

**LOKSHIKSHAN
FOR
SWACHBHARAT-
NIRMALJAL-
AVIRAL GANGA -**

By

GANGA ALLIANCE
[AREA WATER PARTNERSHIP, Jajmau-Kanpur]

October 2014

EXECUTIVE SUMMARY

The Kanpur has been the focus of maximum attention in last three decades on the issue of pollution to Ganga. The interventions which have been carried out in the past, have failed to achieve the intended results. For the last three years (2011-14) we have been working in Kanpur. Our activities have been more focused in the Jajmau Area of Kanpur- Zone 2 of Kanpur Nagar Nigam, even while we have been raising issues related to all aspects of Ganga pollution in Kanpur. **AWP-Area Water Partnership, Jajmau, Kanpur or Ganga Alliance, is a citizen's forum in Kanpur.** This is intended to be a mechanism whereby all stakeholders can come together on a common platform to find a solution to problems of pollution of Ganga water in Kanpur. Despite our best efforts, it has not been possible for us to get the representation of the government and KNN representatives on this forum, but we are continuing with our efforts. There are some very important lessons in terms of indentifying the problems and understanding the apathy and lack of action, which we aim to address through this **Lok-Shikshan (Education of the Public) methodology.** While this module will be developed further in course of our work this year in Kanpur, under AWP, we intend to propagate it to the Clean Ganga Mission and the newly set up Ganga Rejuvenation Ministry for wider replication across the Ganga basin cities

Chapter one provides the context of the Lokshikshan for Ganga -Rejuvenation and objectives, methodology and target audience for the LokShikshan Program. **Chapter-Two-** gives the basic information about the Ganga River and describes its long journey from Gaumukh to Ganga sagar **Chapter-Three-** gives a brief history of the modern development paradigm and quest for growth which led to destruction of Ganga River, its pollution and damage to its ecology. It dwells on the historical dimensions, economic and political compulsions and technology choices made in that context. The last section provides a brief overview of the global context of river restoration. **Chapter-Four -** we describe the overall status of Ganga Pollution in different cities in India. We also provide brief case studies of specific issues and challenges [for cities of Kanpur, Allahabad, Varanasi, Devprayag and Delhi) for prevention of Pollution to Ganga . We also give a brief overview of governance and techno-managerial challenges which need to be addressed. **Chapter-Five-** provides , some suggestions to explore a new path to overcome the failures of the past and achieve the objectives of the Ganga Rejuvenation and prevention of Ganga pollution. NamamiGange.

THE MAIN MESSAGE IN THIS MODULE : The Objectives of the Lok- Shikshan Program are To inform the participants on all aspects of Ganga River (ecology, geomorphology, history, culture, challenges of restoration and ongoing Government programs); To imbibe and create respect for the Ganga River as an 'organic unity' and for its spiritual and cultural dimensions, so that these considerations can become integral components of our development planning; To develop a healthy analytical and critical attitude and capacity for understanding the results of the past developmental efforts and how to make lateral and innovative thinking to find new solutions, instead of doing more of the same; and To develop a common national vision and mission for the collective and joined up efforts for the rejuvenation of Holy Ganga River.

The Methodology and Target Audience: The following elements of the training strategy are suggested initially, which need to be modified based on feedback loop from the ongoing assessment of the training and communication sessions at different levels: (i) Communication strategy based on Indian Principles of Nav-rassidhnata (of Bharat Muni) (ii) *Emphasis on cognitive understanding and not on behavioural change* , per se; Audience specific and levels of training – (iv) *Interactive and not only didactic*; and (v) *Practical work combined with classroom*..

Table: Suggested audience and levels of Training for Lokshikshan for Ganga Rejuvenation

SN	Audience	Number of days
1	Common People	One day or one half day
2	Students in schools	!-2 hrs session.
3	Students in colleges and universities	2-3 days program
4	Government and NGO functionaries	7 days program combined with field work
5	Top planners and decision makers	1-2 days program away from their location of work
6	Trainers – schools and colleges	1 day program; half day dedicated to training methodology
7	Trainers – government functionaries and planners	3-5 days intensive program including techniques of training and communication needs assessment

Following initial actions are suggested to the Ganga Rejuvenation Ministry and Clean Ganga Mission to make a new beginning(i) Explore the Third Path for Ganga Rejuvenation: Give Up the World Bank mind-set and paradigm for finding the solution. (ii) Lok-Shikshan Prorgam-Educate the people about Ganges, on the lines suggested above. We can perhaps begin by aiming at training faculty of 1000 activists/ academicians politicians/bureaucrats/common citizens who are reasonably well informed on the entire range of issues regarding the Ganga River and have the skills to educate and train others, and undertake communication research to adapt the training curriculum to the needs and results; (iii) Research:the traditional knowledge, beliefs and cultural practices of our people regarding water management and reverential attitude towards water bodies and rivers. (iv) focus on the poorest and most marginalized along the Banks of rivers of Ganga negatively affected by mismanagement of ecosystem of Ganga; (v) **Nirmal Jal-** Revive public hand pumps and piasos'- the free facilities for drinking water in all the public places – ‘to ensure provide free drinking water to the public; Conserve groundwater and treat it as primary source of water supply for the city. On the other hand curb the unsustainable use of ground water (vi) Swach Bharat and National Urban Sanitation Mission in the right way: (vii) Governance - Clarify the primary accountability -Who are the agencies which are responsible: State Government, Central Government, National Green Tribunal, Allahabad High Court & Supreme Court, para-statal organizations and Urban local bodies; Empower Nagar Nigam and Nagar Palika; (viii) Recognize the Rights of the River.

CONTENTS

NO	CHAPTER	PAGE NUMBER
	EXECUTIVE SUMMARY	1-2
	GANGA STOTRAM	04
	FOREWORD	05-06
1	LOK-SHIKSHAN- EXPLORING A NEW PATH FOR THE REJUVENATION OF GANGA	07-12
1.1.	Objectives of the Lok- Shikshan Program	07
1.2.	Methodology and Target Audience	08-09
1.3.	Understanding the ambivalent mindset of the audience :	09-12
2.	GANGA RIVER – ITS SOCIAL AND CULTURAL GEOGRAPHY	13-14
3.0.	HISTORY OF DAMAGE TO ECOSYSTEM OF GANGA	15-22
3.1.	Ganga in Modern Indian History	15-16
3.2.	State of Ganga Today	16-17
3.3.	The Issues regarding damage to the ecosystem of Ganga	17-18
3.4.	Ganga rejuvenation- an Indian perspective	18-19
3.5.	Global Perspective of Ganga rejuvenation	19-22
4	GANGA POLLUTION	23- 43
4.1.	Perspective of CPCB	23-25
4.2.	City Specific Case Studies of Ganga Pollution – Kanpur, Varanasi, Allahabad, Devprayag, Delhi	25-35
4.3.	Challenges of Governance for prevention of Ganga Pollution	35-38
4.4.	Options for Techno-managerial solutions	38-40
4.5.	Swachh Bharat mission(sbm) : october 2014	41-42
4.6.	Issues and options for the Ganga rejuvenation for the consideration of the New Government	42-43
5	NAMAMI GANGE : PUBLIC ACTIONS FOR CLEANING GANGA and GANGA REJUVENATION	44-48

SriGangaStotram This Ganga Stotram, written by Sri Adi Shankaracharya, devotee of Lord Shiva, purifies us and fulfills all our desires Victory

O Goddess Ganga! You are the divine river from heaven, you are the saviour of all the three worlds, you are pure and restless, you adorn Lord Shiva's head. O Mother! may my mind always rest at your lotus feet.

O Mother Bhagirathi! You give happiness to everyone. The significance of your holy waters is sung in the Vedas. I am ignorant and am not capable to comprehend your importance. O Devi! you are full of mercy. Please protect me.

O Devi! Your waters are as sacred as "Charanamriti" of Sri Hari. Your waves are white like snow, moon and pearls. Please wash away all my sins and help me cross this ocean of Samsara.

O Mother! those who partake of your pure waters, definitely attain the highest state. O Mother Ganga! Yama, the Lord of death cannot harm your devotees.

O Jahnavi! your waters flowing through the Himalayas make you even more beautiful. You are Bhisma's mother and sage Jahnu's daughter. You are a saviour of the people fallen from their path, and so you are revered in all three worlds.

O Mother! You fulfill all the desires of the ones devoted to you. Those who bow down to you do not have to grieve. O Ganga! You are restless to merge with the ocean, just like a young lady anxious to meet her beloved.

O Mother! those who bathe in your waters do not have to take birth again. O Jahnavi! You are held in the highest esteem. You destroy your devotee's sins and save them from hell.

O Jahnavi! You are full of compassion. You purify your devotees with your holy waters. Your feet are adorned with the gems of Indra's crown. Those whose seek refuge in you are blessed with happiness.

O Bhagavati! Take away my diseases, sorrows, difficulties, sins and wrong attitudes. You are the essence of the three worlds and you are like a necklace around the Earth. O Devi! You alone are my refuge in this Samsara.

O Ganga! those whose seek happiness worship you. You are the source of happiness for Alkapuri and source of eternal bliss. Those whose reside on your banks are as privileged as those living in Vaikunta.

O Devi! It is better to live in your waters as a turtle or fish, or live on your banks as a poor "candal" rather than to live away from you as a wealthy king.

O Goddess of Universe! You purify us. O daughter of muni Jahnu! one who recites this Ganga Stotram every day, definitely achieves success.

*Those who have devotion for Mother Ganga, always get happiness and they attain liberation. This beautiful and lyrical Ganga stuti is a source of Supreme bliss.
to Ganga! Victory to Shiva! Victory to Ganga! Victory to Shiva!*

FOREWORD

Why This Training Module

GANGA ALLIANCE- - AREA WATER PARTNERSHIP –JAJMAU- had been formed in Kanpur by the civil society organizations in the year 2011, as an offshoot of the ongoing save Ganga movements of various shades in the country at that time. While the Ganga movement was raising its pet slogan of aviral Ganga and nirmal Ganga, the emphasis was to give primacy to the demand for aviral Ganga, and it was assumed to some extent that once the aviral Ganga demand was achieved, the nirmal Ganga also, will become possible. However, some of us, at that time thought that the issue of **nirmal Ganga, or** Ganga River Pollution needed more attention than it was getting from civil society organizations. We agreed with the basic premise of the save Ganga movement on the primacy of aviral Ganga. The interventions required for aviral Ganga were not really in the purview of the newly set up NGRBA, and this was causing a disjuncture between the civil society representatives and government representatives in NGRBA and not leading to any fruitful results in terms of a clear policy and program consensus, across the spectrum of varied stakeholders. We also thought that the mandate given to NGRBA was more focused on prevention of Ganga pollution issues. The actions of the government were not being sufficiently scrutinized by the civil society organizations collectively, and the government was not being taken to task on its failure to achieve any results even on the actions that it had prioritized to save Ganga. Therefore, we decided to engage on the pollution issues of Ganga. Since the Kanpur city was home to tannery industry. The Kanpur City had acquired the ill-reputation for being location where Ganga river was most polluted, partly due to alleged pollution caused to Ganga water by the Tanneries. Therefore we thought that a process of bringing multiple stakeholders together on the platform of AWP will pave the way of some informed action on the ground and will provide useful lessons for the saving the Ganga, as a whole. This was the beginning of our very small and modest effort in the form of AWP, Jajmau, Kanpur.

AWP: The pollution to Ganga in Kanpur has drawn maximum attention in last two decades. However, the interventions which have been carried out, have failed to achieve the intended results. For the last three years (2011-14) we have been working in Kanpur. Our activities have been more focused in the Jajmau Area of Kanpur- Zone 2 of Kanpur Nagar Nigam, even while we have been raising issues related to all aspects of Ganga pollution in Kanpur. AWP Jajmau, for the time being, is a citizen's forum in Kanpur. This is intended to be a mechanism whereby all stakeholders can come together on a common platform to find a solution to problems of pollution of Ganga water in Kanpur. ***We must state very frankly that in terms of a project, we could not achieve a positive action on the ground, which we had hoped to achieve. Despite our best efforts, it has not been possible for us to get the representation***

of the government and KNN representatives on this forum, but we are continuing with our efforts. However, there are some very important lessons in terms of indentifying the problems and understanding the apathy and lack of action which we aim to address through this lok-sjikshan methodology.

One of the reason for this lack of interest on the part of various government and Urban local body officials, in our understanding is due to their ingrained apathy towards the health of the river. The river as an entity in itself, deserving attention in its own right, as a dimension of our urban, rural or basin planning, has almost been totally absent from the consciousness of our administrators, and political masters in the last six decade. Therefore the issues of river protection have never been discussed and debated in the official circles. Hence it is important that this important dimension is restated and reestablished in our national consciousness.

Now, with the coming of power of the NDA Government in the Centre, the prevention of Ganga pollution and Ganga rejuvenation issue is expected to get more serious national attention. The PM has made a personal promise for this to the entire nation and more so for the city of Varanasi, which he represents as a M.P. in the Parliament. A new Ministry has been set up for the first time for Rivers rejuvenation and **Ganga Rejuvenation** and Clean Ganga Mission – NamamiGange has been placed under this Ministry. A **Ganga University** is planned to be established to train the scientists and technologists in Ganga science. A Fresh initiative has been taken -**Swachh Bharat Abhiyan (SBA)** and a National Urban Sanitation Mission has been launched on 2nd October, 2014. **In this context, the program of lokshikshan becomes very important.**

While a lot of documentation has been produced on this issue in last two decades and a half, there is very little that is available to an average person or practitioner. Therefore it was felt by us, that we need to develop a curriculum and a training module which can be used for educating the common people, the students and government functionaries on the importance of Ganga river, the various facets of *Aviral Ganga and Nimal Ganga*, the history of the crisis of Ganga and challenges of Ganga Rejuvenation and options for finding various administrative and technical solutions. We feel that such an education program will help to raise awareness and bring greater seriousness in various stakeholders to take up the issue in a joined-up and integrated manner. The present work is a first draft in this exercise. A Hindi version of the same will follow very soon.

While this module will be developed further in course of our work this year in Kanpur, under AWP, we intend to propagate it to the Clean Ganga Mission and the newly set up Ganga Rejuvenation Ministry for wider replication across the Ganga basin cities. The change of ways of working for Ganga Rejuvenation cannot be limited to one city and a unified methodology and approach is required across the spectrum. We do hope that this module will be able to make its humble contribution in this noble quest.

[The AWP acknowledges receipt of small grants from India water Partnership, SPWD and (Global Greens during the last three years, in support of its activities)]. .

October -2, 2014

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(ED, SPWD)

CHAPTER -1

Lok-Shikshan- Exploring a new path for the rejuvenation of Ganga

This chapter provides the context of the Lokshikshan for Ganga -Rejuvenation and objectives, methodology and target audience for the LokShikshan Program

The challenges of Ganga Rejuvenation are three fold- (i) Technical - the necessity of working simultaneously on the *Aviral and Nirmal issues*; (ii) Understanding – a deep sense of self-critical reflection that the present state of Ganga is due to development paradigm of the last 150 years and a quest for exploring a third path (iii) a will for joined up working between different levels and tiers of the government and with the Government –citizen participation to plan and implement solutions which can yield the desired results.

In order to achieve this, we need a detailed course curriculum and training methodology to bring everyone on a common denominator. The history of the past 40 years of ganga rejuvenation efforts has been by the civil society to criticize the government and the government to announce new interventions which are of the same kind which failed in the past. As a nation, we need to come out of this abyss and explore a new path, in the great *samanvaywadit* tradition of our philosophical systems.

The present module is a humble attempt to put this agenda on the national table, in the context of the renewed commitment of the Central Government and Supreme court, High Courts and National Green Tribunals to pursue a concerted course of action for Ganga Rejuvenation in the country.

1.1.. Objectives of the Lok- Shikshan Program

- To inform the participants on all aspects of Ganga River (ecology, geomorphology, history, culture, challenges of restoration and ongoing Government programs)
- To imbibe and create respect for the Ganga River as an 'organic unity' and for its spiritual and cultural dimensions, so that these considerations can become integral components of our development planning
- To develop a healthy analytical and critical attitude and capacity for understanding the results of the past developmental efforts and how to make lateral and innovative thinking to find new solutions, instead of doing more of the same.
- To develop a common national vision and mission for the collective and joined up efforts for the rejuvenation of Holy Ganga River.

1.2. Methodology and Target Audience

The following elements of the training strategy are suggested initially, which need to be modified based on feedback loop from the ongoing assessment of the training and communication sessions at different levels:

- i. **Communication strategy based on Indian Principles of Nav-rassidhnata(of Bharat Muni) :** The human motivation is linked to many different bhavas within our manas. In order for us to make right effort, the link to these bhavas or rasas.. One of these navrasas is bhakti ras. It is well known that the Indians have highest devotion to Ganga as teerth and purity of water on religious principles. These elements of our collective manas have not been tapped for mobilizing the nation in collective effort to clean and rejuvenate Ganga in a methodical way. One of the important element of this training curriculum is to resurrect this vital force in our collective consciousness to induce people to work for Ganga rejuvenation.
- ii. **Emphasis on cognitive understanding and not on behavioural change-** The ongoing communication programs in different projects of Government of India and International donor development agencies have access to huge amount of financial resources and trained human resources having expertise in behavioral change communication. However, without exception, these programs have failed to achieve the desired results. We need a fresh approach which is aimed to develop a correct knowledge and collective self-critical approach amongst the varied stakeholders, so that they can arrive at a shared understanding of the problem and an implementation plan with joined up commitment. Such an approach is lacking at present.
- iii. **Audience specific and levels of training –** A general audience of schools students or community members may require just half a day orientation. The more active and interested persons amongst them can be provided 203 days training program. The academics and the practitioners may require a week long course to become familiar with all aspects of the challenge and get a deeper understanding of the issues, which they can use to reflect on their theoretical and practical challenges and come up within fresh insights and solutions.
- iv. **Interactive and not only didactic:** The curriculum has been suggested merely as an aid in stimulating discussion around these points and should not be used as a kind of lecture design to be delivered in one sided manner to the audience. Even when it is half a day program, the participants can be encouraged to divide in groups and have short group discussion among themselves after initial short lecture. The presentation made by the group lead members can be followed by more detailed discussion on the issue. There are other participatory techniques which can be taught in ongoing faculty training programs.
- v. **Practical work combined with classroom:** The trainer should encourage the participants to undertake some rapid practical tasks like visit to a river or any other water body to make observations on its health or a short interaction with local people to understand their views and perceptions on the health of the water body, level of pollution and causes of pollution and possible solutions.

Table: Suggested audience and levels of Training for Lokshikshan for Ganga Rejuvenation

SN	Audience	Type of training	Number of days
1	Common People	Lecture for education	One day or one half day
2	Students in schools	Lecture for education	!-2 hrs session.
3	Students in colleges and universities	Learning program – certificate course	2-3 days program
4	Government and NGO functionaries	Learning programs with certificates	7 days program combined with field work
5	Top planners and decision makers	Sessions dedicated to experience sharing and reflections	1-2 days program away from their location of work
6	Trainers – schools and colleges	Training of Trainers	1 day program with half day dedicated to training methodology
7	Trainers – government functionaries and planners	Training of Trainers	3-5 days intensive program including techniques of training and communication needs assessment

1.3. Understanding the ambivalent mindset of the audience :

A systematic process of communication and training needs assessment needs to be undertaken before embarking on the program of designing a training and communication strategy and a course curriculum. Such a process has recently been commissioned jointly by the Clean Ganga Mission and the World Bank to a Howard educated consultancy company based in India and a communication plan is being worked out, based on their research in the communication and training needs of a wide section of stakeholders in Ganga Basin. This needs a review, by the New Government in Centre and the New Ministry of Ganga rejuvenation.

The experience and knowledge of our small group is based on our engagement on this issue for the last forty years in different capacities in the grass root, academia, spiritual exploration and national and international agencies. (The details of this experience are given in the annex). We are very much humbled by the failure of ours, as national to effectively intervene in the processes of protecting and rejuvenating Ganga river. Our very small and focused effort in Kanpur, as AWP has also been able to take off the ground. We would like to forthrightly share here the ambivalent mindset of the nation, as per our understanding, so that this curriculum is well informed by this challenge and able to contribute to some lateral and innovative thinking to take us out of this abyss.

(a) Ganga Water: a Teerth

Holy water has been used in religious rites by the Hindus, Buddhists, Jains, Christians, Muslims and other religions since ancient times. The Hindus believe that water of the Ganga provides moksha or salvation. The Ganga Dashahara brings throngs of bathers to the riverfront in Hardwar and all Tirthas on the dashmi of the waxing moon fortnight of the lunar month of Jyeshtha. A dip on this day in the Ganges is said to rid the bather of ten sins. The photograph at ManikarnaGhat at Varanasi has the following caption, " Who dies in the water of Ganges obtains heaven". Since Ganga had descended from heaven to earth, she is also the vehicle of ascent from earth to heaven. Consequently Ganga is considered to be a Tirtha, crossing point for all living beings as well as dead irrespective of the world in which their soul is located at present.

(b) The River and the humans

The river is not only outside us but 'within' us also. The river is not only on the surface, it is underground, in the clouds and perhaps in the galaxy too. The merging of the river in the sea, formation of fresh water streams around the coastal areas, its relationship with Indian monsoon, all these phenomenon form an integral whole. The human interventions affect these in more than one way, whether we understand it or not, perhaps we do not. Man, as part of nature, needs to understand this and act accordingly despite the apparent dissociation due to the use of technology that can modify nature on an unprecedented scale. Man has therefore to evolve further to perform the role of protector of the nature that gives man life . Unfortunately, our recent history is a pointer in the opposite direction. In a recent conference in Delhi, called as India River week, it has been recognized that our planning processes have failed to give cognizance to river as an entity, at all, which is so surprising. This has been one of the important reason that we have tended to destroy our rivers, as for our modern minds, in our quest for national development and growth, the river as an entity which required consideration in its own right did not exist at all. In our quest for getting more golden eggs, we ended up killing the goose. When we try to understand Ganges, we have to keep all these aspects in view.

The Goose That Laid the Golden Egg: an Aesop Fable

A man and his wife owned a very special goose. Every day the goose would lay a golden egg, which made the couple very rich. "Just think," said the man's wife, "If we could have all the golden eggs that are inside the goose, we could be richer much faster." "You're right," said her husband, "We wouldn't have to wait for the goose to lay her egg every day." So, the couple killed the goose and cut her open, only to find that she was just like every other goose. She had no golden eggs inside of her at all, and they had no more golden eggs.

© Ganga River in Crisis and Modern Industrial civilization

The Ganges water is important not only for the land through which it is flowing but also for the Sea in which it merges. What happens to the water that reaches the Sea in Bay of Bengal relates to many phenomenon which we may or may not see as well. The drainage of the river water into Sea, the water bodies and forest cover contributing to the moisture regime in the atmosphere over the Indian subcontinent, these various elements related to the climate affect the entire Ganga basin. The relationship of these elements to Indian monsoon has been largely

ignored in the current discourse over the water policies, river policies, climate change and saving the river Ganges. The adoption of the food and cropping patterns not useful to the climate of this country are causing an agrarian crisis, water crisis and health crisis all over the Ganges basin. As a basin spanning 60% of India, its ramifications are immense. We need to reflect on all these dimensions if we are serious about saving the river. The rivers have changed course and directions countless times in their history. It may be fascinating to study that. The same must have been the story of Ganga river through the ages.

In recent times, in the past 200 years,beginning with entry of the East India Company Armies in Delhi in the year 1803 and the initiation of the Imperial Canal building enterprise in India, the very existence of Ganga river has come into crisis due to the acts of humans. We need to understand the processes that led to this tragic state of affairs. All us are party to destruction of the river. We need to change our 'journey' of the last 200 years, if want to save the Ganges. The demand for more hydro-power and electricity, more water for domestic and industrial use, the modern large scale enterprise of mixing of human excreta with water, all these are all our own sins. This has led to the current crisis of Gangetic River Systems. The crisis is further compounded for the posterity by our failure to educate and engage the younger generation on the very basics issues of the Ganges River systems in india.

(d)...The Teertha and Tourism in Modern Life

The teertha and tourism in Modern 'Hindu' Nationalism have got mixed up with commoditization and monetization of life. Today, it has become difficult to separate out the reverence for Ganga from the various market mechanism and other demands of the modern life and polity that surrounds the expressions of that reverence in national life. The two sets of processes have intricately intermingled with each other. Mindless expansion of roads has been undertaken in Himalayas for the needs of the national defense as well as for boosting the tourism. As a result, millions of people are seen crowding and thronging to various pilgrimage sites like Kedarnath and badrinath and KumbhaMela at Hardwar, Allahabad and other teeerthas. The agencies of the State have been facilitating these movements, respecting the religious sentiments of the people, rather than controlling and preventing excessive crowds to protect the ecology of the river and Himalayas. Often the argument has been promoted loudly, even from Ganga-bhaktas, promoting tourism in Utrakhand and other religious places may enable the state and local to earn more revenue. This may greatly outweigh the potential revenue earning from hydro-power projects on the tributaries of Ganga in Himalayas and hence the promotion of tourism may be a savior for Ganga. Another set of Ganga-Bhakt have tried to make a case for sparing Ganga from Hydro-power projects, but the same can be done on other rivers in the country. The implications of these options and arguments have never been debated seriously in any public forums in the country. .

(e) Modern Culture and aesthetics and maintainingswachta and purity of water

The modern aesthetics has no resonance with this sacred attitude towards Ganges and its purity of water. There is total apathy towards maintaining this purity; This apathy may be

reflected in following practices which are harmful for the purity of the Ganga water, by almost everyone in India, irrespective of their religion:

- Use of detergents for cleaning clothes
- Use of chemical dyes to make clothes colorful
- Drainage of untreated human excreta into the river; *some may even claim that mother river has the capacity to absorb the human excreta and purify it.*
- Throwing all kind of garbage into streams and river, even in temple towns. People shed their old clothes and other personal belongings in Ganga water, assuming that their personal sins are attached to these belongings and so they cannot carry these things back.
- Use of leather –shoes and other accessories for smartness
- Willingness to mix excreta with water purely for our convenience;
- Other issues related to health/healthyfoods/agriculture/lifestyles –Crisis of Life Style diseases –diabetes, hypertension, metabolic disorder, cancers

(f) Need for new spirituality

There are moments in the history of nations when we need to pause and reflect and go back to the basic tenets of our endeavors, the departure points of our journey and locate the mistake there. . The Ganga activists need to realize that more than anybody else. We as a nation need a change in our developmental paradigm, social transformation and transformation in governance, if we are serious about saving the Holy River Ganges. The pristine beauty, the purity of water and the bounty of the river is in the end our own self reflection- to refer to the famous advait philosophy of india.

Chapter -2

Ganga River – its social and cultural Geography

This chapter gives the basic information about the Ganga River and describes its long journey from Gaumukh to Ganga sagar

GANGA RIVER : A BRIEF INTRODUCTION

Ganga river stretches from Himalayas to Gangasagar in the length of 2615 km. The “Ganges” originates in the Himalaya after the confluence of the six rivers: The Alaknanda meets the Dhauliganga at Vishnuprayag, the Nandakini at Nandprayag, the Pindar at Karnaprayag, the Mandakini at Rudraprayag, and finally the Bhagirathi at Devprayag(after which point the river is known as Ganges) in the State of Uttrakhand. The Bhagirathi is considered as source stream; it originates at the Gangotri Glacier, at an elevation of 7756m. The streams are fed by melting snow and ice from glaciers including glaciers from peaks such as Nanda Devi and Kamet.

The IITs in its description has divided ganga into following three segments:

- Upper Ganga – Gaumukh to Hardwar – 294 km
- Middle Ganga- Hardwar to Varanasi -1082 km
- Lower Ganga –Varanasi to Gangasagar- 1134 km.

However all the five major river streams in Uttrakhand are considered part of the Ganges Systems. Hence, It may be useful to divide the river into **four stretches** for its proper understanding –

- (i) Bhagirathi and Alaknanda with their tributaries merging to form Ganga at Devprayag,
- (ii) from Devprayag to Bijnore barrage;
- (iii) Bijnore Barrage to Varansi; and
- (iv) Varanasi to Gangasagar.

- **The first and second stretch** had relatively pure water until now in the five Ganges in Uttrakhand, but the planned new dams on these rivers may destroy the entire Ganges river system in UttrakhandHimalyas. This includes the so called run of the river (ROR) dams and the run of the river dams with ponding (RORP).
- **The Third stretch** is joined by tributaries like Yamuna, Ramganga and Kali. This stretch is particularly under stress of industrial, sewerage and agricultural pollution.
- **The fourth stretch** is joined by tributaries like Ghagra, Gandak, Bagmati and Koshi. This stretch faces the problems of repeated floods and related disaster

After travelling 200 km through Himalayas, The Ganges emerges at the pilgrimage town of Hardwar in the Sivalik Hills. At Hardwar, a dam diverts some of the waters into the Upper Ganga canal, which links the Ganges with its main tributary, the Yamuna. The Ganges, whose course has been roughly southwestern until this point, now begins to flow south east through the plains of North India.

Further the river follows an 800 km long curving course passing through the city of Kanpur before being joined from the south west by the Yamuna at Allahabad. This point is known as Sangam at Allahabad. Sangam is a sacred place in Hinduism. According to ancient Hindu texts, at one time a third river, the Saraswati met the other two rivers at this point.

Joined by numerous rivers such as Kosi, Son, Gandaki and Ghagra, the Ganges forms a formidable current in the stretch between Allahabad and Malda in West Bengal. On its way, it passes the towns of Mirzapur, Varanasi, Patna and Bhagalpur. At Bhagalpur the river meanders past the Rajmahal Hills, and begins to run south. At Pakur, the river begins its attrition with branching away from its first tributary, the Bhagirathi-Hooghly, which goes on to form Hooghly River. Near the border with Bangladesh the Farakka Barrage, built in 1974 controls the flow of the Ganges, diverting some of the water into a feeder canal linking the Hooghly to keep it relatively silt-free.

After entering Bangladesh, the main branch of the river is known as Padma River until it is joined by Jamuna River the largest tributary of the Brahmaputra. Further downstream, The Ganges is fed by Meghna River, the second largest tributary of Brahmaputra, and takes on the Meghna's name as it enters the Meghna Estuary. Fanning into the 350 km wide Ganges Delta, it finally empties into Bay of Bengal.

Chapter -3

History of damage to Ganga ecosystem

This chapter gives a brief history of development paradigm and quest for growth which led to destruction of Ganga River, its pollution and damage to its ecology. It dwells on the historical dimensions, economic and political compulsions and technology choices made in that context. The last section provides a brief overview of the global context of river restoration.

3.1. Ganga in Modern Indian History

The process of damage to the Ganga river system in Modern India was initiated in the 18th century itself with the advent of the British. In 1842, the famous Upper Ganga canal was constructed by the British Engineer Col. *Probe Cautley*, ostensibly to prevent famines in the area. At around the same time, the British started the process of destruction of Himalayas and started engaging in commercial forestry by planting pine trees which caused irreparable damage to the Himalayan ecology.

Also in British India, there was a school of thought which was in favor of using Ganges as a major means of transport and trade. This school was defeated and preference was given to railways. This was another major water shed in the process of destruction of Ganges. A river that had steamers flowing in it in Patna, today has ankle deep water.

In 1916 when the diversion canal around Hardwar was being made, Mahamana Madan Mohan Malviya Ji led a major agitation against the British and obtained promise from the colonial government of India that no further damage will be done to the flow of the Ganges in its entire course. However the Government of Independent India did not keep the promise and embarked on mind boggling course of further destruction of the Ganges River systems including its tributaries: Some of the major acts of destruction are following:

A large number of interventions have led to the destruction of the river are in the last 200 years: the destruction of the forests and its impact on river streams and local climate; the obstruction to the flow of the river due to large dams and barrages in its entire course; the diversion of river water in the canal systems; the over extraction of the underground water; destruction of the ponds and other water bodies; and encroachment over the river lands and flood plains.

Some of the specific major acts of destruction of the river Ganges may be recounted as following:

The direct damage to the main stem of the river:

- i. The story begins with construction of upper ganga canal by the British Engineer Colonel [ProbyCautley](#), between 1842-54. Further diversion of water through upper ganga canal systems has been done by doubling its capacity in the post Independence India;
- ii. Construction of Farakka Barrage
- iii. Construction of Tehri dam
- iv. Over extraction of ground water all along the river for agriculture purpose

Indirect damage to the river due to damage to its tributaries and smaller streams:

- v. Diversion of water in Western Yamuna canal, by the barrage at Tejawala in Yamuna Nagar . This diversion was further enhanced by construction of new barrage a HathiniKund in 1980
- vi. Construction of a series of new dams- already constructed and planned, in all the five 'Ganges' in Utrakhand
- vii. Construction of Kosi Barrage in 1960 and straitjacketing all the major rivers of Bihar causing immense damage to North Bihar;
- viii. Construction of Farrakka Barrage at Rajmahal in 1971
- ix. Destruction of Forests and plantation of commercial species for Timber in Himalayas by the British and continuation of these acts in post-independence India.
- x. Use of all the major tributaries of Ganges – in the middle Ganges – Yamuna, Kali, Ramganga and others- as dirty water drains

By the time we entered onto a new chapter in our recent history of destruction of our river systems after adoption of the new liberal economic policies in 1980s, to hide the truth, GAP-1 was launched in 1986, to clean the river Ganges. This was a complete failure but success from the governance point of view, as people's attention got diverted to the false issues and in the backyard the river systems were destroyed one by one. We need to be aware that what real game is played in the garb of NGRBA today and what are the real intentions of World Bank for making its investments in the Ganga river and for GOI to accept it.

3.2. The State of Ganga today

The maximum part of the flow of Ganga is instantaneously diverted in the western/Upper Ganga canal at Hardwar and following that in other places in her onward journey towards the sea. The width of the flow has become drastically reduced. The depth and velocity are reduced. The river thus is drying day by day. But the pollutant load is increasing. Many species of aquatic life, the real stakeholders have disappeared. The phreatic line slope has increased. The seepage velocity has increased due to differences in ground water level and level of the river, known as free seepage height. This is causing more subsidence of the land. The bank erosion and damage to villages and towns situated on the river bank have increased during floods. The Ganga thus is losing her depth and width relationship. It needs to be protected. *–[ref: U.K. Choudhary]*

The combined effect of low flow and discharge of polluting effluents into the Ganga has caused severe deterioration in the quality of water in the river. The following synoptic statements bear out the sad condition of the river(Ref: Paritosh C Tyagi):

- i. Of the total length of 2525 kms, barely 371 km is fit for bathing throughout the year.
- ii. This perennial snow-fed river is dry or nearly so downstream of lift irrigation projects and the various dams and barrages constructed on it.
- iii. Snow melt is threatened by climate change. Gangotri Glacier is receding; it may vanish in 2030 according to a UN report.
- iv. River fronts are severely degraded by insanitation, dumping of wastes and encroachments-even by philanthropic bodies.
- v. Several episodes of 'Ganga on Fire' have occurred due to industrial effluents causing fire accidentally.
- vi. Ganga Action Plan Phase 1 and phase -2 have not been able to clean Ganga to expected level, i.e. make it fit for bathing.
- vii. The Ganges dolphin is was near extinction before Ganga Action Plan and is still critically threatened.

3.3. The Issues regarding damage to the ecosystem of Ganga

The justifications that have been given to intervene in the river in the name of economic good and human interests – for example –canal making for surface irrigation, making reservoirs for flood control or for augmenting lean season flows; for dam building for making hydro-power and for using river as waste water drain – all these interventions are open to debate. The modern trained robotic educated mind makes interventions based on assumptions grounded in an arrogant attitude and with surety of authoritarian power at its command. The pragraaapradh or hubris committed with its available science and technology is leading to the disastrous consequences- but these are not sufficient to dissuade it from the harakari..

- **Aviraldhara-uninterrupted flow of the Ganges:** Almost 100% educated believe that river water should not be allowed to wastefully flow into sea, but should be harnessed for making reservoirs and embankments for flood protection, harnessing hydroelectric power, canals for irrigation and for domestic and industrial usage. There is some understanding today on deleterious effects on river ecology if the flow is obstructed or channelized, but this is yet to be taken into cognizance by the mainstream hydrocracy. Those who are raising the aviral as a slogan should avoid the deception of language and should not use it as synonymous with ecological flows or minimum ecological flows. We need to clearly recognize as a nation that with Tehri Dam and other dams and Farakka Barrage and many other barrages and embankments in place, the aviral flow cannot be restored. At same time the everyone needs to be educated on the deleterious consequences on the river ecology of the dam building enterprise.
- **Dam building in Himalayas and other rivers:** The world commission on dams in late nineties had taken a neutral and middle of the stool stand on dam building. It has opined that other options should be explored before the dam building option is undertaken. One

result at that time was the withdrawal of funding by the world bank for Narmada project. However in recent years, the World Bank has surreptitiously revised its stand and issued a new guidelines which are openly propagating the dam building on rivers. The Government of India is carrying on large scale enterprise of dam building in Sikkim, Bhutan, North East and Uttarakhand. In almost all of these cases, the local populations have to sacrifice the destruction of their natural resources while all the benefits accrue to the needs of cities hundreds of miles away. It is a myth to consider the common people of Uttarakhand are in favor of dam building. In fact the state of Uttarakhand is seeing large scale migration today of its population, this was an issue on which the movement for Uttarakhand was built. Hence we need to build a comprehensive consensus against this option. All so called development enterprise should be shown first of relevant to the local context and people.

- **The agriculture in the Indo-Gangetic plains - the case of canal systems and overexploitation of Underground water** There seems to be some consensus that we need to conserve water in agriculture. The canal building programs have failed to yield dividend and farmers are largely dependent on exploitation of ground water. The water tables are going down fast. Traditionally the farmers in Indo-gangetic plains have used floods as a means of irrigation and increasing the fertility of the soil. These systems were destroyed under the colonial enterprise. The new systems have come under crisis only in last sixty years.
- **Flood catastrophes in North Bihar** :The entire way of life of North Bihar has been destroyed by the embankment building enterprise on Koshi, Bagmati and Gandak in last fifty years resulting in large scale environmental disasters.
- **Climate Change**:The issue of destruction of Ganges system is totally absent from the debate on climate crisis and climate change. The Indian monsoon, the role of fresh water stream along the Indian Coastal line and its impact on Indian Monsoon and the other regional dimensions of Climate change are not even considered in the climate change debate. There is a lack of *Ecological awareness resulting in* Maximum and mindless exploitation of mother earth. Even a good sense of restraining counterproductive exploitation is lost – e.g. endless hydro-electric projects; commercial forestry replacing the natural habitat;. *The new catchword of Integrated water resources Management (IWRM) also treats* River a resource to be pragmatically managed in an ‘integral’ manner . It assumes that We can direct the water, as per our will. *Central to all this malaise is pragyaaprath – misusing knowledge as* An incentive to earn more money and more bodily pleasure.

3.4. Ganga rejuvenation- an Indian perspective – [Ref: Inner Voice of Bharat Research Team]

Development of Energy slavery in India:What and where the things go wrong. And what is the solution? Many Indians are too often criticized as very superstitious in following strictly traditional life of excessive cleaning of themselves, even to cook daily food in terms of their acharas or vyavahars even today. But from the beginning of independence, an irreversible trend started.

- In the name of development , we resorted to unprecedented industrialization which was necessary for a newly born nation. But what got created was unprecedented industrial pollutants which were left in the air and rivers without treatment.

- Second in the name of agriculture development we started resorting to the usage of unprecedented chemical and industrial fertilizers which ultimately ended in our water streams, water bodies and rivers polluting the pristine rivers, that are source of live saving water, commerce and backbone of transportation of ancient India.
- Third, an unprecedented rush to build dams in the name of modern temples was unleashed on India when at that time and even today every western nations is de-damming themselves to allow uninterrupted flow of their rivers. This damming is going to disrupt the surface moisture distribution on the earth and results in disruption of the already scarce monsoon rains which will pave way for another round of water scarcity and abandoning agriculture. This creates demand for more dams.
- This created large stretches of river bed exposed without water thus paving the way for these river beds to become the grounds for dumping every waste that is generated in the name of modernization along the stretch of rivers.
- Another dimension is the dependency on petrol. For a long time, it was cow dung and cows that were central to energy/transportation/economic model of oriental countries but it was replaced by oil [petrol and diesel] as central to economic engine since independence. In the agrarian sector for long, the energy requirements are based on the concept of one man's waste is another man's resource. This belief set a trend of massive natural community recycling each doing his role. With the replacement of oil as central economic engine we created another round of massive pollutants being created and released in already scarce water bodies without any supervision.
- With rivers vanishing, agriculture lands vanishing, associated cattle production vanishing, the space thus created by these receding systems were filled with the filth of unprecedented kind causing unprecedented damage to environment and public health.
- India's cattle wealth and energy needs: India is having the largest cattle population in the world. The electricity generation potential from Indian Cattle is calculated by IIT Delhi. We can generate electricity or create fuel grade methane using cattle alone to supply for the entire South Asia probably free of cost for next thousands of years without depending on other fossil fuel or nuclear energy. And surprisingly, the cost of this energy generation is cheaper than solar energy and nuclear energy cost. Unlike solar that cannot work during cloudy season or when sun is not there in the night, the CBG works 24X7 in generation of electricity or auto fuel or for cooking gas, if professionally run like industry. And this way we can do away with all wastes created by any sources as all that will turn up in huge plants generating energy. We can relieve not only Ganga, but all rivers from effluents and make them clean and continuous (aviral and nirmal). We can do away with disastrous damming of rivers and its impact on environment and ecology of India.

3.5. Global Context of River Rejuvenation

A Successful Push to Restore Europe's Long-Abused Rivers

From Britain to the Czech Republic, European nations have been restoring rivers to their natural state — taking down dams, removing levees, and reviving floodplains. For a continent that long viewed rivers as little more than shipping canals and sewers, it is a striking change.
byfredpearce

From the industrial cities of Britain to the forests of Sweden, from the plains of Spain to the shores of the Black Sea, Europe is restoring its rivers to their natural glory. The most densely populated continent on earth is finding space for nature to return along its river banks. The restoration is not perfect. River floodplains cannot be fully restored when they contain cities,

and hydroelectric dams are still needed. But The political imperative is strong, with the 2000 European Union's Water Framework Directive requiring that all rivers be returned to a "good status" by 2015. The phrase is not defined, but the idea is that rivers should no longer be used as industrial sewers or as canalized and concreted shipping lanes. The change has been dramatic. While water engineers in Europe have been cleansing rivers of pollution for half a century, they now are trying to restore them to something like their natural state.

Britain, for instance, has promised to restore some 1,500 kilometers of rivers. It has 2,700 projects in its National River Restoration Inventory, 1,500 of them already completed. One of Spain's largest rivers, the Duero,

Some of the most dramatic environmental battles in Europe have been over water engineering projects.is being cleared of dams and other man-made obstacles. On France's longest river, the Loire, where two decades ago activists from all over Europe successfully battled to prevent construction of the Serre de la Fare dam near Le Puy, engineers are now tearing down existing dams, such as the Maisons-Rouges. Denmark's largest river, the Skjern, is getting back some of the marshlands at its mouth, after meanders were reinstated and artificial banks lowered to allow seasonal flooding of arable fields that have now been returned to grass meadows.

For too long, engineers have seen rivers as little more than navigation routes, and pipes to supply water, remove waste, and rush floodwaters to the ocean. Nature was an inconvenience that had to be tamed. But if you pick a fight with nature, you usually lose, as flood engineers from the Mississippi to the Rhine and Danube have learned.

During floods on the Rhine in 1995, levees failed and large parts of the Netherlands at the river's mouth flooded. The country decided that confronting rivers did not work because, however high you raise the levees, a river in flood will find the weakest spot and burst through. It began instead to set aside land for flooding — to "make room for the river."

That realization, combined with a growing anti-dam movement, has caused big changes in how engineers considered rivers.

Some of the most dramatic environmental battles in Europe have been over water engineering projects, most notably on the Danube. Back in the 1980s, the Soviet-inspired Gabčíkovo-Nagymaros project — aimed at improving navigation, preventing flooding, and generating hydropower for Czechoslovakia and Hungary — helped end the Cold War. Massive opposition in Hungary to the Nagymaros dam on a much loved bend in the Danube near Budapest helped cause an upwelling of more general political opposition that eventually brought down the communist government in 1989.

The Danube, which runs west to east, from Germany's Black Forest to its delta on the Black Sea, is the most international river in the world, with a catchment that includes 19 countries. The river has been cut off from Austria and Germany have been removing levees to restore the floodplain of a tributary of the Danube.percent of its floodplain. But today much of the floodplain is slated for restoration.

For instance, Slovakia, the Czech Republic, and Austria are together putting meanders back into a canalized Danube tributary, the Morava River, where NATO forces on one bank once eyed Warsaw Pact forces on the other. Austria and Germany have been removing levees to restore the floodplain of another tributary, the Inn River, at the foot of the Alps. And downstream, Ukraine has taken down levees on two of the largest islands of the Danube delta,

Ermakov and Tataru, allowing spring flooding and the return of birdlife and the introduction of free-roaming cattle.

"Until recently, the model for our engineers was to have straight rivers," says Gheorghe Constantin, director of water resources in Romania, another Danube nation. "We kept building levees right up to 2006, when there were huge floods on the Danube. The levees broke. So we decided to leave more space for the river. It was a new model, taken from the Netherlands."

So what, in practice, is meant by river restoration? In some urban areas, it can mean simply taking some forgotten stream out of a sewer pipe or concrete culvert. In northwest England, the Environment Agency, a government body, is bringing back into the light the Irwell and Medlock, both of which run through Manchester, once the world's first great industrial city.

Progress is slower in London. Take a trip on the city's Underground to Sloane Square station and you will find, hanging above the platform, a large green metal conduit that carries what remains of the River Westbourne on its way to the River Thames. London has 20 other lost rivers, including the Westbourne, Fleet, and Tyburn. In Belgium, the Zenne River through Brussels has been a covered sewer for centuries.

Cleaning up famously filthy rivers remains a challenge. "We have been to hell and back on the Thames," says Alastair Driver, of the Environment Agency in England, which has been in charge of the river for two decades. New sewage treatment works brought salmon and other fish back to the tidal Thames, but a growing city population and slow investment have recently put things into reverse. "The river is becoming dirtier again," Driver says. Restoring rivers requires recreating old channels and meanders and revegetating banks. river each year. For a few days a year, it becomes disastrous. You can see sewage in the river for 10 kilometers upstream of London Bridge."

After cleaning pollution, bringing back natural flows is next on the restoration checklist. Europe's water demands on rivers are not so great that they generally run dry. But disruption to their natural hydrology is intense. Dams, weirs, and other barriers proliferate, disrupting fish migrations and changing river flows. Hans Bruyninckx, director of the European Environment Agency, says his agency has counted half a million man-made barriers across rivers in Europe. "That is one every two kilometres."

Restoring rivers also requires recreating old channels and meanders, revegetating banks, and reconnecting rivers with their floodplains. The task is huge. Northern Sweden may appear unpopulated and largely untouched by humans. But, in fact, foresters there straightened and cleared vegetation on huge numbers of rivers between the 1850s and 1970s, so their logs could be floated downstream to ports.

Now those Swedish rivers are being restored. The main technique is dumping trees in the river. "We need large structures — they are very important for slowing down water and trapping organic material," says Johanna Gardstrom, an ecologist at Umea University. "The trees are also food for aquatic insects, which in turn are food for fish." Another benefit of putting trees back is to keep rivers cool. "Salmon and brown trout die if water temperatures stay above 22 degrees [Celsius] for over seven days," says Rachel Lenane of Britain's Environment Agency. "With climate change, we are seeing those conditions in southern England now. But trees can cut two degrees off water temperatures, and up to five degrees if there is full cover."

One of the last free-flowing stretches of the upper Danube, between Vienna and Bratislava, the capital of Slovakia, is managed by a new Austrian national park where wardens are restoring lost side channels of the river, as well as riverine forests. "We want to end the fortification of the Danube," said Carl Manzano of the Donau-Auen park authority. "We are taking away concrete and rip-rap so the river can recreate its natural bank. 50,000

Everywhere Europe's river restorers face practical limits on what they can achieve. cubic meters of stone structures have come down. Kingfishers are returning, and wild bees and birds like the little ring plover."

But, he admits, full restoration would require much more.

Naturally, the river would be braided here, with many channels, he says. But "we have to accept" that may never come back. And hydroelectric dams upstream have lowered the river's average water level by half a meter since the 1980s. Everywhere Europe's river restorers face practical limits on what they can achieve. Ulrich Pulg of Uni Research in Bergen, Norway, estimates that 50 percent of rivers in Germany, 30 percent in Norway and 70 percent in Belgium can never have their ecosystem processes restored. Whole cities would have to move. So the challenge is often to recreate rivers that recognize humanity's needs. But while the restorers work out what they can achieve in some areas, they are losing ground in others. Ill-advised engineering projects continue. And to the restorers' frustration, some are being carried out in the name of the environment. For example, to fight climate change, hydroelectric power generation is making a comeback in Europe. It is seen by some as the solution to low-carbon energy generation. Sweden already gets more than 40 percent of its power that way, Austria 60 percent, and Norway more than 90 percent. The latest craze is for small-scale hydro plants, without dams — hundreds of them. The presumption among policymakers is that with no large dams these "run-of-river" schemes have no ecological impact. But Klement Tockner, of the Leibniz Institute of Freshwater Ecology in Berlin, warns that their cumulative impact on river flows, as water is diverted through turbines, is becoming significant. "We are seeing huge numbers of small hydropower plants affecting lots of free-flowing rivers, but not delivering much power," he complains.

Most alarming of all, engineers in some countries continue to propose pouring more concrete and chopping down more trees to upgrade flood defenses and protect against coming climate change. Such is the story in Poland today, where the conservation group WWF has recently revealed a potent mix of European funding and old Stalinist engineering habits that is creating an environmental disaster. Across Poland in the past five years, some 16,000 kilometers of small rural rivers have been "improved" by engineers. Often using EU development money, the rivers have been straightened, fitted with artificial banks, cleared of vegetation, and diverted in the name of flood protection. This "rehabilitation" work has occurred on one third of the nation's rivers. The results of this throwback to past engineering practices are often disastrous and rarely of any flood protection benefit, says WWF's Przemysław Nawrocki. He has published a poster that reads: "***Poland will soon be the perfect site for river restoration...because most of its rivers will be destroyed.***"

That's the trouble with river restoration. It is, of course, valuable work. But first you have to destroy your river.

CHAPTER- 4 GANGA POLLUTION

In this chapter we describe the overall status of Ganga Pollution in different cities in India. We also provide brief case studies of specific issues and challenges [for cities of Kanpur, Allahabad, Varanasi, Devprayag and Delhi] for prevention of Pollution to Ganga . We also give a brief overview of governance and techno-managerial challenges which need to be addressed.

4.1. OVERALL PERSPECTIVE OF CENTRAL POLLUTION CONTROL BOARD

a. Major point sources of Pollution of Ganga

Major point sources of pollution in river Ganga are discharge of untreated/partially treated sewage from- -urban- centres- discharge from open drains carries sewage, -industrial wastewater, returned storm water discharge from major tributaries discharge of untreated/partially treated/treated wastewater from industrial units.

Central Pollution Control Board has a network of 57 water quality monitoring stations on river Ganga and monitoring 9 core parameters regularly. With respect to said network, it was observed that river Ganga within the prescribed limits in terms of BOD from its origin to Rishikesh and in the segment of Bihar. However, in the stretch of Rishikesh Downstream to Garhmukteshwar and Kannauj Upstream to Trighat and few locations at West Bengal (Dakshineshwar, Uluberia& Diamond Harbour) water quality exceeds the criteria in terms of BOD Dissolved Oxygen & pH is meeting the criteria at almost all the monitoring locations while Faecal Coliform is not meeting the criteria at most of the monitoring locations from Kanpur Downstream onwards upto Diamond Harbour.

b. Status of Drains discharging wastewater to river Ganga

CPCB has inventorized and monitored 138 drains in Ganga river Catchment. 76 % of the pollution load was contributed by Uttar Pradesh. Maximum flow was also measured in Uttar Pradesh. In Uttar Pradesh, Chhoyia, Permiya, Sisamaunala are the major polluters which contributes maximum pollution load. In West Bengal maximum numbers (54) of point sources were identified. This indicates that if the pollution load in the major drains of **Uttar Pradsh**, Bihar and West Bengal is addressed, water quality would show substantial improvement.

c. Performance Evaluation Of Sewage Treatment Plants

Performance evaluation of 64 Sewage Treatment Plants was conducted. It was observed from the findings that capacity utilization wise, West Bengal needs immediate attention. All the non functional STPs needs to be made functional. The STP's at Bhatpara (new), Titagarh, Bandipur need improvement. With respect to Uttar Pradesh, Jajmau, Dinapur, Bhagwanpur at BHU needs improvement in its performance. In case of Bihar, treatment plant at Chapara, Patna needs to be made functional. STP at Lakkarghat in Utrakhand needs improvement in its performance.

d. Reconnaissance survey of river Kali (East) and Ramganga

CPCB has surveyed and monitored river Kali (East) and Ramganga and inventorize point sources of pollution. Major tributaries of river Ramganga are river Kho, Gagan, Kosi, Dhela, Bhakara, East and Waste Begul and Deohra (Gorra). During survey, it was found that Moradabad and Rampur drain are two major drains discharging industrial/domestic wastewater in river Ramganga. Total BOD load discharge to river Ramganga by tributaries/darins is 132 TPD. Flow of river Kali at Khatauli town was zero which shows that natural source of river Kali was abolished and flow was only observed during monsoon. There are nine point sources namely Abu Nallah-1, Abu Nallah-2, Odean drain, Chhoyia drain, Hapur drain, Kadrabad drain, Gulaothi drain, Bulandshar drain-1 and Bulandshar drain-2 which carry industrial and domestic wastewater into river Kali. Total BOD load discharged by 09 drains to river Kali (East) is 165 TPD.

e. Inventorisation Of Grossly Polluting Industries (GPI)

CPCB has also inventoried 764 grossly polluting industries discharging wastewater to main stem of River Ganga (either directly or through drains) and its two important tributaries Kali-east and Ramganga in Uttarakhand, Uttar Pradesh, Bihar and West Bengal. It was observed that water consumed by grossly polluting industries is 1123 MLD. In terms of number industrial units, tannery sector is dominating where as in terms of wastewater generation Pulp & paper sectors dominate followed by chemical and sugar sector. It is also observed that GPI in Bihar generate minimum wastewater (19%) in terms of water consumed whereas GPI in West Bengal generate maximum wastewater 75.5% in terms of water consumed this followed by Uttarakhand (56.7%) and Uttar Pradesh (39%).

In the riverine system Ramanga carries maximum industrial wastewater followed by main stream of river Ganga and Kali-East respectively.

f. Industrial Pollution of Ganga in Uttar Pradesh

- It is observed that there are 687 industries of grossly polluting status discharging 269 MLD wastewater.
- The Sugar, Pulp and Paper and Chemical are the major industrial sector which discharged 70% of total wastewater generated in the state.
- Out of 688 industries 594 are located in the main stem of Ganga River. It is also observed that 442 industries are tannery.
- Volume wise highest wastewater 85.7 MLD is coming from sugar industry. This indicates that the tannery although have a higher number of industries but discharging less volume of wastewater, which concludes that tanneries are basically small scale industry.
- With respect to River Kali-East sugar, distillery and pulp & paper are the major industrial sectors which are discharging in to the river. In comparison to the number of the industries with respect to Ganga is small (53) but discharging 71.4 MLD wastewater. Pulp & paper is discharging 36.8 MLD wastewater, which is 52% of the total wastewater discharged into the river Kali-East by grossly polluting industries. Next to Pulp & paper is Sugar industry (15) and discharging 14.8 MLD.
- It is pertinent to mention that Ramganga which houses 44 industries but discharging 106 MLD wastewater and major of them are sugar industries which are discharging 50% of total wastewater discharged into the river Ramganga in Uttar Pradesh.

CPCB has issued directions to all State Pollution Control Boards, following 17 Industries have been identified as most hazardous industries

Aluminium, Fluoride; Cement; Distillery; Dye and dye intermediate; Chlor Alkali; Fertilizers; Iron Et steel; Oil refinery; Petrochemical; Pesticides; Pharmaceuticals; Power Plants; Pulp Et paper; Sugar; Tannery; Zinc; Copper

The State Pollution Control Boards (SPCBs) is to plan a comprehensive programme for the prevention, control or abatement of pollution of streams, wells and air pollution in the State. For this, SPCBs are also required to ensure installation and regular operation of the requisite pollution control facilities in the polluting industries; For strengthening the monitoring and compliance through self regulatory mechanism, online source and effluent monitoring systems need to be installed and operated by the developers and the industries on installed and operated by the developers and the industries on 'polluter pays principle'

4.2...CITY SPECIFIC CASE STUDIES

4.2.1...Kanpur

A large number of industries in Kanpur are equally responsible for pollution of Ganga and other water bodies, **other than the tannery industry**. ? What steps are required for prevention of pollution to Ganga water from Industrial sewage.

Nearly 50 percent of the population of Kanpur or even more is facing utmost constraints in access to drinking water and sanitation which is an outcome of total mismanagement of our urban development policies and programs. Do we have any alternative policies and programs to offer concretely to bring **about an actual change in this state of affairs in next five years?**

The following is the latest data on Ganga Pollution in Kanpur

PRIMARY WATER QUALITY CRITERIA FOR Ganga – Upstream and downstream against DESIGNATED - BEST - USE - CLASSES

	DO/mg/litre	BOD/mg/litre	Coliform Count MPN/100 ml
Kanpur Ganga Upstream	8.3	3.42	3825
Kanpur Ganga Downstream	6.7.	6.7.	72917
Drinking water – tolerable limit I	6.0 or more	2.0 or less	50 or less
Bathing water	5.0 or more	3.0 or less	500 or less

While the above data is alarming as far as Ganga Pollution is concerned, this does not reflect the status of Industrial Pollution in Kanpur. It is well known that thousands of Industries in Kanpur are discharging their effluents in Pandu River, Ganga canal and in various water bodies and sewerage systems which is ultimately going into Ganga River. Since the year 1987, the

tannery Industry has been in the focus for Ganga Pollution in Kanpur, but it should not be forgotten that large number of Industries are equally culpable.

Though the political voice has been created for finding a solution to tannery pollution to Ganga water in Kanpur, no solution has been forthcoming despite involvement of the World Bank. It is high time that the UP Pollution Control Board and the Kanpur Nagar Nigam own up their responsibility for this mess and come forward for a time bound solution on this issue.

In Kanpur, 10 drains were identified contributing 598 MLD (20%) of wastewater with BOD load of 634915 kg/day (86%).

TABLE: ANALYTICAL RESULTS OF POINTS SOURCES OF POLLUTION OF GANGA IN KANPUR –CPCB

SN	Nala	Flow -MLD	BOD Load- Kg/Day
1	Dabkanala -1 KachaaNala	94	15792
2	DabkaNalla -2 PakkaNala	25	3475
3	DabkaNalla 3 PakkaNalla	0.26	10
4	Shetla bazaar Kachhanala	29	12296
5	WazidpurNala	54	45522
6	Sati Chaura	1.1	97
7	GolaGhatNala	0.83	114
8	BhagatdasNala	11	1144
9	SisamauNala	197	544980
10	Permiyanala	186	11485
	SUBTOTAL	598.19	634915
	Unnao		
1	Loni Drain	41.9	4860
2	City Jail Drain	35.86	7208
	SUBTOTAL	77.86	12068
1	Pandu River	1396	34900

Status of Sewage Treatment Plants Under River Action Plan

- Kanpur Population 2005- 2690,486
- Number of Drains- 23; Discharge Drains- 371 MLD; Sewage Diverted – 160 MLD
- STP constructed – 3 Capacity – 170 MLD; STP proposed under Phase II- Constructed -1 capacity 200 MLD.

The status of World Bank Funding for Kanpur Ganga River Action Plan

Ganga Basin Authority has approved Ganga cleaning project submitted by the Kanpur Jal Nigam. The authority on its part has now forwarded the project worth Rs 69.6 crore to World

Bank for grant. Nigam authorities said that two more projects were being prepared under Ganga Action Plan. Implementation of the three projects would give a facelift to the river in the city, said the officials. The authorities of Kanpur Jal Nigam prepared an initial level project for Ganga Cleanliness worth Rs 69.6 crore.

"The plan has been cleared and forwarded by the GBA to World Bank for financial approval." Stating that work on the project would begin as soon as funds were released by the World Bank, he said that the Nigam would focus on repairing sewer lines and sewage treatment units. Besides a few new treatment plants too would be set up, he added. Semval further said that the Jal Nigam was also working on two other projects of worth Rs 443 crore and Rs 1,200 crore respectively. "The Rs 443 crore worth project too is on the verge of completion and we will send it for GBA's approval in next few months. The work on Rs 1,200 crore worth project too is in the pipeline," added Semval. He added that if all goes well, Ganga Ghats would get a major facelift after implementation of these projects. Though the projects were meant to check river pollution, the beautification of ghats would be possible if the river gets clean. The pollution level of the river is quite high in the city. The big nullahs opening into the river along with discharge of waste from ill-treated sewage has made the river water unfit for drinking. [**According to GM, Jal Nigam, Sharad Kumar Semval, press statement**]

The Challenge of Tanneries Pollution: The tanneries, in the last three decades have made earnest efforts to curb the menace of pollution in holy Ganga. We were the first to install Primary Treatment Plant in our premises with our own funds. Then we contributed 17.5% of Rs. 22 crore for Common Effluent Treatment Plant (CETP) to Ganga Pollution Control Unit of U.P. Jal Nigam. In an affidavit filed in Supreme Court Jal Nigam had submitted that proposed CETP will treat chrome, sulphite, chloride etc in the wastewater received by it. But after the C.E.T.P started operations, we received notices for establishing Chrome Recovery Plants in our campus. To solve this issue of recovering chrome from the treated hides, every big tannery in Kanpur established chrome recovery plant in their campus with their own funds. The Small Tanneries were asked to contribute Rs 19200/-each, to Kanpur Nagar Nigam for establishing the common chrome recovery plant, which they did diligently. C.E.T.P is operated and maintained by U.P. Jal Nigam and Tanneries at Jajmau are paying operation and maintenance charges every month. Common chrome recovery plant is run by Kanpur Nagar Nigam.

Sir after removing suspended solids through primary treatment plant, the remaining effluent reaches CETP through Conveyance system. As per our information no tannery drain is connected with Holy River Ganga. If any Tannery is discharging its effluent in River, it should be punished for this crime. At the same time, if the U.P. Jal Nigam's CETP treatment requires upgradation or modernization, it should be undertaken immediately by the State Government. For last six years, the tannery owners have been running after the Government departments to ensure that the old CETP could be upgraded. We contracted **ILFS** as our consultant and paid a consultancy fee of Rs 60/- lacs to get a DPR prepared for upgradation of CETP. However nobody in the government is listening to us and helping Industry. Every body is busy in blaming the Tanneries. Ironically, billions of rupees were spent under Ganga Action Plan (GAP-1 and 2) to clean Ganga River. However, nobody is asking about the utilization and results of these funds. To save the corrupt, who in the name of Ganga, mismanaged crores of public funds, the tanneries are being chosen as easy target for blame. Today, the Tannery Owners are

being blamed for the crime which they are not committing. No acknowledgement and appreciation is made of our sincere efforts to cooperate with the Government to prevent pollution to Holy Ganga River. Tragically, the tanneries are getting the bad reputation for being the major polluter of Ganga River. Sir we don't want to anyone to pollute the Holy River. It is our life line.

Sir, if this situation continues like this, I can predict that this industry which today, is giving employment to millions of people, will become history. The same danger is faced by the river because of unfair targeting of the blame and not catching the actual culprits.

Naiyer Jamal.Small Tanneries Association.

4.2.2.....Varanasicase study summary

1. Total Population today

1.4 million; 1931- 3 lakh

2. Sanitation ranking of Varanasi City

Out of the 423 cities being ranked for the levels of sanitation, Varanasi fares at 331. It is under the red category which means that it is on the brink of public health and environmental —emergencyll and needs immediate remedial action

3. **Ganga Water Quality at Varanasi** :The Ganga Action Plan launched in 1986 by the Government of India has not achieved any success despite expenditure of over five billion rupees. Even though the government claims that the schemes under the Ganga Action Plan have been successful, actual measurements and scientific data tell a different story. The failure of the GAP is evident but corrective action is lacking. The ineffectiveness of the current Ganga Action Plan could be found based on the results observed

Location / Parameters	Biochemical Oxygen Demand (mg/l)	Fecal Coliform Count / 100ml
At beginning of the Varanasi City ... Near Assi/Tulsighat	3-8 mg/l	20,000 - 100,000 per 100ml
Downstream of the Varanasi City ... Varuna confluence with Ganga	20-50 mg/l	1,000,000-2,000,000 per 100ml
Permissible limits for bathing	Less than 3mg/l	Less than 500 per 100ml

Note : Higher the Biochemical Oxygen Demand, higher is the pollution (conversely there is **more dissolved oxygen needed** to make the water safe)

4. **Safe Domestic Water Supply:** We have queer situation (at least three cities where we have had a closer look- Delhi, Kanpur, Varanasi) where the city on paper has relatively surplus water supply available, yet the citizens are facing water shortages. One common

reason is old rustic water supply lines. Second is contamination of water supply lines with sewage- due to variety of reasons.

5. **Sewage**- Some part of city has sewage and others not, most of it goes to Ganga, untreated. STPs are under construction...with JNNRUM money and JICA loan, would they solve the problem – Industrial pollution primary due to dying industry and metal industry; STP Technology- the wastewater irrigation is causing heavy water pollution of vegetables. Another issue is that UASB technology of STP is not successful due to low BOD in sewage –as the septic tanks are still being used – GIZ
6. **Sanitation** : Varanasi is famous for its distinction in Open air defecation ; 30 lakh tourists every year, yet even Ghats do not have proper toilets
7. **Solid waste management** system of VMC very weak
8. Uncremated/ semicremated dead bodies and animal carcasses dumped into Ganga
9. **The problem of drainage**, in several areas in the city during the rainy season. The Ganga water also intrudes on the Ghats – part of the city natural drainage is towards ganga and other parts it is towards varuna and other parts towards Assi River
10. **The BHU** has its own systems of water supply, sewage treatment and solid waste management
11. **Governance** : usual mess between Varanasi Nagar Nigam, Jalsanathan, GPCU of Jal Nigam – no community systems existing. A comprehensive plan for the river had not been prepared so far. There should be a comprehensive plan for the Ganga basin and the approved project should be linked with it,
12. **History and heritage** – Pinseps proposal for building underground canal for drainage ... the community control mechanisms during KashiNaresh in British India and change of these arrangements : Need to improve the city and ghats as Heritage city

Varanasi: suggested way forward

Unlike in the case of Kanpur, where IITs have suggested a model river management plan, no such plan exists for Varanasi. The City mayor himself has questioned the various investments being made by JICA and JNNRUM, in absence of such a plan for the city. Based on past experience and current challenges, it is obvious that mere construction of two new STPs and rehabilitation of some of the sewer lines is not going to solve the basic challenge of NirmalJal and Nirmal Ganga in Varanasi.

Following alternative approach is hereby suggested for further discussion with Ganga activists and practitioners:

- Discard the World Bank approaches suggesting more and more addition of infrastructure without any strategic thinking – like 24X7 water supply, metering, waste water treatment through BOT and other similar interventions. The reality of Indian cities and local solutions need to be taken into account, e,g – nallahs work as storm water drainage and you do not perhaps need new storm water drain,
- Restoration and resurrection of traditional citizen and society centric city management traditions- in the new context- citizen centric city government .

- Considering that a large population in city is still using the Ground water and ponds water , there is need to include as essential components of city water supply systems – the hand-pumps, wells and ponds. The exclusive dependence on piped water supply should be revised. At the same time greater emphasis needs to be laid on protecting the water sources and find indigenous ways of purifying water
- Treat traditional nallahs or drains of the city, as sacred as river - ensure no solid waste is thrown in these nallahs so that ultimately the river is protected from contamination
- Decentralized waste water treatment to be prioritized/ and allow the treated wastewater to throw through nallahs; Industries to put their own plants for treatment of industrial waste water
- Give top priority to Soild waste management in the city - have local committees to include - bhishti, piao, plumber, mehtar GIVE THEM ALL TITLES OF GANGA PRAHARIS
- Water as great healer/ research into purity of ganga water / emphasis on safe water to protect health / prohibit mixing of domestic waste water with Industrial waste water to protect wastewater irrigation

Points to ponder from the case study

- While the overall quantum of water available with Jalsansthan seems to be plenty, there is little water available to majority of citizens. Moreover, more often than not, the water seems to be contaminated. What steps are required to address this problem
- If the two STPs one under JNNRUM and others through JICA become operational, would this solve the problem of Ganga pollution in Varanasi,?
- What additional steps are required for example, in prevention of pollution to Varuna and Assi rivers and their restoration as living rivers?

4.2.3...Allahabad: summary of case study

1. Total Population :1 million

2. Sanitation ranking of Allahabad City :Out of the 423 cities being ranked for the levels of sanitation, Varanasi fares at 249. It is under the red category which means that it is on the brink of public health and environmental —emergencyll and needs immediate remedial action (Reference:)

3. Challenges of water and sanitation in city

SUMMARY

Sectors in order of priority/ preference of requirements –

1. sewerage & drainage,
2. Water Supply,
3. Solid Waste Management,
4. Roads &transport,
5. Slums,
6. Public transport,
7. Beautification/ heritage & tourism, encroachments etc.
8. There is no willingness to pay among the citizens

1. Sewerage and Drainage

- Drainage is the biggest problem in the city; Several areas in the city are low lying where water logging takes place (Allahpur, Tagore town, George town, New Bahrana, Rambagh, Naqashkona, DarashahAjmal, Bakshi Bazar, Karbala, Lukarganj, Minhajpur, Katji Road, Subedarganj, Chaukhatka, Ghantaghar); Open drains pass through several areas; There are no drains along the road; drainage master plan is needed
- Only 20% of sewage is treated; 70% of city has no sewer line; • New houses have septic tanks while the old ones are connected to city drains;
- Treated wastewater is not acceptable by farmers; 100% treatment of sewerage & disposal is needed
- Sewerage and rain water are mixed; Sewer water and rain water should be separated;

2. Water Supply

- Water supply is mostly tubewell based; • Groundwater level is going down; Cannot depend on groundwater for long time
- First water works project to be boosted/ revamped; • Rs 22.14 crore scheme proposed but only Rs 5 crore granted by government ; Second water works for treated riverwater is needed
- Water supply lines are rusted, leaking, burst at several locations; Old lines are deep into the ground (15 feet) while the new ones are only 2-3 feet down; Old pipelines need be replaced
- Overhead tanks need be constructed
- People pump their own water from piped supply

3. Solid Waste Management

- No proper collection and disposal system in place. sweepers, vehicles, equipment; Insufficient equipment and manpower; No filling lands available; No petrol/fuel to dump at land fills which are located 30 km away. Required small size vehicles to pick and dump waste at identified sites for power generation (egVijaywada)
- 105 dumping yards identified where from MSW is collected; Equal number of dump yards on the roadside;
- 1-2 m high, covered dustbins required every 200 m in residential areas; No effective collection mechanism –. Waste segregation already started in Allahabad

4. Slums

- All slums to be attended to Improvement of slums on authorized land with provision of basic amenities; DUDA is preparing some schemes Community centres SulabhShauchalaya;
- Encroachments on government lands (railway land, defence) Rehabilitation of illegal occupants• • Rain Basera at convenient locations;

5. Status of Ganga Pollution in Allahabad

- The decreasing volume of water, in the post Tehri situation, is making things complicated for the scared river

- A number of nullahs are still carrying the effluent into Ganga and Yamuna..Starting from Manauri to Kaniapur, Rajapur, Rasulabad, Sankarghat, Talirgunj, Salori to Mori Gate - all are contributing in making Ganga more pollutedEvery nullah, was disposing volumes of human waste, intermediary blocked by piled garbage dominated by plastic. Leave alone the normal human waste, the waste from the state TB hospital, which specialises in treating patients suffering with tuberculosis, also falls in Ganga.
- Although authorities do claim that a chunk of effluents are now being disposed in the river only after getting treated in the functional STPs, but the ground conditions speaks contrary to these claims. Take the example of the STP at KanaipurGhat having Kodra STP or for that matter the Rajapur STP. The Kodra STP is not yet complete and the big nullah continues to dispose huge volume of human waste in Ganga.
- Equally alarming is the situation at Rajapur STP, wherein the marathon effort of the company (IVRCL Ltd) has somehow made the STP functional, but still a major drain, carrying the effluents of large population continues to dump human waste in the Ganga. Similarly, the Salorinullah poses a major challenge for the authorities as this very nullah was constructed by the UP Jal Nigam for checking the flow of pollutants in Ganga for which 2,050-metre long underground pipeline was laid, but ground reality is drastically the opposite.
- With tonnes of plastics and human waste being drained in Ganga and heaps of toxic foam dominating the area, the ambitious plan proves futile. However, with the Salori STP becoming functional, authorities are optimistic that treated water would be disposed in the holy river

6. **The High Court Involvement into environmental management and Ganga Polution issues in Uttarpradesh****The story of PIL on Ganga :**However, the overarching public interest litigation (PIL) for ensuring flow of water in Ganga during KumbhMela that the order is a part of has been running since 2006, expanding in scope over the years and allowing the High Court to extend its authority over statewide environmental management of the Ganga. A case that began as a prayer to ensure that the Ganga is suitable for bathing at the Sangam in Allahabad during the Magh (Kumbh) Mela has now become the go-to PIL for all petitions related to the river in Uttar Pradesh.In 2006, the high court issued strict orders on the regulation of flow from the Narora dam, without any details on the quantum of release downstream. On the water quality front, in 2007, the Court ordered all tanneries, industries, sugar factories, distilleries and paper manufacturing factories which discharge effluents into the Ganga be identified and shut down if they are found without an effective treatment plan. The Court has been continually demanding reports on sewage treatment plants (STPs) in Allahabad, Varanasi and Kanpur. It also formed a committee to look into proper dredging methods in 2007, and ordered the state to look into banning plastics two kilometre from the river in every major city along the Ganga in 2010. Solid waste from each of these cities finds its way and settles in the river bed. Polythene bags were banned in Allahabad during the MahakumbhMela earlier this year. Though the Court has been persistent in directing the state of Uttar Pradesh to consider a plastic ban in all cities on the river, this is yet to be implemented by the state. It remains to be seen how exactly the state will execute these orders as ban on plastic and construction restrictions in Allahabad will set a precedent for regulation in other cities along the Ganga.The order is not restricted to the Ganga floodplain. As per the order no construction shall be undertaken by any resident or builder within 500 metres of highest flood level in city of Allahabad for the river Yamuna, too, as it flows by Allahabad and joins the river Ganga.

Points to Ponder

- The Jalsanathan and Jal Nigam are seem to be driven by meeting the piped water supply targets rather than improving the service levels for the citizens.
- The general picture in the city is following: service level is low in terms of quantity of supply and quality of water. Municipal water is available for not more than 3-4 hrs a day, in many cases 1-2 hrs with very low pressure. There is back siphonage resulting in cracks leading to contamination of water in distribution network.
- Slum dwellers are provided water through standposts- handpumps – get relatively much lower level of services than rich. What measures do you propose to make amends to this situation.
- The city seems to be totally dependent on Ground water while the ground water in getting polluted . what is the solution for this
- If the proposed STPs in different sewer districts of Allahabad under JNNRUM and other through NGRBA /World bank become operational, would this solve the problem of Ganga pollution inAllahabad ?
- What additional steps are required ,for prevention of pollution to Ganga from waste water and solid waste in Allahabad ?

4.2.4....Devprayag: in Uttrakhand

- "**Great holy river Ganga starts from Devprayag, the confluence town of Bhagirathi and Alaknanda, the originating source.** It is the need of the hour to promote and start a serious clean-up efforts in this strategic starting point of the journey of Ganga, for its religious and symbolic value. This small mountain town of about 2000 families, its people and itsPanchayatkaramcharis, all dump its garbage directly into the Holy Ganga River - heaps of the *thermocole dinner plates* after weddings, the *panni*of Haldiram dalmot, chips, tobacco, rotten vegetables, TV fridge packing, nylon sacks, waste water from restaurant/houses, laundry detergents, excreta of about 50 domicile pigs and 110 abandoned cows, all find its destination into the Holy Ganga River. **The heart of the problem is the lack of systems for solid waste and liquid waste management in the town** -the Nagar Panchayat. Its political masters and officials, have neither the will, nor the requisite equipment to sort out the domestic garbage and other harmful materials and dispose it off in a scientific way. The Town Devprayag is, though, is currently building a sewerage treatment plant, but it may take another year or two before it is commissioned. The treated wastewater from this plant will be discharged into the river Ganga..
- Further downstream, beforeRishikesh town, about 100 campsites at the Ganga river bed with about 50,000 camps, dump their human excretion, sanitary pads, condoms, and everyotherwasteproduct, in the dug-up holes on the river bed. This has been , going on for about last 15 years or so. All this dumped waste in the river bed, may weigh, few thousand tons by now. Perhaps, nowhere in the world, this kind of carnage of nature and river i allowed by any government.
- **Live For Others Foundation** has been trying hard in these areas for the last 4 years to protect the river ganga from these damages , but we have not been able to achieve much, except creating an awareness among opinion leaders and Govt. officials. The Foundation

has been using the money collected from the contributions of its own members for its awareness and advocacy activities. We have not been able to get any financial grants or even moral support from any other group for our efforts."Ref: **MohamadShamim -Live for Others Foundation**

4.2.5. Delhi water scenario

- The city of Delhi with its fast growing population is an example of unplanned urbanization which is associated amongst other things with irregular supply and uncertainty in the availability of water for drinking and other domestic needs. Every year in the summer when the water flow of the river Yamuna is reduced, this water crisis becomes very acute. The water situation in city is in some sense a great equalizer in the sense that some of the most posh colonies face the water crisis while some of the slum areas may have a plentiful supply of water. Many of the established areas with piped water supply frequently face the problem of the supply of contaminated water which smells bad and is no good for any use. Ironically, the average per capita supply of water is said to be one of the best in the world cities. A large number of areas have piped water supply, but within that there are many who are still dependent on the private water tankers. At least one fourth of the city gets its supply through water tankers with a quantum of available water supply as low as 3 litres per capita per day, while the city average is said to be 120 litres per capita per day. **The thematic audit of Delhi Jal Board points out that 24.8 per cent of Delhi's population is being supplied with 3.82 litres per capital daily, far less than the minimum stipulated average or the 40 litres minimum established by the World Health Organisation.** 49% of water produced, does not generate any revenue (non-revenue water or NRW). This is an unacceptably high level. However, the non-metered supplies through tankers and standposts account for an estimated 8% of water produced, about a sixth of the NRW.
- Given the failure of the Delhi government to ensure water supply, close to a third of the city's residents are thus forced to depend on so-called "informal systems of water supply" meaning private contractors supplying water drawn from bore-wells at high rates. All this is leading to severe public resentment, often spilling out into the streets. It has been estimated that about 200,000 such tube-wells exist. In addition to private tube-wells, there are supplies of DJB bottled water as well as numerous hand-pumps. No consumption figures are available for hand-pump supplies. Bottled water supplies by DJB are so small as to be insignificant. Nevertheless, 23% of households used such sources for at least part of their water supplies, as revealed by the sample selected for the willingness-to-pay survey carried out under the Study.
- On paper, about 12% of Delhi's water needs are met by groundwater reserves. Unofficially, the figure reaches almost 50%. A recent analysis of groundwater abuse conducted by the Centre for Science and Environment (CSE) reveals that over 2,000 private tankers draw groundwater from tube-wells and sell it to residential localities and industries at exorbitant rates. Their business is pegged at Rs 400 crore annually. Even the latest assessment of groundwater resources carried out by the Central Ground Water Board (CGWB), in collaboration with the state government, says that out of 27 sub-district areas – *tehsils* in nine districts, 20 *tehsils* are over-exploited. **In conclusion, there is a large deficit in the**

water supply system, partly alleviated by private alternative supplies. Private measures are also prevalent to help reduce the shortcomings of the system.

4.3. Challenges of Governance for Ganga Rejuvenation

4.3.1. Accountability: Where lies the responsibility lies *for preparing a river action plan for prevention of pollution to Ganga in these cities* – Whose task is it to prepare a plan and implement. Who should be held accountable if the planned interventions do not lead to desired results? Is it the bureaucracy or technocracy or the legislature- who should be held accountable. The legislature is to allocate resources and ensure implementation and accountability. But there have been very little meaningful debate in our state and national legislature for deliberating on the failures of the Ganga Action Plans. In case, we suggest that primary responsibility is that of Urban Local Bodies, how will we ensure that the urban local bodies in the cities along Ganga actually take up this primary responsibility in a time bound manner so that we have well defined plans ? . . What is the mechanism by which the Councils in the urban local bodies can develop this plan in a participatory manner with citizens on ward, zonal and city level? These plans, if implemented in letter and spirit, should actually lead to prevention of pollution to Ganga water. The battle then will be to ensure that appropriate financial and management resources are made available to the urban local bodies and by the State Governments and the central governments. **CPCB:** The pollution from domestic and industrial sewage is happening all through from Rishikesh to Kolkta. The water act 1974 has been made to penalize the agencies who are causing this pollution. The Central Pollution control Board is the agency for implementation of this act. What steps do we plan to take so that culprits are actually penalized and not go scot free as has been happening for last so many decades. **High Court and NGT** Alternatively, would we like Allahabad High Court to continue to remain in lead ..as has been happening for past ten years.

4.3.2. The NGBRA, Clean Ganga Mission and Ganga Rejuvenation Ministry :The Year 2009-14: The Ganga Movement and Ganga activists made consistent efforts in last five years to press upon the governments of the day to take effective steps for restoring the Ganga river to its pristine glory and ensure aviral ganga and nirmal ganga. While some important decisions were taken by the previous central government to establish NGRBA. The world bank funds have been provided to the state governments for laying sewer lines in the city and set up STPs.. The World Bank has released its finances for many cities for laying new sewer lines and installing new STPs. It has also commissioned a big study through a US based company for preparing the communication strategy for Ganga. The efforts under NGRBA have met the same fate, as happened with GAP I and GAP-II. **A Ganga Knowledge Mission** has also been set up within Clean Ganga Mission of MOEF with a budget of Rs. 500 crores to work on Ganga issues. This is now being shaped as setting up of Ganga University in Lucknow, UP! **However, the hard core challenges of Ganga rejuvenation remain un addressed**

4.3.2. Scrambled egg of overlapping institutional role

Multiple agencies have overlapping roles in Governance and management for Nirmal Gangan Kanpur and other cities in Uttar Pradesh

- Nagar Nigam and Jal-sansthan ;

- GPCU of UP Jal-Nigam and UP Jal Nigam and other parastatals like Development Authorities ;
- MoEF/ Now Clean Ganga Mission and Ganga Rejuvenation Ministry – [should these have a primary role, as suggested by the IIT consortium in its interim Report]./ CPCB ;
- International donor development agencies like World Bank and JICA and their allies transnational consultancy companies and Transnational water and wastewater utilities

If the different doctors are kept to look after different diseases separately, and they do not have coordination in dealing with the disease, it is difficult to cure the disease. The Ganga is facing similar problem. The flow of effluent in the city is under UP Jal Nigam; the management of drinking water is done by Jal- sansthan; irrigation department does the management of erosion and the bathing places; sand bed management is done by the fisheries department. The work of one affects the work of others. For example, if the department of fisheries does not manage the sand bed, it causes increase in erosion pocket, logging of more pollutants, impure supply of drinking water etc. Thus it is the main hurdle in the solution of the problem. Ref. UK Choudhary

4.3.4. Need for capacity building of ULBs in upkeep of STPs [Ref: BK Agrawal: expert in waste water treatment technology]

- Policy framework should begin with financial viability of ULBs as it impossible to keep supporting these services even at current level.
- First all **there is need to build technical competence within the ULBs** These ULBs are to have capacity and capability building exercise before they can embark upon this mission. These plan will yield results only when existing STPs are operated rightly to meet process requirements. Most of these are either under capacity or designed on wrong parameters or do not have competent O&M staff
- ULBs' responsibility should shift from individual facility maintenance to monitoring the difference in upstream and downstream river water quality across the city under their respective control.
- Current practice of operating existing plants is mostly based on **inadequately trained manpower** which has been outsourced in many cases to labor supply contractors and it is impossible to operate the plant through this mechanism. There is need to employ technically competent agencies which will be at higher O&M rates but there is no short cut.
- There is a need to strongly highlight the **lack of technical expertise with ULBs in** terms of human resource and also very low O&M budget availability with them. Until ULBs develop their own competence level, private sector could be the only possible option. We must appreciate that BOT model for setting up new facilities could be non-starter if entire cost including finance cost is passed onto citizens as BOT model will lead to multifold increase in tariff as current tariff does not even reflect O&M cost leave aside finance cost. Financially sound ULBs/Govt. must consider annuity based model to private operators if they are roped in for setting up new facilities or upgrading existing ones.

- Technology intervention will probably increase O&M cost but someone should carry out some study on its benefits vs the cost associated with addressing the health issue arising out of water quality issue. Or may be such studies already exist. This is critical as we go to World Bank or ADB or JOCA for creating new capacity additions whereas existing plants functions far less than desired KPIs.

4.3.5. COMPLEX GOVERNANCE CHALLENGES – MANAGING WATER AND SANITATION UTILITY IN A CITY- A CASE STUDY OF DELHI JAL BOARD

FOLLOWING CHALLENGES HAVE BEEN IDENTIFIED IN THIS CASE STUDY

- (i) **How do we define water scarcity:** The city government raises the boggy of water scarcity – is water scarcity a problem or the real problem is rational water distribution in different city areas?;
- (ii) **How do we identify and focus on the needs of areas which have genuine difficulties with supply of water:** These areas may not get piped supply due to terrain or other difficulties in laying pipelines. The other areas may have become dependent on tankers, due to withdrawal of excess water from the pipelines by the citizens by installing illegal pumps inside the pipelines . There may be other factors of mismanagement of distribution of water supply by the DJB;
- (iii) **How do we define the rationale for supplying ‘free water:–** in many cases, people may want Piped Water Supply and even Water Meters and may be willing to pay – but the DJB may not be willing to provide connections– as it will legalize and provide them the right to demand piped water from DJB;
- (iv) **How to focus the debate and civil society challenge on institutional arrangements:** – nuts and bolts of working of the state institutions and mechanisms of change, in this case the Delhi Jal Board-DJB –
 - who exercises control – is it engineers, bureaucracy or the contractors?;
 - mechanisms of Community control at four levels – mohalla, ward committees, district and State-DJB;
 - giving control to MCD instead of the Delhi Government,
 - Having an independent regulator etc.

Right to Water through Urban Swaraj: some possible steps

- i. **Strengthen the DJB:** Conduct an assessment for additional staff requirement of the DJB to serve as a public utility and not as a commercial contract management agency as it has now become. **Increase technical and non-technical staff, particularly line staff who can service faults and complaints.**
- ii. **Corruption:** The deeply entrenched corruption in the government bureaucracy and political culture is another big barrier in reforming the utility. Have separate units for monitoring and fraud prevention. Increase transparency and public scrutiny.
- iii. **Assess and Review Questionable investments of DJB:** and Cancelling the 3- Public Private Participation (PPP) agreements with private agencies. Stopping all wasteful capital

infrastructure relating to setting up of District Metering Areas underground water tanks for private distribution of water.

- iv. **Local Action Plans:** for access to water and sanitation: each locality will have to develop its own action plan and fight for its implementation. It is essential that in Delhi, and in other metros and cities, a comprehensive plan for improving water supply is drawn up. This should include such institutional restructuring as may be necessary **but with full participation of citizens and all relevant planning and other statutory bodies such as CGWA.**
- v. **Creating a social accountability division within the DJB:** to support this process by mohallasabhas. At the same time, to address grievances and complaints by individuals, MohallaSabahs and Resident Welfare Associations (RWAs). Establishing mechanisms of people's control over the public utility is the most important action to make the public utility like the DJB an effective and efficient instrument for fulfilling the right to water. Establishing empowered mohallasabhas may be an important mechanism in this direction. In the city of Delhi, with its very large size and increasing population, multiplicity, overlapping and fragmentation of governance mechanisms, real challenges of establishing urban swaraj are complex and a public utility should perhaps set up its own mechanisms to promote citizen participation and accountability .
- vi. **Metering of consumer connections :**Do a water consumption audit of slums and unauthorised colonies to determine their water consumption. If it is less than the 20Kl/month/household then there is **no need to install water metres in the slums,** unauthorised and resettlement colonies of Delhi. This will be a wasteful expenditure
- vii. **Sustainable Utilization and Augmenting Ground Water:** The city of Delhi is dependent on river and canal waters from other states. The Central Ground Water Authority has proposed several measures to augment water supply through sustainable utilization of groundwater from areas of natural recharge. This issue did not figure very prominently prominently in the plan of DJB, except passing references to palla project at Yamuna and other symbolic references. The present emphasis is only only with laying new infrastructure for laying of water and measurement – the underground reservoir, District metering areas and SCADA etc. The exclusive focus on distribution management and tariff structures is short sighted.

4.4. Techno-managerial challenges and possible Solutions

PPP Model: Do we have a view on the suggestion made by the IIT consortium that all the waste water in the cities along the Ganga River is treated by private companies on BOT basis and a minimum price is ensured to them for the sale of water treated by them to make it a profitable proposition – *approximately Rs. One Paise per liter*. The price of fresh treated water should be kept higher than this price¹. Do we need a Central Legislation on Ganga, the demand for which is being made by some sections of Ganga movement Activists.[ref: Interim report of the IIT

consortium] The Ganga river's present-day water quality is abysmal due to anthropogenic wastes polluting the river network in various ways. The main approach in GRBMP has been to identify the types of pollutants, their sources of generation, and the feasibility of collecting and treating them to the degree needed for reuse and/or safe environmental disposal. Urban and industrial wastewaters are major point sources of pollution that need immediate remediation. For municipal wastewaters it was found that it is economically feasible to treat them to the point where they can be re-used for noncontact purposes, the cost of such additional treatment being only about **1 paisa per litre** at 2010 price levels. It is therefore recommended that all Class 1 Towns of NRGB immediately embark on such treatment through competent service providers under the Design-Build-Finance-Operate model, whereby the service provider receives remuneration for providing reusable-quality water over a reasonably long contract period. It is also recommended that all fresh water withdrawals from the basin be priced at least 50% higher than the recycled water, considering the minimum costs of full treatment in nature. For major polluting industries (*such as tanneries, pulp and paper units, distilleries and dyeing units*) in NRGB, the cost of treatment for reuse purposes are higher, but these costs are much less than the damage caused to NRGB otherwise, justifying the expenditure on such treatment

Some views on Treatment standards of wastewater for river protection

Rejuvenation of rivers is of great importance as these are dumped with either un-treated or partially treated sewage. Unless this is addressed, river protection will remain a mirage. River rights must include treated sewage quality < 5 mg/l BOD, < 5 mg/l TSS, < 100 fecal coliform, < 10 mg/l TKN, <0.5 mg/l phosphorous, > 3 mg/l DO level etc. This will need change in effluent standards and mind set at ULBs management.

As the dilution level in rivers has reduced drastically, there is need to review the effluent standards across STPs as most of the existing facilities do not have nutrient removal capacities as their designs are based on age old effluent standards. One of the problems of inadequate treatment in Ganga basin is that very large number of STPs has been installed on **UASB technology**. This is among the main culprits as this technology is incapable of handling the challenge in terms of current treatment requirement including nutrient removal. But all the lab results maintained by O&M staff maintain records as if these are operating satisfactorily just to satisfy PCB officials on paper.

Zero Discharge: Many kinds of waste water and solid wastes are being discharged into the Ganga River today. The Concept of zero-discharge into the Ganges river system has been proposed as the standard to be followed by the cities river action plan by the IIT consortium to the Government of India, in its interim report. The concept of zero discharge is primarily related to wastewater emanating from the domestic and industrial sewage. A new slogan has been coined today by the transnational waste water utilities wanting to do business in India- i.e. *waste is gold*. The transnational wastewater utilities are claiming that they can clean and convert the waste water into clean water and resell it. Our city planners and political leaders are being enticed into the mirage of creating markets for wastewater for the national economic growth. Only lip- service is paid to the concept of aviralganga, in the same breath it is quietly asserted that this is only a fantasy and no longer feasible. The dilution factor in the river for secondarily treated wastewater is no longer available. Hence we need to go for new technologies available

for tertiary treatment. These also require less land and are more effective and efficient, the claim is made. , The possibility of minimize the withdrawal of water from the river system is not brought on the table. Hence this slogan of zero discharge and tertiary treatment of wastewater is becoming a rallying point of all the transnational waste water utilities, their Indian counterparts, international donor development agencies and the several NGO activists and academicians.

Hyderabad is a case in point where sewage is being treated to extremely good level broadly upto the desired effluent standards. Incidentally, two such plants have been done by a private company for HMDA, Hyderabad and treated sewage quality is so good that HMDA has now floated tender for sell of this water for non-potable use

Industrial Pollution

- These are complex effluent and needs large investment if we are to ensure long term solution.
- Currently situation is so bad that this will end up panelizing most of the ULBs. We must create a time bound program city-wise under a technically competent nodal agency within ULBs. If this requires outsourcing external agencies/consultants, this must be done

Drinking water supply and quality

- Source water quality is mostly contaminated in these basin to an extent where it is not possible to treat water fit for drinking as per applicable quality standards. Conventional treatment cannot produce requisite drinking water quality from these sources.

There is need for a technological intervention and Agra city has taken huge step forward in this direction which need to be viewed from larger scale implementation we should understand that this will need much higher O&M cost but this is the only way to provide safe drinking water to the citizens..They were adding upto 70-90 mg/l of chlorine whereas safe limit should be 5-6 mg/l in drinking water. They were doing this because conventional technologies can not handle currently available contaminated water from Yamuna which is case in many UP towns. One should understand effect on citizens' health when drinking water has been treated with such a high level of chlorine dosing.

Malanpur in Maharashtra is another example of how citizens participation can result in 24X7 water supply to this city's 25,000 citizens. I do not think such interventions are across any state until now. There are far & few spread all over among pockets of excellence and commitments of few individual.

4.5. Swachh Bharat Mission(SBM) : October 2014

Introduction

The Swachh Bharat Mission(SBM), a joint Mission of the Ministry of Urban Development and the Ministry of Drinking Water and Sanitation, emanates from the vision of the Government articulated in the President's address to the Joint Session of the Parliament on 9th June 2014:

“We must not tolerate the indignity of homes without toilets and public spaces littered with garbage. For ensuring hygiene, waste management and sanitation across the nation a “Swachh Bharat Mission” will be launched. This will be our tribute to Mahatma Gandhi on his 150th birth anniversary to be celebrated in the year 2019.”

The PM Narendra Modi declared Clean India Campaign from USA. The honorable PM called one and all to dedicate themselves for avow to clean India (physically) in next five years. At the same time PM reiterated the need for cleaning River Ganga

The Urban Development Minister Shri Venkata Naidu, in his letter dated 19th September 2014 to all the mayors/chairpersons of the ULBs of the country, urged them to take up SWACHH Bharat Abhiyan. He defined the large part of the challenge as lying in – creation of mass awareness, ensuring public participation and bringing about behavioural change. He outlined a set of 20 activities (see the list below) to be undertaken in the preparatory phase commencing from 25th September for one week for the launch of SBA on 2nd October on the birthday of Mahatma Gandhi.

Box: Quotes from Mahatma Gandhi in the letter

- Sanitation is more important than political freedom
- Everyone must be one's own scavenger

The Sub-Mission - Swachh Bharat Mission (SBM) for urban areas to be implemented by the Ministry of Urban Development (MoUD) aims to achieve the objective of providing **sanitation** and household toilet facilities for all 4041 statutory towns in the country. These towns are home to 31% of the Country's population or about 377 million people. The numbers are expected to go up to 600 million by 2031. Hence, this programme has been taken up on a Mission mode. The Mission will be implemented over a period of 5 year commencing 2nd October, 2014.

The estimated cost of implementation of the Swachh Bharat Mission is Rs. 62,009 crore. The Government of India share amounts to Rs. 14,623 crore. In addition 25% amounting to Rs 4874 crore shall be contributed by the States as the State/ULB share.

Goal: The overall goal of the National Urban Sanitation Policy is to transform Urban India into community-driven, totally sanitized, healthy and liveable cities and towns. The “Swachh Bharat Mission” strives to achieve this goal.

Objectives: Eliminate open defecation.; Conversion of insanitary toilets to pour flush toilets
Eradication of manual scavenging.; 100% collection and scientific processing/
disposal/reuse/recycle of Municipal Solid Waste.; To bring about a behavioural change in people regarding healthy sanitation practices.; Generate awareness among the citizens about sanitation and its linkages with public health.; Strengthening of urban local bodies to design, execute and operate systems.; To create enabling environment for private sector participation in Capital expenditure and Operation and Maintenance expenditure (O&M).

The Mission has the following components: i. Provision of household toilets; ii. Community toilets; iii. Public toilets; iv. Solid Waste Management.;v. IEC and Public Awareness; vi. Capacity Building and A&OE

Events list for Swach Bharat Abhiyaan- Ref- letter of MOUD dated 19th september 2014

Awareness and Publicity

- Dedication of public toilets at important places by honorable CM/Central Minister/MP/Mayor
- Flagging off of Swach Bharat marathon/walkathon by honorable CM/Central Minister/MP/Mayor
- **Building awareness in public at large-** Organizing 'PrabhatPherie' in various society/mohallastocreate awareness; Household Sanitation: 7-8 A.M; Locality Sanitation: 8-9 A.M; Mohalla Sanitation and other sanitation related activities : 9-11 A.M; Pledge taking not to litter on road and to deposit only at designated waste collection points and not to spit in public places; 100 hrs voluntary service to sanitation by each citizen in a year ; Display of message of cleanliness through sign boards at public places /markets; Create awareness on usage of toilets to eliminate open defecation; Educating schools children about importance of sanitation through distribution of education material; School children sanitation painting competition; Sanitation marathon/walkathon; Kites flying celebration with messages on kite- swachbharatmerasapna

Action on The Ground

- Repair, maintenance, cleaning and sanitation of public community toilets Creating establishing SHGs for maintenance of public/ community toilet ; Cleaning of toilets in government buildings /hospitals and schools; Engagement of swachdoot in each ward as ear and eyes for ULBs
- River/Talab side waste cleaning
- Cleaning of public common areas of city and locality; Cleaning of statues of National Leaders; Removal of debris and garbage heaps in public places; Cleaning of government buildings including removal of excess furniture /records lying in corridors

4.6. Issues and options for the Ganga rejuvenation for the consideration of the New Government

- **The governance deficit – one dimension is lack of policy for mulation** which leads to arbitrary decisions. On the other hand, the resistance movement should be fully informed on the policy formulation process and should find ways to effectively intervene in the debate. Policy formulation should also be informed by the people's wisdom and views which is not the case today. There is a need to find a common ground by the contending forces in this arena. **The water policy in country has been deficient on river issues**, now there is more talk of river. However Ganga movement has kept the focus only on main -stem of the

Ganga River. We need more than that – a **Ganga River Basin Policy**. The Ganga river basin policy remains an empty ground

- **Data is needed on water flow and climate in Himalayas.** Without this there cannot be any rational engineering interventions.
- **Certain myths are prevalent** which prevent sensible and rational discourse on policy, these myths need to be challenged systematically
- **The promotion of navigation** needs to be deciphered for its true motivation. Transport of coal could be one such motive. However the challenge to this should be informed by assessing the impact of the Farakka barrage which is an ecological disaster. At the same time the rights of fishermen on Ganga cannot be ignored.
- **There is widespread loss of livelihoods** due to ecological damage to agriculture, fisheries and landscape due to past interventions. These need to be taken into account for the formulation of Ganga River basin Policy. This also needs to be systematically documented.
- **Aviral Ganga** : There is almost total absence of Ganga jal from Himalaya by the time Ganga reaches Varanasi. (ref-Prof UK Chudhary/ Observations of Allahabad High Court). One of the major contributors to it is the withdrawal of water from Ganga through Upper Ganga canal and Lower Ganga canal. Ganga is said to be greatly narrowed at Varanasi in recent years and at some places it seems to be flowing away from the Ghats (Ref: Rana SP Singh). Similar lack of lean season flow is being reported from Kanpur, Patna and other cities. What measures do we propose to ensure that water withdrawn from these canals is much less than it is done at present..
- **Floods**: The discourse in last few years tended to focus on minimum ecological flows, but in the same years we faced biggest flood disasters. There has been surprising absence of **discourse on space to the river for maximum flow.**
- **Review and debate the work of IITs in last five years** : A seven IIT consortium was also given responsibility to prepare the environmental management plan for Ganga and draft report has been submitted by them- It is interesting to note that the new Government has decided to entrust the IIT consortium with new work, without critically evaluating its work done in last five years

CHAPTER 5 –

NAMAMI GANGE :PUBLIC ACTIONS FOR CLEANING GANGA and GANGA REJUVENATION

Learning Objective: In this chapter, some suggestions are made to explore a new path to overcome the failures of the past and achieve the objectives of the ganga rejuvenation and prevention of Ganga pollution

The story of destruction of Ganges began with cutting of forests in Himalayas for the needs of sleepers for the Indian railways. Its reached its climax in Kedarnathvalley cloud burst, during the char dharmyatra, in the year 2013 causing immense physical destruction and human tragedy in Garhwal Himalayas. There is a need to recapture this story if our planners have to become equipped with finding a real solution, instead of repeating the mistakes of the past on a grander scale.

We suggest a program of self reflection: first, We need to deconstruct our colonial consciousness. Certain solutions were imposed on us by our colonial masters without our consent and against our resistance. These were alien to our landscape and the unique ecology. Since we were militarily defeated nation, by default, we had to accept the superiority of an alien science and technology of our colonial masters. There was no space for a rationale self-reflection at that time. .

After attaining independence, we continued the colonial enterprise of quest of profits through 'development with destruction' instead of deconstructing that consciousness. We proceeded on the same path and further compounded the errors of our colonial masters. We are continuing to do the same today. Our obsessive pursuit has blinded us to the possibilities of any alternative science and technology and alternative path of modernity and national development.

If we want to save ourselves from this impasse, we need to explore a new path.

- We should not fall into the trap of neoliberal, neocolonial solutions enticed by the power of their so called science, technology and virtual capital. An attitude conducive to understanding and comprehending nature and the river in its totality, with a reverential attitude, is the precondition to it
- The Ganges should be considered in its entirety and should not be limited to certain locations which are ascribed higher spiritual values. For example the issues related to flooding, embankments and Farakka Barrage should be given equal importance.
- Initiate a process of consultation with people living along the banks of river to understand their experiences and seek their views on what we have done to the Ganges River
- Review and debate the technical and governance solutions being proposed by the NGRBA and its international donor development agencies partners.

Following initial actions are suggested to make a new beginning

5.1. Explore the Third Path for Ganga Rejuvenation:

- Give Up the World Bank mind-set and paradigm for finding the solution. A truthful assessment of the impact of the interventions made under the guidance and tutelage of world bank in India's water sector will point to their abysmal failure and provide the rationale for moving away from this thinking, which has been one of the major contributory factor in mis-management of our rivers and water systems.
- The logical corollary of this is to stop borrowing from the World Bank for the Ganga rejuvenation and Clean Ganga Mission

5.2. Lok-Shikshan Prorgam

- Educate the people about Ganges, on the lines suggested above. We can perhaps begin by aiming at training faculty of 1000 activists/ academicians politicians/bureaucrats/common citizens who are reasonably well informed on the entire range of issues regarding the Ganga River and have the skills to educate and train others, and undertake communication research to adapt the training curriculum to the needs and results.
- Use of hindi and other national languages in the official and academic discourse on Ganga: all the discourses and dialogues are being done in English For the complete marginalization of the 600 million people living in the Ganga basin, which is not the first language of the people of Ganga basin. Majority of the social and political activists and political leadership gets marginalized in the process.
- Dissemination of knowledge and awareness regarding the how damage to the Ganges river systems and other rivers in the country. These have inevitably resulted from the faulty development and growth policies adopted in last 200 years. These have been further compounded, since the advent of neo-liberal growth agenda in the country in early nineteen eighties. [this is part of 2]
- Water –health linkage- The swach-swasth linkage needs to be emphasized and people need to be made aware of impact of polluted water on their health. More studies should be undertaken to document this. Existing studies need to be brought in public domain and disseminated. This will mobilize national social and political demand for clean ganga and will contribute to political and social action.

5.3. Research:

- Study (for education and dissemination) of the traditional knowledge, beliefs and cultural practices of our people regarding water management and reverential attitude towards water bodies and rivers.
- Invite people to reflect on current dichotomies of our modern ways of living and belief systems.
- The mico-level success stories in restoration of small river systems, recharging of the ground water and other systems like ahar-pine systems of Bihar and many others in different parts of the country, must be documented and replicated.

5.4. The last should be the first:

The vulnerable and underprivileged communities living on the banks of Ganga River, have been sufferers of the destruction processes of the Ganges river system. They should be given a fair deal. They should be made equal partner in the endeavor of maintaining the *aviral-pravahof* Ganga. They should be partners in the processes of preventing pollution to the Ganga and its tributaries. These communities may include-

- the fishermen who have lost their livelihoods;
- the farmers whose lands have been destroyed due to the use of waste water for irrigation pollution of the river caused by the industrial pollution and other dangerous chemicals discharged into the river system;
- also the destruction of the agriculture land by the river erosion;
- the dalit communities who have lost rights over the common property resources on the banks of Ganga;
- Balmiki community who are associated with sanitation work in the cities and in the villages.

5.5. NirmalJal

- Revive public hand pumps and piasos'- the free facilities for drinking water in all the public places – 'to ensure provide free drinking water to the public. The policy for appropriate use of ground water should allow -to dig hand pumps and bore wells- for public drinking water and domestic water consumption, wherever the ground water is available in plenty.
- Preserve and conserve groundwater and treat it as primary source of water supply for the city. On the other hand curb the unsustainable use of ground water

5.6. Swach Bharat and National Urban Sanitation Mission in the right way:

- Solid waste management : to prevent any waste matter from entering into the drainage systems and nullahs of the city and then into the river streams and water systems
- Develop reverence towards the cleanliness of the city nullahs also. The flow in these nullahs should also be as sacred as the river stream. Only treated wastewater should flow into nullahs. The bioremediation measures should be used. At the same time, the extremes of tertiary treatment and zero discharge should be avoided.
- Discuss whether investments in Sewerage system and STPs by JNNRUM and World Bank will be able to achieve the desired purpose and not end up in failures like GAP-1 and 2. Prepare an alternative plan- district wise and for the catchment areas of city/district nullahs get it improved in the municipal council and JilaParishad and make demand for allocation of funds from higher levels of government for implementation of these plans
- Resolve the tannery and other industries pollution issue.

5.7. Governance

- **Clarify the primary accountability -Who are the agencies which are responsible:** State Government, Central Government, National Green Tribunal, Allahabad High Court & Supreme Court, para-statal organizations and Urban local bodies.
- **Empower Nagar Nigam and Nagar Palika:** Empower urban local bodies,(provide skilled and trained staff at higher and middle level with properly equipped office and resources) Give complete control and powers over other parastatals- Jalsansthan/ Jal Nigam/ Development authority - as far as Nirmaljal-Nirmal ganga issues are concerned , adequately resource and empower them. Do not hide behind the court management of water supply/city sanitation/river protection tasks
- Begin process of river protection and clean water planning through public participation
- Recognize the rights of the river

SWACH BHARAT SHAPATH: ACTION FOR CIVIL SOCIETY:

Following symbolic Shapath or oath may be considered by the civil society organizations as a constructive program of engagement with all:

- Personal pledge not to use plastic packets and campaign for the same at the village level/ward level
- Personal pledge minimize the use and not to waste water and electricity, as much as possible

ANNEX-

BARRIERS IN THE FLOW OF GANGA

- **Existing:** A. Badrinath (1.25MW); B. Tapovan (0.8MW); C. Tharali (0.2MW); D. Tilwara (0.2MW); E. Urgam (3MW); F. Vishnuprayag (400 MW)
- ▲ **Under Construction:** a. Kaliganga-I (4MW); b. Kaliganga-II(6MW); c. Kotli Bhel IB (93.20MW); d. Madhmaheswar (10 MW); e. Topovan Vishnugad(520 MW); f. Shrinagar (330MW)
- **Proposed:** 1. Alaknanda (Badrinath) (300MW); 2. Bagoli (72MW); 3. Bowla Nandprayag (132MW); 4. Chuni Semi (24MW); 5. Deodi (60MW); 6. Devsari Dam (255MW); 7. Gaurikund (18.6MW); 8. Gohana Tal (60MW); 9. Jelum Tamak (60MW); 10. Karnaprayag (160MW); 11. Lakshmganga (4.4MW); 12. Lata Tapovan (310MW); 13. Maleri Jelum (55MW); 14. Nandprayag Langasu (141MW); 15. Padli Dam (27MW); 16. Phata-Byung (10.8MW); 17. Rambara (24MW); 18. Rishi Ganga-I (70MW); 19. Rishi Ganga-II (35MW); 20. Singoli-Bhatwari (99MW); 21. Tamak Lata (280MW); 22. Urgam- II(3.8MW); 23. Utiyasu Dam (860MW); 24. Vishnuprayag Pipalkoti (444MW)

Figure 4: Hydroelectric Projects in Alaknanda River Basin

- ▲ **Existing:** a. Maneri Bhali I (99 MW); b. Maneri Bhali II (304 MW); c. Tehri (1000 MW)
- **Under Construction :** A. Loharinag Pala, now abandoned (600 MW); B. Koteswar (400 MW); C. Kotli Bhel IA (195MW); D. Kotli Bhel IB (320 MW); E. Kotli Bhel II (530MW); F. Pala Maneri I (480MW)
- **Proposed:** 1. Bhaironghati I (380 MW); 2. Bhaironghati II (65 MW); 3. Bhilangana I (22.5 MW); 4. Bhilangana II (11 MW); 5. Gangotri (55 MW); 6. Harsil (210 MW); 7. Jadhganga (50 MW); 8. Karmoli (140 MW); 9. Tehri PSS (1000 MW)

Figure 5: Hydroelectric Projects on Ganga (Bhagirathi) and Bhilangana River

(copied from Gangapedia documents)