Opinion



# Ganga's gleaning for cleaning

## Opinion

Every year, we observe 'World Environment Day' to raise awareness for the protection of our living environment and 'Earth Day' to demonstrate our support for the same. We all will continue do the same in future as well. Do we really mean it?. My esteemed Professor Indra Bir Singh, who received the National Geoscience Award for Excellence (2013) by our honorable President of India, concluded his research experience on rivers of the Ganga Plain by saying "*the river is not polluted; we are. I will not see the Ganga clean in my life time*'. This made me to stop and think as an ordinary man about the present situation. Like many others, neither I nor my professors are happy about the present situation of the Ganga and the planning for its cleaning. The Ganga River is not just a combination of water, sandbars and ghats. It is a natural resource and a key to human and environmental health. It is indispensable to the people as who live within its drainage basin and breathe in its environment. It is presently the obvious indicator of our existing environment which is home to 500 million people. At the same time, the river flows in our mind and resides in our heart as a goddess. Therefore, it is indeed paradoxical to me, and to you as well, that seeing the clean Ganga remains a distant reality. Achieving a clean Ganga is a gargantuan task. In 1986, the Ganga Action Plan, the first cleaning phase, was launched by selecting 25 urban centers located along its banks. It may be successfully considered as an example of timely action of 'political will' for an environmental issue. In 1993, the second phase of the action plan was re-launched which included only four tributaries. In 2009, the government gave the river the status of a National River to ensure abatement of pollution and conservation of the river along the entire basin for proper planning and implementation. However, all these plans were highly centralized with very little coordination with Sate Pollution Control Boards and municipalities. For the last almost thirty years, we have utterly failed in our actions to make any significant impact and the river still flows even more polluted than ever. The river's physical, chemical and biological parameters show that its environment is getting worse with time. Why and where have we miserably failed in understanding the river's problems? What kind of future are we heading towards or wishes for our future generation? Can we justify our act of eroding the Ganga's environment so inequitably? Cleaning the Ganga seems to divide the country on scientific and religious lines. The radical unscientific remarks amount to heresy for most of us and motivated me to write this column. Perhaps none of us of my age will live to see a Ganga clean. The future generation may be lucky enough, if we make an earnest start today. The reasons are not many; but we are unable to comprehend the present real environmental situation, as we are unable to see through our eyes, to feel by our hearts and to understand by our minds. Let us start with the example of the golden rule for clean water: "*As long as there is no bad smell, taste and looks clear, everything is fine with drinking of it*." However, through recent researches, it cannot be applied for arsenic loaded water anymore. Arsenic is 'a silent toxin' and responsible for contamination in drinking water throughout the Bengal delta region. In the same way, we all have to look at all the angles for rectifying the mistakes in our understanding of the present situation.

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## To begin with common characteristics

The Ganga is an international river with national status bestowed in 2009; but not called by name at its source 'Gangotri' and at the terminus 'Ganga Sagar'. About 80 per cent of its drainage basin extends over eleven states in India, the rest in Nepal, Bhutan, China (Tibet) and Bangladesh. The river basin encompasses three geological and geomorphological different sub-divisions of the Indian sub-continent: the geologically young and unstable Himalaya in the north, the geologically old and stable northern Peninsular region in the south and the unconsolidated newly born Ganga Plain in the middle. All sister rivers drain these diversified regions to make the Ganga we know. The basic characteristics of these diversified regions play a central roles in any environmental planning and management, and therefore, cannot be ignored for the Ganga's cleaning program at any stage. The basic point of understanding is that any environmental problem can only be fully solved with international cooperation and basin wise close coordination between the affected states.

## Change from riverbank management to river basin management

Every river has its basin to flow through its environmental components which is characterized as a dynamic system. In this regard the past and present policies of riverbank management that was selection of sites in the name of river cleaning program, did not play any significant role. River Basin Management is not a task that government organizations and water boards can perform on their own. They need the cooperation and support of scientific institutes, non-governmental organizations, business communities, public societies and people's participation. People must be well-informed and aware about the opportunities as well as threats of government actions. The present government is also looking for solutions through riverbank management like *Ghat development* under Integrated Ganga Conservation Mission. It can be a part of beautification, but cannot be the part of comprehensive Ganga cleaning program.

## Sanitation with management

After discussions with my research students, it was distressing to note that our own back and gray waters directly enter the Gomati River. Lucknow city alone, you guessed it, transfers 90 percent of its untreated liquid waste directly to the Gomati- a Ganga River tributary. On festive occasions, we generate about five thousand kg of

solid waste just at one location on Har Ki Pouri ghat (Haridwar). It is nearly six times higher than what we generate during normal days. At Varanasi, more than 200 million liters of greywater along with ashes of more than 200 dead human bodies discharges into the river daily. Thankfully, we are living in the summer monsoon controlled system. If we condensed one year time into 12 minutes, it acts exactly like our flush system that pushes all unwanted material from our residence to the outside drain. Similarly, the monsoon system which accounts for 75% of total rainfall, sweeps our wastes from the river basin to the Bay of Bengal, annually. We, off course including myself, are all good people, but not aware enough to understand and to recognize our role in the present state of affairs. We personally do care for the river to extent of worshipping her as a deity, but socially suffocate her due to age old traditions and skewed religious practices. Our unholy interactions with the rivers are illustrated in the book published by New Delhi's Center for Science and Environment in two volumes 'Excreta Matters'. On the other side, there is no dearth of indigenous technology and suitable expertise is available on this issue. Presently, we neither understand our acts nor are willing to solve the gigantic environmental problem of our everyday droppings.

## Classified hydrological data

Few years back in a summer field trip, I became listless after seeing the completely dry riverbed of the Yamuna at Karnal-Shamli road. There is a clear message behind it. All rivers need their own water from their respective basin to flow normally during the summer season. We have overexploited the water for our irrigation and domestic purposes and that makes the river dry. What is flowing during the summer season in all the rivers are mostly our black and grey waters, not the natural river water. The Ganga along with all its sister rivers is highly seasonal in nature with that fact that half of the river's discharge passes within ten-days during the monsoon season and maximum and minimum discharge varies by a factor of 10 to 100. Hydrological characteristics, therefore, have a significant role in the environmental planning and management. To understand and develop the water resource plans in the Ganga River Basin, hydrological data are still unavailable. There is a strong need to declassify the hydrological data of the Ganga and its sister rivers for their best use in managing the huge water resources available. It is immensely beneficial for all the rivers not only to maintain their environmental flow for cleaning but also to manage flood-related disorders.

## Rainwater harvesting and watershed management

In the entire Ganga River Basin, we are ill-prepared to use the excess rainwater of monsoon season as river water for the non-monsoon seasons. One of the biggest recompenses of our river cleaning program would be taking measures for watershed management for the whole basin. We have the expertise and capability of doing it. Delhi, one of the first cities to introduce rainwater harvesting in 2001, is still struggling to meet its water demand due to improper implementation; and at the same time, Chennai is showing a successful way because of making rainwater harvesting mandatory. In 2007, a study concluded that the groundwater of the Chennai city has gone up by 50 percent due to the fruitful impacts of rainwater harvesting. Each square kilometer of the Ganga River Basin annually receives rainfall amounting to one million cubic meter of water. Only 20 % of it seeps as groundwater, 50 % moves as river's runoff and rest 30 % gets lost through evaporation. Overall watershed management of the whole basin through sub-basin and first-order tributaries will significantly improve the availability of groundwater and surface water by conserving rainwater during the summer and winter monsoons. It will not only place our farmers independent of the mercy of seasonal rains that controls their harvest; but also the Ganga River and its tributaries will then have their discharge above the minimum required environmental flow during the non-monsoon seasons. Proper watershed management will help the Ganga to flow above three meters of water depth in the active river channel. It has a great social impact by providing us an option of vibrant inland water ways at national, state and local levels to connect people across the deep east to the heart of northern India. This will certainly realize the economic potential of 'Namami Gange Project' by the hydrological rejuvenation of sub-basins across the entire Ganga Basin.

## Creating public awareness

In 2014, our greatest achievement in the health sector was that India became free from polio. It is the successful example of coordinations among international, regional, and national public and private organizations along with a striking feature of campaign by celebrities such as Amitabh Bachchan. We similarly need several Amitabh Bachchans for the campaign of Ganga cleaning. Thanks to the movie *Jurassic Park*, we all recognize the existence of dinosaurs in the geological past. But unfortunately, most of us are unable to link ourselves with the environmental issue raised by director and producer Raj Kapoor in his flim 'Ram Teri Ganga Maili'. There is a clear indication of our scientific inaptitude with social insensitivity regarding our understanding related to the present environmental issue. The impact of polluted river in our living environment is an underestimated challenge in the awareness of the general populace. Whatever we might say, there is a visible apathy that exists among us towards the practical aspect of cleaning the Ganga.

## Research

Research on the Ganga River encompasses a wide range of physical, chemical and biological processes that interact and contribute in complex ways to produce a true picture of the Ganga's environment. In this context, the strengthening of river research and water management institutions, university systems and students involvement are vital, as we cannot improve our performance without investment at the ground level. The comprehensive, updated assessment of scientific database and the knowledge acquired can be harnessed to ease the pollution burden and improve the environmental health of the river. The Ganga has been domesticated by us in the name of development. We need a better understanding of all the above doable ideas. What is the overriding concern about the total environment, pollution and cleaning the Ganga? The ordinary and common people have suffered much from their acts; unfortunately have not been able to link their actions due to inability of proper understanding of the basic science involved in their actions. We cannot protect the Ganga River without recognizing the needs and aspirations of our people along with the right to development. At the same time, we cannot have development or needs and aspirations of the people without protecting the Ganga River. Close collaboration, cooperation and coordination among universities, research institutions, management institutions, State and Central governments with their various departments, private and public management groups and,

 

last but not least, people's participation is the need of the hour. The scientific community acts as a creator of knowledge used not only for understanding our problems, but also to find out the solutions. We are presently living in an anthropogenic era, characterized by the strong impact of humans in our living environment. We all must listen to their inner voice in the interest of the Ganga River and more above our future generations. As a teacher, it is my obligation to stimulate and encourage thinking among young students to understand the existing environmental problems. I simply believe that the only hope is to know as much as possible about the river and its interactions with humans. At this movement, I feel petty, because of myself, unable to see the Ganga flowing clean in my lifetime.

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## Conflict of interest

The author declares there is no conflict of interest.