

Water Pollution Control of Chambal River: Efforts and Results

Abstract

The Chambal river is a main source of water for drinking and irrigation purpose. Due to increasing sewage of cities directly discharges to the river without any treatment, the river water pollution increasing continuously year by year. The literature reveals that how many efforts are done by government and non government bodies to control the water pollution and what are the results of these efforts.

Keywords: Chambal River, Water Pollution, Sewage, Treatment Plant, Natural, Efforts.

Introduction

The Chambal River is a tributary of the Yamuna River in central India, and thus forms part of the greater Gangetic drainage system. The river flows north-northeast through Madhya Pradesh, running through Rajasthan, then forming the boundary between Rajasthan and Madhya Pradesh before join the Yamuna in Uttar Pradesh state. The Chambal River is considered pollution free, [3] and hosts various water species like mugger and gharial, freshwater turtles, smooth-coated otters, gangetic river dolphins, skimmers, black-bellied terns, sarus cranes and black-necked storks etc.

The Kota Barrage is the fourth in the series of Chambal Valley Projects, located about 0.8 km upstream of Kota City in Rajasthan. Water released after power generation at Gandhi Sagar dam, Rana Pratap Sagar dam and Jawahar Sagar Dams, is diverted by Kota Barrage for irrigation in Rajasthan and in Madhya Pradesh through canals on the left and the right sides of the river. The work on this dam was completed in 1960.

Sources of Pollution

One of the important sources of water pollution is domestic effluents and sewage. Man, for his various domestic purposes such as drinking, cooking, bathing, cleaning, cooling, etc., uses on an average 140 litres of water per day. About 70 per cent of this is drained out through drains, which through municipal drains poured into a river. The domestic waste water and sewage is the main source of the water pollution. This is the inevitable and unfortunate fallout of urbanisation. This organic waste decreases the oxygen of water and upsets the natural balance of the aquatic ecosystem. Municipal sewage is considered to be the main pollutant of water. Most of the sewage discharge without treatment in rivers, especially in developing countries like India. The quantity of waste water is increasing continuously with population growth and also the production of large quantities of sewage. Sewage contains decomposable organic matter and exerts an oxygen demand on the receiving waters.

The sewage water contains numerous micro-organisms in the form of pathogenic bacteria and viruses derived from human faces. It also contains organic materials such as soaps, synthetic detergents, fatty acids, and proteinaceous matters such as amines, amino acids, amides and amino sugars. Untreated waste water is often the carrier of viruses and bacteria and, with poor household sanitation practices, results high infant mortality rates in developing countries like India.

Even where most sewage is treated, as in the developed world, some countries indicate increasing water pollution. Sewage supports the growth of other forms of life that consume oxygen; it is measured in terms of Biochemical Oxygen Demand (BOD). It is the lack of oxygen that kills fish and other aquatic life.

Most of the thermal and electric power plants also discharge considerable quantities (about 66%) of hot water into nearby streams or rivers. This has resulted in thermal pollution of river water. Thermal pollution is undesirable for several reasons. Warm water does not have the same oxygen holding capacity as cold water. Kota super thermal power



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station is the main source of thermal pollution of the Chambal river water near Kota city

Therefore, fishes like black bass, trout and walleyes, etc., which require a minimal oxygen concentration of about 4 ppm, would either have to emigrate from the polluted area or die in large numbers. When the temperature of the receiving water is raised, oxygen level dissolved in water decreases and the demand for oxygen increases, hence anaerobic conditions will set in resulting in the release of foul gases. Thermal pollution is considered hazardous for the whole aquatic ecosystem. Several industries have installed cooling towers, where the heated water is cooled. But even so, thermal pollution has become a serious problem for water bodies located near thermal plants.

Pollution Problem

Chambal River has two clear sections, upstream till Kota Barrage and downstream section which transforms into a nullah for disposal of Kota city's sewage. The downstream section is a nullah having regular water flow only when excess water from Kota Barrage is released into it. We have yet to install a sewage treatment plant. KOTA The stench of the stagnant Chambal River, a team of scientists from the Central Pollution Control Board (CPCB) landing in Kota to investigate the matter. Water samples will be collected at 18 points where the nullahs from the city fall into the Chambal River. Dead fishes and the recent crocodile deaths can be attributed to stagnation of sewage water with no oxygen supply left. It has been given to understand that sewage treatment plants (STPs) are yet to be fully commissioned and linked with sewage lines.

Water was tested in the downstream section, right bank of Chambal River approx 100 metres from Nayapura Road Bridge (culvert) Wildlife and fishes will survive in Class D water though human beings need Class A water for drinking. Three elements/criteria must for the survival of wildlife and fishes are pH level, dissolved oxygen and free ammonia levels. All these were reported at much lower levels than required. The pH level was reported at 10.15 but for survival pH must be between 6.5 to 8.5. Next important element is dissolved oxygen which is needed between 4mg/l or more while the board found it at 0.77. Free ammonia is must at 1.2 mg/l or less while the report found it at 0.81.

The water is fit for drinking and called Class A water when the pH is between 6.5 and 8.5, dissolved oxygen at 6mg/l or more and biochemical oxygen demand at 2mg/l or less. But, wildlife and fishes will survive in Class D water, with pH between 6.5 to 8.5 having dissolved oxygen between 4mg/l or more and free ammonia 1.2 mg/l or less.

"In a National Green Tribunal (case no. 318\2014 dated October 7, 2015) ruling, the municipal corporation, UIT and the district administration have been asked to clear the MSW which is lying in nullahs. A time period of was given for carrying out a special massive drive for this purpose jointly by all agencies. This case was filed by Babulal Jajoo before the bench of Justice Dalip Singh and Bikram Singh Sajwan, who had deemed it a prosecutable offence

along with penalties for each day's delay in accordance with the provisions of the MSW Rules, 2000, and the provisions of the Environment (Protection) Act, 1986, and National Green Tribunal Act, 2010. It was also stated that due to technical reasons, the STP could not be commissioned, but positively the same will be commissioned after some time. This downstream patch of 17 km is most polluted. Recently, a crocodile was found dead, bloated and floating on the surface. Dead fishes too have added to the cesspool created here. Here, a dozen nullahs from Sakatpura, Kunhadi, Ghantaghar, Rampura and Ladpura flow. The water is stagnating and creating a poisonous environment. The hot and humid climate has added to the damage.

Efforts to Control the Pollution

The local administration will try to ensure that the nullahs do not dispose their waste into the downstream section of the Chambal section. This action plan will be a time-taking process which will involve a network of nullahs being linked to STPs in the future. Even after the expenditure of rupees 200 crore in last eight years the water of Chambal river becoming more and more pollute. At present 389.878 MLD sewerage mixed in water from 34 nullah as compared to 288 MLD sewerage from 22 nullah, before eight years when this river was joined to NRCP (National River Conservation Plan) to make it pollution free. To develop sewage treatment plants (STP) and sewerage lines in Kota city, rupees 149.59 crore allotted to UIT and Nagar Nigam Kota by center and state government at that time. The work to be carried out from this amount is to develop a STP of 30 MLD at sazidehra, a STP of 20 MLD at Dhakarkhere, a STP of 6 MLD at Balitha, 6 sewerage pumping station, 143 km long sewer line and 5.9 km long rising main line and to be completed up to May 2013 but only 37 percent of this work is completed in eight years. The fund allotted for various works through different plans are given below.

NRCP Plan (National River Conservation Plan)

Starting from 27 Oct, 2009 and to be completed up to May 2013

Center Govt allotted-Rs 149.59 Crore

State Govt allotted- Rs 44.88 Crore

Total fund allotted-Rs 149.59 Crore

Only 37 percent of work is completed in eight years.

JNNURM Project

Total amount sanctioned-5211.44 Lakhs

Received from center govt.-2132.2 Lakhs

Received from state govt.-172.88 Lakhs

Amount deposited by UIT Kota-128.06 Lakhs

Total expenditure-1894 Lakhs

Now UIT Kota plans to complete the remaining work in next three years. For this a revised package of Rs 282 crores send to Govt. for sanction. Order of the National Green Tribunal (Central Zonal Bench, Bhopal) in the matter of Babulal Jajoo Vs. State of Rajasthan & Others dated 10/01/2018 regarding Chambal river conservation. Counsel for the State of Rajasthan submits that the work at Sajidera has already been completed and at Ram Dham it is 80% completed and he would be filing the time bound Action Plan for construction of STP. He further

submitted that as already ordered the water to the extent of 5000 cusec (once in a week) is being released to the river Chambal during the lean season by reducing the supply of water to the industries.

Natural Treatment of Water

Expenditure of rupees 200 crore, UIT and Nagar Nigam KOTA, could not save the life of Chambal river then naturally formed wetland save the life of Chambal river free of cost. A number of nullahs are falling on the up stream of river. Between these nullahs and river a marshy land of 500 to 700 m distance is formed in which a network of roots of marshy plants formed that works as a natural filter plant for water coming to the river. Even though there are 34 nullahs delivered 349.878 MLD sewerage in Chambal river from Kota city, but the river is not as polluted as other rivers. The reason for this is the natural treatment of water by strong network of roots of marshy plants. The plants like jalkumbhi (Eichhornia) floating type, hydrilla verticillata and chara submerged type and kamal, lily, kumudini are of dense root type are developed on the clay coming with flowing water of upstream nullahs named Shivpura, Godawaridham, Sazidehra, Adharshila etc deposited between river and nullah. These all prepare a natural water treatment plant.

First of all, the sewerage comes along with nullahs water passes through the different layers of sand and clay deposited and get filtered. Then the dissolved chemicals of water are absorbed by the roots of the plants. The polluted water then passes through the xylem and phloem tissues of plants grow on the developed wetland. This filters the water and gives nutrients and oxygen to the water. This is a complete natural sewage treatment plant and gives the new life to the Chambal river.

Results

Approximately 389.87 MLD of sewerage is produced by the city, out of which only 50 MLD is treated daily through 2STP's running in the city. Rest

is dumped directly into the Chambal River through 34 open drains. The number of open drains are 22 in 2008-10 are now increasing to 34 and quantity of sewerage production now increases from 288 MLD to 389.87 MLD. Hence there is an urgent need for a few new STP's in the city. This study also highlights the fact that parameters viz., pH value and dissolved oxygen quantity of all samples from various locations are alarmingly out than the prescribed limits. These values exceeding above their respective limits may cause heavy damage to aquatic plants and animals.

Conclusion

The main source of river water pollution is drainage system of city and hot water of near by industries which are directly discharged to the rivers. Government and local administration take action against this problem when the problem increases very much and situation becomes uncontrollable. Then all the efforts to control the water pollution of the river becoming less and water continuously becoming more and more polluted.

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