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An Empirical Research on the Prospects of River Tourism in Delhi

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Abstract

River tourism in India is just picking up with states such as West Bengal and Kerala, investing money on it because families top the list among travellers who opt for river vacation and it is time to develop tourism on major rivers because a vacation along the rivers promises a soothing and relaxing experience for those who are looking for solitude. A riverside vacation spells exciting water sports, camping, yoga and meditation bonfire and a memorable holiday experience to visitors.

But what an ironical that not a single river of India is free from pollution. River Yamuna is one of the most polluted rivers of the country. According to the Central Pollution Control Board (CPCB) pollutants are increasing at an alarming rate in the River water. Only two per cent of the river's length passes through Delhi, yet the city constitutes around 76% of its pollution load. At least 22 drains empty into the river. River pollution has been causing serious water-borne diseases and health problems affecting human population as well as animals, fish, and birds in the environment.

In order to attract travellers, we have to preserve and sustain our rivers so that we can project India as multi tourism product destination and offer a memorable holiday experience to visitors. A riverside destination would be an ideal bet for backpackers, solo travellers, nature lovers, adventure buffs and people looking for some good time.

So the aim of the research paper is to transform the river and suggests way restoring the rivers and its lost connection with the city by making them accessible to the public, conserve Delhi's lifeline Yamuna and to promote River oriented Tourism in Delhi.

Keywords: River, Delhi, Pollution, Tourism, Sustain

Introduction

Behind every historical city there is a great big river. New Delhi, national capital of India, is situated in the north-central part of the country on the west bank of the Yamuna River, adjacent to and just south of Delhi city (Old Delhi) and within the Delhi national capital territory. Rivers in India are not just the water bodies but worshipped as God and Goddesses. Despite such an esteem status, rivers are being polluted due to open sewage drains, lack of sufficient sewage treatment plants, soil erosion and by dumping plastic garbage in river water etc. One such example where every cleaning effort has failed is that of the river Yamuna. The Yamuna is one of the most polluted rivers in the world especially around New Delhi. Pollutants are increasing at an alarming rate in the River water. The River Yamuna enters Delhi from Palla village near (Delhi-Haryana Border).

The Yamuna, also known as the Jumna, is the longest and the second largest tributary river of the Ganges in northern India. Originating from the Yamunotri Glacier at a height of 6,387 metres on the south-western slopes of Banderpooch peaks in the uppermost region of the Lower Himalaya in Uttarakhand, it travels a total length of 1,376 kilometres and has a drainage system of 366,223 square kilometres, 40.2% of the entire Ganges Basin, before merging with the Ganges at Triveni Sangam, Allahabad, the site for the Kumbh Mela, every twelve years. It is the longest river in India which does not directly flow to the sea. Nearly 57 million people depend on the Yamuna's waters. The river accounts for more than 70% of Delhi's water supplies. Like the Ganges, the Yamuna

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is highly venerated in Hinduism and worshipped as the goddess Yamuna. In Hindu Mythology, she is the daughter of Sun God, Surya, and sister of Yama, the God of Death, hence also known as Yami. According to popular legends, bathing in its sacred waters frees one from the torments of death.

Literature Review

The large scale of urban growth due to the increase in population or migration of people from rural areas to urban areas has increased domestic effluents while industrial development manifested either due to setting up of new industries or expansion of the existing industrial establishments resulting in generation copious volume of industrial effluents, though the point sources like domestic waste and sewage are the first order contamination sources in Yamuna River. Human activity and cattle grazing also add to the river pollution. Once the contaminants enter the water source it is a difficult and expensive to remove them, unplanned and injudicious disposal of municipal waste causing pollution of Yamuna River. The Third World Centre for Water Management has estimated that less than 10% of wastewater generated in the country is now properly collected, properly treated and then discharged to rivers and lakes in an environmentally safe manner (Report on government of NCT of Delhi, 2005).

River Yamuna, one of the major freshwater sources of India, which covers part of geographical area in the states of Uttaranchal, Uttar Pradesh, Himachal Pradesh, Haryana, Rajasthan, and Madhya Pradesh & NCT – Delhi. These urban centres draw fresh river water for various activities. In return, almost the entire wastewater generated by these centres is disposed into the river. This is one of the prime reasons for the destruction of Yamuna River water quality from urban agglomeration of Delhi up to Chambal River confluence. About 85% of the total pollution in the river is contributed by domestic sources. The domestic pollution is the major source of pollution in Yamuna River, mainly caused by the urban centres. The intensity of impact of domestic pollution on river therefore depends on the efficiency of the wastewater digest system, type and length of the waste transportation system. The condition of river deteriorates further due to the abstraction of significant amount of river water (for domestic and irrigation purposes, both amounting to nearly 92% of the river water), leaving almost no fresh water in the river, which is essential to maintain the assimilation capacity of the river**.** (Central Pollution Control Board Report, November 2006) River pollution has been causing serious water-borne diseases and health problems affecting human population as well as animals, fish, and birds in the environment. A Report by the Central Pollution Control Board (CPCB) has termed Yamuna "almost dead" because of the filth that it carries (Haider, 2017).

The National Green Tribunal had directed the Central Pollution Control Board (CPCB) to resolve the issue of high ammonia content in the water. After directions from the tribunal, CPCB submitted its analysis of ammonia. The analysis showed that the level of ammonia in Yamuna exceeded the safe limit and that most of the ammonia was coming from drains in Delhi. At Delhi Gate, Najafgarh and Sonia Vihar, the ammonia level was at least 35-45 times higher, according to the report. Earlier reports have revealed that total coliform, or mostly human and animal excreta continues in lakhs, or in some cases, even crores of particles (measured in 'most probable number' or 'mpn' per 100 ml) in the river in Delhi. The standard is a maximum of 5,000 mpn/100 ml (most probable number/100ml). The dissolved oxygen, which is a must for many forms of life in the water, continues to be negligible, which reiterates that it's a dead river (Hindustan Times Correspondent, 2018).

The Yamuna River once had 'clear blue' water but now the river is one of the most polluted rivers in the world especially around New Delhi because four drains Najafgarh, Najafgarh supplementary, Shahdara and Barapullah, are the key contributors to pollution. Estimated amount spent in cleaning the Yamuna over Rs.2000 crores in more than two decades. (Jeelani, 2018) Various studies have reported pollution of water and change in biota of River Yamuna during past four decades. The extraction of water through a series of barrages, extensive channelization and heavy discharge of untreated domestic and industrial waste has turned the river into a sewer at least between Delhi and Agra (A Report on Toxity load of Yamuna River in Delhi, 2014).

Environment Concerns

Delhi is also knows as one of the polluted and congested destination, which reduce its appeal for visitors to visit Delhi in terms of cleanliness, pollution, to waste disposal. Delhi, the capital of India, according to a World Health

Organization survey of 1600 world cities, is the worst of any major city in the world in terms of water and air pollution. Water pollution and a lack of solid waste treatment facilities have caused serious damage to the river Yamuna. Weak sanitation and untreated sewage cause water pollution and have huge health impacts. These effects to well-being of the cities and areas inhabitants as well as the flora and fauna. The deteriorating environment is the result of population pressure and the over use of scare resources such as water which put heavy pressure on the environment. Water pollution and a lack of solid waste treatment facilities have caused serious damage to the river on whose banks Delhi grew, the Yamuna. (Thakur, 2018) Yamuna River flows for 54 km from Palla to Badarpur through Delhi, the 22 km stretch from Wazirabad to Okhla, which is less than 2% of the river length of 1376 km from Yamunotri to Allahabad, accounts for about 76% of the pollution level in the river. This 2% stretch from Wazirabad to Okhla receives maximum direct discharge of completely unregulated waste from residences and untreated industrial waste into the river (2% of Yamuna accounts, 2018) Another area of concern is the absence of sewer lines in 1700 unauthorized colonies, housing around 40 lakh people in the national capital is one of the main reason of pollution in the Yamuna. The river which is the lifeline of the city as it supplies drinking water to most parts is almost dead with high levels of toxic chemicals. Faecal sludge from these colonies being directly emptied into the river, adds to extremely high levels of pollutants not allowing the water body to sustain life. Faecal sludge has 2000 mg/litres of biochemical oxygen demand (BOD) load per day, which is much higher than the 150 - 300 mg/litres of BOD of sewage. The BOD levels – oxygen needed by the river to sustain life in Yamuna is alarming high. This is because sewage from planned colonies goes to the sewage treatment plants (STP) and drained into the river. However, sludge from the unauthorized colonies is collected in septic tanks by private contractors and is directly emptied into the river, thus adding to the BOD levels (Sewage from 1700 colonies, 2018).

Apart from these, there are 28 industrial clusters in Delhi and only 17 industrial clusters of these are connected to 13 common effluent treatment plant (CETP). The remaining 11 clusters are not connected to any CETP which pollutes the river Yamuna. (2% of Yamuna accounts, 2018) From the Wazirabad barrage Yamuna enters the capital city, to Okhla barrage where it exists in the south, the Yamuna consists of only treated and untreated sewage and other toxic effluent. The water to the North is rendered "dead", with zero percent dissolved oxygen, posing serious health hazards to the citizens of Delhi. The ecological impact on river Yamuna has been immense – with the aquatic life disappearing by the day. Fish, turtles, alligators and other such life dependent on fresh water are dying in the toxic industrial pollutants and sewage dumped in Yamuna. The Taj Mahal, situated on its banks is under threat, as conservationists fear a dry river Yamuna would weaken the wood-based foundation of the Taj Mahal, which requires moisture (Rajan, 2019).

Significance of Yamuna in the Promotion of Tourism

Delhi is the only city in the country having maximum number of 1200 monuments, which makes Delhi a popular destination in the world. (Delhi Tourism) In order to be a successful tourist destination apart from manmade resources, focus should be more on natural oriented tourism like rivers, lakes, seas etc. because for some tourist, monument for them are bore, dead and dull. If we focus on natural resources like rivers and other water bodies it make the destination 100% successful because clean air, clean water and clean earth, always attracts and inspires travellers to visit a destination. Moreover to project and promote India as a multi oriented tourism destination and a 365 days destination, ministry of Tourism has also taken up the initiative of identification, diversification, development and promotion of niche tourism products of the country like Cruise, Eco-tourism etc.

So the main objective of the present paper, is to offer multi-tourism products to visitors, sensitize people about the environment, preserve the river Yamuna in order to promote Eco/River oriented Tourism in Delhi and to project Delhi as a "Swachh Tourist Destination" which will enhance the experience of visitors from India and abroad (Annual Report, 2019).

Tourism Activities in River Yamuna in Delhi

Yamuna Ghats in Delhi are one of the popular location for many, a fashion photo-shoot for young couples sitting or standing on the edge of the boat under a beautiful evening sky. These Ghats have also become a popular location for

pre-wedding and professional photo-shoots in the last 2-3 years. Now more focus on taking visitors on a boat ride for leisure and photo shoots and performing traditional rituals related to birth and death. From the last two years back, tourism business has picked up, visitors have been increasing every day because people like boating with families, as it comes out really well in photographs. Now some boatmen on other Ghats have also got their boats painted red. During the winter (Nov- March) various models and professionals photographs come to the River Ghats and it is the time when the areas gets a lot of migratory birds, that is another popular location for photo-shoots. Earlier, most people used to come here to offer prayers to get rid of evil spirits. Now many come for photo shoots as the tall grass provides a nice background. Evening Aarti is performed for visitors on the Ghats by the priests and follows is an hour long aarti clubbed with bhajans. Priest places flowers, roli (vermilion) and oil lamp on a steel plate for the aarti. Till the mid 80's, the older timers say, people from across the city and neighborhoods areas in Haryana, U.P. used to come here regularly to offer prayers and also to spend some leisure time, participating in swimming competitions, boat rides etc. Delhi resembles Varanasi on these Ghats in the evening during the aarti (Chitlangia, 2019).

Yamuna River that has been a silent witness to Delhi's history and visitors often loves to walk on the meditative quiet banks of the Yamuna at Nigambodh Ghats. A visit to the famous Ghats for boat tour and for watching migratory birds, circling above the calm waters - unravels the ritualistic devotion with which the Hindus treat the historic rivers. Despite its current struggles with pollution, the Yamuna is a goddess to the eyes of her devotees. Concluding with a memorable view of the Jama Masjid back through the streets of Old Delhi, the Yamuna Route is a true experience in the stimulating contradictions that is India. The newly built Akshardham temple is a very popular destination for tourists and the temple is situated on the banks of Yamuna River, and is besides the Common Wealth Games village (delhitourism.gov.in).

Research Methodology

The primary data for this work was gathered from primary and secondary sources. The questionnaires were given to domestic and foreign tourists, who visited Delhi for sightseeing in the month of October-December 2019. The research involved 240 respondents altogether, using random sampling. The survey consisted of 'two opinion statements' identified to gauge the overall perception of the tourists, regarding level of cleanliness of Natural resources in Delhi. Secondary Data was collected from various travel magazines, brochures and pamphlets published by the department of tourism. Apart from this, information's been collected through electronic and print media.

Findings

The primary aim of this research paper is to project and promote Delhi-NCR, as an emerging eco-tourism destination, as well as to cater the needs of visitors, so that Delhi can become a favorite destination for International Tourists.

Table 1: Foreign & Domestic Respondents

Sr. No.	*Question*	*Foreigners*		*Domestic*	
		No	*%*	*No*	*%*
1.	**Are you aware of availability of eco destination in Delhi-NCR?**				
	Yes	48	40	36	30
	No	72	60	84	70
	Total	**120**	**100**	**120**	**100**
2.	**Environment/Eco destination, consideration while selecting Delhi/NCR as a tourist destination.**				
	Yes	42	35	54	45
	No	78	65	66	55
	Total	**120**	**100**	**120**	**100**
3	**Are you satisfied with the cleanliness of Delhi NCR?**				
	Yes	54	45	36	30
	No	66	55	84	70
	Total	120	100	**120**	**100**
4.	**Will you like to visit again at Delhi/NCR?**				
	Yes	54	45	36	30
	No	66	55	84	70
	Total	**120**	**100**	**120**	**100**

Source: Primary Data through Questionnaires

Result and Discussions

For tourists Delhi always being a great tourist destination for its historical and cultural importance. Majority of the domestic and foreign respondents are not aware that Delhi is also an eco-oriented destination and prefers to explore Delhi only for its amazing culture, deep in history, museums and human diversity. Today the concept of tourism has changed, earlier tourism activities for tourists in Delhi were restricted only to man-made attractions, now majority of the visitors consider to explore natural beauty spots of flora and faunas during their visit to Delhi. To make Delhi more popular among visitors, Delhi should be projected as an eco- oriented destination for this we have to sustain our natural resources. Nature makes things beautiful. Man is to blame for destroying nature. Natural resources are the cause of tourism.

From the above table, majority of the foreign and domestic respondents were not satisfied with the cleanliness. A destination having healthy environment like clean air, clean water, and clean earth always attracts and inspires travellers to visit at that destination because visitors won't full value of their money and won't compromise with their health while on tours. More over good environment conditions enhances the experience of visitors.

From the above table, majority of the foreign and domestic respondents were not showing interest to come again for tourism in Delhi because Delhi is trailing behind in the Cleanliness and the level of pollution is high as majority of the foreign and domestic visitors observed that littering, throwing household garbage on roads are common things in Delhi. Reasons include a lack of education, disregard for public places and the absence of a hefty fine to deter people. So enough number of public dustbins should be constructed by the government. In case of any violation, fines should be imposed on those people who do such things in order to keep the city neat, clean and green. Cleanliness was not up to the standard, which creates a very bad impression. The standard of the cleanliness needs to be maintained and it is the responsibility of the civic agencies because cleanliness and hygiene of the destination is the biggest criteria by which a visitor decides to go on tourism.

Suitable Remedial Measures to Make River Yamuna Swachh

India is already a global leader in recycling and in innovation. We cannot say that it happened because god wanted it to happen. These are man-made crisis and if these are man-made than, only man can bring out solutions. The battle against pollution is a never-ending one since we are constantly harming our natural resources. There are plenty of ways to diminish the waste, and if every person does their part, the world can be changed for the better.With a little change in our daily lifestyle, one can definitely help to protect the entire planet by maintaining a healthy ecosystem (Vardhan, 2018). Some of the suitable remedial measures are given below:

For a long time in Delhi, the city's sewage and waste is disposed in the Yamuna. To re-envision the river, a team of experts comprises urban ecologists, architects from the University of Virginia and government experts have worked for six years to devise a workable solution. In collaboration with the Delhi Jal Board, University of Virginia's Yamuna River Project is an inter-disciplinary research program whose objective is to revitalize the ecology of the Yamuna River in New Delhi, thus reconnecting India's capital city back to the water. The Yamuna River Project aims to transform the river into a place that residents will enjoy spending time on. The plan will include cleaning the river, developing the river bank as a biodiversity zone, treating drain water and using spaces on the banks of drains as public spaces and it will take place in 2 phases: Phase-I of the clean Yamuna project, which aims to lower the pollution levels in the Najafgarh and Delhi Gate drains, while Phase-II deals with Shahdara, Barapullah and other drains (yamunariverproject.org).

Yamuna Action Plan (YAP) is for cleaning the Yamuna. Since from the year 1993 Japan International Cooperation Agency, Govt. of Japan is assisting the Govt. of India to clean the Yamuna in Phases. The cleaning of polluted Yamuna was carried out in line with the level of the biological oxygen demand of Yamuna. Under these two phases, 286 schemes, which also included 39 sewage treatment plants (STPs), were completed in 29 towns of Delhi, Uttar Pradesh, and Haryana at a cost of Rs 1,453.17 crore and sewage treatment capacity of 767.25 million litres per day has been spent under Yamuna Action Plan I and II. (Start Yamuna Project, 2017) The YAP has so far completed two phases as YAP-I and YAP-II. The YAP-I covered Delhi, eight towns in Uttar Pradesh and six towns in Haryana. Under YAP II, emphasis was on the 22-km stretch of Yamuna in Delhi. Now we have YAP-III, phase III of Yamuna Action Plan for Delhi, at an estimated cost of Rs 1,656 crore. In 2013, the YAP-III was initiated.

The objective of the project was to reduce pollution load in the Yamuna River by providing sewers and public toilets, and implementing educational activities regarding environment and hygiene in 15 cities in the 3 states situated in the Yamuna River Basin, and thereby contribute to the improvement of water quality. The Yamuna Action Plan (YAP), one of the largest river restoration projects in the country, is a bilateral project between the Government of India and Japan. The Japanese Government has provided financial grant of 17.7 billion yen to carry out the project, under the Japanese Bank for International Cooperation (JBIC), and this project is being executed by the Ministry of Environment and Forests, National River Conservation Directorate and the Government of India. Under the Yamuna Action Plan Phase III, the Delhi stretch is given prime emphasis as it is the most critical stretches of Yamuna, where most of the city's sewage is dumped (yamunaactionplan.org).

The Noida authority (Uttar Pradesh) has decided to beautify and revive its 17 km irrigation drain that passes though the city and also clean the 13 other similar drains that are connected with the main drain, which emptied into the river Yamuna near sector 150/168. The drain that once used for irrigation purpose for agricultural land. But since 1976, when Noida was established, the drain that once used to carry clean water now became a carrier of sewage. By reviving the irrigation drain by trapping its sewage, we can stop dumping our waste into the Yamuna and Hindon Rivers. In order to keep Yamuna clean "The Indian Institute of Technology (IIT), Roorkee, prepared a detailed plan to trap sewage and clean the same before dumping it into drains connected with Yamuna. These drains carry sewage and waste water from villages in Delhi. Soon it will be completed, and it will ensure that only clean water flows through the drains. The plan will go on long way in protecting groundwater. Apart from this IIT Roorke, has also made a detailed project report on the beautification and revival of all 13 drains that pass through various residential and industrial areas. The beautification involves repairing the banks of the irrigation drain and plantation of fragrant trees. These irrigation drains originates at the Delhi-Noida Border near sector 11 before finally merging into the river Yamuna at Sector 150/168 as carries sewage from East Delhi, Ashok Nagar, Kalyanpuri and other areas (Rajput, 2017).

The Noida authority has decided to set up five Sewage Treatment Plant (STP) by 2021 for treating an estimated 310 million litres per day of sewage to check dumping into the Yamuna and Hindon Rivers. STP is the process of removing contaminants from municipal wastewater, containing mainly household sewage plus some industrial wastewater. Physical, chemical, and biological processes are used to remove contaminants and produce treated wastewater that is safe enough for release into the environment. At present, Noida has the capacity to treat 231 million litres per day sewage in its six sewage treatment plant (STPs). Two STPs each are located in sector 54 and 50, and one each in sectors 123 and 168. The total sewage generated in Noida is 175 million litres per day. All the STPs will be functional by the end of 2020. The Noida authority will spend around Rs. 400 crore on this project in order to make Noida a zero discharge city. Zero discharge indicates that zero sewage is dumped into the soil and also that sewage is treated before it is dumped into the river (Rajput, 2017).

To keep Yamuna clean various companies are installing Effluent Treatment Plants (ETP). ETP, are used by leading companies in the pharmaceutical and chemical industry to purify water and remove any toxic and nontoxic materials or chemicals from it. These plants are used by all companies for environment protection. Apart from this installation of Common effluent treatment plants (CETP), when it collects sewage from surrounding localities and treat it with industrial wastewaters. The advantages of such systems are: – Dilution to toxic constituents and dissolved inorganic solids from the industrial wastewaters. Apart from these, Yamuna Action Plan to create environmental awareness campaign are few of the initiatives taken by the Delhi Govt. to clean the Yamuna and water is checked regularly for its quality (Pandey, 2018).

In order to keep Yamuna clean Central Pollution Control Board (CPCB), Delhi Pollution Control Committee (DPCC) and a team of scientist and other institutions like IIT Delhi suggested to carry out inspections and submit reports to it for remedial action. The committee has also recommended a mechanism to be worked out jointly with DPCC & CPCB to install an online system for quality testing of water in Yamuna in Palla and Wazirabad (2% of Yamuna accounts, 2018).

Conclusion

India is a blessed country when we consider its rich natural sources of water in the form of numerous rivers and lakes. The country has rightly been referred to as the "Land of Rivers" and the people worship the rivers as god and goddesses. But what is ironical is that in spite of our profound respect for our rivers, we have not been able to maintain their purity, cleanliness and the physical well-being. Every goal of cleaning the Yamuna has not worked so far and the river is still polluted. Most of the sewage treatment facilities are either underfunded or not functioning properly, moreover, river gets fresh water only during the rainy season.

We should never forget how much we are dependent on our rivers. It is the river systems in our country which provides us with potable water, irrigation, electric city, transportation and also they are a great source of livelihood for a large majority of people in the country. So we cannot ignore our rivers and let them die. The government is already splurging massive amount of money for the last so many years in the name of preventing and reducing river pollution by setting up effluent treatment plants and sewage treatment plants to clean up industrial waste but nothing has changed. The social habits of people of throwing garbage and other waste etc. in rivers is disgusting which shows river Yamuna is not Swachh.

To preserve our rivers farmers should adopt organic methods of farming by reducing chemicals pollutions in rivers. Any type of religious practices should be banned on the river banks in order to save rivers from pollution. Besides this, there should not be any Dhobhi Ghat near rivers. Proper drainage and sewage systems will not allow the river water to get mixed with polluted water.

Often it is also heard that we the citizens of the country are equally responsible for polluting the rivers. It is claimed that we can promote communities involvement in cleaning up of local rivers and water bodies then why it has not been done? We should raise the awareness among the people on the causes and effects of river pollution by organizing awareness programs, meetings and distribution of literature on river pollution and its dangers.

A riverside destination would be an ideal bet for nature lovers, adventure buffs and people looking for some good time and families top the list among travellers who opt for river vacations. Kerala, Brahmaputra, Sunderbans, Ganges, Goa, Uttarakhand and Cochin are some of the destinations where river tourism is picking up as travellers are flocking to these ones in huge numbers. Rishikesh, Sahastradhara (Deharadun), Renukaji Lake (Sirmour-Himachal Pradesh), Chakki Mod (near Kasauli), Danedeli and Kabini among others are also favourites. The Indus flowing through Ladakh and Zanskar and Chenab in Kashmir offer different experiences. Others rivers like the Sutlej, Beas, Teetsa and Yamuna also offer sporting challenges.

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