Journal of The Gujarat Research Society

ISSN: 0374-8588
Volume 22 Issue 1, January 2020

A REVIEW ON THE YAMUNA ACTION PLAN

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Abstract

For several human activities, water is a primary resource, and rivers are a significant source of water in different parts of India. Problems with the water environment are progressively becoming serious across Asia, which is witnessing rapid progress. This is due to the increasing human population, urbanization, and Activities in economic terms. In particular, riverine water supplies are increasingly becoming vulnerable. River water management is an essential field of natural resource management that spans several disciplines and needs public involvement through appropriate institutions in order to be successful. First of all, this paper addresses the critical situation of the water supplies of the Yamuna river and the need for public action. The Yamuna River originates at Yamunotri in Himalayas and crosses through Himachal Pradesh and Uttaranchal, drawing water from many big streams in the upper stretch of 200 km The implementation of the Yamuna Action Plan will then be addressed and a broad management structure will demonstrate the institutional approach to river water management, using suitable policy instruments to achieve the objectives.

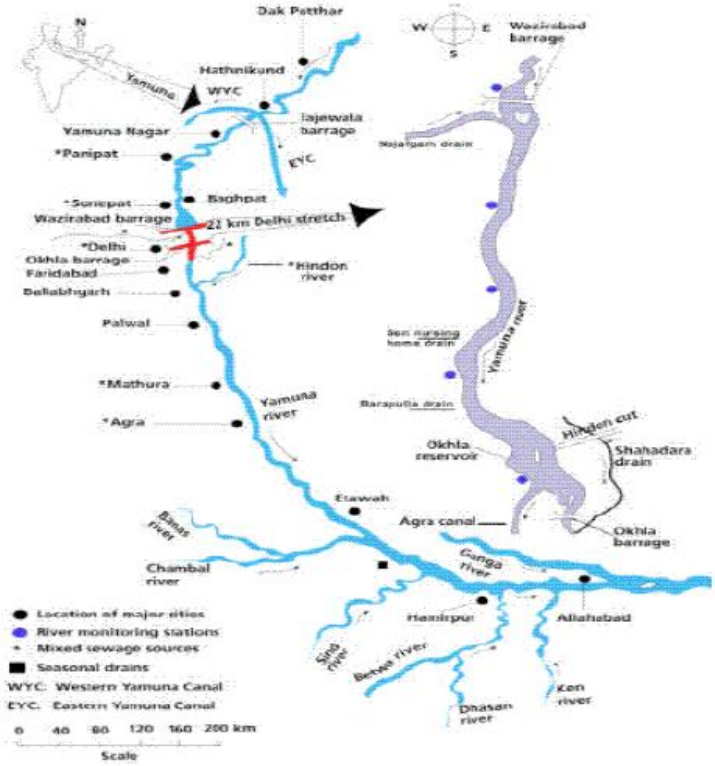
Keywords: *Himalayas, Natural resource management, Riverine, Yamuna Action Plan.*

I. INTRODUCTION

Problems with the water environment are progressively becoming serious across Asia, which is witnessing rapid progress. This is due to the increasing human population, urbanization, and Activities in economic terms. In particular, riverine water supplies are increasingly becoming vulnerable. Owing to human activities, more so in a country like India, which has as many as 14 rivers and several cities next to them, quantity decline and quality degradation. The Yamuna River is one of India's main rivers and is also a major tributary to the largest river in India - the Ganges River. The Yamuna River originates at Yamunotri in Himalayas and crosses through Himachal Pradesh and Uttaranchal, drawing water from many big streams in the upper stretch of 200 km (figure 1) [1]. At Dak, it reaches the plains of Pathar in

Uttranchal, where the river water is regulated via the weir and diverted for power generation into the canal Hathnikund. It hits Tajewala in Haryana state's Yamuna Nagar district, where the river water is diverted for irrigation into Western and Eastern Yamuna canals. No water is permitted to flow downstream to the Tajewala barrage in the river during the dry season, and it remains dry in some stretches between Tajewala and Delhi. Due to ground water accrual and feeding channel contributions through Som Nadi (seasonal stream) upstream of Kalanaur, the river regains water.

After traversing a route of about 224 Km, it enters Delhi near Palla village. In Wazirabad, the river is again tapped into a barrage for the supply of drinking water to Delhi. The untreated or partially treated domestic and industrial wastewater contributed via many drains along with the water transported by the Haryana Irrigation Department from the Western Yamuna Canal (WYC) to Agra Canal through Nazafgarh Drain and the Yamuna is whatever water flows in the downstream of the Wazirabad Barrage [2]. There is another barrage after 22 Km downstream of Wazirabad barrage, Okhla barrage, from which Yamuna water is diverted for irrigation into Agra Canal. During the dry season, no water is permitted to flow through the barrages. Through domestic and industrial waste water produced from East Delhi, Noida and Sahibabad, whatever water flows in the river beyond the Okhla barrage is contributed and joins the river through the drain of Shahdara. The Yamuna joins the Ganga River and the underground Saraswati at Prayag (Allahabad) after receiving water from other large tributaries after crossing approximately 950 km.



Due to characteristic hydrological and ecological conditions, the Yamuna river cannot be designated as a continuous river, particularly in the dry season of nearly 9 months, but can be segmented into five separate segments. Sections of the states of Uttar Pradesh, Uttranchal,

Himachal Pradesh, Haryana, Rajasthan, Madhya Pradesh & Delhi cover the catchment of the Yamuna river system. The tributaries account for 70.9% of the catchment area and 29.1% of the remainder accounted for direct drainage into the Yamuna River or the smaller tributaries. The Yamuna catchment basin amounts to 40.2 percent of the Ganga Basin and 10.7 percent of the country's total land mass, based on area [3]. There are many significant practical uses of River Yamuna water, such as irrigation, drinking water, bathing water, fishing, livestock use, navigation, esthetics and leisure, and religion and culture.

Irrigation is the primary use of the net irrigated area in the basin, although there has been a change from conventional canal irrigation to ground water irrigation (which is replenished by the Yamuna River and rains) from 47,000 sq km to 110,000 sq km during 1950-90[4]. During the 1950-1990 period, the population of the basin increased from 51 million to 131 million at 2.4% and Delhi, in particular, grew at 4%, while the level of economic growth in the basin is high and diverse. During this time, water use has risen from 1000 MCM to 4000 MCM. The next most important use is drinking water, and the growing population represents a rapid increase in domestic and drinking use. Industrial use has also grown as a consequence of the rapid growth in the number of large and medium-scale enterprises, which by the 1990s had reached almost 10,000. In addition to serving as a supporting resource for use, the Yamuna river also acts as a drain by assimilating waste from domestic, agricultural and industrial activities. For various uses, primarily for agriculture and drinking purposes, most of the water in the area is drawn from the Yamuna River through various diverging canals in the upstream parts of the river basin. These applications draw a decent amount of water from the Yamuna River. For example, in 1992, the total water consumption in the capital, where drinking is the main consumption, was 1,027.84 mcm, which increased by almost 30% in three years to 1,330.04 mcm in 1995 [4]. At the same time, in 1992, the total water usage in the basin, where the majority of water is used by agriculture, was 44,926 mcm, which increased by 10% to 50,437 mcm in 1995.

The annual flow of river water decreased from 10 mcm/y over time to 5 mcm/y over time [3]. In addition to low flows, heavy municipal and industrial pollution load discharges emanating from Delhi give rise to the Yamuna River's low self-purification capacity. While Delhi accounts for only 2 percent of the Yamuna basin catchment, it still contributes to about 80 percent of the pollution load. There are 16 drains that discharge into the Yamuna treated and untreated waste water/sewage from Delhi. Around 1,900 mld of waste water from the municipal sector and 320 mld from the manufacturing sector was discharged. The installed capacity is 1,270 mld for treatment. At the same time, the current treatment potential is not up to the required secondary standard of treatment. Therefore, every day, a large amount of untreated waste and partially treated sewage is discharged into the Yamuna. The Najafgarh drain provides 60 percent of the total waste water and 45 percent of the total BOD load discharged into the Yamuna from Delhi. In 1977, urban waste water grew from 960 mld to 1,900 mld in 1997, while treatment capacity increased from 450 mld to 1,270 mld [5].The implication is that the river no longer acts as a water stream. A decreasing trend in water quality calculated on several parameters soon after it enters Delhi is clearly shown by the river.

The sewage flowing into the Yamuna River consists of urban and industrial waste. The Central Pollution Control Board (CPCB) is in charge of controlling the water quality of the Yamuna River upstream from Wazirabad and Okhla [6]. The level of dissolved oxygen (DO) is 7.5 mg/l at the upstream of Wazirabad and the level of biochemical oxygen demand (BOD) is 2.3 mg/l, while the level of DO decreases to 1.3 mg/l with BOD at the downstream of Okhla to 16 mg/l, suggesting a major deterioration in the quality of water in the stretch due to discharge of sewage and industrial effluents. In terms of its water use, the stretch between Wazirabad and Okhla is referred to as the bathing efficiency standard. At Wazirabad, however, the number of coliforms is 8,506/100 ml, whereas at Okhla it increases to 3,29,312/100 ml. A safe river should contain in its water at least 5 mg/l of dissolved oxygen (DO) and a maximum of 3 mg/l of biochemical demand for oxygen (BOD). Pathogens or bacterial diseases suggested by the count of faecal coliforms should not exceed 500 per 100 ml of water. As pollutant-containing waste or industrial effluents (organic matter) are pumped into the river, they draw oxygen from the river water for organic matter oxidation. Continuous pollutant discharge results in DO depletion in river water that adversely affects the ecosystem's flora and fauna. Untreated waste also involves pathogenic or faecal problems that give rise to disease in the river water that causes bacteria. When people take a bath in the river, pathogenic bacteria are passed on to the human body, affecting their health.

Yamuna Action Plan:

Over time, the Yamuna River lost good use of many of its functions and became almost a drain flowing through the capital, causing significant public health problems. Urbanization, industrialization, water withdrawal, farm runoff, and excessive religious and social practices are the principal causes of river water contamination. The river has very low flow rates has poor water quality. In 1993, the Yamuna Action Plan was initiated to improve the river's water quality and return it to the Ideal Bathing Class [7]. In two points, it was implemented:

- Since 1993, the National River Conservation Directorate (NRCD) of the Ministry of Environment and Forests has implemented Yamuna Action Plan-I (YAP-I) in 21 toons. For implementation in 15 of the 21 towns, the JBIC provided soft loan assistance of around Rs. 700 crore and GoI provided the funds for the remaining 6 towns. It concentrated on reducing the discharge from the towns situated along its banks of untreated domestic waste water and other waste into the river.
- The Government of Japan agreed to extend the loan for a further two years from 2000 to 2002 at the behest of GOI and the project was referred to as Yamuna Action Plan II (YAP-II)[8]. Continuing construction, along with some remedial works, will be undertaken over the extended period to increase the project's performance.

The Yamuna Action Plan has been drawn up to avoid the contamination of the Yamuna River. Its key aim was to enhance the river's water quality and return it to the ideal bathing class. Pollution mitigation schemes have been envisaged in 21 towns in 3 states. Domestic sewage pollution is tackled under the Yamuna Action Plan, while industrial pollution is regulated and managed under current environmental legislation. Under YAP, the principal emphasis is on:

- Trunk laying & intercepting sewers for sewage outflow diversion into the river
- Construction of wastewater treatment plants to handle the sewage collected

Non-point emissions sources to be discussed by:

(i) Installation of wood-based electric/improved crematoria to reduce river emissions on disposal account of unburnt dead bodies

(ii) Constructing low-cost bathrooms to discourage the public from resorting to open defecation.

II. CONCLUSION

The Yamuna Action Plan is an initiative, but it is carried out as a project and, once again, based on controlling pollution through water treatment rather than prevention of river water pollution. A dedicated institution that takes a holistic approach to the management of river water is needed here. In turn, the Central Government, under the Central Water Commission, needs to set up a river basin authority to work independently in order to coordinate with state and central government agencies in order to ensure that activities are carried out and to track progress. The said river basin authority shall take care of the quality and quantity of river water by adopting a regional approach and using economic policy-making methods with broader stakeholder involvement based on the scheme outlined and discussed above. Accordingly, the Authority shall formulate goals and set objectives, analyze different water management options and evaluate them and their alternatives in a context for benefit-cost analysis, using economic valuation as a main evaluation method, and adopt an action plan using different policy instruments to take effective action.

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ISSN: 0374-8588
Volume 22 Issue 1, January 2020

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