besides, the number of class-I towns increased from 14 in 1991, to 54 in 2001 and 64 in 2011, whereas the number of metropolitan cities increased from 6 in 2001 to 7 in 2011. As per census 2011, 34% of the Household having connected with sewer pipeline, 56% household depend upon septic tank and 10 % household depend upon other facilities.

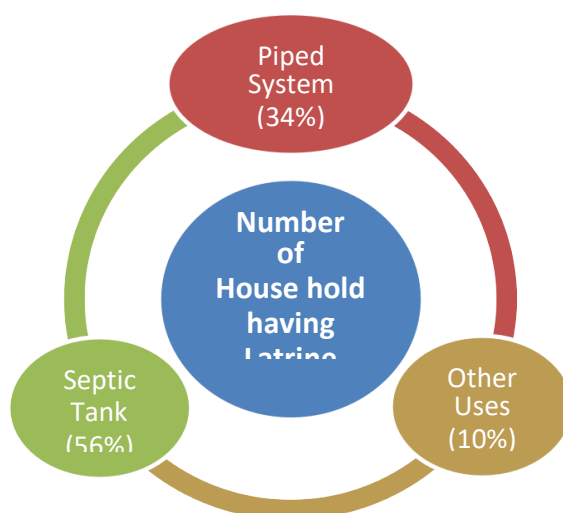


Figure 1.1



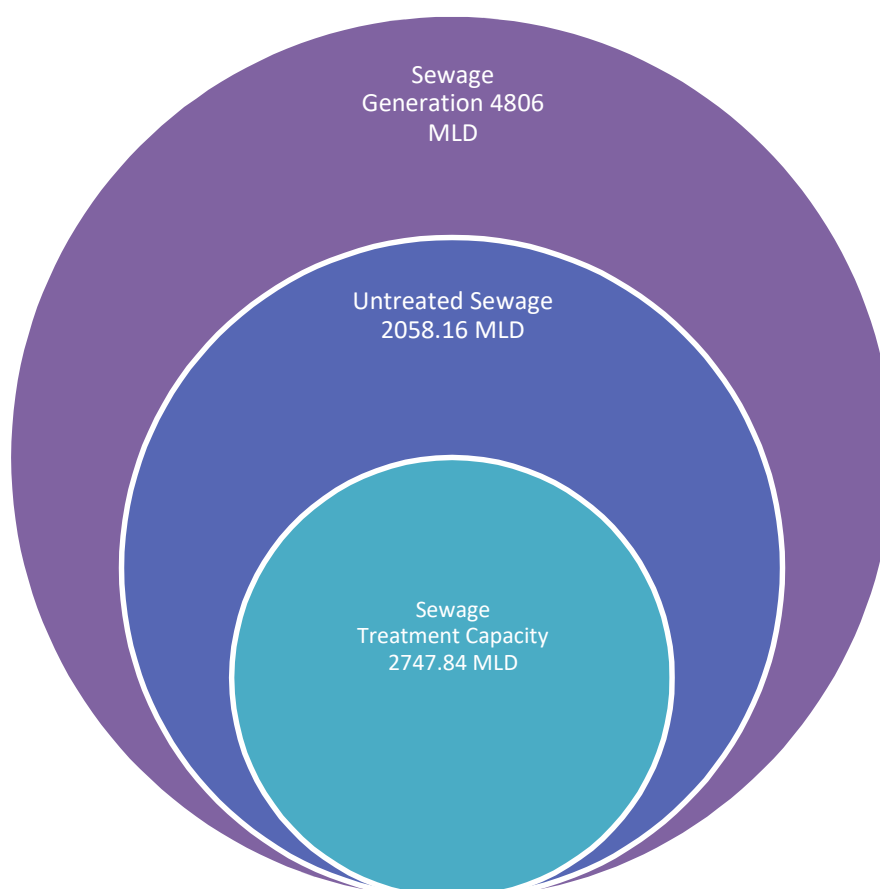
The wastewater generation from urban areas is as per given in the table-1 below.

**Table-1 (Waste Water Generation in Urban area)**

Categories	No's	Population as per census 2011	Per capita water demand (LPCD)	Total water demand (MLD)	The quantity of wastewater (80% of water demand) (MLD)
Urban ULB	654	44500000	135	6007	4806

Total number of STP in Uttar Pradesh is 119 out of which 90 S.T.P are Operational whereas 29 are under construction. The total capacity of STP is 2747.84 MLD. The details of STPs shown in *Annexure 4* attached after the document.

As per the details, there is a gap of 2058.16 MLD between of Treated and a untreated water in Uttar Pradesh and once the under construction STP are commissioned the gap will be reduced down to 1121.31 MLD. In Present as per shown in table-1 we have 2747.84 MLD Treated water.



*Figure 1.2*



## 2. KEY OBJECTIVES

1. To reach 100% reuse of treated waste water sanitation for all municipal cities.
2. To define the role and responsibilities of various government entities and the stakeholder for effective Implementation of Treated Waste Water project in U.P.
3. To put Uttar Pradesh on the path of mainstreaming reuse of Treated Waste Water.
4. To Protect the public health, environment and nature.
5. To prevent wastewater flowing in to our natural resources.
6. To enhancing economic efficiency with the reuse of treated waste water.
7. To conduct Public-Private Partnership (PPP) in the most collected appropriate manner.
8. To ensure sustainability and preserve freshwater.
9. To increase the treatment facilities and requirement of Treated water.
10. To promote recycling & reuse of treated sewage for non-potable applications.

## 3. VISION

**Promote Treated wastewater as an economic source and maximize its use, reduce the dependency of Freshwater.**



## 4. WATER QUALITY CRITERIA FOR BEST USE AS PER C.P.C.B.

The water Quality standards fixed by U.P.P.C.B as per given in Table-2

**Table-2 standards for use of water**  
(As per U.P. P.C.B.)

	Parameter	Toilet flushing	Fire protection	Vehicle Exterior washing	Non-contact impoundments	Landscaping, Horticulture & Agriculture			
						Horticulture, Golf course	crops		
							Non edible crops	Crops which are eaten	
								raw	cooked
1	Turbidity (NTU)	<2	<2	<2	<2	< 2	AA	< 2	AA
2	SS	AA	AA	AA	AA	AA	30	AA	30
3	TDS	2100							
4	pH	6.5 to 8.3							
5	Temperature °C	Ambient							
6	Oil & Grease	10	nil	nil	nil	10	10	nil	Nil
7	Minimum Residual Chlorine	1	1	1	0.5	1	nil	nil	nil
8	Total Kjeldahl Nitrogen as N	10	10	10	10	10	10	10	10
9	BOD	10	10	10	10	10	20	10	20
10	COD	AA	AA	AA	AA	AA	30	AA	30
11	Dissolved Phosphorous as P	1	1	1	1	2	5	2	5
12	Nitrate Nitrogen as N	10	10	10	5	10	10	10	10
13	Faecal Coliform in 100 ml	Nil	Nil	Nil	Nil	Nil	230	Nil	230
14	Helminthic Eggs / litre	AA	AA	AA	AA	AA	<1	<1	<1
15	Colour	Colourless	Colourless	Colourless	Colourless	Colourless	AA	Colourless	Colourless
16	Odour	Aseptic which means not septic and no foul odour							

All units in mg/l unless specified; AA-as arising when other parameters are satisfied:



## 5. TREATED WASTEWATERUSERS

Sr. No.	Name of users	Details
1	Irrigation Department	Agriculture sector covered
2	Industries	All small and large Industries which used 100000 lit water daily for their non-potable use
3	Construction Industries	All Multistoried building, commercial building, Govt. offices
4	Vehicle workshop	All authorized motor workshop
5	Local bodies	For maintenance of parks under different local bodies, Authorities, Awas Vikas etc. Local bodies may be used for flushing their sewerage network, or household flushing
6	Government Institutions	Office Building, Colleges, Hospitals
7	Fish Farming	For Farmer who does Fish farming

### IRRIGATION

Irrigation department uses a lot of surface water for irrigation purpose through their canal, the treated water may be used as an alternative of surface water which will save surface water which may be used as potable water.

We can direct connect STP outlet to Canal through a Pipeline and can supply the treated water to the Irrigation Department. Irrigation department can make the payments as per the quantity of water used/consumed. There will be a provision of Meter at the outlet of STP to measure the quantity of water released.

IRRIGATION	
Existing Condition	
Distribution Source	Canal
Present condition	Using Surface water from River
Revenue source	Taking tax from Farmers of the area From where canal passing through
Disadvantages	In Summers there is shortage of water due to the low level of water in the Rivers result



	lack of water for Irrigation purpose. Dependency upon rain. surface water is used for non-potable use
After policy for treated water Reuse	
Water source	Local bodies will provide Treated waste water through canal, and open channel.
Revenue	Irrigation department pays as per rates fixed by Govt. based on the consumed.
Advantage	We can save surface water, In summer Sufficient quantity of water will be available for irrigation purposes.

### INDUSTRIES

It should be mandatory for the Industries running in the range of 20 Km premises of STP to use Treated wastewater from STP through a Pipeline if feasible for all their non-potable uses. The use of fresh water for their non-potable requirements will be prohibited if treated water is available and can be supplied within 20kmpremises.

It compulsory for new Industries within premises of 20 km to take connection for treated wastewater on their own expenses if feasible, otherwise, they will have to take water through tankers, and NOC will be mandatory provide after getting a connection or written agreement to buy Treated wastewater through tanker from pollution control Board. In every future project, the STP location should be prioritized and located in such a manner so that there are possibilities to set up new Industries surrounding it.

INDUSTRIES	
Existing Condition	
Water Source	Ground water from the tube wells supplied by ULB and by individually tube well also.
Revenue	Paid to local bodies as per tariff decided, Money spent on energy to suck ground water by using Tube wells.
Disadvantages	In Summers there is a problem of water as the Ground water level depletes. Then they have to increase pumping hours resulting decreasing Ground water level and spending more money on



	energy. Groundwater used for non-potable needs.
After policy for treated water Reuse	
Water source	Local bodies provide Treated wastewater through tanker/Pipeline, and it is mandatory for UPSIDC that every industry which is consuming 1 lacs or more fresh water for their non-potable use to reuse treated waste water situated within 20 km premises. It shall not be mandatory to use Treated wastewater for industries where direct human contact is there .It is mandatory for new Industries to lay down the pipeline from STP to their compound on their own expenses if feasible.
Banned on Existing source	After availability of treated waste water, Existing source of fresh water for non-potable use will be cut off/banned.
Conveyance	The Industry should have their own tankers facilities.
Revenue	They have to pay the as per Govt. Tarriff and quantity of water used.
No objection certificate	Pollution control board will take written agreement from concern industry authority to use treated wastewater for non-potable use before provide no objection certificate.
Advantage	We can save Ground water, In summers sufficient quantity of water will be available. We can save energy.

### **CONSTRUCTION INDUSTRIES**

It should be mandatory to use treated wastewater for all concrete mixer plants and large construction with sites in 10 Km from Municipal Boundary. Sites such as multistoried buildings, commercial complexes etc. The tankers will be used for the conveyance of water by construction companies.



<b>CONSTRUCTION INDUSTRIES</b>	
Existing Condition	
Water Source	Ground water from the tube wells supplied by ULB and by individually tube well also.
Revenue	Paid to local bodies as per tariff decided, or spend money on establishing pumping plant and energy to run and suck groundwater with Tube well.
Disadvantages	In Summer season there is a problem of water due to the low level of water in Ground. Then they have to increase pumping hour result spend money on energy. Ground Freshwater using for non-potable use.
After policy for treated water Reuse	
Water source	Local bodies will provide Treated waste water, and it is mandatory for every concrete mixing plant and construction industries and large construction sites of Government which is situated within the Development Area of City to use treated waste water. It is mandatory for all to give written Agreement for use Treated wastewater while getting approval their map from concern Authority like Development Authority, Awas Vikas etc, RERA, Pollution control Board.
Existing source banned	After availability of treated waste water Existing source of fresh water for non-Potable use will be cut off/banned.
Conveyance	There should be own tanker facilities available with construction authority.
Action against Violation	They have to give warning two times after that construction may be stopped.



Revenue	They have to pay as per quantity of water use with Govt. tariff.
Advantage	We can save Groundwater, In summer season sufficient quantity of water available. We can save energy.

### VEHICLE WORKSHOP

It is mandatory for all the vehicle workshops within the city development area, to be use Treated waste water for all their non-potable use such as washing vehicles etc. The small-scale workshops can take water using tankers and large-scale workshop can lay down their own pipeline wherever feasible and also depending on their use.

<b>VEHICLE WORKSHOP</b>	
Existing Condition	
Water Source	Ground water from the tube wells supplied by ULB and by individually tube well also.
Revenue	Paid to local bodies as per tariff decided, or spend money on energy to suck groundwater with Tube well.
Disadvantages	In Summer there is a problem of water due to high demand and low availability. Then they have to increase pumping hour result spend money on energy. Ground Freshwater using for non-potable use.
After policy for treated water Reuse	
Water source	Local bodies provide Treated waste water, and it is mandatory for every Workshop which is situated within 20 km premises from stp to use treated waste water for non potable purpose.
Existing source banned	Existing source of fresh water for non-portable use will be cut off/banned.



Conveyance	There should be tanker facilities available with workshop authority.
Revenue	They have to pay as per quantity of water use with Govt. tariff.
Advantage	We can save Groundwater, In summer season sufficient quantity of water available. We can save energy.

### LOCAL BODIES AND GOVT.INSTITUTIONS

All institutions, offices where more than 1000 employees will start to use treated water by a provision of separate line for flushing purpose and horticulture purpose which is situated within 10km premises.

LOCAL BODIES AND GOVT.INSTITUTIONS	
Existing Condition	
Water use	Govt. Institutions Using Ground water for flushing and Horticulture purpose and local bodies for flushing of sewer line and maintaining Parks.
Revenue	Govt. Institutions paid to local bodies for fresh water,
Disadvantages	In Summer season due to shortage of water flushing has not been done properly result problem of choked occur in the sewer line, maintenance of park affected due to the scarcity of water. Ground Freshwater using for non potable use.
After policy for treated water Reuse	
Water source	Local bodies will start to use treated water for maintenance of Parks and provide Treated wastewater to Govt. All institutions, offices where more than 1000 employees will start to use treated water by a provision of separate line for flushing purpose and horticulture purpose which is situated within 10km premises.
Conveyance	There should be tanker facilities available with institutions.



Revenue	They have to pay according to use and Tariff.
Advantage	<p>We can save Groundwater,</p> <p>In summer season sufficient quantity of water available.</p> <p>Treated water will be available at a low cost than fresh water.</p> <p>We can save energy and fresh water also.</p>

### FISH FARMING

FISH FARMING	
Existing Condition	
Water use	The fish farmer using ground water for Fish ponding.
Revenue	They have to spend a lot of money on the arrangement of water through, Tubewell
Disadvantages	In Summer there is a problem of water then they face the problem and suck groundwater through Tube well. Ground Freshwater using for non-potable use.
After policy for treated water Reuse	
Water source	Treated waste water with prescribed standards will be used for Fish farming through tanker or separate line if feasible within 10 km premises. It is mandatory to use treated wastewater for Fish ponding.
Revenue	They have to pay as per quantity of water will use by them with Govt. tariff.
Advantage	<p>We can save Ground water, In summer season sufficient quantity of water available.</p> <p>Treated water will be available at a low cost than fresh water. We can save energy.</p>

**Terms and Conditions:**

With respect to reuse of treated waste water for agriculture, it shall be essential to maintain water quality parameters compared to reuse by the other sectors, it is not sufficient or safe enough for reuse by the agricultural or horticultural sectors. Indian STPs typically receive a mixture of industrial waste and domestic sewage. A significant concentration of heavy metals and emerging contaminants (ECs) like pharmaceuticals, plasticizers, etc, in the treated wastewater. Recycle of treated waste water for agriculture may led to an increase in the heavy metal and ECs concentration in the plants and vegetables, due to bioaccumulation. So for Agricultural and horticulture sectors, the tertiary treatment, with ozonation, shall be required degrading these trace organics which will otherwise bio-accumulate and contaminate the food chain. While the traditional parameters such as BOD, COD, TN and TP, shall be done along with the tertiary treatment, with ozonation when the water is to be reused for agriculture or horticulture. The need, method and level of tertiary treatment shall depend on the third party as per the use of treated waste water with respect to different areas.



## 6. COST OF TREATED WASTEWATER

The price of Treated wastewater is decided on behalf of investment made for, quality of water, the requirement of distribution infrastructure, operation and maintenance of STP.

**Table 3: O & M cost of STP**

Parameters	ASP	MBB R	SBR	UASB +ER	MBR	WSP
Daily Power Required, kWh/d/MLD Tertiary + Tart Sludge	4.5	2.5	2.5	4.5	2.5	2.5
Total daily Power Req. kWh/d/MLD	185.70	223.7	153.7	125.7	302.5	5.70
Daily Power Cost (@ 6.0 per KWh), MLD/Day (including Standby power cost)	1114.2	1342.20	922.20	754.2	1815	34.2
Yearly Power Cost, pa/MLD	407	4.90	3.37	2.75	6.65	0.49
<b>Repair cost/MLD</b>						
Civil Works Maintenance, pa/MLD	1.94	1.3	1.04	2.11		1.7
E & M Works Maintenance, pa/MLD	0.43	0.65	0.81	0.38		.06
Annual repairs costs, pa/MLD	2.38	1.94	1.84	2.48		1.76
<b>Chemical cost</b>						



Recurring Chemical/Polymer Costs, pa/MLD Sec Treatment	0.4	0.4	0.4	0.4		
Recurring Chemical, pa/MLD (Alum, Chlorine, Polymer) Costs, Tertiary. Treatment	4	4	2	5		6
Total Chemical Cost, pa/MLD	5.3	5.3	3.3	6.3		7.2
<b>Manpower cost</b>						
Salary+Benefits pa	2	1.5	1.5	2.5		1
Total Cost/Mld(Lacs)	15.22	15.59	20.37	11.86	6.65	12.21
Cost of Treated wastewater per KL	=1000* 6*30*1 2 =21.6 Lacs So Rs. 6/KL	=100 0*6* 30*1 2= 21.6 Lacs So Rs. 6/KL	=1000* 9*30*1 2= 32.4 Lacs So Rs. 9/KL	=1000 *5*30 *12= 18.00 Lacs SoRs. 5/KL	=1000 *3*30 *12= 10.80 lacs SoRs. 3/KL	=1000 *5*30 *12= 18 lacs So Rs. 5/KL
Cost of transportation charges	Extra	Extra	Extra	Extra	Extra	Extra

## 7.POLICYCONSIDERATIONS

The policy will work on the following conditions

- 1- Creation of capacity for wastewater management planning and implementation of wastewater reuse infrastructure will be the responsibility of the JalNigam/Local body wherever the prime responsibility to reuse the wastewater will be of Local Body. It will also depend on the availability of fund, for which the state Govt. will do the effort. The rights related to economic including the supply of Treated waste water in water bodies, lakes, rivers, the canal will reside with local body/JalNigam. All the guidelines mentioned in the policy will be followed by local body/JalNigam.
- 2- The treated waste water should meet all quality standards so that it does not pollute another source of water.
- 3- Treated waste water will be considered as an additional source of water for its users.



- 4- Treated wastewater will be considered as economic resource.
- 5- The price of Treated wastewater will depend upon the principle of recovery of Treatment cost and distribution to sustain the project.
- 6- The Industrial units shall treat their generated domestic waste water and reuse it for their non-potable use or dispose of as for the standards of pollution control Board.

## 8. ALLOCATION OF WASTEWATER

- 1- After decided of policy local bodies declare that how many treated the water they have.
- 2- All waste water users will apply as per their requirement.
- 3- If the demand is more than quantity available, then the distribution shall be made as per the state govt's norms.
- 4- Fresh water should be supplied in metered manner for potable usage only once the distribution channel for treated wastewater.
- 5- Uttar Pradesh Govt. concern departments such as Irrigation /State water Board, state water management and regulatory commission should enforce users to use treated waste water is set.
- 6- All the activities like storage, treatment, and sludge management should be done keeping in mind the environmental aspects as well.

## 9. IMPLEMENTATION TIMELINE

Considering different stages of works developed in different towns, our policy suggests a timeline to achieve a policy objective.

**Table 4 : Timeline**

Existing system in Local Body	Target/Goal	Duration for reuse of treated wastewater
Both Underground drainage, collecting system and STP Exists	Minimum of 10% of fresh water consumption in the local body	One year
Underground drainage, collecting system exist but STP not Exists	Minimum of 10% of fresh water consumption in the local body	Six months from the date of the running of STP



## 10. PRICING PRINCIPLES

If the treated water is available as per demand then it will be supplied as per the fix tariff. If demand is more than the availability, then provision of E-Tendering should be made. The price of treated waste water should be kept lower than the fresh water. The price should be fixed for five years and a suitable agreement should be done with the revision of rates after five years. An automated measurement and billing system should be in place. A separate account should be maintained by local bodies for the amount received, and it shall be further for O&M. The agreement between local bodies and the consumers should be clear terms and condition. There should be a provision of Audit on a yearly basis to analyze the income and expenditure.

**Include monetary and non-monetary incentives:**

To encourage the use of treated waste water, urban local bodies shall be incentivized by the state government.

## 11. PRIVATE/EXTERNAL SECTOR PARTICIPATION

The use of treated waste water is of a high order of priority. All effort shall be made to expedite the plan to prepare and to implement such projects. If the funding has been done by the external agencies has been made then it should be explored by Govt. All efforts will be made to explore the possibility of projects being implemented by private capital by using various procurement models based on public-private partnership. The PPP model shall be finalized after due diligence and detailed assessment. The model for private participation will be proposed and all decision in this regard shall be taken by SHPSC.

## 12. STAKEHOLDER ROLES AND RESPONSIBILITIES

The wastewater treatment, water recycling and its reuse will be the responsibility of the local body. Creation of capacity for wastewater management, planning and implementation, availability of the funds is also the responsibility of the local body. The Implementing agency



will be appointed by SHPC (state high power steering committee), who will plan, execute and operate and maintain the Treated waste water project. All users should apply for permission to take treated wastewater. There will be a Regulatory agency who will finalize the legal framework, quality standards, and norms for using Treated wastewater for various purposes.

### **13. CAPACITY BUILDING RESEARCH AND DEVELOPMENT**

There will be a provision for research cell for new wastewater treatment plant, economical management plan. Training should be organized for planners, managers, designers, and users, by coordinating with water and land Management Institute, National Institute of Hydrology Roorki, Agricultural Universities, Engineering colleges for getting maximum productivity and maximum utilization of water. It also plays as a nodal unit and creates an umbrella to bring all stakeholders into its ambit.

### **14. IEC (INFORMATION, EDUCATION, COMMUNICATION) AND STAKEHOLDER INVOLVEMENT**

A campaign should be arranged to educate various stakeholders about the different benefits of recycling and reuse. ULBs and RCUES Lucknow task has been assigned to create awareness about the scheme, good sanitation practice, monitoring of wastewater recycling and reuse, the community ward leader, the registered group should also help to communicating. Various publicity/IEC activities, brochures, booklets, workshop, road shows, rallies, announcements and meeting should be used to communicate with the people. IEC plays a key role in creating awareness, mobilizing people, and making development process participatory through encouragement and by sharing knowledge, skills and techniques with the people. Involvement of Institution's academicians for the Environment and atmosphere building by school/College Student as School Rallies, Slogan writing, essay Competition etc. Sensitization cum workshop at the community level, it shall be done by way of ward level camps and other community-based activities. Local bodies will spend 10% of their income for these IEC activities.



## 15. GOVERNING CELL

There will be a provision of Treated waste water cell headed by Chief Engineer for implementation, coordination at the district level and state level under the guidance of Chief Secretary. The cell will play the role of advisor and prepare the DPR with consultation with local body. The cell will provide secretarial assistance to SLTC and SHPSC in carrying out their role.

The cell will also prepare literature in regard to the information regarding waste water generation, treatment, reuse, the technology adopted for wastewater treatment plants, costing, revenue generated, class of consumers with the local bodies.

The main two governing body are as bellow.

- 1- State level High Power Steering Committee
- 2- State level Technical Committee

### STATE LEVEL HIGH POWER STEERING COMMITTEE (SHPSC)

The State level high Power Steering committee will be the apex body to take decision-related to the implementation of the policy. The project approval, price determination, selection of implementing agency, disputes redressed, and policy advisory will also be governed by SHPSC.

The SLTC will give the technical approval to projects, freeze the format of projects agreements, and Monitor the execution and Guideline for O&M etc. The State Government may give time to time notification for appointment of the members of the above committees.



## MISCELLANEOUS

### Annexures-1

#### Different uses of Treated wastewater in India

1. Delhi supplies treated sewage to industrial establishments like power plants, industrial areas and hospitals. The Delhi government gave an option to Pragati Power Corporation Limited (PPCL) to operate two of the DJBs 20 MLD STPs to meet its water requirement. The current O&M cost incurred by PPCL stands at about INR 4per kL(USD 0.075). The Delhi Jal Board (DJB) has also evaluated technologies to retrofit the existing 113 MLD portion of the Okhla sewage treatment plant (STP) for recycling and reuse of wastewater for non-potable applications in the nearby industrial units.
2. The Bangalore Water Supply and Sewerage Board (BWSSB) is one of the few agencies involved in the tertiary treatment of wastewater and supplying the same to nearby industries/plants. Currently, four of the seven STPs undertake tertiary treatment. The average cost of tertiary treatment comes to about INR 10–15 kL (USD 0.19 – 0.28). Bengaluru charges INR 60 kL(USD 1.12) for freshwater to be used for industrial purposes. BWSSB supplied treated sewage to a number of industries, Bengaluru International Airport, Bharath Electronic Limited, Indian Tobacco Company, Rail Wheel Factory and Indian Air Force. BWSSB has initiated a scheme on the Integrated Water Resource Management Reuse of Wastewater from Vrishabhavathi Valley (V Valley). It consists of a 135 MLD reuse process scheme to be undertaken in four phases. The landed cost of high quality treated water from V Valley to River Arkavathy will be INR 12 KL(USD0.22).
3. The Surat Municipal Corporation (SMC) is also supply treated wastewater to industrial units in the Pandesara Industrial Estate. The SMC is also developing a 40 MLD tertiary treatment plant at Bamroli on a PPP basis. The cost of procuring freshwater from the current level of INR 22/ kL(USD 0.41) for industrial use. In addition, cities like Hyderabad, Nagpur and Pimpri– Chinchwad is also undertaking initiatives to promote the use of treated wastewater. Hyderabad is planning to implement a project to recycle wastewateratitsthreemajorSTPs(Amberpet,NagoleandNallacheruvu)andsupplyit



to industries. Recently, the Japan International Cooperation Agency (JICA) gave its approval for providing financial assistance to the project. HMWSSB charges INR1/ kL(USD 0.019) for treated water available for reuse.

4. The Gurgaon District Authority has made it mandatory for all construction firms to use treated wastewater from its STPs for construction and other non-potable purposes. The Authority has started supplying tertiary treated wastewater from two STPs – Behrampur (15 MLD) and Dhanwapur (25 MLD) at a rate of INR4 /kL (USD0.062).
5. The Jaipur Municipal Corporation has implemented an Asian Development Bank (ADB)–funded STP in Delaware. The treated wastewater from the 62.5 MLD STP is supplied to nearby small-scale industrial units and for irrigation purposes. Also, the sludge generated is used as manure for agriculture and nursery purposes. The STP was commissioned in September2006.
6. Chandigarh Municipality charges INR 500 per acre (USD 7.81) for supplying treated wastewater to be used for agricultural irrigation and charges INR 50 per kanal (USD 0.7874) (500 yards\*2) month for irrigation of green spaces.
7. Chennai Metro Water (CMW), the water supply and sanitation authority in Chennai, uses secondary level ASP plants to treat its sewage slightly beyond CPCB standards for freshwater discharge. Out of 740 MLD of STW currently produced CMW sells 36 MLD to three large industries located in the north of the city. The STW is sold for Rs 10.20/KL and includes the cost of pumping the STW to the plant gates. An average O&M cost for collection and treatment across all its plants is Rs 8.90/KL. The O&M cost of treatment alone is estimated to be approximately Rs 4.08/KL. Also CMW’s four newest plants are completely powered by internally generated biogas for nine months of the year that reduces its electricity costs by about Rs0.45/KL
8. The CPCL plant in Chennai encountered acute water shortage and scarcity of supply in the wake of severe water shortages in the city. CPCL set up a wastewater recycling plant to treat partially treated wastewater from the water utility. The cost of recycled wastewater to the industry is INR 45/KL (USD 0.70) compared to INR 60/KL (USD 0.70) for the water purchased from the waterutility.
9. The City of Nagpur (Nagpur Municipal Corporation (NMC)) has entered into an MoU with the Maharashtra Power Generation Company Limited (Mahagenco), a public sector company, for “Construction and Operating Agreement of Treatment and Transmission Facilities for Reclaimed Water Usage”, whereby NMC will provide 110 MLD of untreated,rawsewagetoMahagencoattherateofINR15crore/year(USD2.8



million<sup>46</sup>), will allocate land at no additional cost to the company. The treatment cost to Mahagenco about INR 3.4 m<sup>-3</sup> (USD 0.05), which would have been significantly higher if the company had decided to source freshwater from municipal or irrigation command project (about INR 9.6 m<sup>-3</sup> (USD 0.15

10. In the absence of available tertiary treated STW, some industrial units have chosen to buy either raw sewage or secondary STW and treat it further to meet their water purity requirements. For example, Madras Fertilizers Limited (MFL) in Chennai and Rashtriya Chemicals and Fertilizers Limited (RCF) in Mumbai are purchasing STW and raw sewage, respectively from their local water authorities. MFL utilizes 60 per cent of its water at the tertiary treatment level while 40 per cent is sent for RO and DM. RCF uses 73 per cent at the RO level and 27 per cent at DM stage.



## Annexures-2

**(U.P.Municipal Act)**

**According to Municipal Act 1975** Cost of disposal of waste water.- (1) A Jal Sansthan shall, by notification in the Gazette, fix the cost of disposal of water according to its volume (which shall be such percentage of the volume of total water supplied to the consumer as may be prescribed), and also the minimum cost to be charged in respect of such disposal. (2) A Jal Sansthan may in lieu of charging the cost of disposal of waste matter according to the basis stated in sub-section (1) accept a fixed sum for a specified period on the basis of expected disposal of wastewater during that period.

**Meter Rent.** - A Jal Sansthan may provide water meters and charge such rent for the meter as may be provided in the bye-laws.

**Security.** - A Jal Sansthan may demand such sum as security from the consumer in connection with the supply of meter or for sewer connection as provided by bye-laws provided that the Jal Sansthan shall pay interest at such rate as the Nigam may, from time to time, determine, on any sum so deposited with it.

**Fees.**-A Jal Sansthan may charge such fees, for connection, disconnection, reconnection of any water supply or sewer or testing or supervision or for any other service rendered or work executed or supervised as may be provided by bye-laws.

**Recovery** of taxes and other sums due.- (1) Any sum due to A Jal Sansthan on account of tax, fee, cost of water, cost of disposal of wastewater, the meter-rent, penalty, damage or surcharge under this Act, shall be recoverable as arrears of land revenue. (2) Nothing in sub-section (1) shall affect the power of Jal Sansthan to cut off in accordance with its bye-laws, the connection of water supply in the event of nonpayment by the consumer of any dues referred to in that sub-section.



**(Treatment Technology)**

**Waste Stabilization Pond Systems**

Performance of the Unit

- ❖ Can reliably produce high-quality effluent with low BOD, SS, Faecal coliform and high D.O levels.
- ❖ BOD reduction of the order of 90% or so.
- ❖ Suspended solids reduction is
- ❖ somewhat low due to possible
- ❖ Overflow of algae.
- ❖ Coli form reduction can be up to 6 units.
- ❖ Total Nitrogen removal between 70-90%.
- ❖ Total Phosphorus removal between 30-45%.
- ❖ Detention time: 6 to 8 days

**Trickling filter**

Proven 100 year old technology

- Less monitoring required than
- ❖ ASP
  - Rugged system with simple and
- ❖ Silent operation.
  - Consistent effluent quality
  - Standalone treatment process
- ❖ For sewage, if operated at low rates.
  - To be used in combination with ASP for efficient performance.
  - Low pathogen removal Bacteria, 20-90% Viruses 50-90% Giardia cysts 70-90%

**Activated Sludge Process**

- ❖ Proven and tested methodology all over the world for the last 7-8 decades.
- ❖ Several modifications available for a specific requirement
- ❖ Uninterrupted power supply required for aeration and sludge recirculation.



- ❖ Reactor sludge levels to be carefully monitored and sludge is to be withdrawn from the system.
- ❖ 80-90% removal of bacteria.
- ❖ 90-99% removal of viruses

### **Fluidized Aerated Bed**

**(FAB)**Two-stage biological oxidation.

- ❖ Treatment scheme without primary sedimentation and sludge edigestion.
- ❖ Reactors up to depth 5m ensure low land requirement.
- ❖ High BOD removal with an effluent concentration less than 10mg/l
- ❖ High Suspended solids removal with an effluent concentration less than 20mg/l
- ❖ Faecal coliforms removal of the order of 2-3 on a log scale.

### **Sequencing Batch Reactor (SBR)**

- ❖ Essentially activated sludge process operated in batches through auto control.
- ❖ Aeration and settling in one tank leading to lower plant foot print.
- ❖ The uninterrupted power supply is a must as the whole process is auto controlled.
- ❖ High BOD removal with an effluent concentration less than 10mg/l
- ❖ High Suspended solids removal with an effluent concentration less than 20mg/l
- ❖ Faecal coliforms removal of the order of 2-3 on a logscale.



## URBAN WASTE WATER TREATMENT POLICY

### Annexure - 4 (Details of STP)

Name of Town/City	Operational STP		Under Construction		Constructed Under Program
1		2		3	4
Saharanpur	1	38			Yamuna Work -1
Muzaffarnagar	2	32.50			Yamuna Work-1
Gadhmukteshwar	3	6			N.G.B.R.A.
Gadhmukteshwar	4	3			N.G.B.R.A.
Narora	5	4			N.G.B.R.A.
	6	2.25			Narora Power Plant
Ghaziabad	7	56			
Ghaziabad	8	70			
Ghaziabad	9	56			
Ghaziabad	10	74			
Ghaziabad	11	56			
Ghaziabad	12	56			
Ghaziabad			1	56	
Ghaziabad	13	3			State Sector
Loni	14	30			State Sector
Noida	15	33			Yamuna Work -1
Noida	16	27			Yamuna Work -1
Noida	17	9			Yamuna Work -1
Noida	18	25			Noida
Noida	19	34			Noida
Noida	20	35			Noida
Noida	21	50			Noida
Noida	22	5			Noida
Greater Noida	23	137			Noida
Meerut	24	10			Meerut Development Authority
Meerut	25	10			Meerut Development Authority
Meerut	26	15			Meerut Development Authority
Meerut	27	6			Meerut Development Authority
Meerut	28	6			Meerut Development



## URBAN WASTE WATER TREATMENT POLICY

					Authority
Meerut	29	7			Meerut Development Authority
Meerut	30	15			Meerut Development Authority
Meerut	31	1			Meerut Development Authority
Meerut	32	5			Meerut Development Authority
Meerut	33	6			Meerut Development Authority
Meerut	34	72			J.N.N.U.R.M.
AnupShahar	35	.81	2	1.5	Ganga Work Scheme-II
AnupShahar	36	1.76	3	1	Ganga Work Scheme-II
Pilkhuwa	37	3			U.I.D.S.S.M.T.
Moradabad	38	58			N.G.B.R.A.
Bijnor			4	24	State Sector
Rampur	39	15			State Sector
Rampur	40	14			State Sector
Agra	41	12			Yamuna Work Scheme-I
Agra	42	40			Yamuna Work Scheme-I
Agra	43	24			Yamuna Work Scheme-I
Agra	44	36			Yamuna Work Scheme-II
Agra	45	4.5			State sector
Agra	46	10.45			Yamuna Work Scheme-II
Agra	47	13.45			N.U.R.M
Agra	48	36			Agra Development Authority
Agra	49	4.5			Agra Development Authority
Etawah	50	10.45			Yamuna work scheme-I
Etawah	51	13.45			State sector
Firozabad	52	3			U.I.D.S.S.M.T.
Firozabad			5	67	U.I.D.S.S.M.T.
Mainpuri	53	23			U.I.D.S.S.M.T.
Mathura	54	13.59			Yamuna Work Scheme-1
Mathura	55	14.50			Yamuna Work Scheme-1
Mathura	56	16.00			N.U.R.M.
Mathura	57	2.76			N.L.C.P.
Mathura					NamamiGange



## URBAN WASTE WATER TREATMENT POLICY

Vrindavan	58	4.00			Yamuna Work Scheme-1
Vrindavan	59	.5			Yamuna Work Scheme-1
Vrindavan	60	8.00			U.I.D.S.S.M.T.
Vrindavan			6	5	NamamiGange
Prayagraj	61	60.00			Ganga work scheme-I
Prayagraj	62	20.00			N.G.B.R.A.
Prayagraj	63	29.00			Ganga work scheme-II
Prayagraj	64	50.00			N.G.B.R.A.
Prayagraj	65	25.00			N.G.B.R.A.
Prayagraj	66	10.00			N.G.B.R.A.
Prayagraj	67	60.00			N.U. R.M.
Prayagraj	68	14.00			N.G.B.R.A.
Prayagraj			7	42.00	NamamiGange
Prayagraj			8	14	NamamiGange
Prayagraj			9	16	NamamiGange
Pratapgarh			10	8.95	State Sector
Mirzapur	69	14			
Mirzapur	70	4			
Mirzapur			11	8.50	NamamiGange
Mirzapur			12	8.50	NamamiGange
Varanasi	71	80.00			Ganga Work scheme-I
Varanasi	72	9.80			Ganga Work scheme-I
Varanasi			13	140.00	Ganga Work scheme-II
Varanasi			14	120.00	N.U.R.M.
Varanasi	73	12.00			Ganga Work Scheme-I
Varanasi			15	50.00	N.G.B.R.A.
Ghazipur			16	21.00	NamamiGange
Ramnagar			17	10.00	
Chunar			18	2.00	
Ballia			19	19.00	State Sector
Gorakhpur	74	30.00			N.L.C.P.
Gorakhpur	75	15.00			N.L.C.P.
Lucknow	76	345			Gomti work scheme-II
Lucknow	77	42			Gomti work scheme-I
Lucknow	78	14			N.U.R.M.



## URBAN WASTE WATER TREATMENT POLICY

Lucknow			20	120.00	Naya Savera
Lucknow	79	36.5			Housing Board
Unnao			21	13.00	
Shuklaganj			22	6.00	
Banda			23	4.00	U.I.D.S.S.M.T.
Chitrakoot	80	3.42			State Sector
Kanpur	81	5.00			Ganga work scheme-I
Kanpur	82	36.00			Ganga work scheme-I
Kanpur	83	130.00			Ganga work scheme-I
Kanpur	84	210.00			N.U.R.M.
Kanpur					
Kanpur	85	42.00			N.U.R.M.
Kanpur			24	15.00	N.U.R.M.
Saifai	86	1.60			Immediate fund
Kannauj	87	13.00			State Sector+N.G.B.R.A.
Bithoor			25	2.40	N.G.B.R.A.
Fatehgarh	88	2.70			Ganga Work scheme-I
Fatehgarh-Farukhabad			26	28.00	NamamiGange
Fatehgarh-Farukhabad			27	5.00	NamamiGange
Kanpur-Panka			28	30.00	NamamiGange
Ayodhya	89	12.00			State Sector
Sultanpur	90	5.00			Gomti Work scheme-I
Jhansi			29	26.00	N.L.C.P.
Total	<b>90</b>	<b>2747.84</b>	<b>29</b>	<b>936.85</b>	