

Pollution and Conservation of Ganga River in Modern India

Basant Rai

Haryana Space Application Centre (HARSAC), (Deptt. of Science & Technology, Govt. of Haryana), CCS HAU Campus, Hisar – 125004

Abstract- According to a World Bank Sponsored Study (State of Environment Report- U.P.) (In: Mallikarjun, 2003), pollution levels in the Ganga are contributing 9-12% of total disease burden in Uttar Pradesh (U.P.). The coliform bacteria levels are in excess of 2 lakh MPN as against the national water quality standard of 5000 (Mallikarjun, 2003). The report estimated total health damage on account of water pollution in up to is around 6.4 million daily (Disability Adjusted Life Year).

According to the CPCB survey report, the total municipal sewage generated in the identified 25 towns in 1985 was of the order of 1340 million litres per day (mld). Apart from this sewage, 260 mld of industrial wastewater, runoff from 6 million tons of fertilizers and 9,000 tonnes of pesticides used in agriculture within the basin, large quantities of solid waste, including thousands of animal carcasses and human corpses were being released into the river every day. Out of this, works corresponding to 873 mld only (65%) were taken up under the first phase of GAP. The remaining sewage was to be taken up under the 2nd phase of GAP which is already in progress. The Action Plan primarily addressed itself to the interception and diversion for treatment of the targeted municipal sewage of 873 mld.

According to report of Water Resources Planning Commission (May, 2009), the programme GAP and NRCP has been positive. Water quality monitoring done by reputed independent institutions indicates some improvement in the water quality over pre-GAP period. The water quality analysis of samples collected at 16 stations on River Ganga during 1986 and 2008 shows improvement in Dissolved Oxygen (DO) levels at 4 locations namely up and down streams of Allahabad and Varanasi. All the 16 stations except Patna downstream and Rajmahal show reduction in Biological Oxygen Demand (BOD) values. The BOD level show marked reduction in Allahabad and Varanasi indicating improvement in the water quality over pre-GAP period. However, at 7 of these 16 sites, BOD level does not meet standard for bathing water. The situation is much better for DO for which at only one site the bathing standard is not met. On the other hand in terms of total coliform count only at one place the bathing standard is met. The count exceeds by many times the bathing standard.

I. INTRODUCTION

The Ganga is a holy and historical river of India and Bangladesh. The Ganges calls at the join of Devprayag the Bhagirathi and Alaknanda rivers. The Bhagirathi flows at the foot of Gangotri Glacier, at Gaumukh, at an elevation of 3,892 m (12,769 ft.). The Bhagirathi is considered to be the true source in Hindu culture and the Alaknanda is a longer. It has total length 2,525 km river rises in the western Himalayas in the Indian state of Uttarakhand, and flows south and east through the Gangetic Plain of North India and go to Bay of Bengal through Bangladesh, It is the longest river of India and is the second greatest river in the world by water discharge. The Ganges basin is the most heavily populated river basin in the world, with over 400 million people and a population density of about 1,000 inhabitants per square mile (390 /km²). The Ganga was ranked among the five most polluted rivers of the world in 2007. The Ganga Action Plan, an environmental initiative to clean up the river, has been a major failure thus far, lack of good environmental planning, Indian traditions and beliefs, and lack of support from religious authorities. Kumbh Mela is a one of the most reason of pollution of Ganga river in India.

II. CAUSES OF POLLUTION IN GANGA

It provides water to drinking purpose and irrigation in agriculture about 40% of India's population in 11 states. After 27 years and Rs. 1000 crore expenditure on Ganga river, it has a critical situation. In modern times, it is known for being much polluted, 30 polluted nals flows in Ganga river from Varanasi city within seven kilometers.

A. Human waste

The river flows through 29 cities in which cities population living above ten lakh. A large proportion dump the solid and liquid wastes in Ganga river like domestic usage (bathing, laundry and public defecation), Sewage wastes, unburnt dead bodies through in Ganga river. Patna and Varanasi cities are more responsible to water pollution in Ganga and 80 % sewage wastes are responsible to water pollution of Ganga.

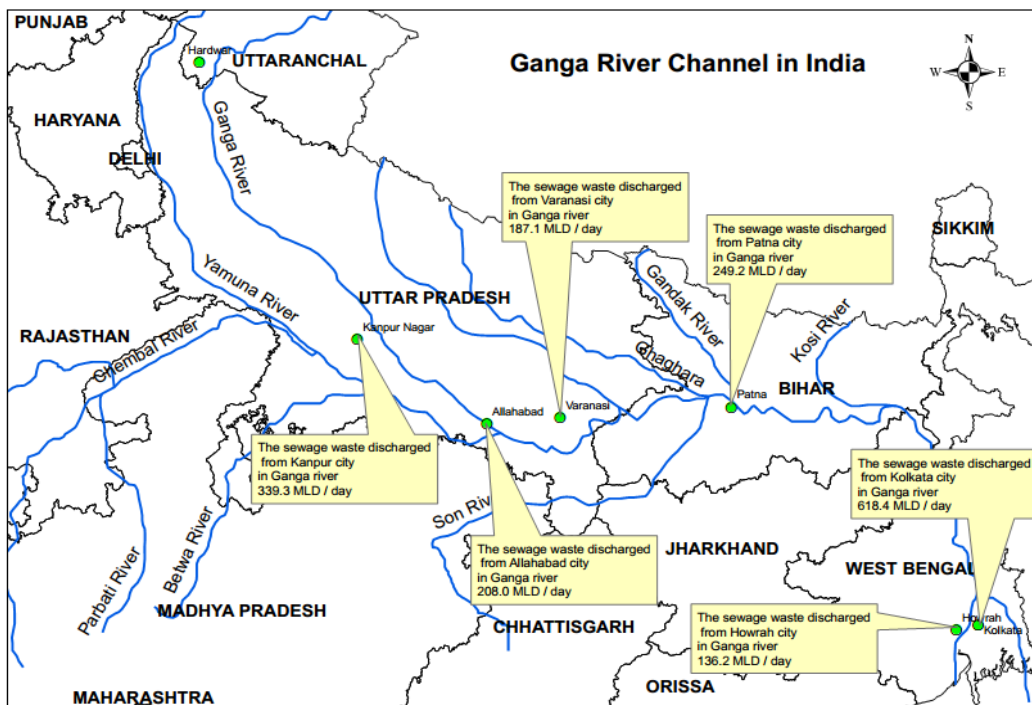


Figure 1: Showing the Ganga river channel and sewage waste discharge volume per day in 2009 (CPCB) from major cities of India

B. Industrial waste

Countless industries lie on the bank of the Ganga river from Uttarakhand to West Bengal like chemical plants, textile mills, paper mills, fertilizer plants and hospitals waste. These industries are 20% responsible for water pollution and dump solid waste and liquid waste in the Ganga river. It is very dangerous to water quality, their chemical properties and riverine life.

C. Religious factor

Festivals are very important and heartiest to every person of India. During festival seasons a lot of people come to Ganga Snans to cleanse themselves. After death of the people dump their ash in Ganga river it is a tradition of India because they think that Ganga gives mukti from the human world. Khumbha Mela is a very big festival of the world and billion people come to Ganga Snans at Allahabad, Hardwar in India. They throw some materials like food, waste or leaves in the Ganges for spiritualistic reasons.

III. IMPACT OF POLLUTION

A. Riverine life

The Ganga river pollution increased day by day and from this pollution marine life has been going to be lost in the near future and this polluted water disturbs the ecosystem of the river. And irrigation and Hydroelectric dams give struggle to life in their life cycle.

B. Bio life

Some dams are constructed along the Ganges basin. Dams are collected a huge volume of water and this is hazardous for wild life which are moving in Ganga river. The Kotli Bhel dam at

Devprayag will submerge about 1200 hectares of forest. In India wildlife has been warning that the wild animals will find it difficult to cope with the changed situation.

C. Human beings

An analysis of the Ganges water in 2006 showed significant associations between water-borne/enteric disease occurrence and the use of the river for bathing, laundry, washing, eating, cleaning utensils, and brushing teeth. Exposure factors such as washing clothes, bathing and lack of sewerage, toilets at residence, children defecating outdoors, poor sanitation, low income and low education levels also showed significant associations with enteric disease outcome. Water in the Ganges has been correlated to contracting dysentery, cholera, hepatitis, as well as severe diarrhea which continues to be one of the leading causes of death of children in India.

IV. GANGA ACTION PLAN

The Ganga Action Plan or GAP was a program launched by Rajiv Gandhi in April 1986 in order to reduce the pollution load on the river. Under GAP I, pollution abatement schemes were taken up in 25 Class-I towns in three States of U.P., Bihar and West Bengal. GAP I was declared complete on 31.03.2000 with an expenditure of Rs. 452 crore.

As GAP I addressed only a part of the pollution load of Ganga, GAP II was launched in stages between 1993 and 1996, 59 towns along the main stem of river Ganga in five States of Uttarakhand, U.P., Jharkhand, Bihar and West Bengal are covered under the Plan and included the following tributaries of the Ganges, Yamuna, Gomti, Damodar and Mahananda.

V. NATIONAL RIVER GANGA BASIN AUTHORITY (NRGBA)

National River Ganga Basin Authority (NRGBA) was established by the Central Government of India, on 20 February 2009 under Section 3 (3) of the Environment Protection Act, 1986. It also declared Ganges as the "National River" of India. The chair includes the Prime Minister of India and Chief Ministers of states through which the Ganges flows.

VI. STRUGGLE TO GANGA RIVER

Noted environmentalist Swami Gyan Swarup Sanand, who has been fasting to press for his demand of conservation of Ganga River, has once again been forcefully admitted to hospital here, sources said on Saturday night. Posted on: 06 May 2012.

VII. KUMBHA MELA ISSUE OF WATER AND POLLUTION IN RIVER GANGA

According to Hindustan Newspaper, January 11, 2013, the Prime Minister has been monitoring the availability of adequate water from Tehri Dam in river Ganga at Allahabad during the Kumbh Mela. Directions have been given to control the pollution load flowing in river Yamuna during the Kumbh Mela period.

- Tehri Hydro Development Corporation (THDCIL) has agreed to release 250 cumecs water from 21st December 2012 to 20th February 2013 and 220 cumecs water from 21st February 2013 to 28th February 2013 in view of demand of water for Allahabad 'Kumbh Snans'. Instructions have also been given by PMO that Delhi Jal Board should ensure that the performance of the 72 MGD STP (Sewage Treatment Plant) at Keshavpur renovated /commissioned recently is stabilized so that it functions optimally and the effluent meets the norms. The Delhi Government has been asked to ensure that the performance of the STPs and CETPs (Common Effluent Treatment Plants) is optimized to meet the effluent quality norms.
- At Sangam, Allahabad, the Biochemical Oxygen Demand (BOD) of Yamuna and Ganga is generally less than 6 mg/ltr but the main issue is of the color of effluents discharged by the pulp and paper industries into the river Ram Ganga and Kali (both tributaries of Ganga). Monitoring of water quality in river Ram Ganga and river Kali and their tributaries is being initiated on a daily basis by the State Boards of Utrakhand and Uttar Pradesh with the coordination of CPCB. Action will be taken against the industries for violating the norms.
- Spiritual dip in holy Ganga at Kumbh is not clean. The pollution level in the sacred river has risen since Kumbh started at the historical city of Allahabad on January 14, 2013 and the water is no fit for bathing purposes, latest evaluation by country's pollution watchdog the Central Pollution. The level of the Biochemical Oxygen Demand (BOD) levels - used to measure of the level of

organic pollution in the water - had increased to 7.4 milligram per litre at the main bathing place, known as Sangam, since the Kumbh started.

- A day before the Kumbh, the pollution level was 4.4 milligram per litre slightly more than the national standard for bathing quality of water of 3 milligram per litre. "Higher the BOD level worse it is for one's skin," said a CPCB expert. High exposure to dirty water can result in skin rashness and allergies. The official reason for the sudden rise of contaminants in the river was sudden increase in flow of human waste because of increased bathing during Kumbh. Around 10 million people have already visited the Kumbh and the UP government has employed around 10,000 sweepers to keep the city clean. Off the record officials admit that their drive to check sewage from industries in Ganga upstream of Allahabad has not worked as dirty sewage was still flowing into the river.
- The Board has been asked by the environment ministry to monitor the pollution level in Ganga under its National Ganga Basin River Authority and conduct periodic check on polluting industries along the river bank. But, the dirt in the river is not a deterrent for people to take a dip at Allahabad. Hindus believe that the Ganga water has ability to clean and purify itself, a claim not scientifically proven. And, this belief has driven millions to the world biggest Hindu congregation and another 15 million are expected to visit in the 55-day long festival to end on March 10.

VIII. CPCB ACTION FOR PREVENTION OF POLLUTION OF RIVER GANGA

- Training cum Awareness programme on Saltless Preservation of Hides/ skins was organized by CPCB at Lucknow and Kanpur, which was attended by representatives from slaughter houses, tannery & allied units and officers of UPPCB. The programme was oriented towards the ongoing efforts pursuing basin-wise approach for reduction of dissolved solids in wastewater from leather processing industries in particular by invoking salt less preservation of hides/ skins.
- CPCB has initiated a Techno-Economic Feasibility for setting up of Common Recovery Plant & Common Effluent Treatment Plant for Pulp & Paper Industries identified clusters at Muzaffar nagar, Moradabad and Meerut. CPCB also made a reconnaissance survey from Gomukh to Uluberia (West Bengal) for identified the point source and its impact on River. This reconnaissance survey is conducted in association with Shri Rajinder Singh, Member, NGRBA.
- CPCB issued direction to UPPCB and Uttarakhand PCB in the matter of Prevention and Control of Pollution from agro based Pulp & Paper Sector Mills. As a result 31 industries have been issued directions in U.P., 25 digester sealed at Uttarakhand, 8 industries were directed and 4 were stop chemical pulping. CPCB conducted monitoring of 26 industrial units in the stretch of river Ganga between Kannauj to Varanasi in the month of September 2010. Of these 7 were found closed during inspection, 2 were

complying to the prescribed discharge norms, 9 were requiring minor improvements, 4 have been issued directions (under section 5 of Environment Protection Act 1986) for closure, 3 have been issued directions for corrective measures (under section 5 of Environment Protection Act 1986) and 1 have been issued Show Cause notice for closure (under section 5 of Environment Protection Act 1986).

IX. CONCLUSION

This study is dedicated to Ganga river which is flow in northern India and it is a proud to Indian population. This study is successful with analysis with previous study on the Ganga river and here positive results to clean Ganga.

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ABBREVIATION

CPCB- Central Pollution Control Board
MLD- Million Litres per day
Gap- Ganga Action Plan
DO- Dissolved Oxygen
BOD- Biological Oxygen Demand
CETP- Common Effluent Treatment Plants
STP- Sewage Treatment Plant
PMO- Prime Minister Office
UPPCB- Utter Pradesh Pollution Control Board

REFERENCES

- [1] Tare, Dr Vinod. "Pulp and Paper Industries in Ganga River Basin: Achieving Zero Liquid Discharge". ReportCode:14_GBP_IIT_EQP_S&R_04_Ver 1_Dec 2011.
- [2] K. Jaiswal, Rakesh. "Ganga Action Plan-A critical analysis", (May, 2007).
- [3] A report "Status Paper on River Ganga" State of Environment and Water Quality, National River Conservation Directorate Ministry of Environment and Forests Government of India, Alternate Hydro Energy Centre Indian Institute of Technology Roorkee, (August, 2009).
- [4] Singhania, Neha. "Pollution in River Ganga". Department of Civil Engineering, Indian Institute of Technology Kanpur. October, 2011.
- [5] Das, Subhajyoti. "Cleaning of the Ganga". Journal Geological Society of India, Vol.78, pp.124-130, August 2011.
- [6] A report of Central Pollution Control Board, Ministry of Environment and Forests "Ganga Water Quality Trend", Monitoring of Indian Aquatic Resources Series, Dec., 2009.
- [7] A report of Water Resources Planning Commission, "Report on Utilisation of Funds and Assets Created through Ganga Action Plan in States under Gap", May, 2009.
- [8] http://en.wikipedia.org/wiki/Pollution_of_the_Ganges

AUTHORS

First Author – BASANT RAI received the Bachelor of Art degree from Kurukshetra University, Kurukshetra, Haryana in 2006, the M. Sc. degree in Geography from the Kurukshetra University, Kurukshetra in 2009 and the M. Tech. degree in Geoinformatics from the Guru Jambheshwar University of Science & Technology, Hisar, Haryana in 2011. Author's contact e-mail: basantrai79@gmail.com