15

MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION

GANGA REJUVENATION

COMMITTEE ON ESTIMATES (2016-17)

FIFTEENTH REPORT

SIXTEENTH LOK SABHA

LOK SABHA SECRETARIAT

NEW DELHI

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Presented to Lok Sabha on 11th May, 2016

LOK SABHA SECRETARIAT

NEW DELHI

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INTRODUCTION

I, the Chairperson of the Committee on Estimates, having been authorized by the Committee to submit the Report on their behalf, do present this Fifteenth Report on 'Ganga Rejuvenation'.

2. The Ganga, revered by millions of people, is the lifeline of the populous gangetic plains sustaining 43 percent of Indian population. The Ganga, traversing a distance of 2525 km from her source in the Himalayas to the sea, bears no comparison with any river of the world because of its highest point of origin, steep gradient, kinetic energy and widely acclaimed water quality. However, indiscriminate anthropogenic interventions like construction of HPPs in the seismically active and fragile Himalayas, diversion of 80 to 90 percent of water, discharge of extremely hazardous affluents by 144 drains and dumping of solid waste has converted the Ganga into one of the ten most polluted rivers of the world. Alarmed by the drying-polluted Ganga and taking note of the solemn resolve of the Prime Minister to rejuvenate the Ganga, the Committee decided to select the subject for in depth examination and report with a view to accelerate the work of Ganga rejuvenation.

3. The Government of India launched Ganga Action Plan (GAP) in 1985. The main objective of GAP was to improve the water quality of the Ganga to acceptable standards by preventing the pollution load reaching the river. Since the GAP-I could not mitigate the pollution load of the Ganga fully, the Ganga Action Plan (GAP)-II was launched in stages between 1993-1996. GAP-II, while continuing the ongoing programmes of GAP-I, also included the works on tributaries, namely, Yamuna, Damodar and Gomti. Not satisfied with the outcome of GAP-I & II and seriously concerned over the burgeoning pollution levels, the Government set up in 2009, the National Ganga River Basin Authority (NGRBA) for conservation of the Ganga and maintenance of environmental flows through comprehensive river basin approach. All these efforts created additional infrastructure to tackle the pollution menace yet the infrastructure so created proved far from adequate to control pollution and to maintain the e-flows.

4. Since earlier attempts of cleaning the Ganga did not bring the desired results, the Government of India launched the 'Integrated Ganga Conservation Mission' on May 13, 2015 called 'Namami Gange' with a budget outlay of ₹ 20,000 crores for the next 5 years. This is a significant fourfold increase over the expenditure of last 30 years. The Mission approaches Ganga rejuvenation by consolidating the existing ongoing efforts and enhance the size and scope of various interventions based on expert advice.

5. The Committee took oral evidence of the representatives of the Ministry of Water Resources, River Development and Ganga Rejuvenation on 29 May, 2015, 13 July, 2015 and 16 February, 2016. The Committee also took oral evidence of the representatives of the Ministry of Environment, Forests & Climate Change on 13 July, 2015 and 16 February, 2016; Ministry of Finance (Department of Expenditure) and (Department of Economic Affairs) on 13 July, 2015; Ministry of Power and Ministry of Shipping on 24 August, 2015 and 16 February, 2016; Central Water Commission, Central Ground Water Board, Central Pollution Control Board, Ministry of Urban Development on 16 February, 2016. The Committee also sought information and suggestions from the State Governments and Union Territories through which the river Ganga flows. Besides, the Committee also invited suggestions from the domain experts and reputed hydrologists on Ganga rejuvenation.

6. The Committee considered and adopted this Report at their sitting held on 6th May, 2016.

7. The Committee wish to express their thanks to the representatives of the various Ministries/ Departments for tendering evidence before them and for furnishing requisite material in connection with the examination of the subject. The Committee also place on record their sincere thanks to S/Shri U. K. Chaudhary, Anupam Mishra, Anil Kumar Gupta, Professor Vinod Tare, Dr. Arun Kumar, Professor A. A. Kazmi, Dr. Sudipta Sarkar, Ms. Mallika Bhanot, Shri Hemant Dhyani and Shri Govind Pokhriyal, who appeared before the Committee besides furnishing written Memoranda as desired by the Committee. The Committee also thank the organization and individuals who submitted their suggestions to the Committee.

8. For facility of reference and convenience, the recommendations/observations of the Committee have been printed in Bold in Part-II of the Report. The Committee ardently hope that the Government would give their earnest consideration to the recommendation of the Committee so that the Ganga is rejuvenated and restored to its pristine form by July 2018.

NEW DELHI:
5th May, 2016
15 Vaisakha, 1938 (Saka)

DR. MURLI MANOHAR JOSHI
Chairperson
Committee on Estimates

ABBREVIATIONS

AHPCL - *Alakananda Hydro Power Company Limited*
BOD - Biological Oxygen Demand
BRO - Border Road Organisation
CC&CIS - Carrying Capacity and Cumulative Impact Studies
CETP - Common Effluent Treatment Plant
CLRI - Central Leather Research Institute
CPSU - Central Project Support Unit
CGWB - Central Ground Water Board
COD - Chemical Oxygen Demand
CPHEEO - Central Public Health and Environment Engineering Organization
CPCB - Central Pollution Control Board
CSE - Centre for Science & Environment
CWC - Central Water Commission
CWPRS - Central Water and Power Research Station
DAC - Department of Agriculture and Cooperation
DNA - Daily News and Analysis
DPR - Detailed Project Report
DO - Dissolved Oxygen
DWS - Drinking Water & Sanitation
DWSD - Drinking Water and Sanitation Department
EA - Executing Agencies
EAC - Expert Appraisal Committee
EAP - Externally Aided Project
EC - Environment Clearance
EFC - Expenditure Finance Committee
EIA - Environment Impact Assessment
EMP - Environment Management Plan
EP Act - Environment (Protection) Act
ESC - Empowered Steering Committee
ETP - Effluent Treatment Plant
FCC - Fecal Colifor Count
GAP - Ganga Action Plan
GKC - Ganga Knowledge Centre
GOI - Government of India
GPI - Grossly Polluting Industries
GRBMP - Ganga River Basin Management Plan
GTF - Ganga Task Force
HEP - Hydro Electric Project
HEPPs - Hydro Electric Power Plants
HLTF - High Level Task Force

HNB - **Hemvati Nandan Bahuguna**
HP - Himachal Pradesh
I&D - Interception and Diversion
IHHL - Individual House Hold Latrine
IITs - Indian Institutes of Technology
ILO - Intermediate Level Outlet
INWTG - Integrated National Waterways Transport Grid
IWAI - **Inland Waterways Authority of India**
IWT - Inland Water Transport
JICA - Japan International Cooperation Agency
JNNURM - Jawaharlal Nehru National Urban Renewal Mission
JPVL - Jaiprakash Power Ventures Limited
JS - Joint Secretary
KLD - Kilo Litres per Day
LAD - Least Available Depth
LCS - Low Cost Sanitation
MCM - Million Cubic Meters
MDDL - Minimum Draw Down Level
MLD - Million Litres of Water a Day
MMIT - Mahamana Malviya Institute of Technology
MoEF&CC - Ministry of Environment, Forests & Climate Change
MoUD - Ministry of Urban Development
M/o WR, RD & GR - Ministry of Water Resources, River Development & Ganga Rejuvenation
MP - Madhya Pradesh
MW - Mega Watt
NEAA - National Environment Appellate Authority
NEERI - National Environmental Engineering Research Institute
NGO - Non-Government Organisation
NGRBA - National Ganga River Basin Authority
NMCG - National Mission for Clean Ganga
NRSD - National River Conservation Directorate
O&M - Operation & Management
ODF - Open Defecation Free
PIAS - Pollution, Inventorization, Assessment & Surveillance
PMO - Prime Minister's Office
PPP - Public Private Partnership
ROR - Run-of-the-River
RRZ - River Regulation Zone
SGRCAs - State Ganga River Conservation Authorities
SLP - Special Leave Petition
SPCBs - State Pollution control Boards

SPMGs - State Programme Management Groups
SPV - Special Purpose Vehicle
STP - Sewage Treatment Plant
TGP - Three Gorges Dam Project
THDCIL - Tehri Hydro Development Corporation India Limited
TRT - Tail Race Tunnel
UDD - Urban Development Department
UIDSSMT - Urban Infrastructure Development Scheme for Small and Medium Towns
UJVNL - Uttarakhand Jal Vidyut Nigam Ltd
UK - Uttarakhand
ULBs - Urban Local Bodies
UP - Uttar Pradesh
WB - West Bengal
WQM - Water Quality Monitoring System for River Ganga
MG/L - Miligram per Litre
WWF - World Wildlife Fund
ZLD - Zero Liquid Discharge

REPORT

CHAPTER-I

Introductory

The Bhagirathi originating from the Gangotri glacier at "Gaumukh" and the Alaknanda originating from the Satopanth glacier in the Himalayas confluence at Devprayag in Uttarakhand and form the Ganga. In hydrology, the Alaknanda is considered the source stream of the Ganga on account of its greater length and discharge but in mythology and popular belief the Bhagirathi is considered its main source also known as the Bhagirathi Ganga. According to legend, the Ganga was brought down to earth by Bhagirath, son of King Sagara, after long penance for salvation of his siblings. The earliest reference to the river occurs in Rig Veda (3.5 8.6) which says that “Your ancient home, your auspicious friendship, O Heroes, your wealth is on the banks of the Jahnavi (River Ganga). Further, in the Bhagwad Gita, Lord Krishna says "Of purifiers I am the wind; of the wielders of weapons I am Rama; of fishes I am the shark; and of flowing rivers I am the Ganges (10.31)." The head waters of the Alaknanda, the Saraswati and the Dhauli, emerge from the Bhagirathi Kharak (east of the Gangotri glacier) and the Bamak glaciers. At Haridwar, the Ganga descends to the plains after cutting across the Siwalik ranges.

The Ganga receives many tributaries including the Ramganga, the Gomti, the Ghaghra, the Gandak and the Kosi from the north and the Yamuna and the Son from the south. The Gomti and the Son are two major tributaries of the Ganga River which have non-Himalayan sources. The Gomti is a rain fed river with its entire drainage in the Ganga plain. Its originates from the reservoir Madho-Tandain in the Pilibhit district, Uttar Pradesh located 50 Km south of the foot hills of the Himalaya. The Yamuna is the largest tributary of the Ganga in terms of drainage area and accounts for nearly 40% of the Ganga Basin. It originates from the Yamunotri glacier in the Himalaya and descends to the Ganga plain at Dak Pathar, after merging with a number of tributaries in the Himalaya. The Chambal, the Sind, the Betwa and the Ken are the major tributaries of the Yamuna, all of which originate in and flow almost entirely through Peninsular India. All these tributaries join the Yamuna in the gangetic plain before its confluence with the Ganga at Allahabad. The Son is another tributary of Ganga River with its drainage predominantly in the Peninsular India. A part of its basin prior to its confluence with the Ganga is in the Ganga plain. The Son originates from the Amarkantak in the Bundelkhand

plateau and merges with the Ganga River upstream Patna. The Kosi (Sapta Kosi), the Gandak (Narayani) and the Ghaghra (Karnali) are major rivers of the Ganga system all of them originating from glaciers and snow-fed lakes of the Nepal Himalaya. The Kosi river system consists of the Arun, the Sunkosi and the Tamakosi rivers. Flowing through a narrow gorge before entering the plains and called the SaptaKosi and enters into the India territory as the Kosi, the Kosi river has the second largest drainage area among the tributaries of the Ganga after the Yamuna. It is joined by the tributaries like the Bagmati and the Kamala rivers before it merges with the Ganga. The Gandaki river system in central Nepal consists of the Kaligandaki, Budhigandaki, Marsyandi, Trishuli and Seti rivers. The Kaligandaki and the Trishuli are the main tributaries of this system. The Kaligandaki converges with the Trishuli and is called the Narayani which meets the Ganga River as the Gandak near Hazipur. The Ghaghra river system originates from the western Nepal. It consists of the Kali, the Karnali, the Seti and the Bheri rivers and has the highest water discharge among the tributaries of the Ganga system. The Ghaghra merges with the Ganga near Revilganj.

1.2 The Ganga river traverses [around 2500 kms through] the States of Uttarakhand [450 kms], Uttar Pradesh [1000 kms], Bihar [405 km], Jharkhand [40 km] and West Bengal [520 km] finally draining into the Bay of Bengal through Sundarbans Delta. It passes through some of the most heavily populated regions of the northern plains of India. The major cities located on the bank are Srinagar, Rishikesh, Haridwar, Roorkee (in Uttarakhand), Bijnor, Kanpur, Allahabad, Varanasi (in Uttar Pradesh), Patna, Bhagalpur (Bihar) and Kolkata (West Bengal). The Ganga river basin is the largest river basin in India, covering a landmass of 8,61,404 sq. km. i.e. more than a quarter of country's land area; and sustaining about 43% of India's population. The Ganga, apart from providing water for drinking and irrigation, has great economic, environmental, cultural and religious significance. The Ganga, along with her many tributaries, has been the source of physical and spiritual sustenance of Indian civilization for millennia.

The dying and decaying river

1.3 Rivers have a self-cleansing ability, which allows for assimilation and treatment of biological waste. But when withdrawal from the river for drinking, irrigation, industrial and power generation purposes is high and dangerous affluents are discharged into the depleted river, inevitably the quality of water in the river goes down and gets affected adversily. So has been the case with Ganga. The Ganga is now no more the life-giving, life-supporting river that as it was. It has degenerated into a big sewer, one of ten - the dirtiest of all rivers.

1.4 **Diversion of water and pollution discharge:** According K.S. Valdiya, having been dammed at Tehri in western Uttarakhand, the Ganga descends onto the plains, only to be robbed of its water by huge diversions through the Upper Ganga Canal at Haridwar, which reduces its discharge to mere 15 billion m^3/yr and then by the Lower Ganga Canal near Aligarh. That leaves so little water in the Ganga that the dry-season discharge at Kanpur is merely 90 to 386 m^3/ second, at Allahabad 279 to 997 m^3/ second, and at Varanasi 278 to 1160 m^3/second. Despite being joined by a number of tributaries, the Ganga is progressively polluted due to heavy discharges at the rate of 3000 million liters per day from towns and cities, despite of sewage treatment plants varying from 13.5% in small cities to 27.8 to 50.4% in big cities - 329 million kilolitres. Nearly 50% of waste waters are discharged untreated into this lifeline of the central Indo-Gangetic Plain. Over 1.3 billion litres of sewage, 260 million litres of industrial waste, runoff from 6 million tonnes of fertilizers and 9000 tonnes of pesticides used in agriculture, and very large quantities of solid waste are daily released into the Ganga[*]. Taking into consideration these facts of pollution, the Ganga water can no longer be described as life-giving and holy. On the contrary the Ganga has been declared as one of the ten most polluted rivers of the world by WWF International, Switzerlad.

1.5 A survey by the Centre for Science & Environment (CSE) (2012) identified state-wise problems of the river Ganga being – Uttarakhand: numerous Hydel projects, decreased environmental flows; Uttar Pradesh: Growing cities, polluting industries, very high pollution

[*] Environmental Geology 2nd Edition 2013, p.492-493.

levels between Kanpur & Varanasi; Bihar & West Bengal: decreased assimilative capacity and growing pollution. The issues affecting the river are thus myriad and complex. The river supports livelihoods of millions in the basin and their drinking water needs.

1.6 The CPCB report (2012) states that in the upper reaches of the river, where oxygenating abilities of the river are the highest, there are growing signs of contamination, which suggests that even here, water withdrawal for hydro-electricity is endangering the health of the Ganga. As the river reaches the plains, the water withdrawal peaks for irrigation and drinking water. In the stretch of the river – from Rishikesh to Allahabad, during winter and summer months, there is almost no water and the river becomes almost dead over long stretches until waste water, affluents and sewers fall in the dry basin. The pollution is being caused by several factors ranging from untreated and inadequately treated/ untreated municipal sewage, flow of untreated industrial waste including chemicals, inappropriate solid waste management, pollution on account of non-point source like use of chemical pesticides and fertilizers from agricultural fields, open area defecation along the river banks/ along nallah-tributaries as also drains, etc.

Earlier attempts to check pollution in the Ganga

1.7 Alerted by the immense damage caused to the purity of the river Ganga due to flow of untreated municipal sewage and also industrial effluents into the river, the Government of India launched Ganga Action Plan (GAP) in 1985. The main objective of GAP was to improve the water quality of the Ganga to acceptable standards by preventing the pollution load reaching the river. Since the GAP-I did not cover the pollution load of Ganga fully, the Ganga Action Plan (GAP) – II was launched in stages between 1993-1996. GAP II, while continuing the ongoing programmes of GAP-I also included the works on tributaries, namely, Yamuna, Damodar, Gomti. Not satisfied with the outcome of GAP-I & II and seriously concerned over the burgeoning pollution levels, the Government set up in 2009, National Ganga River Basin Authority (NGRBA) conservation of the Ganga and maintenance of environmental flows through comprehensive river basin approach. However, all these efforts created additional

infrastructure to tackle the pollution menace yet the infrastructure was far from adequate to yield the desired results in view of ever increasing pollution.

1.8 The Public Accounts Committee (2014-15) in their 8th Report on Water Pollution had expressed distress that the Ganga has become one of the five most polluted rivers in the world, despite launching of the 'Ganga Action Plan' and the 'Mission Clean Ganga' (2009) by the NGRBA. They also noted that despite the far reaching recommendations of the PAC [2003-04], made in their 62nd Report of 13th Lok Sabha on 'Ganga Action Plan', for creation of Sewage Treatment Plants, Industrial Effluent Treatment Plants, Toilet Complexes, Electric Crematoria, Improvement of Bathing Ghats, river front developments, etc., much remained to be done to implement those recommendations.

1.9 Since earlier attempts of cleaning the Ganga did not bring the desired results, the Government of India initiated the 'Integrated Ganga Conservation Mission called '**Namami Gange'** and a sum of Rs. 2,037 crores has been set aside for this purpose in the budget for the year 2014-15. The Mission approaches Ganga Rejuvenation by consolidating the existing ongoing efforts and planning for a concrete action plan for future. The interventions at Ghats and River fronts will facilitate better citizen connect and set the tone for river centric urban planning process.

1.10 During evidence before the Committee on February 16, 2016, Secretary, Ministry of Water Resources, apprised the Committee that Namami Gange has obtained a comprehensive Cabinet approval with initial focus on cleaning the River Ganga. When asked to clarify whether it would be feasible to clean the Ganga and restore its purity, the Secretary, MoWR admitted:

"You are right, unless there is water in the river, what will be cleaned.'

1.11 Asked again whether 'purity' or 'nirmalta' would take care of the ecological flow which has many dimensions, once the ecology is destroyed, considering the fact that river has its own ambience and ecological functions, Secretary testified;

"Nirmalta alone will not help in sustaining the river to perform its ecological functions. Both have to complement each other, adequate flow and cleanliness. But if the flow comes and we continue to dirty the river then the aquatic life will not survive and therefore the government have adopted a comprehensive approach"

1.12 On being enquired whether the government had adopted any city specific approach where the people congregate from far off places so that the people witness the pollution elimination and purity drive and take back home positive message, the witness said:

"We have detailed project reports for cities like Devprayag, Rishikesh, Haridwar, Garhmukteswar, Vthur, Kanpur Allahabad and Benaras".

1.13 On being suggested to include cities on the bank of the Yamuna as well, the witness agreed to do so and assured that in a few months there will be visible improvement in the situation.

1.14 To address all these issues, the Committee decided to have comprehensive examination of the Subject.

CHAPTER-II

POLLUTION IN RIVER GANGA – TYPES AND MAGNITUDE

The water of streams had along been acclaimed from the ancient times for being sustainer of life. There are hymns in the Atharva Veda in praise of streams. For example:

अम्बयो यन्त्यध्वभिर्जामयो अध्वरीयतांम।
पृंच्चतीर्मधुना पयः।। **(I.4.1)**

"As mothers always bring happiness to their children, in the same manner. The streams, nourishers of mankind, flow incessantly, adding milk and honey to their waters all the way".

अप्स्वन्तरमृतंमप्सु भेषजम्।
अपामुत प्रशस्तिभिरश्वा भवथ वाजिनो गावो भवथ वाजिनीः। **(I.4.4)**

"0 learned persons, may you know that there is ambrosia in the waters; there is healing balm in them, and there are medicinal herbs; know this, and by their proper use become vigorous like horses and kine."

शिवेन मा चक्षुषा पश्यतापः शिवया तन्वोपस्पृशत त्वचं मे।
घृतक्ष्चुतः शुचयो याः पावकास्ता न आपः शं स्योना भवन्तु।। **(I.33.4)**

"0 elemental waters, may you behold me with an auspicious glance; may you touch my skin with your body. Dripping luster, glittering here and that are purifying, may those elemental waters be gracious and pleasing to us".

ये किमयः पर्वतेषु वनेष्वोषधीषु पशुष्वप्स्वन्तः।
ये अस्मांक तन्वमाविविशुः सर्व तद्धन्मि जनिम किमीणाम्।।**(II.33.5)**

"The worms, that are found in the hilly regions, in the forests, inside the animals 'and in waters, and that have entered' our bodies, I hereby destroy their entire generation".

इमा आपः प्र भराम्ययक्ष्मा यक्ष्मनाशनीः।
गृहानुप प्र सीदाप्यमृतेन सहाग्निना।।**(III.12.9)**

"I bring her these waters, free from wasteful disease.(consumption)- and destroyers of the wasteful disease. I enter these houses with .the-, never-dying fire".

Its life-giving and healing qualities are evident from the following description in Rajanirghanta (300 AD) *"The qualities of Ganga water are: Coolness, sweetness, transparency, high tonic property, wholesomeness, potability, ability to remove evils, ability to resuscitate from swoon caused by dehydration, digestive property and ability to retain wisdom*"**:**

अस्या जलस्य गुणाः शीतत्वम्, स्वादुत्वम, स्वछत्वम, अत्यन्तरुच्यत्वम्, पथ्तत्वम्, पावनत्वम्, पापहारित्वम्, तृष्णामोहध्वंसत्वम्, दीपनत्वम्, प्रज्ञाधारित्वंच, इति राजनिर्घण्टः

Scriptures cautioned against misusing the Ganga river. For instance, thirteen types of human actions: (1) defecation, (2) gargling, (3) throwing of used floral offerings, (4) rubbing of filth, (5)flowing bodies (human or animal), (6)frolicking; (7) acceptance of donations; (8) obscenity; (9) considering other shrines to be superior,(10) praising other shrines, (11) discarding garments; (12) bathing, and (13) making noise were prohibited.

2.2 The river Ganga is revered as incarnation of the goddess herself by millions of devouts within the country and beyond who believe that a holy dip in its water enables to attain salvation. In the words of Pandit Jawahar Lal Nehru "the Ganga, above all the rivers of India, has held India's heart captive and drawn uncounted millions to her banks since the dawn of history. The story of the Ganges, from her source to sea, from old times to new, is the story of India's civilization and culture, of the rise and fall of empires, of great and proud cities of the adventure of man and the quest of the mind which has so occupied India's thinkers, of the richness and fulfillment of life as well as its denial and renunciation, of ups and downs of growth and decay, of life and death. This is evident from the mass gatherings and social assemblies taking place on the holy bank of the River Ganga."

2.3 However, with urbanisation and industrialisation, the water quality of the Ganga has been significantly affected by disposal of anthropogenic wastes into the rivers which has caused enormous harm to river biota and the ecosystem.

Fact sheet on Ganga River Basin

2.4 The basic physical data on Ganga River basin as furnished by the Ministry of Water Resources, River Development & Ganga Rejuvenation in their Presentation made to the Committee on 13.07.2016 is as given under Table 2.4

Table 2.4 Fact Sheet on Ganga

Total length		2525 Kms
	Uttarakhand	450 Kms
	Uttar Pradesh	1000 Kms
Sharing length	UP-Bihar	110 Kms
	Bihar	405 Kms
	Jharkhand	40 Kms
	West Bengal	520 Kms
Catchment Area		8,61,404Km2
Population in basin		46% of India's total
Main tributaries		Ram Ganga, Kali-East, Yamuna, Gomti, Ghaghara, Gandak, Kosi & Damodar

2.5 The details on the main stem as furnished by M/o WR, RD & GR are as given under Table 2.5

Table 2.5 Settlements and Drains on the Main Stem

Details	Uttarakhand	Uttar Pradesh	Bihar	Jharkhand	West Bengal	Total
Number of districts	08	31	15	01	11	66
Number of Towns	15	31	26	02	44	118
Number of Gram Panchayats	132	959	309	25	224	1649
Number of drains	14	51	25	-	54	144

2.6 There are a total number of 11 States in Ganga basin. On main stem 05 States, other States being 06 (HP, Haryana, Delhi, Rajasthan, MP, Chhattisgarh).

Types of pollution

2.7 The details of various kinds of pollutions - Industrial/ Chemical, Sewage, Open defecation, pollution due to excessive fertilizer use in agriculture, garbage disposal, dumping of carcasses, uncremated dead bodies, leftover materials of religious functions, etc (segment wise) effecting adversely the Ganga, as furnished by M/o WR, RD & GR *inter- alia* are as follows:

> "The pollution in the Ganga River is caused by both point sources such as domestic & industrial waste water and non-point sources such as agricultural runoff, solid waste dumping, open defecation, left over religious material, etc. The domestic sewage contributes to 70% of the pollution load while industrial waste water contribute to 20% of the overall pollution load. Remaining 10% of the pollution is due to non-point sources as mentioned above."

2.8 The assessment made by CPCB on various sources of pollution in the River Ganga is as given in Table 2.8

Table 2.8 Pollution Assessment by CPCB

Pollution Type	Description
Municipal Sewage	As per CPCB, about 2723.3 mld of sewage is disposed in river Ganga from 36 Class I &14 Class II towns, against which a treatment capacity of about 1208.8 mld has been created.
Industrial Pollution	501 mld of industrial wastewater is being discharged into river Ganga from the 764 Grossly polluting industries (GPI) along the main stem of the river. The main industrial sectors responsible for pollution in Ganga are Sugar, Distillery, Pulp and Paper, Tannery, etc.
Open defecation	As per 2011 census, 33.64 Lacs households in the five main states do not have an access to toilet facilities and out of these 28.91 Lacs households defecate openly and 4.72 have an access to community toilets.
Use of fertilizers	Eleven Ganga Basin states consume 10 million tons of chemical fertilizers per year, which constitutes 45% of the total chemical fertilizer consumption of the country leading to disposal of high levels of nitrogen and phosphorus. As per estimates, run off from arable lands contains up to 70mg/l of nitrogen and phosphorus ranging from .05-1.1 mg/l, with potential to raise the nutrient level to a considerable degree in stream waters.
Solid waste	About 14000 metric tons per day of **Municipal Solid Waste** has been estimated to be generated from Class-I and Class-II cities/towns situated on the main stem of Ganga.

2.9 Prof. U. K. Chaudhury, a well known hydrologist who appeared before the Committee stated that during the Kumbh Mela between 4 to 5 crore devotees congregate at Allahabad, they attend their day-to-day activities there itself but River Ganga does not get polluted there. He deposed:

> "the reason behind this is that there is a sand bed of the Ganga system available there which is bearing the total load. I have given a three slope methodology here and forwarded five theories to Central Water Commission but so far not received any response. Singapore International Institute have also placed three slopes system - sand bed in north, south and East of Banaras, this is seven kilometer long and 1 and a half kilometer wide, both sides have gradients one side is Assai river, second is Varna river which has dug complete North to West side of Banaras. [----]. If we move scientifically, use sand bed we will find out the pollution problem of Ganga, Pollutant should be located, where, at what location and in how much quantity the pollutants should be fed in the river system. The

flow of surface water, ground water, their location, their importance and design of sites, we should not think how much quantity we discharge/release. STPs are set up at various locations, I just mention here that unless and until STP is not attached to the sand bed, you cannot solve the problem of river pollution. Therefore, you have to have the idea of river geomorphology."

Pollution Load on the Ganga

2.10 The M/o Environment, Forests and Climate Change, admitting to the ever growing pollution in river Ganga, in their background note submitted to the Committee stated as follows:

> ''Pollution loads in river Ganga has been increasing over the years due to rapid urbanisation, industrialization and increase in population. Extraction of water for irrigation, industrial, drinking purposes, etc. leading to inadequate flows which is compounding the problem. There is a large gap between the quantum of sewage being discharged into the river and the available treatment capacity. Besides open defecation, cattle-wallowing, garbage disposal, carcass-dumping further aggravates the problem of pollution. "

2.11 The Secretary, MoEF&CC appearing before the Committee on 13th July, 2015 on the pollution levels in Ganga testified as follows:

> "Sir, the level of pollution in the river has gone up. Nobody is disputing that. That is why, the Government is thinking of taking new measures and looking at what could be done so that individual polluters which means industries or the public systems which are the sewers or random pollution which take place in the form of leaving the refuge of the cremation grounds."

Pollution levels at various stretches of river Ganga

2.12 Stating that the level of pollution in Ganga is not the same across the entire stretch, a representative of the M/o WR, RD &GR testified:

> "Basically, this is to highlight that if you look at the pollution level in river Ganga the problem really begins Naroda downstream and the problem continues up to Varanasi. After Varanasi there is addition of flow to the river and, therefore, you will find that the pollution levels come down."

Pollution in River Ganga – Contribution from its tributaries.

2.13 With regard to the contribution of tributaries to the sewage and / or industrial pollution in river Ganga and the initiatives taken to assess the quantum of such pollution being added by the tributaries , the M/o WR,RD &GR, despite adequate notice period, were unable to furnish the information.

2.14 The Committee sought the action initiated till date regarding cleaning of polluted tributaries of river Ganga. The reply is awated from the M/o WR,Rd and GR despite granting several extensions.

POLLUTION INVENTORISATION, ASSESSMENT & SURVEILLANCE (PIAS) ON GANGA

2.15 One of the projects *viz.* 'the Pollution, Inventorization, Assessment & Surveillance on River Ganga (PIAS) is being executed by Central Pollution Control Board (CPCB) under NGRBA. The project is funded by the Ministry of Environment & Forests and was sanctioned for Rs. 34.77 crores on 29th March, 2011. The objective of the project is to inventorize the pollution sources, both point and non-point and to assess the pollution load being discharged into the River Ganga directly or indirectly through tributaries, namely Ramganga and Kali-East.

2.16 The project involves in-depth monitoring of GPI (on yearly basis), Sewage Treatment Plants (STP) (on half yearly basis), Common Effluent Treatment Plant (CETP) (on quarterly basis) and Polluted Stretches of the Ganga and its tributaries Ramganga and Kali-East, besides monitoring of the drains falling into the river and its tributaries.

2.17 Chart 2.17 shows the State of pollution in the Ganga.

CHAPTER-III

INITIATIVES – TAKEN IN THE PAST AND CURRENT PROGRAMMES

Ganga Action Plan (GAP) - I & II

3.1 The M/o WR, RD &GR in their status notes submitted that the Ganga Action Plan-I (GAP-I) was launched in the year 1986 in 25 selected towns located alongside the river in the States of Uttar Pradesh, Bihar and West Bengal (States of Uttarakhand and Jharkhand came into being subsequently). Subsequently, Ganga Action Plan Phase- II (GAP-II) was launched in the year 1993, while continuing with the ongoing programmes, it included works on four tributaries of the river – Yamuna, Gomati, Damodar and Mahananda. **Annexure–I** indicates the activities undertaken under GAP-I and GAP-II.

National Ganga River Basin Authority (NGRBA)

3.2 In 2009 the NGRBA was launched as a collaborative centre-state effort, under the Chairmanship of Prime Minister, for conservation of the river Ganga and maintenance of environmental flows through comprehensive river basin approach. The river was given the status of National River. The key difference from GAP-I & II and this new approach was the recognition that the entire river basin has to be the basis for planning and implementation. Yet another key difference was in the recognition that the plan for pollution control must take into account the need for adequate water in the river – its ecological flow.

National Mission for Clean Ganga (NMCG)

3.3 NMCG was created as a registered Society in 2011 as an implementation arm of NGRBA. The five NGRBA programme states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal have notified the State Ganga River Conservation Authorities (SGRCAs) thereby defining the apex policy and decision making structure at the state level. The implementation structure of NGRBA consists of:

(i) Policy making Apex Council headed by the Prime Minister;

(ii) Standing Committee under Finance Minister to regularly oversee implementation;

(iii) Empowered Steering Committee (ESC) to facilitate coordination with the Central and the State Government departments, and prioritise and sanction projects on a fast track basis;

(iv) A Mission Directorate, i.e. NMCG with a core team of professionals responsible for implementing the work programme of the Authority and to perform its day-to-day operations;

(v) State River Conservation Authorities under the Chief Ministers to coordinate and implement river conservation activities at the state level, and;

(vi) Implementation of projects by the states through State Programme Management Groups (SPMGs) and urban local bodies.

The NGRBA Program has developed dedicated functional-level institutions for planning, managing and implementing the program at national and state level. The NMCG at national level and SPMGs in Uttarakhand, Uttar Pradesh, Bihar, Jharkhand (through a dedicated NGRBA Cell) and West Bengal have been established as registered societies for implementing the programme, as tabulated below:

Table 3.3 Statement Management Groups on Clean Ganga

S. No.	Organization	Date of registration/ Establishment	Remarks
1	NMCG	12/08/2011	Registered in South Delhi (596/2011)
2	SPMG, Uttarakhand	19/03/2011	Regn. No. 492/2010-11
3	SPMG, Uttar Pradesh	07/03/2011	Regn. No. 3326-2010-11
4	SPMG, Bihar	30/03/2012	Regn. No. 3640
5	SPMG, Jharkhand	04/11/2011	Established as NGRBA Cell under UD department considering small stretch of the river Ganga (main stem) passing through the state
6	SPMG West Bengal	17/02/2011	Regn. No. 77929/2010-11

3.4 The status of ongoing Projects under NGRBA is at **Annexure-II**

Supplementing further, the M/o WR, RD &GR in their background note submitted that the area of operation of NMCG is the Ganga River Basin, including the states through which Ganga flows, as well as the National capital territory of Delhi. The Mission Director of NMCG is a Joint Secretary (JS) in Government of lndia. For effective implementation of the projects under the overall supervision of NMCG, the State Level Program Management Groups (SPMGs) is, also headed by senior officers of the concerned States.

3.5 Furnishing details of the purpose of the investments and the summary of activities of NGRBA, M/o WR, RD & GR submitted as under:

> "The infrastructure investments under NRGBA Programme included laying of sewerage system, sewage treatment plants, solid waste management, and common effluent treatment plant for controlling industrial pollution, river front management, crematoria, etc."

3.6 The Ministry also furnished the summary of activities of NGRBA as under:

> "Till date the Apex Committee of NGRBA chaired by Hon'ble Prime Minister has met on three occasions: on 5.10.2009, 1.11.2010 and 17.4.2012. A summary of activities undertaken so far by NGRBA is at **Annexure – III** and a summary of STPs created under various programmes viz. GAP-I, GAP-II, NGRBA, JNNURM is at **Annexure - IV.** The NGRBA initiative also resulted in discontinuation of three hydro-electric projects – Loharinag Pala (4x150=600 MW), Bhaironghati (381 MW) and Pala Maneri (480 MW), located on river Bhagirathi. Subsequently, a fourth hydro-electric project, namely, Kotli-Behl 1-B on river Alaknanda (320 MW) was discontinued following the orders of National Environment Appellate Authority (NEAA)."

3.7 With regard to preparation of Ganga River Basin Management Plan (GRBMP), the M/o WR & RD & GR submitted that a consortium of seven Indian Institutes of Technology (IITs) is working on preparing a Ganga River Basin Management Plan. The objective of GRBMP is the maintenance and restoration of wholesomeness of the Ganga system and improvement of its ecological health. The Ministry also noted that :

"The draft GRBMP under preparation by consortium of IITs has taken into consideration various major issues, like maintenance of e-flow, tackling point sources of pollution, recycling and reuse, sustainable agriculture in the basin, floral and faunal diversity in the Rivers, etc. The interim report of GRBMP was given in September, 2013 and so far 36 draft thematic reports on various missions have also been shared by them, which also cover the modelling for working out the estimates of environmental flow of Uttarakhand. These have also been circulated to various stakeholders. Final report is expected later this year."

3.8 On the question of maintaining the continuous flow of water in the river (Aviral Dhara), the Ministry submitted:

"---, it is evident that one of the important factors governing the quality of river water is the quantum of river flow. ***Aviral Dhara*** *(Continuous flow of water)* is particularly relevant for upper reaches in Uttarakhand, where a number of hydro-electric projects have been constructed, are under construction and are being envisaged, which has an impact upon the environmental flow in the river. The e-flows have to be river-specific, based upon its size, climate, season and many other parameters. The concept of ***Nirmal Dhara*** *(Clean Water)* is significant in middle and lower reaches where large amount of pollutant from various sources are pumped into the river."

3.9 In response to a query of the Committee, the M/o WR,RD &GR submitted that' a draft GRBMP report has been submitted by IIT Consortium and is being examined by the Ministry. The Salient recommendations of the said report are as follows:

Objectives of GRBMP

"The main objectives are identified as the following:

- Maintaining Environmental Flows in all rivers and tributaries of the Ganga River System to fulfil their geological, ecological, socioeconomic and cultural functions,
- Water quality in all rivers and tributaries of the Ganga River System shall be consistent with their governing geological, ecological, socioeconomic and cultural functions; and
- Water and other aquatic resources of the Ganga River System shall be used judiciously to enable sustainable development in the entire NRGB."

Formulation of Missions

Given the escalating impacts of human activities on Ganga river basin, the above objectives guided the formulation of eight important areas where restorative actions need to be carried out in Mission mode, viz.: "*Aviral Dhara*", "*Nirmal Dhara*", "*Ecological Restoration*", "*Sustainable Agriculture*", "*Geological Safeguarding*", "*Basin Protection Against Disasters*", "*River Hazard Management*" and "*Environmental Knowledge-Building and Sensitization*".

Mission 1- Aviral Dhara

- Both longitudinal connectivity and adequate flows in rivers are essential to maintain Aviral Dhara.
- Adequate river flows depends on the basin's overall water status.

Recommended Actions:

- Determination of NRGB's hydrological status more accurately and in greater detail.
- Preparation of water resources plan for NRGB with emphasis on wetlands, forests and distributed groundwater and surface water storages rather than large reservoirs storages.
- Increase in anthropogenic water use efficiency through: (i) realistic pricing of fresh water; (ii) incentives, technical assistance, and allocation of water rights and entitlements to consumers; and (iii) reuse and recycling of water.
- Ensuring longitudinal river connectivity and E-Flows at dams, barrages and other man-made interferences, and adoption of new criteria for approving such projects.

Mission 2 – Nirmal Dhara

To check river pollution in the Ganga River Network, it is necessary to prohibit major pollutant ingresses into rivers by-

- Discharge of sewage (either treated or untreated from Class I & Class II towns);
- Discharge of industrial effluents (either treated or untreated from any large, medium or cluster of small industries);
- Disposal of un-burnt and partially burnt corpses and animal carcasses in rivers;
- Open defecation and dumping of municipal/industrial solid wastes or sludge in any river or its active flood plain; and
- Construction of new residential, commercial or industrial structures in river floodplains.

Recommended Actions:

Management of Solid and Liquid Wastes Generated from Domestic/ Commercial/Industrial Sources;

- Riverfront Development, Floodplain Management and Rejuvenation of Water Bodies;
- Management of Polluted Agricultural Runoff.

Effective co-ordination of these activities is envisaged through a high-level constitutional body tentatively named the 'National River Ganga Basin Management Commission' (NRGBMC).

Mission 3 – Ecological Restoration

Factors affecting the habitat of aquatic species of National River Ganga and causing loss of her biodiversity were identified are as follows-

(i) Habitat Fragmentation by dams and barrages;

(ii) Habitat Shrinkage due to increased water diversions from rivers;

(iii) Habitat Alterations by gravel and sand mining from river beds and construction of embankments, levees, guide walls, etc.;

(iv) Habitat Pollution by influx of municipal, industrial and agricultural wastes;

(v) Habitat Invasion by alien river species;

(vi) Habitat Encroachment by constructions in floodplains and river bed farming;

Recommended Actions: Given the above threat factors, the measures recommended are:

- Restoration of longitudinal/ lateral connectivity and unpolluted river flows
- Restrictions on river bed farming, sand-mining from river beds.
- Control of alien species invasions, overfishing and fishing during spawning seasons.
- River nutrient assessment and release of sediments trapped behind dams/barrages into downstream river reaches.

- Long-term bio-monitoring of the Ganga river network.

Mission 4 – Sustainable Agriculture

Intensive conventional agricultural practices with abundant use of water, agrochemicals, soil tillage, and mono-cropping practices have increased soil erosion and degradation, depleted soil nutrients and soil biodiversity, dwindled the basin's waters, and polluted its ecosystems.

Recommended Actions:

- Adoption of Conservation Agriculture, especially in degrading lands to enhance long-term soil fertility and agricultural output.
- Promotion of Organic Farming
- Economically beneficial improvements in water and nutrient application
- Infusing experimentation, adaptability and flexibility in NRGB's agricultural practices to synthesize traditional knowledge with ongoing and future scientific discoveries.

Mission 5 – Geological Safeguarding

The geological vulnerabilities of NRGB include disruptive underground activities such as excavations, explosions, tunnelling, mining, fracking, and over-withdrawal of ground-water from confined and semi-confined aquifers.

Recommended Actions:

- Control/ restriction of geologically hazardous activities including deep groundwater withdrawals, underground excavations, explosions, tunnelling, mining, fracking, and operation of large reservoirs.
- Drainage improvement of low-lying areas and stabilization of disturbed areas.
- Mapping river migration zones, and continuous geological monitoring of NRGB.

Mission 6 – Basin Protection against Disasters

NRGB is prone to catastrophic natural disasters that can significantly harm the basin's ecosystems, and such disasters have been highly accentuated by modern anthropogenic activities. The major natural disasters of real concern for the basin's ecosystems are few, viz.: Extreme Floods, Extreme Droughts, Forest Fires, Tropical Cyclones, Landslides, and Epidemics and Biological Invasions.

Recommended Actions:

- To withstand catastrophic disasters, ecosystems need strengthening by preserving wetlands, promoting mixed indigenous forests and vegetation, and curbing land-use disturbances and encroachments by humans.
- NRGB's ecosystems have evolved over time against certain fire and biological regimes; hence the ecology of Forest Fires and of Epidemics &Biological Invasions in NRGB's ecosystems needs to be studied extensively. Until then, active interventions to counter such events should be limited to checking harmful anthropogenic activities.
- Landslides in the Upper Ganga Basin and other hilly regions are aggravated by deforestation, road and building constructions, and unsafe debris disposal, which need to be strongly checked.

Mission 7 – River Hazards Management

Several rivers-related disasters in India bear witness to the fact that human disturbances have increased the intensity of these disasters and vulnerability of communities towards these issues. Hence it is necessary to identify hazards related to anthropogenic disturbances on rivers and to formulate suitable means to reduce the risk.

Recommended Actions:

- Basin scale flood-risk maps should be prepared based on scientific data and reasoning,
- Drainage improvement and land reclamation in low-lying areas should be taken up systematically.
- Assessment of soil salinity and its mitigation strategy are important

- Alternatives to embankments for flood management with emphasis on 'living with the floods' concept must be emphasized;
- Research needed on sediment dynamics and its application in river management projects for designing sustainable river management strategies.

Mission 8 – Environmental Knowledge-Building and Sensitization

Basin planning and management combine diverse natural resources (water resources, land resources, biological resources, etc.) and processes (river dynamics, geological phenomena, atmospheric processes, etc.) with traditional wisdom and grassroots knowledge. Hence it is necessary to build a comprehensive data bank to enable meaningful analyses and obtain quantitative indicators of NRGB's status.

Recommended Actions:

- Establishment of a comprehensive Data Bank by continuous collection, processing and storage of information on the basin's natural resources, anthropogenic activities, and environmental monitoring of basin
- Preparation of secondary results (representative parameters, charts, tables, etc.) based on primary data
- Preparation of documents and materials for easy understanding by non-specialized people
- Keeping all the above information in the open domain for easy access by interested individuals and institutions
- Conducting educational workshops and campaigns with stakeholders and interested citizens to enable their sensitization and comprehensive understanding of basin processes"

3.10. Responding to a query Whether the Government have accepted all the recommendations contained in the reports, the details thereof ,etc., the M/o WR,RD&GR submitted that 'the report submitted so far are only draft in nature hence the recommendations may be incorporated after the final submission is made and the draft reports are under examination.

Latest Initiatives/Namami Gange

3.11 As indicated elsewhere in the report the Government have formulated an Integrated Ganga conservation Mission 'Namami Gange' with the purpose of rejuvenating Ganga by consolidating the existing ongoing efforts and planning for a concrete action plan for future.

3.12 The Committee were informed that recognizing the multi-sectoral, multi-dimensional and multi-stakeholder nature of the Ganga Rejuvenation challenge, the key Ministries comprising of (a) WR, RD&GR, (b) Environment, Forests & Climate Change, (c) Shipping, (d) Tourism, (e) Urban Development, (f) Drinking Water and Sanitation and Rural Development have been working together since June, 2014 to arrive at an action plan. To quote,

> "The concerned Ministers have nominated a Group of Secretaries to develop a draft action plan and have held periodical meetings to review the progress and provide guidance. The Group of Secretaries submitted its initial report on 21st July, 2014 and after taking into account the feedback received from the Hon'ble Ministers, the final report has been submitted on 28th August, 2014."

3.13 The objective of 'Namami Gange' Program "is to arrest the pollution entering into Ganga river. In order to achieve the objective, following activities are proposed under 'Namami Gange' Program: re-habilitation and up'gradation of existing STPs; Interception & Diversion of drains falling into the river through 5 basin states: Uttarakhand, Uttar Pradesh, Bihar, Jharkhand & West Bengal; creation of additional treatment capacity. National Mission for Clean Ganga is working along with the State Program Management Group for taking forward the activities under 'Namami Gange' Programme"

3.14 Features of 'Namami Gange' Programme:

> The Government of India approved the flagship "Namami Gange" Program on May 13, 2015 which integrates the efforts to clean and protect the Ganga river in a comprehensive manner. The program has a budget outlay of Rs. 20,000 crores for the next 5 years. This is a significant four-fold increase over the expenditure in the past 30 years (Government of India incurred an overall expenditure of approximately Rs. 4000 Crores on this task since 1985).

This comprehensive proposal on the integrated Ganga Conservation Mission 'Namami Gange' intends to introduce convergence of various schemes under Govt of India relevant for Ganga Rejuvenation, enhance the size and scope of interventions under overall framework and other initiatives arising out of recommendations of GRBMP prepared by the Consortium of IITs, through intensive coordination with other ministries. The scheme announced in budget speech 2014-15 for development of ghats at identified places will also be undertaken as a part of Namami Gange programme along with other river front management activities. The main features of design are:

(i) Convergence of existing schemes in operation both domestically and externally supported and introduction of new interventions; rational augmentation and enhancement of size and scope of conventional interventions; strengthening public participation through communication, public outreach in an institutionalized manner to sustain initiatives; interventions on all tributaries and sub-tributaries of Ganga, including Yamuna, in a phased manner and approach Ganga rejuvenation in a manner so as to set a model for rejuvenation of other rivers in India.

(ii) The nature of the programme has been changed from centrally sponsored scheme to central sector scheme (for "Component 'B': New Initiatives", projects under "Component 'A': Existing Programmes" to continue under their approved mechanism) for achieving better synergy between Central & State Governments for expediting the work on Ganga Rejuvenation. In addition, programmes will be strengthened and the measures for the same include [---];

(a) Constitution of a High Level Task Force (HL TF) chaired by Cabinet Secretary (vide order no. 771/4/2/2014-Cab. III dated 6102/2015) for programme monitoring, ensuring synergy and avoid duplication / overlapping of efforts.

(b) Appointment of Minister for Water Resources, River Development & Ganga Rejuvenation as Vice Chairman of NGRBA enabling fast decision making and necessary policy and framework course correction wherever necessary.

(c) Interventions on all tributaries of Ganga including Yamuna.

(d) Immediate focus on pollution abatement through interventions on STP 1 ETP rehabilitation, In-situ treatment of waste water in drains using appropriate innovative technologies.

(e) Active involvement of NMCG in Ganga Rejuvenation programme esp. in areas of selection of Executing Agencies (EA), monitoring, Detailed Project Reports (DPR) preparation, direct procurement for fast tracking of projects, etc.

(f) State's responsibility include providing land for the projects, O&M expenditure post contract period and facilitating programme implementation etc. as per MoU.

(g) Amendment in NGRBA Programme Framework, execution mechanism etc. for cutting time on procedures and expediting the Ganga Rejuvenation.

Design and introduction of a set of incentives and disincentives by regulators have been introduced to ensure strict compliance of standards amongst polluting industries. Regulators are also to ensure detailed mapping of polluting industries on the basis of geographical distribution and type of industries etc.

3.15 **Focus on pollution abatement interventions**: The Committee were informed that in consideration of immediate priority for pollution control interventions, also emphasized by EFC, the mission 'Namami Gange' will focus on pollution abatement interventions namely Interception, diversion &treatment of waste water flowing through open drains through bio-remediation / appropriate in-situ treatment / use of innovative technologies / STPs / effluent treatment plant (ETPs); rehabilitation and augmentation of existing STPs and Immediate short term measures for arresting pollution at exit points on river front to prevent inflow of sewage etc. in river; CETF for major industrial clusters and Operation & Maintenance (O&M) for a definite period etc. Apart from these, projects / Interventions on rural sanitation, river front development /management, solid waste / pious refuse management, sewerage network, national ganga monitoring centre, capacity building, research / pilot studies, non point pollution mitigation, GIS mapping / applications, restoration of special properties of Ganga, sand mining, biodiversity conservation, habitat improvement, institutional development, river flow improvement, Ganga task force, Ganga Vahini, communication & public outreach activities and other activities / pilot projects included in NGRBA Programme Framework and the ones arising from GRBMP aiming at Ganga rejuvenation will also be undertaken.

3.16 **Work coordination between Ministries**: It was stated that Major infrastructure investments which fall under the original mandate of other ministries *viz.* Urban Development (UD), Drinking Water & Sanitation (DWS), Environment, Forests & Climate Change (EF&CC) etc., will normally be undertaken under their own budgets and programmes and role of M/o WR, RD &GR would be of coordination and prioritization. However, in areas of critical importance for Ganga Rejuvenation, certain investments, as indicated in the proposal, may be undertaken directly by M/o WR, RD & GR and also through these ministries/ departments.

The projects will be prepared as per NGRBA programme framework (available at www.nrncq.nic.ln) as amended from time to time and the State Governments will ensure compliance of all environmental /regulatory and other applicable laws, rules & regulations for achievement of the objectives of Namami Gange programme. The project will be implemented as per provision of EFC and also as per decision approved by the Cabinet on this project.

3.17 **Mode of Execution of NGRBA Programme**: The programme will be executed in accordance with NGRBA Programme Framework through a) States in conventional mode, *i.e* in the implementation arrangement (with current and other appropriate implementing agencies) and/or b) Public Private Partnership (PPP) mode and/or c) Special Purpose Vehicle (SPV) mode (with up to 100 percent capital infusion by Government) and/or d) Central Public Sector Undertakings/ Central Government Departments and/or e) Academic Institutes / Research Institutes / Autonomous Bodies or any other appropriate mode for executing the activities of this proposal. The engagement of these agencies by NMCG or States will be either as EA or on nomination basis or as deposit work by these agencies. NMCG may also directly procure DPR preparation and works pertaining to pollution abatement as mentioned above to support the States for Ganga rejuvenation. In addition to above, NMCG may enter into rate contract for equipment or works related items.

3.18 **Projects to be executed State-wise**: For the purpose of various interventions/initiatives, the entire stretch of the river will be divided state wise into multiple project stretches. Action plans for these stretches will be approved by the ESC, including the mode of execution of these

projects through State level agencies or PPP mode or SPV mode or CPSU mode or through any other mode deemed appropriate.

The responsibility of structure and design PPP/SPV process in identified stretches will be assigned through a transparent and competitive bidding process. Support of professional transaction advisors, to guide the PPP/SPV process, may be obtained wherever required.

To ensure satisfactory O&M activities and regular maintenance a dedicated SPV may also be created and memo for EFC / Cabinet note would be prepared separately. PPP/SPV process will be undertaken on the basis of life cycle cost inclusive of capital and O&M cost, preferably for a period of 15 years. The role of the State Governments / local bodies PPP vehicle / SPV concerned will be clearly delineated in relevant agreements / MOUs *vis-a-vis* land contribution, O&M expenses, transfer of existing assets and other antecedent expenses for running and upkeep of assets.

3.19 **Total Indicative cost**: The total indicative cost of the proposal for new initiatives and remaining central liability of ongoing schemes, as recommended by EFC, is ₹ 20,000 crores (Rupees Twenty Thousand Crores only) to be incurred till 2020. The allocations within the indicative cost have been revised in line with the recommendations of the EFC towards need for higher allocations towards pollution control for cleaning of river Ganga being the top most priority. Accordingly, the allocation towards infrastructure development for pollution abatement has been revised upwards to ₹11,050 crore. However, the revised allocation between components & sub-components and year wise phasing of expenditure is indicative and further reallocations / re-phasing can be made by the MoWR,RD&GR for optimum utilization of funds and achievement of programme objectives to be in consonance with pace of implementation and expenditure.

Cost on account of Central 'liability under Component-A on existing programmes (already approved, now being converged under Namami Gange) - ₹7,272 crores. These on-going programmes will continue to be funded as per their earlier approved mechanism.

Indicative cost on account of Component-B on new initiatives - ₹12,728 crores. In accordance with EFC recommendations, these initiatives will be funded as "Central Sector Scheme" with "100% central funding" and includes pre-investment activities like statutory clearances and other preparatory activities. The State Governments shall bear the responsibility and costs towards procurement of land and making it available for projects. The O&M cost will be built into the project contract for a defined period and assets shall be transferred to the State Government / ULB immediately upon completion of the project. O&M within the contract period may be paid by the Central Government.

This being an ongoing programme, funding of O&M of projects sanctioned earlier especially under WB project would be continued under this arrangement & sanctioned separately for the period beyond WB funded project.

3.20 Regarding existence of stipulations for timely implementation of various segments of 'Namami Gange' project especially in the light of the fact that many sewage projects could not take off even after five to six years of sanctioning of the project, the M/o WR,RD&GR submitted that sector wise and year wise budgetary allocation and timelines have been fixed as approved by Cabinet for implementation of various segments of 'Namami Ganga' as may be seen from **Annexure-V**.

3.21 An expert, Prof. Vinod Tare (of IIT Kanpur), in his evidence before the Committee deposed as under:

> "We have submitted first Ganga Basin Management Plan to the Government in 2015. It has been stated in the plan about National Ganga River Basin and its entire geographical conditions. It has also been stated in the plan about its current status about which I will tell you in brief. I admit that our first work should be as to what the Ganga conservation is. We will have to work if we want to bring the Ganga in its present condition. Once upon a time when the condition of all rivers of the world used to be the same, be it Thames, Rhine, Murray Darling or the small river of Singapore. A time of many years has been taken to see to them at least 30-40 years. A lot of money has been spent on them. A lot of efforts has been made and laws have also been enacted. One point is most imperative that whenever we talk about clean Ganga, it cannot be without thinking of clean India. Whatever efforts we are to make is that we will have to make the Ganga clean. If we will do this, the Ganga will be automatically clean. The biggest issue is that what kind of thinking we have towards this, be it a

thinking of an individual, be it a thinking of people collectively, be it a thinking of factory or an industry. But the major issue is that how to clean the Ganga and how to manage all this. The Ganga would not be clean unless there is unabated flow of water therein."

3.22 About the purity and incessant flow of the river, Prof. Tare said,

"If we don't call river a river, we cannot even think of its cleanliness particularly the river like Ganga. There should be current and flow of water therein. The most of expenditure and estimate about which we are talking here that is about cleansing and purging our filthiness, and if we stop pouring our filth in the river, it will become clean automatically. Whatever expenditure is being incurred that is being incurred to purge the filthiness of ours in the name of India."

CHAPTER-IV

STRATEGY FOR TACKLING VARIOUS TYPES OF POLLUTION

Strategies adopted to deal with pollution

With regard to the strategies adopted to deal with pollution under Ganga Action Plan I & II, the **M/o WR.RD &GR** stated as follows:

> "The major interventions planned under GAP I & II were interception & diversion (I&D) works to divert the sewage to treatment plants constructed for the purpose. But operation and maintenance of the treatment plants was not covered under the programme and hence the assets could not be sustained in the long term. The major works undertaken under GAP are as under Table 4.1:

Table 4.1: Pollution Intervention under GAP – I & II.

Pollution Type	Description
Municipal Sewage	Under both phases of GAP, a total of 83 STP have been sanctioned for undertaking pollution abatement activities in the identified polluted stretches of the river Ganga, of which 69 treatment plants with a capacity to treat 1098 million litres per day (mld) - GAP-I: 869 mld, GAP-II: 229 mld have been established.
Industrial Pollution	20 MLD CETP was created under GAP-II at a leather cluster in Kolkata
Open defecation	Total of 43 schemes were sanctioned under GAP-I for providing facilities of Low Cost Sanitation Total of 26 schemes were sanctioned under GAP-II for Low Cost Sanitation
Solid waste	Under GAP-I, Solid Waste Management Schemes were taken up for Haridwar, Kanpur, Mirzapur, and Varanasi Under GAP-II, 2 Solid Waste Management Schemes were sanctioned for Kanpur.

4.2 Furnishing further details of Ganga Action Plan (GAP) Phase-I & II, the **M/o Environment, Forests & Climate Change (MoEF&CC)** in their background note submitted that ''the Ganga Action Plan (GAP) Phase-I, the first attempt of Government to clean the river Ganga was taken up during 1985 -2000 as a centrally sponsored project for abatement of pollution of the river through implementation of various pollution abatement works in towns along the river, as under:

(i) Interception and Diversion works to capture the raw sewage flowing into the river through open drains and divert them for treatment. (I&D)

(ii) Sewage Treatment Plants for treating the diverted sewage. (STP)

(iii) Low Cost Sanitation works to prevent open defecation on river banks. (LCS)

(iv) Electric Crematoria and Improved Wood Crematoria to conserve the use of wood and help in ensuring proper cremation of bodies brought to the burning ghats. (EC&IWC)

(v) River Front Development works such as improvement of bathing ghats etc. (RFD)

(vi) Other measures like plantation, public awareness, etc.

Under Ganga Action Plan (GAP) Phase-I, 260 pollution abatement schemes in 25 towns in the states of Uttar Pradesh, Bihar and West Bengal were undertaken at an expenditure of ₹433 crore. GAP Phase-I was declared completed in March 2000.

Phase-II of GAP was taken-up in stages from 1993 onwards and is under implementation. Under GAP Phase-II, 314 pollution abatement schemes in 59 towns in the states of Uttarakhand, Uttar Pradesh, Bihar (including two projects now falling with the State of Jharkhand) & West Bengal were undertaken. Projects amounting to ₹ 591 crore were sanctioned, out of which ₹522 crore has been released to the implementing agencies till July, 2014.

4.3 Under these two phases of GAP, a total sewage treatment capacity of 1091 million litres per day (mld) has been created as per details given under Table 4.3:

Table 4.3 State-wise sewage treatment capacities created

Sl. No.	States	STP capacity created Million Litres per Day (MLD)*
1	Uttarakhand	73.67
2	Uttar Pradesh	410.72
3	Bihar	122.00
4	Jharkhand	0
5	West Bengal	491.61
TOTAL		1098.00

4.4 The Secretary, MOEF &CC apprising the Committee of the increase in pollution load In Ganga on 13.07.2015 stated *inter alia* as follows:

> "Out of the total measurable point sources of pollution, around 75 per cent is on account of untreated municipal sewage and the remaining 25 per cent is on account of industrial effluents"

4.5 In written reply to a query as to what percent of above mentioned measurable sources of untreated municipal sewage could be plugged (by establishing STPs, etc.) in Ganga Action Plan (GAP) l&ll, the M/o WR, RD and GR submitted that:

> "As per CPCB, 36 Class I towns and 14 Class II Tows located along Ganga generates 2723.3 Million Litres of sewage per day. The capacity created under GAP-I & GAP-II can treat 1098.31 Million Litres of sewage per day which is approximately 40% of the estimated sewage generation."

Sewage Generation – Gaps in treatment capacity

4.6 The data on estimated sewage generation, available treatment capacity and the gap in treatment capacity in **Ganga main stem** was furnished by MoEF&CC in a Presentation made to the Committee on **13.07.15** as follows: (Table 4.6)

Table 4.6 Sewage Generated, Treatment Capacity and Gaps

State	Estimated sewage Generation (MLD)	Available Capacity (MLD)	Under Construction /Approval (MLD)	Total capacity	Gap (MLD)
1	2	3	4	5 Col. (3+4)	6 Col (2)-(3+4)
Uttarakhand	252	92	30	122	130
Uttar Pradesh	3534	1363	841	2204	1330
Bihar	906	136	202	338	568
Jharkhand	652	0	12	12	640
West Bengal	1957	535	103	638	1319
Total	7301	2126	1188	3314	3987

4.7 The Committee sought the details of the action plan prepared by the Government to fill the gap in sewage treatment capacity in ganga main stem. How ever the reply is awaited from the Ministry despite several reminders.

4.8 According to estimation by consortium of IITs, total sewage generation in Ganga basin States) is 12051 MLD; corresponding gap in treatment is 6334 MLD.

Status of STPs

4.9 The status of National River Conservation Directorate (NRSD) funded 51 STPs among the 63 STPs located in the main stem of Ganga in the 5 States (Table 4.9), being monitored by CPCB as furnished by them in the background note on the subject given at Table 4.9:

Table 4.9: Status of NRSD funded STPs

States	No. of STPs	Installed Capacity (MLD)	Utilized Capacity (MLD)	No. of STPs Not In Operation	STPs Exceeding BOD* Limits	STPs Exceeding COD^ Limits
Uttar Pradesh	8	358	287	1	4	0
Uttarakhand	4	54	-	0	1	1
West Bengal	34	457	214	13	3	0
Bihar	5	158	100	1	1	0
Total	51	1009	602	15	9	1

*Biological Oxygen demand ^Chemical Oxygen Demand

The above table indicates 15 STPs were found non functional during monitoring and 9 were not meeting the BOD norms. The utilization capacity of these STPs is close to 60%. Comparing the **Table 4.39 A and table 4.40A ,** it is evident that a large volume (more than 6000MLD) of domestic sewage is being carried through these drains having undesirable characteristics and eventually meeting river Ganga directly responsible for river water quality. In the circumstances, it is understood that the conventional treatment is certainly required to be in place in working form however, before such situation arise non-conventional treatment like “In-situ bioremediation technology” be attempted in the drains.”

4.10 The Committee requested the M/o WR,RD &GR to furnish the data and status of DPRs prepared and submitted for upgradation of Sewage treatment plant and the total no. of treatment plants in the country that need to be upgraded. However, despite reminders, the data could not be provided by the Ministry.

4.11 M/o WR, RD and GR in a presentation made to the Committee on **29th May, 2015**, on the status of NGRBA submitted that '80 projects sanctioned in 50 towns for total expenditure of Rs. 1027 crore with total sewage treatment capacity of 638 Million litres Per day (MLD) were to be created and sewer network of 3315 Kms to be laid. 25 projects had been completed that created 123 MLD treatment capacities and laid 600kms'. The details such as the year of sanctioning, the year of completion and operational nature of these projects, approved projects, names of the towns where these projects were to be built (project wise) tentative year of completion as furnished by M/o WR,RD&GR may be seen at **Annexure-VI.**

4.12 The Committee requested all the States through which River Ganga flows to furnish detailed status paper regarding cleanliness of the river Ganga in each of the districts through which the river flows, the problems being faced by the local bodies in cleaning and checking pollution in the Ganga, status of Sewage Treatment Plants, the measures being taken to address the problems and views/suggestions of the State government for rejuvenating the Ganga. While the states of Uttar Pradesh, Bihar and Jharkhand have furnished information the state Governments of Uttrakhand and West Bengal were yet to furnish the same.

4.13 The State Government of U.P. furnished the following status of STPs in Uttar Pradesh:

> "In Uttar Pradesh, 55 towns, along the River ganga and its tributaries have been identified. Domestic sewage generation in year 2025 is estimated to be 4360.99 mld in these towns. In these towns STPs have been constructed under different programmes such as GAP, JnNURM, UIDSSMT, State Sector, and NGRBA. Some of these STPs have been constructed by different authorities. The present sewage treatment capacity of 2289.07mld is available and 948.55 mld STP works are under execution. After execution of these projects, total sewage treatment capacity will be 3237.62mld in Uttar Pradesh."

Study visit to Kanpur

4.14 During the study visit of the Committee at Kanpur, the local administrative authorities informed that under Ganga Action Plan Phase I, STP and CETP were established to treat 162 mld domestic sewage and 9 mld tannery waste water at Jajmau. The plants constructed during 1989, 1994 and 1999 and the treated effluent of these plants is being used for agricultural purpose through irrigation channel being maintained by Kanpur Nagar Nigam. Out of 20 drains flowing into river Ganga, 17 drains were taped by U.P. Jal Nigam and 3 drains were tapped by Kanpur Development Authority. The works like renovation of existing sewer & pumping stations, relieving sewer , intermediate sewer pumping stations and tapping of Halva Khanda and Ganda Nala, etc. were executed under Ganga Action Plan Phase II. It was further stated that the State government has also completed and commissioned trunk sewer line along C.O.D. drain and the work of intercepting and diverting the flow of COD drain to STP. The works of laying of trunk sewers and sewer networks, construction of four number Sewage Treatment Plants with 310 MLD and renovation of old and construction of new sewage pumping stations are going on for the City.

4.15 The State Government of Jharkhand in their Memorandum submitted to the Committee on 'Ganga Rejuvenation' stated that in the 'Namami Gange' Programme Urban Development Department (UDD) of Jharkhand is implementing body for urban waste management. River Ganga has urban and rural stretch of 83 Kms in Jharkhand. It passes through Sahibgunj district covering two towns i.e. Sahibgunj and Rajmahal. The urban and rural population of Sahibgunj is 159666 and 990901 respectively. Currently, both these towns do not have any STPs. Under Namami Gange program, UDD is implementing sewage projects at Sahibgunj and Rajmahal and furnished the details of the two projects under implementation as under:

> "Municipal waste water , Sahibgunj ; Government has approved the project for Rs. 99.36 crore .The award of project is in the final stage. This will create a capacity of 12mld STP capacity and 55km long sewage network.

Municipal waste water Rajmahal: A DPR amounting to Rs. 51.09 crore has been prepared with sewerage and STP provision which will create a capacity of 3mld STP capacity and 33Km long sewerage network. DPR is under scrutiny for final approval by NMCG."

4.16 **Delay in land acquisition** : In written reply to a query as to why only 25 out of 80 projects and 600 kms out of 3315 Kms network of sewer lines were built, the M/o WR,RD&GR stated that :

"The delay in the construction of STPs is mainly due to delay in land Acquisition and dispute over land. Laying of sewer network in densely populated towns is delayed, mainly due to narrow streets and issues in road cutting. Despite such constraints, 25 out of 80 projects and 600 kms out of 3315 Kms network of sewer lines were built''.

4.17 In reply to a question of the Committee whether the sewage network coverage is 100% in all the 50 towns, the M/o WR, RD & GR submitted that:

"In some of the towns such as Varanasi, Allahabad, etc. 100% coverage of sewerage network will be achieved as the project progresses. The same will be extended to other towns in due course. However, in Phase I of the 'Namami Gange' Programme, the focus is to create treatment infrastructure for the existing sewage outflows into the river."

Status of STPs set up during GAP I & II

4.18 The status of STPs set up during GAP I &II as furnished by M/o WR, RD &GR may be seen at **Annexure-VII.**

4.19 **100% coverage of sewage infrastructure till 2020**

The M/oWR,RD &GR in their presentation made to the Committee submitted that all 118 towns on the main stem of Ganga river will be completely tendered for sewage treatment facilities by June, 2016 and will be completed by June, 2019. Further, the Ministry have also stated that DPRs will be preapared for all the 118 priority towns by December, 2015. Pollution Abatement measures - Timelines for preparation of DPRs received from states may be seen at **Annexure VIII.**

Acquisition of land for setting up of STPs

4.20 In written response to a concern as to whether the acquisition of land for setting up of STPs is an issue and if so, how the ministry propose to address the same, the M/o WR, RD & GR stated as follows:

> "In some STP projects land acquisition is becoming an issue. As per existing NGRBA framework, cost of land acquisition is to be borne by state governments. States have been, requested to identify and acquire suitable land without any legal issues in all approved projects for faster implementation of the projects."

STPs with long term view

4.21 In reply to a question whether the population growth of the areas and the consequent increase in sewage generation for the coming 50- 60 years is taken into consideration while setting up STPs, the M/o WR, RD & GR stated that:

> "The population growth of the areas and the consequent increase in sewage generation for the coming 30 years is taken into consideration while setting up of STPs as per the guidelines of Central Public Health and Environment Engineering Organization (CPHEEO)".

Delay in setting up of STPs

4.22 The STPs at Badrinath and Karanprayag and Rudraprayag though sanctioned in 2008/ 2009, construction of the same could not be commenced and not even a single rupee was spent even after a lapse of about six and half years due to adverse weather conditions, natural disasters, dispute over lands, etc. The M/o WR, RD & GR further informed that -

> "Considering the previous natural disaster in 2013 and lack of availability of suitable land in Badrinath, Karnaprayag and Rudraprayag, instead of centralized STPs, decentralized/modular STPs are being planned in these towns. The revised project proposals for this purpose are already under preparation by State Government, for consideration under Namami Gange Programme."

4.23 With regard to the cost escalation, if any, due to delay in commencement of the above mentioned Projects, the M/o WR, RD &GR stated that the variation in the cost will be assessed only after receiving the revised/ new proposal from State Government.

4.24 Asked about the time frame given for completion of the projects, the M/oWR, RD & GR stated that all the projects under 'Namami Gange Programme' are targeted for completion by 2020.

Delay in sewage Interception and Diversion (I&D) projects

4.25 The projects for Interception and Diversion (I&D) of the sewage at Badrinath, Deoprayag, Karanprayag, Rudraprayag, Joshimath, were sanctioned in 2008/ 2009 /2010 respecively, However, the physical progress of these projects range from 13 - 40% only even after completion of 7 years due to delay in obtaining permission from Border Road Organization (BRO), natural calamities, delay in land acquisition, etc. It is now proposed to be completed 2016-17**.** About cost escalation in these projects and the likely time taken for completion of the same, M/o WR, RD & GR submitted as under:

> "Project of Badrinath, Rudraprayag and Karnprayag are being reframed. However, projects of Devprayag and Joshimath are proposed to be completed in 2016-17.
>
> Revised proposals for the Badrinath, Karanprayag, and Rudraprayag are likely to be submitted soon by the State. For Devprayg one project under Restoration and Reconstruction due to disaster in 2013 has been sanctioned. Revised target for completion of this project is July 2016."

Delay in JICA assisted Sewer projects

4.26 Japan International Cooperation Agency (JICA) assisted Ganga action Plan Phase - II project at Varanasi, though sanctioned on 14.07.2010, could not be completed even after about five years (the physical progress of the project is 22 % only as at end March, 2015). Similarly the project - Sewage System & STP Works (Phase-11) at Kannuaj, though was sanctioned on 24.02.2011, has seen physical

progress of 22% only even after four years. As no reasons were given for the tardy progress of the project, the Ministry were requested to furnish the details of the project including the reasons for delay. The M/o WR, RD & GR accordingly, furnished the following:

> "JICA assisted GAP-II project original date of completion – 31/07/2015. For sewerage system & STP works at Kannauj original date of Completion - 31/08/2012. Additional cost if any will be borne by Government of Uttar Pradesh. The revised date of completion of JICA assisted project is 31/07/2018 and for Kannauj sewage project it is 31/03/2016."

Delay in World Bank funded sewer Projects

4.27 A project for Sewer network, SPS and STP, funded by World Bank, at Begusarai was sanctioned as Externally Aided Project (EAP) on 08.03.2010. However, even after 5 years the physical progress of project is 30% as at the end of March, 2015. Despite tardy progress so far, the project is proposed to be completed during 2015-16. Responding to the request to provide the details of the project including the reasons for the delay and the cost escalation, if any and the acceptance or otherwise of the lender (World Bank) to fund the cost escalation, etc, the M/o WR RD & GR submitted that :

> "(i) The main reason for delay in the Begusarai project is the delay in acquisition of suitable land by the State Government due to various reasons like court cases and introduction of new land acquisition bill and thereby change of compensation eligibility of land owners. (ii) Additional cost if any will be borne by Government of Bihar"

Strategy for most critical stretch

4.28 The strategy for most critical stretch (Kanpur – Varanasi) (at **Annexure-IX)**, the status of drains and STPs at Varanasi, Allahabad and Kanpur under 'Namami Gange' as furnished by the M/o WR, RD and GR to the Committee at their sitting held on 13.07.2015 is placed at **Annexures- X, XI & XII.**

STPs- Performance evaluation / Assessment by third party agencies

4.29 Responding to a question whether any third party/ independent assessment of the operations of these-sewage treatment plants were carried out, , the M/o WR,RD &GR stated that 'CPCB has carried out the performance evaluation of sewage treatment plants under catchment of Ganga river. STPs installed under catchment of Ganga river are 64 whereas MoEF has sanctioned 51 STPs. Total installed capacity of 51 STPs is 1009 MLD and actual utilization is 602 MLD which is 59%. 9 STPs are violating BOD limit and 1 STP exceed the COD limit for discharge. 14 STPs are found non-operational. State-wise performance evaluation of STPs are as follows:

i. "**Uttrakhand**
   - Installed capacity of 4 STPs is 54MLD.
   - 1 STP exceeds the BOD and COD limits.

ii. **Uttar Pradesh**
   - Installed capacity of 8 STPs is 358 MLD out of which 287 MLD is utilized.
   - 4 STPs exceed the BOD limit.
   - 1 STP was found non-operational.

iii. **Bihar**
   - Installed capacity of 5 is 140 MLD whereas actual utilization is 100MLD.
   - 1 STP was found non-operational.
   - 1 STP exceeds the BOD limits.
   - All STP meet the COD limits.

iv. **West Bengal**
   - Installed capacity of 34 STPs is 457 MLD whereas actual utilization is only 214 MLD which is 49%.
   - 3STPs exceeded the BOD limit whereas COD limit of all STPs is under the prescribed limit.
   - 13 STPs were found non-operational.

Under Namami Gange programme all the non-functional and under-utilized STPs will be renovated and upgraded as per the requirement."

4.30 **Impact of usage of water discharged from STPs on crops**

The Committee were informed that in some areas along the river Ganga STP discharged water is being used for irrigation purposes. The M/o WR,RD &GR were requested to provide the details of those areas, the study, if any, conducted by ICAR to assess the impact of usage of such water on the soil and crops,etc. However, the Ministry is yet to respond to the committee's query despite several reminders.

Namami Gange- Sewage Infrastructure

4.31 The details of Sewage Infrastructure proposed to be created under 'Namami Gange' as furnished by the M/o WR, RD &GR to the Committee at their sitting held on 29.05.2015 is as follows:

" - Interception, Diversion &Treatment of waste water flowing through the open drains –appropriate in situ treatment /use of innovative technologies

- Rehabilitation & augmentation of existing STPs
- Creation of Sewage Treatment Plants-4000 MLDs
- CETP for major industrial clusters and Operation and maintenance (O&M) for a definite Period, etc."

4.32 On the specific initiatives taken up for creating sewerage infrastructure under Namami Gange, the M/o WR, RD & GR submitted to the Committee as follows:

" - Projects on going in 50 towns (Rs.5900 crore)

- Last Mile Projects (100% town coverage of Sewage treatment taken up /ongoing) :Allahabad, Varanasi, Haridwar, Garhmukteswar, Patna, Sahibganj,Bhatpara, kalyani, Gayespur, Halishar.
- Kanpur- Strategy being finalized
- Notice issued to all Municipalities (118ULBs) /687 Grossly Polluting Industries –Follow up launched on action Plans

- Projects formulated for tackling Ghat and River surface pollution

  Aerators, /trash skimmers, solid waste collection

- Project sponsoring facility launched with Ministry of Overseas Indian Affairs /CSR funding to incubate innovation and expedite projects

- Bidders Conference held with domestic / international sewage treatment industry – 268 participants

- Conferences scheduled with District Magistrates of districts along Ganga main stem in June."

Problems being faced by Implementing Agencies

4.33 The State Government of Uttar Pradesh has nominated UP Jal Nigam, (U.P. Govt. Undertaking) as Implementing Agency for pollution control works on behalf of Urban Local bodies (ULBs). The U.P Government concluded that:

> "Financial condition of ULBs as well as Knowledge of latest treatment technologies etc., is also not available with personnel. Strengthening of ULBs and training of personnel is required. ULBs do not have sufficient funds for operation& maintenance of assets created for pollution control works. Implementing Agency (U.P. Jal Nigam) is also facing acute financial stress due to non payment of admissible departmental centage to Jal Nigam for works already undertaken."

4.34 The State Government of U.P expressed their difficulty:

> "to produce the actual expenditure of brochures for project preparation of DPR. As these organizations are also engaged for other lot of works regarding planning, etc., of the central as well as State Govt."
>
> It was therefore stated that:
>
> "So it is advisable to reimburse the DPR preparation fee and supervision charges to them (Govt. Organisaions) on producing the bill for the same amount, as sanctioned in the DPRs."

4.35 Measures taken to solve the above problems by Government of Uttar Pradesh are as follows:

> "Under Ganga Action Plan Phase-II 'Yamuna Component i.e. GAP-II a project for strengthening of 8 Local bodies, costing Rs.12.21 crore was undertaken and strengthening of Local bodies of 8 cities achieved. Institutional development component of World Bank aided NGRBA project for pollution control & conservation of river ganga contains (i) build functional capacity of NGRBA's operational institutions at both central and state levels; and (ii) provide support to associated institutions for implementing the NGRBA program. These activities financed under this component are grouped under the following sub components:
>
> (a) NGRBA operationalization and Programme management
>
> (b) Technical assistance for ULB
>
> (c) Technical Assistance for Environmental regulators"

4.36 The Government of U.P. in their communication stressed that it is necessary to take the works of all rivers (tributaries of Ganga) of Ganga river basin i.e. Yamuna, Gomti, Ramganga etc, without taking of these rivers, we can't achieve our goal to clean Ganga'.

4.37 Measures for enhancing Sewage Treatment capacity. The Government of U.P. further submitted that the Sewage Treatment capacity of 335.90 MLD is being generated by constructing 14 nos Sewage treatment plants. Now Under Namami Gange only I&D drains & construction of STPs are to be taken up. The following 23 projects costing ₹4089.84 crore for Interception & Diversion of drains and construction of STPS and 13 projects of non sewerage works (Low cost sanitation, Cremaoria, River front development, etc.) have been submitted to NMCG, GoI for approval. Amount ₹235.16 crore (see Table 4.37). Since last six months no projects has been sanctioned yet.

Table: 4.37 Sewage Treatment Projects proposed in U.P.

A.	**I&D STP (Sewerage Works)**		
Sl.	**Potential Project**	**Town**	**Total**
1.	I&D works & STP of Jhunsi Area	Allahabad	234.77
2.	I&D works & STP of Fafamau Area	Allahabad	184.88
3.	I&D works & STP of Distt-G of Naini Area	Allahabad	297.45
4.	Sewer Network in Sewerage Dist. E of Allahabad Part-2 (Additional sewer network)	Allahabad	62.02
5.	Renovation and up-gradation of Mathura STP/SPS & appurtenant works (O&M 5 Yrs)	Mathura	185.21
6.	Renovation and up-gradation of Vrindavan STP/SPS & appurtenant works (O&M 5 Yrs)	Vrindavan	35.08
7.	Estimates for Up-gradation of 130 mld & 5 mld STP at Jajmau, Kanpur	Kanpur	245.91
8.	Sewerage Treatment Plant Assi-Bhu Sewerage District, Varanasi (O&M 5 Yrs)	Varanasi	156.62
9.	Prevention of Pollution of River Kali by I&D of drains of Bulandshahr with STP and other appurtenant works.	Bulandshahr	313.10
10.	Prevention of Pollution of River Kali by I&D of drains of Meerut with STP and other appurtenant works.	Meerut	748.07
11.	Pollution Abatement of River Gomti, Lucknow (O&M 1 Yr)	Lucknow	456.66
12.	I&D of drains of Anupshahar	Anupshahar	17.79
13.	I&D of Sisamau drain of Kanpur (O&M 10 Yrs)	Kanpur	82.45
14.	I&D and STP works of Ram Nagar	Varanasi	95.13
15.	DPR for I&D & Treatment works of Chunar	Varanasi	53.66
16.	Rehabilitation & Up-gradation of Existing STP of Mirzapur	Varanasi	38.11
17.	Sewerage works in jajmau area Sewerage District-I	Kanpur	91.91
18.	Up-gradation of Deenapur STP & Bhagwanpur STP (5 Yrs)	Varanasi	131.89
19.	PFR for Up-gradation of Saharanpur STP	Saharanpur	57.55
20.	I&D & STP works of Hastinapur	Hastinapur	89.15
21.	I&D of Drains and STP Works of Unnao	Unnao	102.43
22.	25MLD Primary Treatment unit for Tannery waste water at CETP Jajmau	Kanpur	299.55
23.	Estimate for 5 years O&M of Sewerage and Non Sewerage and Non Sewerage Scheme of Allahabad	Allahabad	110.45
	Sub Total		**4089.84**

B	**Non Sewerage Works**		
1.	Const of improved wood based crematoria under Allahabad Nagar Nigam.	Allahabad	5.20
2.	Construction of Bithoor River Front Development Project	Kanpur	1.14
3.	Construction of 75 No. Community/Public Toilets and Dhobi Ghat under KNN	Kanpur	13.61
4.	Const of 22 No. Comm/Public Toilets and 5 No. Dhobi Ghat under NPP Buland Shahar	Bulandshahar	1.58
5.	Const of 11 No. Community Toilets under Nagar Palika Prishad	Hapur	2.18
6.	Construction of 20 No. Community/Public Toilets and 10 No. Dhobi Ghat under Nagar Pallika Parishad	Mirzapur	5.60
7.	Const of 05 No. Sulabh Toilets under Nagar Palika Parishad	Unnao	1.10
8.	Const of 20 No. Comm/Public Toilets and 01 No. Dhobi Ghat under Nagar Palika Parishad	Kashganj	8.97
9.	RFD Works upstream of Kanpur Barrage	Kanpur	50.00
10.	Proposal for Ghat development (Arail Ghat) PFR	Allahabad	42.75
11.	Capacity building project for Nagar Nigam, Kanpur	Kanpur	16.50
12.	Capacity building project for Nagar Nigam, Allahabad	Allahabad	6.12
13.	RFD Works for Dalmau town District-Raebereily	Raebereily	80.41
	Sub Total		**235.16**
	Total		**4325.00**

4.38 **Sewage Treatment Plants of U.P. not approved**: The Government of U.P. submitted that:

> "after execution of these schemes Sewage treatment capacity of 464.50 MLD will be generated by constructing 10nos Sewage Treatment Plants and upgradation of existing STPS having treatment capacity of 236.09 MLD will be achieved . However, the projects submitted have not been approved by GOI till date.GOI is planning for these projects implementation through PPP mode which seems to be a remote possibility in state of Uttar Pradesh."

4.39 The Government of U.P. submitted to the Committee that:

> "Abatement of pollution in river Ganga can only be properly achieved after implementation of comprehensive sewage schemes i.e. including sewage network in all main towns. Simultaneously ,provision for up gradation of existing treatment units

is essential as parameters for discharge of treated effluent have been upgraded by GOI but under 'Namami Gange' plan projects including only 1 I&D of drains and STPs are being taken up which is not a proper solution for abatement of pollution in Ganga"

4.40 **Manpower Requrirements:** Responding to the serious concern expressed by the Committee about the lack of technical and semi skilled /trained manpower and equipment to monitor the levels of pollution in and water quality, the Secretary, MoEF&CC appearing before the Committee on 13.07.2015 submitted as follows:

> "If I am allowed to submit, you hit the nail on the head. Right now the Ministry of Environment has requested the Department of Expenditure to carry out a study of the available manpower within the Ministry, whether it is adequate to handle the enlarging responsibility. As far as the Central Pollution Board is concerned, there has been a situation where there are a number of vacancies of the posts which are already sanctioned. So, right now we have advertised and we are in the process of conducting interviews of technical and scientific manpower. Unfortunately, the response which we get is not very enthusiastic for whatever reasons."

4.41 The Committee also asked the Ministry whether they intend to make the positions vacant to make more attractive so as to ensure the recruitment of right talent, the Ministry was yet to reply.

4.42 Asked whether the Ministries concerned with implementation of 'Namami Gange' project have adequate trained / experienced manpower and if so, the details thereof and if not, the steps taken / proposed to be taken to address the shortage of the trained manpower, the Ministry submitted as follows:

> "National Mission for Clean Ganga hired 17 trained / experienced professionals under various sectors such as Economics, Finance, Environment, Engineering, Solid Waste Management, Geographical Information System (GIS), Information Technology (IT), etc to support implementation of 'Namami Gange' project. Apart from these professionals, scientists and directors from other related line departments of Ministry of Water Resources, River Development & Ganga Rejuvenation such as Centre for Water Commission (CWC), Central Ground Water Board (CGWB) are deputed at NMCG to support project implementation."

4.43 **Magnitude of Flow of Industrial Pollutants into Ganga**: As a part of Pollution Inventorisation, Assessment & Surveillance (PIAS) on river Ganga, CPCB has inventorised 764 GPI is defined as industry which is discharging waste water more than 100KLD and /or hazardous chemicals used by the industry as specified in the Schedule I , part II of The Manufacture , Storage and Import of hazardous chemical Rules of 1989 under Environment (protection) Act, 1986.

4.44 The state wise status of GPI along with their water consumption and waste water generation furnished by CPCB is given in Table: 4.44 (A) and the sector wise status is given in Table 4.44(B).

Table 4.44 (A)

State wise status of GPI, water consumption and wastewater generation			
State	**GPI**	**Water consumption (MLD)**	**Waste water generation (MLD)**
Uttarakhand	42	224	127
Uttar Pradesh	687	693	269
Bihar	13	91	17
Jharkhand	0	0.0	0.0
West Bengal	22	116	87
TOTAL	**764**	**1123**	**501**

Table 4.44 (B): Status of sector specific industrial water consumption and wastewater generation

Type of Industry	GPI	Water Consumption (MLD)	Wastewater Generation (MLD)
Chemical	27	210.9	97.8
Distillery	33	78.8	37.0
Food, Dairy & Beverage	22	11.2	6.5
Pulp & Paper	67	306.3	201.4
Sugar	67	304.8	96.0
Textile, Bleaching & Dyeing	63	14.1	11.4
Tannery	444	28.7	22.1
Others	41	168.3	28.6
Total	**764**	**1123**	**501**

4.45 Monitoring by CPCB of waste water discharged into the Ganga: CPCB in their Background note further informed in this regard as follows:

> "About 632 out of 764 GPI (7 in UK, 590 in UP, 13 in Bihar and 22 in WB) are discharging 200MLD of waste water directly into river Ganga through drains. River Kali-east is also carrying 71 MLD of industrial waste water from 53 GPI. The River Ramganga which is confluencing with into River Ganga at Kannauj, UP and carries 106 MLD of waste water from Uttar Pradesh making a total of about 230 MLD from 79 GPI (44 in UP and 35 in UK).
>
> CPCB has monitored 144 drains carrying 6614 MLD of waste water (domestic and industrial) into River Ganga from 50 Class-I and Class –II towns and from 690 GPI. Only 4 drains are falling into river Ramganga and 9 into river Kali-east and carrying 853MLD of waste water. Details of drains are given in the Table 4.45(A) & 4.45 (B).

Table 4.45 (A): Drains Discharging Waste Water into River Ganga

State	No. Of Drains	Flow (MLD)	BOD Load (Tonnes / Day)
Uttrakhand	14	444.2	42.8
Uttar Pradesh	51	3811.2	188.01
Bihar	25	579.7	99.50
West Bengal	54	1778.9	95.53
Total	**144**	**6614.0**	**425.84**

Table 4.45 (B): Drains Discharging Waste Water through Tributaries

S.N.	Name of Tributary	No. of Drains	Flow (MLD)	BOD Load (tonnes/day)
1	Ramganga	4	258.3	53
2	Kali -East	9	595	165
	Total	13	853.3	218

4.46 The CPCB further observed from the above Table that focus needs to be given on tributaries for improvement in water quality in terms of industrial waste water discharge and drains on the main stem involving the local authorities for improvement in domestic waste water quality. Further, the large no. of tanneries (440) are operating in the main stem and discharging about 22 MLD of waste water directly into river Ganga:

"Although the effluent from tannery is a major concern since toxic chemical like Chromium (Cr6+) is being discharged in the effluents. The chromium (Cr6+) has been associated with birth defects and carcinogenic and becoming a cause of concern. Although quantity of effluent is less but number of industries are more making the issues more complicated."

4.47 The data on the contribution of key sectors to the industrial pollution in Ganga as contained in the presentation made to the Committee on 13.07.16 by MoEF &CC is as given in Table 4.47

Table 4.47: Industrial Pollution discharged into the Ganga

Sl no	Sectors	No of units	Effluent generation	Average BoD* Discharged	Organic Pollution Load
01	Pulp & Paper	67	201	380	76,514
02	Distillery	35	37	600	22,210
03	Sugar	67	96	130	12,484
04	Textiles	63	11	40	457
05	Tanneries	442	22	290	6,404
Total		674	367	----	1,18,069 out of total of 1 31,728 (90%)

*Bio Chemical Oxygen Demand

4.48 **Identification of GPIs and action taken** : M/o WR, RD &GR furnished the following details on the identification of polluting industries along the River Ganga and the action taken against such industrial units for releasing industrial pollutants in River Ganga:

"Under NGRBA programme, 764 GPIs have been identified and the Central Pollution Control Board has completed one round of inspections of 704 industries and has issued suitable directions. Actions have been taken against 165 non-complying industries under the Water (Prevention & Control of Pollution) Act, 1974 and Environment (Protection) Act, 1986. Closure notices have been issued to 48 GPIs.

The CPCB has issued direction to all the 11 basin State Pollution control Boards (SPCBs) on 5th February, 2014 to ensure that the GPIs shall install real-time effluent monitoring system for effective compliance through self-regulatory mechanism before discharging effluents outside their premises."

4.49 As a part of Pollution Inventorisation, Assessment & Surveillance on River Ganga (PIAS), the CPCB has inventorised 764 GPIs operating in the main stream of river Ganga. On the action taken against such GPIs, a representative of the M/o WR, RD and GR appearing before the committee on 29.05.2015 stated as under:

"First time we have issued a notice to 764 grossly polluting industries. I have given them a notice saying that within 15 days they have to give their action plan; road map of how they will move from polluting today to a zero liquid discharge tomorrow".

4.50 **Time bound plan for elimination of industrial pollution:** Apprising the Committee of the existence of time bound action plan and the targets for pollution abatement, the representative of MoEF&CC deposed on 13.07.2015 **,** as under about the main components of Action Plan;

(i) Zero Liquid Discharge (ZLD) in three sectors : textiles, tanneries and distilleries;

(ii) Increasing water use efficiency & recycling and Irrigation Standard Discharge to be achieved in two sectors: Sugar and Pulp & Paper;

(iii) Online realtime 24x7 monitoring of effluent / emission from polluting industries; and

(iv) Realtime monitoring of water quality at 113 locations on main stem.

4.51 The representative also presented the following (Table 4.51) Action Plan;

Table 4.51 Action Plan for Pollution Abatement

Sl no	Sectors	Timeline	Overall Target
1	Pulp &Paper(67)	March, 2017	Irrigation Standard effluent and no discharge into tributaries and drains
2	Sugar (67)	December, 2016	Irrigation Standard effluent and no discharge into tributaries and drains
3	Distilleries (35)	September, 2016	Zero Liquid discharge (ZLD)
4	Textiles(63)	December, 2016	Zero Liquid discharge (ZLD)
5	Tanneries(442)	2 years from DPR prepared(July, 2015)	Zero Liquid discharge (ZLD)
6	Total 674/764		These sectors cover 367 MLD out of 501 MLD (73%)

4.52 With regard to the expected outcomes through the CPCB Directions, the representative of MoEF&CC, submitted the following information;

"**Immediate**

(i) No black liquor discharge from Pulp &Paper sector
(ii) No discharge of spent wash from distilleries
(iii) Improved water Quality especially in terms of colour in drains, tributaries, and river
(iv) Enhanced water flow in drains and tributaries due to recycling in industry and reusing in irrigation
(v) Improvement in land environment
(vi) Compliance through transparent mechanism

Long term

(i) Significant reduction in pollution load discharge into water and land environment
(ii) Conservation of surface and ground water with optimal design of water cycle in three sectorial purposes viz. Industrial, irrigation and domestic
(iii) Recharge of ground water and effective exchange of influx and out flux between ground water and surface water

(iv) Use of innovative technology in overall improved environment

(v) Restriction of malpractices to frustrate the law"

4.53 With regard to the road map indicating the time schedule (Table 4.53) to eliminate pollution from Grossly Polluting Industries(GPIs) the M/o WR,RD &GR stated that CPCB has issued sector wise time bound directions to eliminate the pollution from GPIs as follows:

Table 4.53: Time schedule for elimination of GPIs

Sl. No.	Setup	Deadline
1	Real time monitoring meters	30th June 2015
2	Distilleries ZLD	March, 2016
3	Pulp & Paper ZLD	March 2017
4	Tannery ZLD	March 2017
5	Textile ZLD	March 2017
6	Sugar- no ZLD, instead, reduction in waste from 100 tons to 40 tons per ton of cane crushed	December 2015

4.54 **Financial incentives to become Zero Liquid discharge (ZLD) units:** In reply to a query whether the Ministry has carried out any assessment of the capacity/ financial wherewithal of these industrial units to invest required amounts to become zero discharge companies and if so, the details there of and if not , how the Government propose to ensure that these GPIs become zero discharge units, M/o WR,RD &GR stated that 'detailed consultations were taken up with Industries by CPCB at regular intervals from October 2014 to March 2015 for assessment of the capacity/ financial wherewithal of these industrial units to invest required amounts to become zero discharge companies. Based on the consultations, the industries that lacked finance and capacity for achieving zero discharge are provided with appropriate technical and financial assistance to achieve the zero discharge, the details of which are given below:

"Distilleries and sugar mills being large and medium industries in a financially viable position and have already started putting up ZLD units.

Small scale industries like tanneries for them implementation will be a constraint however financial support will be provided to setup CETP in Clusters by MoEF&CC. For 6 Textile clusters are also being supported by NMCG for setting up CETPs for ZLD".

4.55 The M/o WR, RD and GR in response to a question whether there is any proposal to extend financial incentives - tax and /or non tax incentives, soft loans, financial assistance, etc, to enable these industries to adopt clean technologies/ treat the effluents generated by them stated 'that Offering suitable incentives such as interest subvention, viability gap funding for CETPs etc. are under consideration'.

4.56 Asked about the clean technologies made available to GPIs to reduce, eliminate or to treat the effluents, M/o WR, RD & GR submitted that the following initiatives have been taken up for making clean technologies available to GPIs to reduce, eliminate or to treat the effluents:

- **"**Tanneries**:-** Cleaner technology being suggested by CLRI Chennai to reduce pollution at source.
- Sugar Mills &Distilleries**:-** Operating on continuous batch process best available technology
- Paper Mills: Already a charter to reduce water intake and waste water production is implementation in a phased manner as per directions issued by CPCB."

4.57 **Development of technologies for recycling / waste water treatment:** The M/o WR,Rd &GR were requested to furnish the initiatives taken to develop technologies for recycling waste water and the details such as cost effectives , impact of such technologies. However, the Committee are yet to receive the reply from the Ministry.

4.58 With regard to the proposals for setting up of CETPs catering to the requirements of the polluting industries in these areas to ensure financial viability of these industries, the M/o WR, RD & GR submitted that the following proposals have

been initiated to set up CETPs:

> "Tanneries: DPR for CETP at Jajmau cluster received from CLRI and it is under examination by NMCG.
>
> Textiles: Institutes identified by NMCG to prepare DPRs for 6 textile Clusters for ZLD based CETPs."

4.59 During evidence held on 16 February, 2016, the Committee asked the representatives of Ministry of Water Resources, River Development & Ganga Rejuvenation regarding the status of Memorandum received by the Committee during the study visit to Kanpur on setting up of common effluent treatment plant and what is the experience of tanneries in Calcutta alongwith the pollution norms for industrial department. The Secretary informed the Committee that:

> "Almost four hundred units are operating in the Kanpur Jajmau area today. Out of them some are illegal also. In this connection a detail study was conducted. First study was conducted by Central Leather Institute. The same study is being got conducted again by Tamil Nadu Water Corporation as the Common Effluent Treatment Plant of zero liquid discharge is in Tamil Nadu and its four units are operating in Tamil Nadu. This common effluent plant is meant for tanneries."
>
> "The presentation is to be made on 18th in my presence regarding this detailed study report. The preliminary report in this connection was at first sent to the Chief Secretary U.P. One point is coming up from the report as to what size of a common effluent treatment plant should be. Today whatever effluent is being discharged by every tannery that is almost 25-30 million per day. It is all happening when 100 kilo litre water is being used out of per kilo hide whereas there is a norm of Central Pollution Control Board that it should not be about 25, if we admit it as 40, it should be 15 million litre per day. We are preparing a detailed project report on common effluent treatment plant and there is a mention of 20 million litre per day therein, if units quantity consent is kept in mind, it should be hundred litre per kilo as whatever hide is being used, it should be about 11 million litre according to the hide. We have talked of making it double. The entire cost will be borne by Government of India and Government of Uttar Pradesh collectively. But we also want that tanners should also be the equity holders therein."
>
> "At Present norms of Industrial Department, Government of India we have, there is 40 per cent of Government of India, 40 per cent of State Government and there is 20 per cent of tanners. We don't want as much from them but we want that some contribution of theirs must be there so that their involvement could be made therein."

"This particular plant will treat the water and they will be able to use it in their tanning process. We demand from them that we will invest the same but you will have to purchase the water. If you purchase this water, you will have to shoulder the liabilities. Whatever liabilities we have fixed, we have fixed on finished products not that on hide. It costs nine rupees per pair of shoes. Horse saddle costs rupees 15 and a belt costs 90 paise. Here only these three things are being manufactured. It is not a heavy kind of liability. Government of India is bearing 80-90 per cent cost thereof. If it purchases the water, it will continue to complete the O&M cost thereof otherwise O&M cost would not be available."

4.60 Chairman, CPCB further added that:

"xxxxx we had a meeting last week with the tannery industry as well as with the technical organizations like CLRI and others. They were willing to look at this option. They have developed a mixture which will allow them to use lesser water. They were claiming about 20 per cent to 30 per cent lesser water, which can be used."

4.61 While clarifying the query of the Committee as to whether the residual salt will remain in the river Ganga, what happens to that, the Secretary, water resources stated as under:

"A lot of salt is mixed with the hide to keep it preserved. If we shake off hide at first, salt will not remain clung to the hide and thus, we will need of less water. There is 70 per cent recovery of salt in treatment of water. Two types of salt are mined, one is sodium sulphate which has a market and the second is sodium chloride which is mined 99.9 per cent pure. At least industrial salt could be sold always. Recovery of 70 per cent salt could be made but we are still not in a position to make a recovery of 30 per cent. But technology of ZLD has been in the existence for the last ten years. There is zero per cent recovery of salt in Tamil Nadu. Today, we are in a position after 10 years that we can recover 70 per cent. We hope that we will be able to recover 100 per cent salt within 3-4 years and this recovered salt will be sold. I understand that this problem is not that much serious, hence the association will have to come forward in this connection."

Monitoring of Industrial Pollution

4.62 Under Pollution Inventorisation, Assessment & Surveillance(PAIS) Project , CPCB is also implementing Compliance verifications of Standard of the GPI and inspected 727 units and

action taken status as on 10th November, 2014 as furnished by MoEF&CC in their background note is as follows: (Table 4.59)

Table: 4.59; Monitory of 727 units by CPCB

S.No.	Action/State	Uttar Pradesh	Uttarakhand	Bihar	West Bengal	Total
1	Direction under section 5 of Environment (Protection)Act, 1986	172	23	2	3	200
2	Direction under section 18(1)(b) of Water Act,1974	177	0	0	1	178
3	Letter issued for ensuring compliance	48	7	1	6	62
4	Compliance with standards	90	0	1	5	96
5	Action taken for reinspection/revalidation	33	3	1	7	44
6	Industry found closed/ not traceable	117	1	0	0	118
7	Action under process	27	0	0	2	29
	Total	664	34	5	24	727

i. Based on the above observation CPCB is taking sector specific action plan and already implemented charter for Pulp & paper sector. Self regulatory monitoring mechanisms through real time effluent monitoring system in the identified GPI are also being implemented with the help of respective SPCBs.

ii. CPCB is in the process of implementing Zero Liquid Discharge concept in the important industrial sectors of Ganga Basin which is as follows;

a. Zero liquid discharge in respect of distillery and sugar sector is already in progress. The spent wash from the distillery is to be utilized in making the compost following the CPCB protocol or to be

incinerated employing the evaporation and concentration techniques.

b. The effluent from the Sugar Mills is required to be recycled completely in the manufacturing process following a territory level of effluent treatment adopting reverse osmosis and sand filtration process.

c. The concept of zero liquid discharge in the tannery has been tried successfully in southern part of India and therefore, is required to be adopted likewise in Kanpur region.

d. To minimize the water consumption and waste water discharge from the Pulp and Paper sector, CPCB is in the process of developing protocols in consultation with technical experts and other stakeholders. Series of interaction meetings are proposed to be held with all stakeholders so as to minimize or to achieve zero liquid discharge from this sector."

4.63 **Measures to Deal with Open Defecation in Areas Along the River Ganga**: The Ministry of WR, RD & GR in their presentation made to the Committee on 13th July, 2015 submitted the following actions /plans / proposals under 'Namami Gange Programme' to tackle the open defecation in villages/ towns/ cities on the banks of Ganga as under:

"Letter of Authority issued to Ministry of Drinking Water and Sanitation for the budget requirement of Rs.263 crore for 2015-16 for comprehensive sanitation coverage for 1657 Gram Panchayats situated along the River Ganga

Amrutamandamayi trust came forward to fund Rs. 100 crore for construction of toilets in Jharkhand

Letter written to District Magistrates for identification of 3-4 villages to be developed as 'Ganga Grams'. The criteria for selection of' Ganga Grams' is as mentioned below:

Village having historical and cultural importance
Villages where large congregations are normally organized for specific events

Villages of tourist importance
Villages which are prominent from cultural/ heritage point of view.''

4.64 With regard to the efforts being made by Govt. of Jharkhand in keeping river Ganga clean, in a memorandum submitted to the Committee, the following details were furnished:

> ''The total rural population of 6 blocks, 78 villages and 33 Panchayats in Sahibgunj District are covered in Namami Gange project. Drinking Water and Sanitation Department (DW&SD) has a mandate to make the area 100% ODF by providing community toilets, IHHL and Bio-Diestible toilets including solid and liquid waste management projects too. In rural areas there is a target of constructing 34120 nos of Individual House Hold Latrine (IHHL). Total 12698 nos of IHHL has already been constructed by DWSD as on date. Construction of balance IHHL is in pipeline"

4.65 Explaining the need for change in the design of the toilets presently being undertaken under Swachh Bharat Abhiyan to ensure that people really use them, Dr. Sudipta Sarkar, Asst. Prof. IIT, Roorkee, on 20 January , 2016 submitted:

> "I recommend that 100 per cent village sanitation should be required. When we decide on the technologies, it should not be top down approach… As a designer, I should ask myself – can I go there and use the toilet? If I cannot, I should not tell the people to use this toilet. The toilets that are being constructed now lack the minimum amount of privacy and comfort to the user. Incase these basic lacunae are not addressed people will start going to field again". I interacted with some people from villages on the issue. Those people actually have toilets in their homes but they are going to open field. I asked them the reason for going to the open field. The answer I got, in almost all the cases, was – stinking smells and lack of privacy. Lack of privacy is there in open areas also. But stinking smell is the main reason which is causing people to go in open for defecation. So, this is some hard reality which we have to admit.
>
> As you mentioned that technologies have been developed in other countries, For your kind information I wish to say that we in our laboratories are trying to develop the technology which requires less amount of water for flushing. You were also mentioning about covering it with dust. We are trying to develop the technology which will actually try to extract some commercial value out of it so that carbon can be sequested in the food chain again."

4.66 **Use of Fertilizers – Impact on Pollutin in Ganga -: Need for alternate agriculture practices:** In response to a query whether the M/o WR, RD &GR agree with the view that conventional irrigation techniques require a great deal of water , much of which is lost in evaporation causing over extraction of the water needed to

sustain life elsewhere and the concrete long term action taken or proposed to be taken to encourage water saving techniques, alternative farming techniques such as organic farming and setting up of solar power plants on canals to prevent evaporation of water, etc, the Ministry submitted as follows:

> "Yes, the cabinet note for Namami Gange Programme states that "While efforts will be made to recycle / reuse the treated water so that extraction of fresh water is reduced." In the inputs received from Ministry of Agriculture on the draft cabinet note for Namami Gange programme it is stated that Department of Agriculture and Co-operation (DAC), Ministry of Agriculture is promoting - Rain water conservation, Rain water harvesting, reduction of runoff of silt, promotion of organic farming, ensuring balanced use of fertilizer etc. in the nation.
>
> For promoting research on estimation of non-point pollution load in River Ganga, a research study on estimation of non-point pollution at small watersheds in Ganga Basin has been planned in collaboration with NEERI."

4.67 When the Committee asked the Ministry to submit the details of the alternative modes of irrigation being developed, their reply of the Ministry was awaited.

4.68 The Committee enquired from Prof. U.K. Choudhury, Fonder & Director, MMIT, for Ganga Management, about the changes required to be made in the irrigation technologies. He deposed before the Committee on 19 January, 2016 as under:

> "Why shall we not change our irrigation methodology? There is sprinkle method of irrigation, other methods of irrigation, groundwater enrichment irrigation and all. The quantum of water required for irrigation from western Ganga canal could be reduced to a large extent. Why can't we have a technical dialogue to devise a methodology? We can have a technical dialogue with U.P. Government, Central Government and other stakeholders in this regard.

4.69 **Solid Waste – Impact on Pollution in Ganga**: Solid Waste Management in towns and cities along the river Ganga: Sharing the concern of the Committee over lack of proper planning to deal with the problem of solid waste, Secretary, M/o WR, RD&GR deposed:

"In fact, solid waste management is also very important because as a result of the filth that one sees conveys the impression that this river is dirty because of the solid waste that is floating."

4.70 A representative of the M/o WR, RD&GR added as follows:

" One is to remove the river surface silt. Namami Gange will take that over and they will take over the removal and disposal of the solid waste. Drain water goes into rivers and other material relating to pujas and religious customs is thrown into rivers too.

4.71 A representative of the Ministry further added as under:

"Sir, that part we have left to the MoUD. We are as of now collecting the trash and we want to give it to them for disposal, re-cycling and reused."

4.72 Asked whether the solid waste management in towns and cities along the river Ganga is also part of Ganga rejuvenation, and if so, whether the ministries have any concrete plan to ensure collection, processing, recycling, and reusing the solid waste generated to prevent its being dumped into river Ganga in these cities, the M/o WR,RD &GR submitted that :

"As per the Cabinet note for Namami Gange Programme the component of Solid waste management in towns/ghats and disposal of flowers and other puja materials, river surface solution abatement and improved methods of last rites on the river bank, have been included in the overall programme.

For class I & II towns the Solid Waste Management works will be taken up by Ministry of Urban development (MoUD)"

4.73 On the specific measures/ steps taken to deal with the solid waste floating in river Ganga, the M/o WR, RD &GR submitted

"NMCG is preparing a tender document for River surface pollution abatement and Ghats cleaning in certain priority towns in main stem of river Ganga. The detailed components of scope of work are being finalized."

4.74 Plastic Waste (Management and Handling) Rules of 2011 framed under the Environment (Protection) Act, 1986 bans the usage of plastic bags. However, it is reported in the press that its continued usage in the riparian states is causing threats to is eco system. Asked whether MOEF&CC were aware of the continued usage of the plastic carry bags in the riparian States and the resultant threat to Ganga and its eco system, the ministry replied that:

> "Plastic Waste (Management and Handling) Rules, 2011 framed under Environment (Protection) Act, 1986 prohibit usage of plastic bags below 40 microns, not all the plastic bags. Accordingly, the continued usage of plastic bags of more than 40 microns is permissible under the Rules and they are found everywhere. However, it is a fact that if plastic bags are not disposed in environmentally sound manner it can choke drainage system and create unhygienic conditions; animals ingest plastic bags with the discarded food leading to their illness and sometimes death; the plastic waste when disposed of on soil reduces recharging of ground water aquifers; recycled plastic bags and containers contaminate packaged food; plastic waste when disposed of in landfill sites causes leaching of metals and additives into the soil and ground water; and uncollected plastic waste litters the surroundings'.

4.75 With regard to the measures proposed to be taken to deal with the problem of solid waste Management, the M/o WR, RD and GR, in a presentation made to the Committee submitted the following:

> "-Arresting the entry of all floating solid waste into river at all inlet points; Cleaning of floating trash from river surface and surveillance through public address system; Cleaning of ghats; Installation of adequate dustbins; Disposal of cremation ghat waste; Creation of toilet facilities to ensure open free defecation ghats/river banks; Collection of waste from 100 m wide corridor along the bank through vehicles fitted with public address systems"

4.76 The State Government of Jharkhand submitted to the Committee that a DPR, amounting to Rs.70.50 crore to cater 1,10,080 current population of Sahibganj and Rajmahal and future growth for next 30 years . [DPR], is under scrutiny for final approval.

4.77 **Impact of the initiatives taken on reduction of pollution in Ganga**: The Secretary, MOEF &CC apprising the Committee of the increase in pollution load in Ganga on 13.07.2015 stated that the pollution load in Ganga has been increasing over the years due to rapid urbanization, industrialization, increase in population, etc. In response to a query as to whether this could mean that approx Rs. 5000 crore spent under GAP I &II have not had any positive Impact on reducing pollution in Ganga and hence can be termed infructuous expenditure, the Ministry submitted as under:

> "(i) Under both phases of GAP, three phases of Yamuna Action Plan, National River Conservation Plan, Gomti Action Plan, Damodar Action Plan, Mahananda Action Plan, and NGRBA, total of 927 schemes have been completed. A capacity to treat approximately 2620 MLD has been established, details of which are given in the table below-
>
> In an assessment done by CPCB, STPs installed Ganga river basin are 64. Out of these 51 STPs of 1009 MLD are monitored by CPCB and actual utilization in these STPs is 602 MLD which is 59%. 9 STPs are violating Biological Oxygen Demand (BOD) limit and 1 STP exceeds the Chemical Oxygen Demand (COD) limit for discharge. 14 STPs are found non-operational."

4.78 The data on the money spent under GAP, and other river rejuvenation programmes were implemented through MoEF&CC as furnished by M/o WR, RD & GR is as contained in Table 4.78:

Table: 4.78: Schemes, expenditure and capacities created under GAP

Details	Schemes	Expenditure (in Cr)	Capacity Created (MLD)
GAP-I & II	524	961	1098.31
YAP-I,II & III	304	1526.4	942.25
Haryana (Yamuna) under NRCP	0	121.54	0
Gomti Action Plan	59	472.22	392
Damodar Action Plan	14	4.29	13.17
Mahananda Action Plan	1	50.54	50
NGRBA	25	1032.51	123
Grand Total	927	Rs 4168.55 Cr	2618.73

4.79 **Impact on Pollution Levels:** With regard to the impact of money spent in the past on reduction of the pollution levels in Ganga, in a written reply, the M/o WR,RD & GR *inter alia* stated as under:

> "The Money spent under the GAP I &II have positive Impact on reducing pollution in Ganga. A report titled "Report on Utilisation of Funds and Assets Created through Ganga Action Plan in States" published by Ministry of Environment & Forests on May,2009 states: "Though a considerable sum of money has been spent on the programme and the impact of GAP and NRCP has been positive, it has been less than desired.

4.80 **Shift in the Strategy**: Asked whether there will be a shift in the strategy to deal with pollution *vis-a- vis* the earlier strategy adopted during GAP I & II under 'Namami Gange, M/o WR, RD & GR submitted as under:

> "One of the major shift in the strategy for NGRBA/Namami Gange program was to approach the river rejuvenation in a holistic manner. This includes not only creation of treatment infrastructure for domestic/industrial waste water but also ensuring adequate flow in the river, conservation of biota , river front development, public outreach and capacity building."

4.81 The Ministry further explained the focus of the Namami Gange Mission:

> "The mission 'Namami Gange' will focus on pollution abatement interventions namely Interception, diversion &treatment of waste water flowing through the open drains through bio-remediation / appropriate in-situ treatment / use of innovative technologies / STPs / effluent treatment plant (ETPs); rehabilitation and augmentation of existing STPs and Immediate short term measures for arresting pollution at exit points on river front to prevent inflow of sewage; CETP for major industrial clusters and Operation & Maintenance (O&M) for a definite period etc. Unlike GAP the investment is made for the entire life cycle of the asset created by including the O & M cost as well for a period of 15 years. Apart from these, projects / interventions on rural sanitation, river front development / management, solid waste / pious refuse management, sewerage network, national ganga monitoring centre, capacity building, research / pilot studies, non-point pollution mitigation, GIS mapping / applications, restoration of special properties of Ganga, sand mining, biodiversity conservation, habitat improvement, institutional development, river flow improvement, Ganga task force, Ganga Vahini, communication & public outreach activities and other activities / pilot projects included in NGRBA

Programme Framework and the ones arising from GRBMP aiming at Ganga rejuvenation will also be undertaken."

4.82 About the nature of the programme, the Ministry submitted:

"The nature of the programme has been changed from centrally sponsored scheme to central sector scheme for achieving better synergy between Central & State Governments for expediting the work on Ganga Rejuvenation. The mission "Namami Gange" would enable integration of different programs on Ganga Rejuvenation and the ones impacting Ganga and help in developing a comprehensive action plan, cutting across various stakeholders, sectors, ministries, etc., for Ganga Rejuvenation. The mission will facilitate expeditious implementation of the interventions needed for river Ganga rejuvenation and help accelerate the process of river water quality improvement, conservation of bio diversity & aquatic life, health & livelihood improvements, etc. apart from providing improved sanitation facilities, hygienic conditions and improved citizen-river interaction & connect."

4.83 **Critical Assessment of Ganga Action Plans I & II:** In reply to a query whether any critical assessment of the Ganga Action Plan (GAP) I &II was carried out by any Ministry / any agency and the details thereof, the M/o WR,RD&GR stated as follows:

"As the part of GRBMP report prepared by consortium of IITs, a detailed analysis of the strengths, weaknesses, opportunities and threats (SWOT) on Ganga action plan (GAP) was carried out. Several issues such as delays in implementation of the program, confusion over funding, technological issues, lack of support for operation and maintenance of the assets have been identified as major factors for mixed results of the program. The report also highlighted the slackness in program planning& implementation, monitoring & evaluation, lack of centre-state coordination &state - ULB coordination, etc. The conflicting/overlapping roles of multiple of institutions, especially at the local level warranted development of suitable institutional mechanisms for effective implementation. Inefficient implementation and low levels of citizen's participation resulted in poor sustainability of the assets created."

4.84 The Ministry also clarified that the preparation of GRBMP was funded by Ministry of Environment, Forest and Climate Change under NGRBA Program. The shortcomings under GAP were considered while planning for 'Namami Gange' Programme.

CHAPTER-V

Allocation of funds for Ganga Rejuvenation

Funds allocated and spent in the past: With regard to the amount of money spent in the past (since 1985) and is proposed to be spent in the next five years on Ganga Rejuvenation, a representative of the M/o WR,RD&GR appearing before the Committee on 29th May, 2015 stated *inter alia* as under:

> "Totally money spent on Ganga from 1985 till now is ₹ 25,000 crore out of which ₹12,500 crore is programmes which were identified earlier, ₹ 12,500 crore is programmes which will be identified in the next five years. Out of ₹ 12,500 crore of earlier programmes, ₹ 5000 roughly have been committed. ₹7000 roughly is what we are putting in this, so this ₹7,000 crore and the new ₹12,000 comes to around ₹20,000 crore. That is the gist of it. That is the ballpark figure"

5.2 The GAP and other rejuvenation programmes were implemented through MoEF&CC. The details of the money spent on the programme for Ganga cleaning as furnished by the M/o WR, RD &GR are as contained in table 5.2:

Table 5.2: Expenditure incurred and Capacities created for Ganga Rejuvenation

Details	Schemes	Expenditure (in Cr)	Capacity Created (MLD)
GAP-I & II	524	961	1098.31
YAP-I,II & III	304	1526.4	942.25
Haryana (Yamuna) under NRCP	0	121.54	0
Gomti Action Plan	59	472.22	392
Damodar Action Plan	14	4.29	13.17
Mahananda Action Plan	1	50.54	50
NGRBA	25	1032.51	123
Grand Total	927	Rs 4168.55 Cr	2618.73

5.3 Furnishing the details of assets created out of ₹ 4168 crore (approx) spent on Ganga rejuvenation including *inter alia* nature of assets created, the maintenance or otherwise of these assets, the contribution of these assets in stopping / preventing

pollution in Ganga and the extent of improvement in its water quality, the M/ WR, RD &GR in a post evidence reply stated as follows:

> "(i) Under both phases of GAP, three phases of Yamuna Action Plan, National River Conservation Plan, Gomti Action Plan, Damodar Action Plan, Mahananda Action Plan, and NGRBA, total of 927 schemes have been completed. A capacity to treat approximately 2620 MLD have been established, details of which are given in the table below.
>
> In an assessment done by CPCB, STPs installed Ganga river basin are 64. Out of these 51 STPs of 1009 MLD are monitored by CPCB and actual utilization in these STPs is 602 MLD which is 59%. 9 STPs are violating BOD limit and 1 STP exceed the COD limit for discharge. 14 STPs are found non-operational."

5.4 **Establishment Expenditure:** Responding to a query as to the amount of money spent on 'establishment' out of the total money spent on cleaning River Ganga during GAP-I&II, a representative of the M/o WR,RD&GR at The Committee's sitting held on 29 May, 2015 submitted as follows:

> **"**The establishment expenditure is different from ₹ 4,168 crore which is the expenditure made on assets that have been created. The establishment expenditure of the Mission is definitely not included in this. The establishment expenditure of the executing agencies is also not included in this. But they do take what is called centage administrative cost of executing a project….That is the only establishment cost which is there in this amount of ₹ 4,168 crore. It differs from place to place, but under NGRBA framework, there is a ceiling of 8 per cent.."

5.5 **Funding Pattern:** The NGRBA was launched in 2009 as a collaborative effort for conservation of the river Ganga and maintenance of environmental flows through comprehensive river basin approach. Furnishing the funding pattern of NGRBA in their status on the subject , M/o WR,RD &GR stated as follows:

> "The funding pattern for the NGRBA programme consists of Direct Funding by Government of India, as well as Externally Aided Funding. The earlier initiative consisting of GAP-I and GAP-II to the tune of ₹ 1560 crore, as well as the recent initiative under "Namami Gange" consisting of ₹ 2037 crore and additional ₹ 100 crore for 'Ghat development', are being funded directly by Government of India.

Further, a project in Varanasi with estimated cost of ₹ 469.9 crore is being funded by Japanese International Co-operation Agency (JICA). Also, World Bank is providing technical assistance and financing of ₹ 7000 crore (US $ 1 billion assistance) for NGRBA.

Infrastructure projects (except Industrial Pollution Control sub-project on 50:25:25 basis) and Institutional Development Component are being shared between Centre and State Governments on 70:30 cost sharing basis. Projects sanctioned earlier from Government's own resources for ₹ 576.32 Crores have been taken up for retro-active financing by the World Bank.

Also, there is direct Govt. funding out of the 12th Plan outlay of ₹ 2200 Crore earmarked for NGRBA programme. So far, projects have been approved for ₹ 1560 Crore from Government's own resource, cost of which are also being shared between Centre and State Governments on 70:30 cost sharing basis."

5.6 **Projects sanctioned under NGRBA:** As per details furnished by the M/o WR, RD &GR the NGRBA has so far sanctioned a total 93 projects in 55 towns in Ganga States costing ₹ 7350.38 crore under NGRBA program including EAP component with the assistance of Japan International Agency (JICA) and the World Bank. These include projects of ₹ 2406.:96 crore in Uttar Pradesh, of ₹ 2155.62 crore in Bihar, of ₹ 99.36 crore in Jharkhand, of ₹ 1352.51 crore in West Bengal and of ₹378.29 crore in Uttarakhand for laying of sewage networks, treatment plants, development of river fronts, etc: These sanctioned projects also include three CPCB projects worth ₹ 198.48 crore on Pollution Inventorization, 'Assessment and Surveillance (PIAS) on river Ganga, Strengthening of Environmental Regulator (SER)-CPCB and a project of setting up the Ganga Knowledge Centre (GKC) in NMCG (₹ 48. 54 crore). Further, for projects related to biodiversity conservation, afforestation, assessment of special properties of Ganga and communication & awareness for Dolphin conservation ₹ 11.24 Crores have, been sanctioned. An amount of ₹1414.54 crore (as on 31st March 201S) has been released by both Centre and the States for implementation of the sanctioned projects.

5.7 On the sharing of cash and funding mechanism between the Centre and the States, the Ministry submitted:

"The investments required to create the necessary treatment and sewerage infrastructure would be shared between Centre and State Governments on 70:30 basis. The State Governments would be required to motivate ULBs for resource

recovery and revenue generation. Also, the cost of Operations and Maintenance (O&M)for the initial five years in NGRBA projects would be shared between Centre and States in the ratio of 70:30 with a periodical review."

5.8 **Physical and Financial Performance**: The Financial and Physical Performance during XII and XII Five Year Plan as furnished by M/o WR,RD &GR *vide t*heir status report on the subject is as under:

"The NGRBA Programme is being implemented using a variety of financing sources, as approved by the Government of India from time to time; and may include public-private partnerships. So far, only government financing i.e., Externally Aided Program (EAP) and Government's own resources (Non-EAP) has been considered."

XI Plan Target: The XI Plan Target has been made for ₹ 1250 Crore including Scheduled Caste Sub-Plan allocations. During XI Plan period, the budget allocations and expenditures are as under:-

XI Plan: Budget allocation- ₹ 816.16 Crore; Expenditure- 792.41 Crore

XII Plan Target: The XII Plan Target has been made for ₹ 2200 Crore. During XII Plan period, the budget allocations and expenditures so far are as under:-

(₹in crore)

Year	Expenditure reported by States	Budget Outlay (as per Demands for Grants of MoEF&CC)	Expenditure (as per Demands for Grants of MoEF&CC)
2011-12	236.48	216.61	192.58
2012-13	329.99	193.50	191.52
2013-14	187.84	310.92	303.95*
Current year (till June, 2014)	88.21	355.0 *(Budget outlay transferred to MoWR, RD &GR)*	Nil
Total	842.52	1076.03	688.05

** Provisional*

The Committee in a post evidence questionaire asked the Ministry to furnish details of Budget Estimates proposed by the Ministry during 2015-16 and 2016-17, details of previous ongoing projects for which funds have been allocated and utilised/to be utilised out of the allocation for 2015-16 and 2016-17 and the details of the plan prepared by the Ministry for

utilisation of 3/4 remaining funds i.e. ₹ 15,000 crore over the remaining period of Namami Gange Project. The reply of the Ministry was awaited.

5.9 The volume of work and details of schemes /projects and the Status of institutional & infrastructure investment components under NGRBA as given by M/o WR, RD and GR in their status notes are as follows:

> "The works under NGRBA Programme sanctioned to 5 basin states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal since the financial year of 2008 - 09 include laying of sewerage system, sewage treatment plants, solid waste management, common effluent treatment plant for controlling industrial pollution, river front management, crematoria, etc. So far, 70 investment projects in 48 towns in five Ganga States, 5 institutional development and 1 implementation support projects including Automatic Water Quality Monitoring and Ganga Knowledge Center have been sanctioned at a total cost of ₹ 4974.79 Crore under the programme. An amount of ₹ 1232.87 Crore has been released from centre and state, of which Central Government's share is ₹ 915.52 Crore and State Governments share ₹ 317.35 Crore. Treatment capacity of 659.23 Million Litres per Day (MLD) shall be created on implementation of these projects, of which a treatment capacity of 110.50 MLD has been created so far."

5.10 **External Assistance under NGRBA**: The MoEF&CC in their background note on the subject furnished inter alia the following details of the external assistance to NGRBA programme:

> "A World Bank assisted NGRBA project for abatement of pollution of river Ganga is under implementation at an estimated cost of ₹7000 crore. The World Bank is providing technical assistance and financing US $ 1 billion (approx. ₹4600 crore) for the project. The share of Government of India in the project is Rs.5100 crore and that of the State Governments of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal will be ₹1900 crore. Implementation of the Project will be spread over a period of 8 years. The principal objective of the project is to set up institutional structure at Centre and States and fund priority infrastructure investments for conservation and restoration of the water quality of the river Ganga.
>
> A pollution abatement project for river Ganga at Varanasi is under implementation at an estimated cost of ₹496.90 crores, with loan assistance of 11.184 billion yen from the Govt. of Japan. The project comprises of schemes pertaining to sewerage, pumping stations, construction of 140 million liters per day (mld) Sewage Treatment Plant, community toilet complexes, construction of dhobi ghats, improvement of

bathing ghats, public awareness and participation and institutional development & capacity building of the local body.

Since inception of the NGRBA programme, 73 schemes (67 infrastructure investment, 5 institutional development and 1 implementation support) in 48 towns in Ganga States have been sanctioned at a total cost of ₹ 4683.61 crore. Against this, ₹ 945.60 crore has been released by the Centre including the matching share of the States so far and a total expenditure of ₹ 910.57 crore has been incurred till June, 2014 for implementation of the projects."

5.11 Implementation of pollution abatement works in towns along the river is being done by the concerned agencies of the State Govts. The expenditure incurred on both phases of GAP & NGRBA programme till June, 2014 as furnished by MoEF&CC are as under:

Table 5.11: Expenditure incurred under GAP -I & GAP- II

Sl. No.	State	Total expenditure till 31.06.2014 (₹ in crore)			Total Expenditure
		GAP-I	GAP-II	NGRBA	
1	Uttarakhand	0	54.79	64.73	119.52
2	Uttar Pradesh	194.45	189.99	560.39	944.83
3	Bihar	52.72	3.05	76.49	132.26
4	Jharkhand	0	0.25	0	0.25
5	West Bengal	186.13	257.23	205.31	648.67
	Institutional			3.65	3.65
	Total	**433.30**	**505.31**	**910.57**	**1849.18**

5.12 MOEF&CC has also stated that ongoing works of GAP-II and NGRBA are being handled by NMCG/M/o WR,RD&GR from 01/08/2014 onwards.

5.13 **Funds allocation for Namami Gange Programme**: Appearing before the Committee on 13.07.2015 submitted the following details of the funding aspects of Namame Gange' Programme :

"Duration – 05 years 2015-16 to 2019-20

Cost -2014-15 t0 2018-19) : ₹ 20,000 crores and includes two major components:

A. Existing programmes- ₹.7272 crores (remaining Government of India Liability under already approved ongoing schemes)
B. New Initiatives – ₹12,728 crore to strengthen Namami Gange programme

A significant fourfold increase over the expenditure in the past 30 years

Primary focus on pollution abatement
Government of India incurred an overall expenditure of approximately
₹ 4,168.55 crore on this task since 1985"

5.14 The indicative budgetary outlays and allocation for Component A –Existing programmes, & Component B –New Initiatives , (ii) Budget allocation for Component B along with targets, (iii) Year wise break up of new initiatives , (Iv) Budget outlays 2015-16 at **Annexures XIII-XIV**

5.15 The key features of 'Namami Gange' as furnished by the representative of the Ministry at the sitting of the Committee held on 13.07.2015 are as under

- Marking a major shift in Implementation
- Improved inter ministerial and centre state coordination
- Strengthening Public Participation
- Measures for expediting implementation:
- Centre takeover 100% funding – Central Sector Scheme
- Public Private Participation (PPP) / SPV
- approach for pollution hotspots
- Establish four battalion Ganga Eco Task force
- Developing performance outcomes and indicators
- Three tier mechanism: HLTF chaired by Cabinet Secretary ; State level Committee chaired by Chief secretary ; District level Committee chaired by District Magistrate.

5.16 With regard to the problems (Table: 5.16) being addressed in 'Namami Ganga', the Ministry of WR,RD &GR submitted as under:

Table: 5.16, Issues and Solution proposed under Namami Ganga

Issues	Proposed solutions
Huge gap in sewage treatment capacity	Creation of sewage treatment plants
144 major drains discharging pollution in river ganga	Tapping of the drains
Open Defecation	100% sanitation coverage for 1657 Gram Panchayats
Small Industrial units discharging toxic effluents	Financial incentives for pollution abatement to industries
Ineffective inter –Ministerial & centre –state Coordination	Three tier monitoring mechanism
Delay in execution and implementation	Execution by PPP/SPV
Insufficient funds with states for giving its share	Centre takes over 100% funding
Inefficient operation and Maintenance	Provide for O&M of the assets for a minimum 10 year period
Inadequate Public participation	Involving ex servicemen living on the banks of river Ganga

5.17 The expected year-wise fund release has been grouped under three phases as given below:

Year	Amount (Rs. Ii crore)
2015-16*	2,750
2016-17	3,955
2017-20(Dec)	13,295

includes "Component 'A'; Existing programmes" for 2014-16

For channelising the voluntary contributions for Ganga clean up, the M/o WR, RD & GR informed that an account 'Clean Ganga Fund' was created and an website-www.cleangangafund.com was created. A trust deed has been approved and a first meeting of the trust was held on 29 May, 2015. The Committee was informed of the receitp of ₹ 54 crore (approx.) and requests are being sent to PSUs and embassies for donations.

5.18 Provision of funds on the basis of tender cost: Governemtn of Bihar suggested that the central government should consider providing fund on the basis of tender cost and not on the basis of project approval cost under Namame Gange programme. Further , they also stated that flow of funds from the central government is very slow causing slow progress in on going projects. Purchase of land , the Government of Bihar stated that is creating heavy burden on the state Government . Hence, they felt that Central Government may also provide grants for the purchase of land.

5.19 The M/o WR, RD &GR were requested to provide the funds released to states for various projects under 'Namami Gange' and also their utilization by the states. However, the Ministry could not furnish the reply despite several reminders.

CHAPTER VI

MAINTENANCE OF ENVIRONMENTAL FLOWS IN GANGA

Definition of Environmental Flows: Environmental flows ('E-Flows') are the flow regimes needed to maintain the ecological integrity of a river and the goods and services provided by it .It is computed by the Building (bigger) Block method or other standard holistic methods.

6.2 **Measurement of E' flows**: The Ministry of Power in their presentation made to the Committee stated that e-flow is still an evolving concept as evident from recommendations (Table: 6.2) of different Committees given below:

Table 6.2: E flow according to different Committees

Sl. No	Reports/ Committees	E-flow Recommendations	
		Lean season	Non-lean season
1	AHEC,IIT Roorkee 931 projects)	20%	20-30%
2	WII,Dehradun (70 projects)	30%	20%
3	Inter ministerial Group (IMG) under Shri B.K. Chaturvedi	30%	25%
4	Prof. Ravi Chopra Committee (on adhoc basis)	50%	30%
5	CWC (on adhoc basis)	20%	

6.3 The M/o WR, RD & GR in the status note regarding the flow in Ganga submitted as under:

> "The NGRBA set up an Inter-Ministerial Group (Chaturvedi Committee), which recommended about 30% flow during monsoon season and about 20% in the non-monsoon season with 20-30% during non-lean and non-monsoon period, based on a 90% river flow dependability factor. However, this got overtaken by the events of 16.6.2013 in the aftermath of tragedy in Uttarakhand, which led to setting up of a High Powered Committee by Ministry of Environment & Forests on directions of the Hon'ble Supreme Court (Ravi Chopra Committee), whose report submitted already in April, 2014, is under consideration of the Supreme Court. No directions have so far been given by the Apex Court in the matter."

6.4 With regard to maintenance of adequate flow in river Ganga, the Ministry of Power in their Presentation to the Committee submitted as under:

> "Ministry of Environment, Forests and Climate Change (MoEF&CC) prescribes a minimum and continuous flow of water i.e. e –low while clearing and Hydro Electric Power Projects.
> Water withdrawl for power generation is subjected to release of prescribed and mandatory e-flow
> For example, Tehri project ensures adequate flow in the river throughout the year"

6.5 The minimum amount of water flow required for maintaining adequate flow in the Ganga and its tributaries and water actually provided throughout the year, as furnished by the Ministry of Power, in the background note on the subject, is as under:

> "According to CWC, apart from aquatic ecosystem requirements, river provides various eco-services to the society such as cultural, spiritual, livelihood, fluvial geomorphology etc. The assessment of requisite flows (minimum) for these services of the river are very subjective and are difficult to be quantified. Such allocation needs to be decided holistically keeping a fine balance between development and ecological needs. Looking at the limited water resources availability particularly during lean period, a trade-off between water resources development and river maintenance in healthy or reasonable condition is inevitable. CWC further recommends that for allocation of water to meet ecological needs, a comprehensive basin study is required. Till outcome of such basin study is known, CWC recommends 20% of the natural flow as e-flow. Minimum prescribed e-flow would be followed for all hydroelectric projects under construction or to be constructed.
>
> The EAC has been generally recommending a minimum stretch of 1-2 km of free flow of river in between two consecutive projects in a cascade development of projects in a riverine system, so that the natural /original flow and rejuvenate capacity will not be lost/hampered permanently. However, where steep slope is involved this may not be recommended because of very high velocity/gush of flow."

6.6 Government of Bihar *vide* their letter no. BGCM/2015/13/01-193 UD&HD dated 21.04.2016, inter laia emphasizing the need for maintenenace of free flow of Ganga submitted that :

"(i) Maintaining continuous free flow of the Ganga should be accorded high priority. The Water Resources Department, Govt. of Bihar has earlier suggested that a study should be conducted by CWPRS, Pune to ensure the continuous and free flow of the River Ganga, which is yet to be conducted. Along with "Nirmalta" (------) of river Ganga, equal if not more importance should be accorded to "Aviralta" (-------).

(ii). Only 16% of the catchment area of the river falls in Bihar, but the tributaries in Bihar contributes almost 3l4th of flow available at the Farakka barrage during the lean season of February to April. Approximately 400 cumecs of flow is estimated at the border of Bihar, while, as per the Farakka agreement, 1500 cumecs flow is to be ensured at the barrage, which becomes possible only due to contribution by the rivers of Bihar. In reality, even 400 cumecs of flow is not received at the border during lean season. In this context, the intervention by the Central Government is required to ensure the contribution of upper co-basin states in the continuous flow of Ganga, so that a minimum environmental flow is ensured throughout the entire length of river Ganga and the burden of ensuring requisite quantity at the Farakka barrage does not become the responsibility of only Bihar. Further, Bihar can utilize the water of rivers in Bihar for its development projects. At present, whereas the upper riparian states utilize more water than their share, objection are put on even miniscule use of Ganga water by Bihar."

6.7 **Peak and lean flows**: Responding to a specific query as to whether the peak flow in Ganga is reducing rapidly than the lean flow if compared with flows during the last 40/50 years, if so, the reasons there for and the measures taken or proposed to be taken to arrest, the Ministry of Power submitted as follows:

"In order to assess the above aspects, the flow data of river Ganga has been analysed at Karnaprayag, Rudraprayag, Devprayag, Haridwar, Kanpur, Allahabad, Patna, Hathidah (Bihar), Azamabad (Bihar) and Farakka (West Bengal). The flow data of river Ganga at Hathidah (Bihar), Azamabad (Bihar) and Farakka (West Bangal) where runoff contribution of almost all the tributaries of river Ganga is coming into the river is enclosed as **Chart 6.7**

The Lean flow at all the above locations has not shown any declining trend in the last 40/50 years. Regarding peak flow, no declining trend has been observed at Karnprayag and Rudraprayag. In case of Devprayag and Rishikesh, some decrease in peak flow and increase in lean flow after the year 2005 took place due to storage of monsoon water in Tehri reservoir and subsequent controlled release during lean period. At Kanpur, Patna, Hathidah and

Azamabad also there is no trend of rapid reduction of peak flow. In case of Allahabad there is reduction in peak flow, which is due to less contribution from Chambal and other tributaries of Yamuna resulting into less contribution from Yamuna at Allahabad. Chambal is a relatively parched sub basin and has variability of rainfall. The growth of agriculture and other development in the area needs additional water for maintaining the livelihood. The water resources development in Chambal and other tributaries of Yamuna may be the reason of less contribution from these rivers in Yamuna and ultimately in Ganga. From Patna up to Azamabad the absence of any trend is due to significant contribution of flow into Ganga from Ghaghra, Gandak and Kosi river systems. At Farakka there is some decrease in peak flow, which may be due to withdrawal of river water through pumping from some intermediate points for consumptive uses.

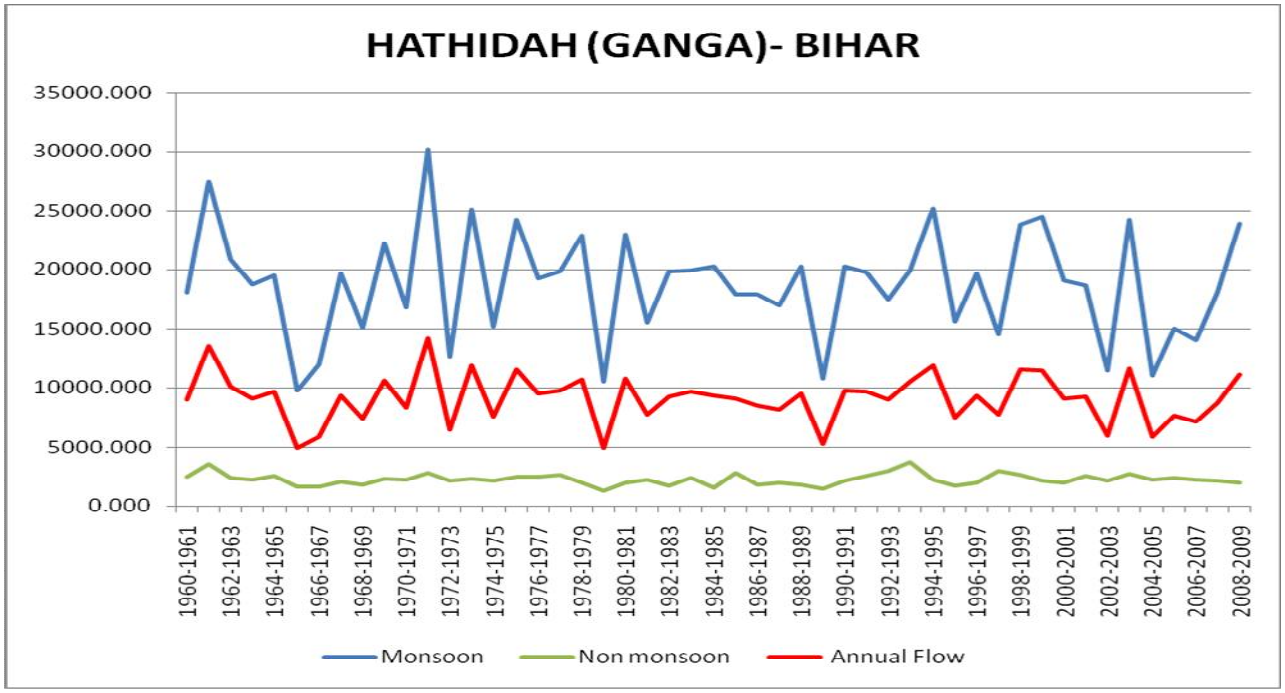
Thus the reduction in peak flows in Ganga at some locations is a consequence of water resources development in basin as well as sub-basins. At present Ganga basin with a population of about 540 million is a water scarce basin, where per capita water availability in a year is less than 1000 cubic meter (Falkenmark Water Scarcity Index says when availability in a basin falls below 1700 cubic meter per person per year the basin is water stressed and when it falls below 1000 cubic meter per person per year then the basin is water scarce). However, the intensity of scarcity is more pronounced on South bank of Ganga and adjoining part compared to North bank of Ganga. Considering the increase in surface water demand to meet the requirement for increasing population, the following measures may be necessary to keep the river in a healthy state:

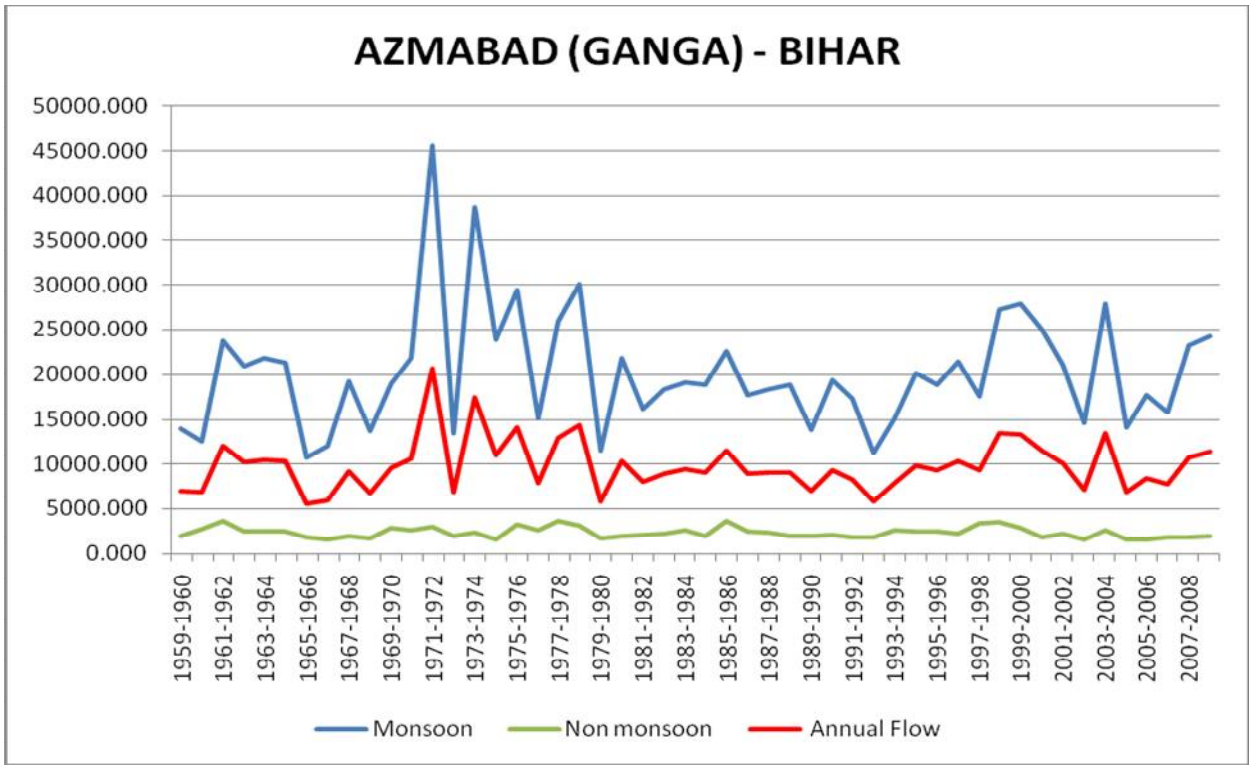
1. River interlinking programme
2. Storage of monsoon (Flood) water at appropriate locations requiring less land occupancy for storage
3. Increase in irrigation efficiency
4. Implementing efficient recycle and reuse measures for water

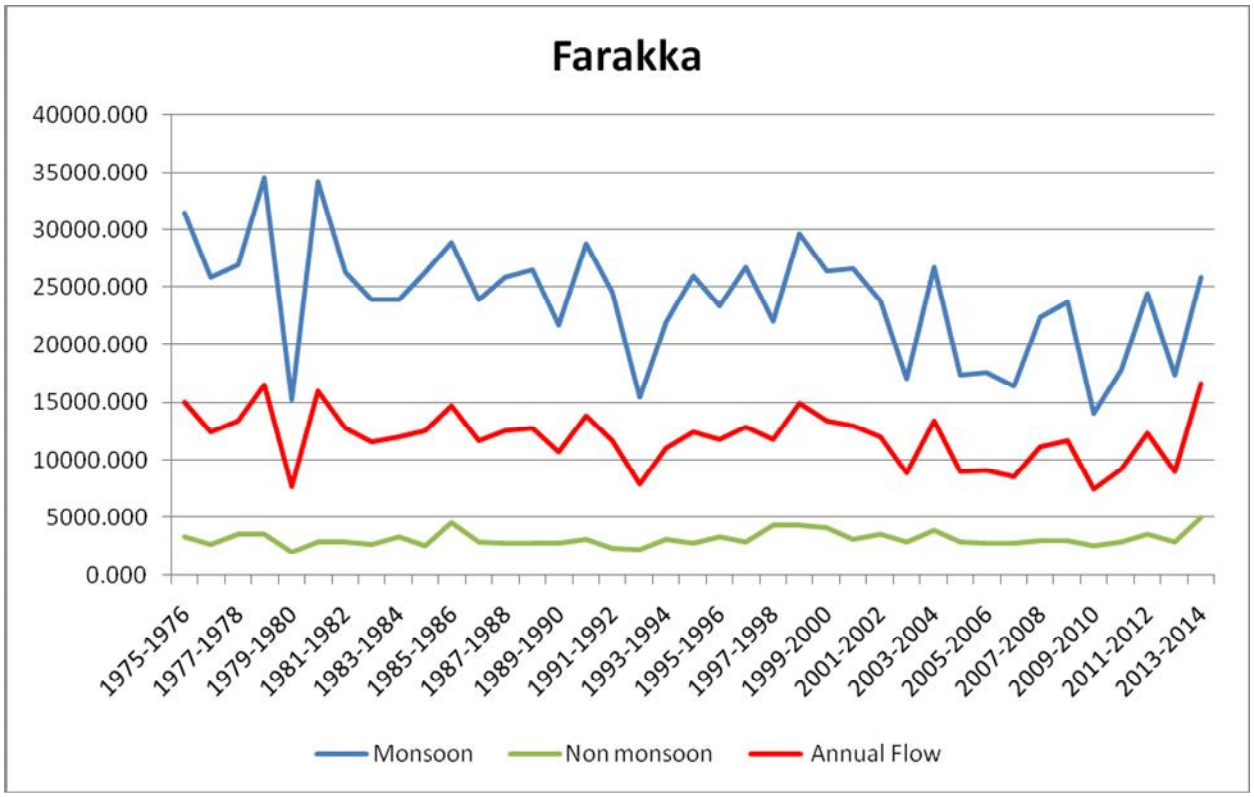
(Source: CWC)"

Details of water flow in River Ganga & Yamuna

(Monsoon: June to October, Non-Monsoon: November to May)






Farakka
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30000.000
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2011-2012
2013-2014
Monsoon
Non monsoon
Annual Flow

6.8 **Lack of data about lean flows and peak flows**: Asked to furnish the lean flow and peak flow decadal data from 1951 to till 2011 at the major towns and cities in the Ganga basin from Karanprayag down to Farakka, the CWC, Ministry of Water Resources stated that they do not have the decadal data before 1961. The Committee also desired that the data relating to lean and peak flows may be furnished to them in statistical form rather than in the graphical form. Despite reminders, the ministry was yet to furnish the data.

6.9 **Changes in peak and lean flows in Ganga:** In view of the prevailing situation the Ministry of Shipping were asked what steps were taken. The Ministry of Shipping were in agreement with the view that not only peak flow but also lean flow was decreasing in Ganga making it difficult to navigate and carry cargo in ships, the steps taken or proposed to be taken to address the lesser flows during lean season. The Ministry replied as under:

> "Ministry of Shipping , Inland waterways Authority of India are generally in agreement that both the peak as well as the lean flows may be decreasing in Ganga river , making it more difficult for navigation by bigger cargo vessels and thus making navigation thereon , particularly on upper regions of river Ganga progressively less viable compared to road and rail….
>
> Navigation is done in residual water in a river. The other usage of water such as irrigation, drinking water, thermal power plants , ,etc., use significant amounts of water which effects adversely navigation particularly during lean flow season. Since withdrawl of water for these uses is consistently increasing over the years the discharge available in the river for navigation in the lean season appears to be decreasing.
>
> Development of infrastructure is at a nascent stage in the country and therefore, no steps can be taken by IWAI/ Ministry of Shipping to increase the lesser flows during lean season .Under Jal Marg Vikas Project which is aided by the world bank, a consultancy agency is undertaking a detailed technical study with the objective of increasing Least Available depth (LAD) in River Ganga between Haldia-Allahabad with the available flow therein ."

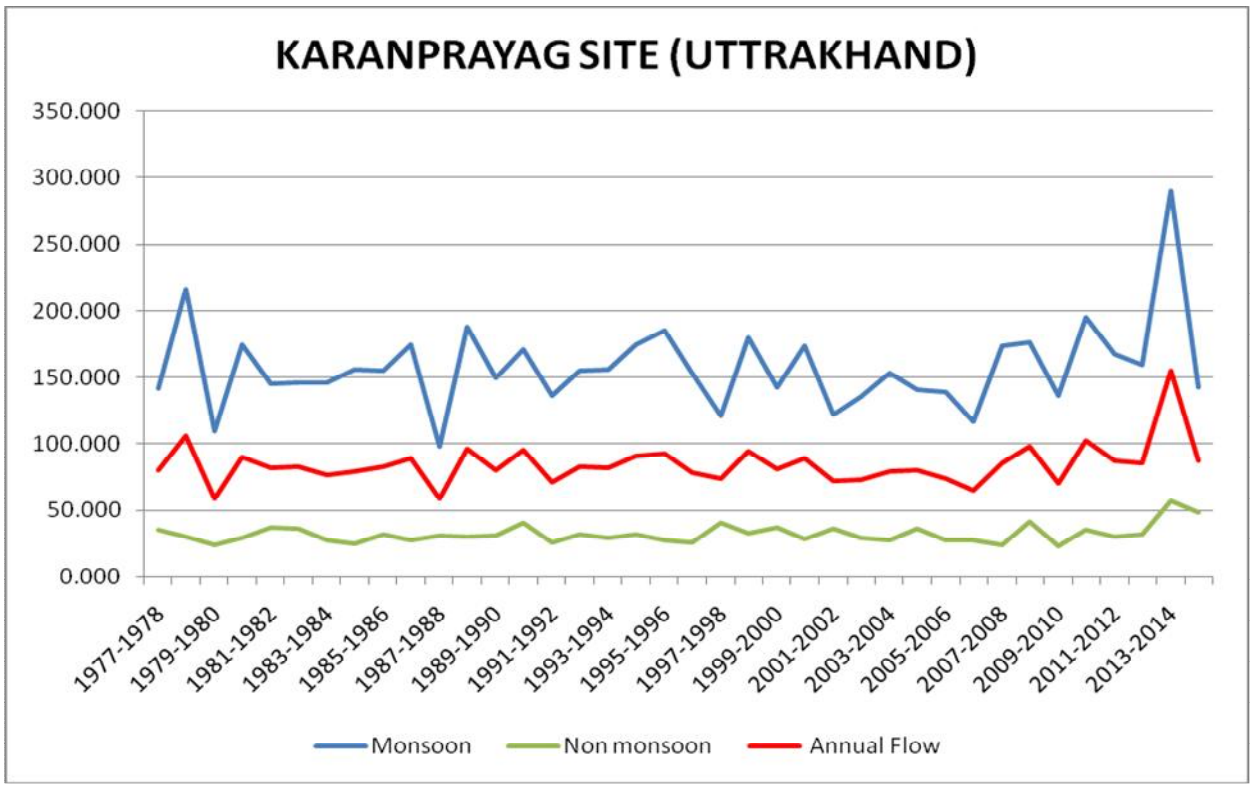
6.10 **Discharge in the Ganga:** With regard to the data on the flow, the discharge, that is natural flow coming from the source in the Ganga during peak and lean seasons of the years during the last 20 years, state wise and year wise, (for example Karnaprayag, Rudraprayag,

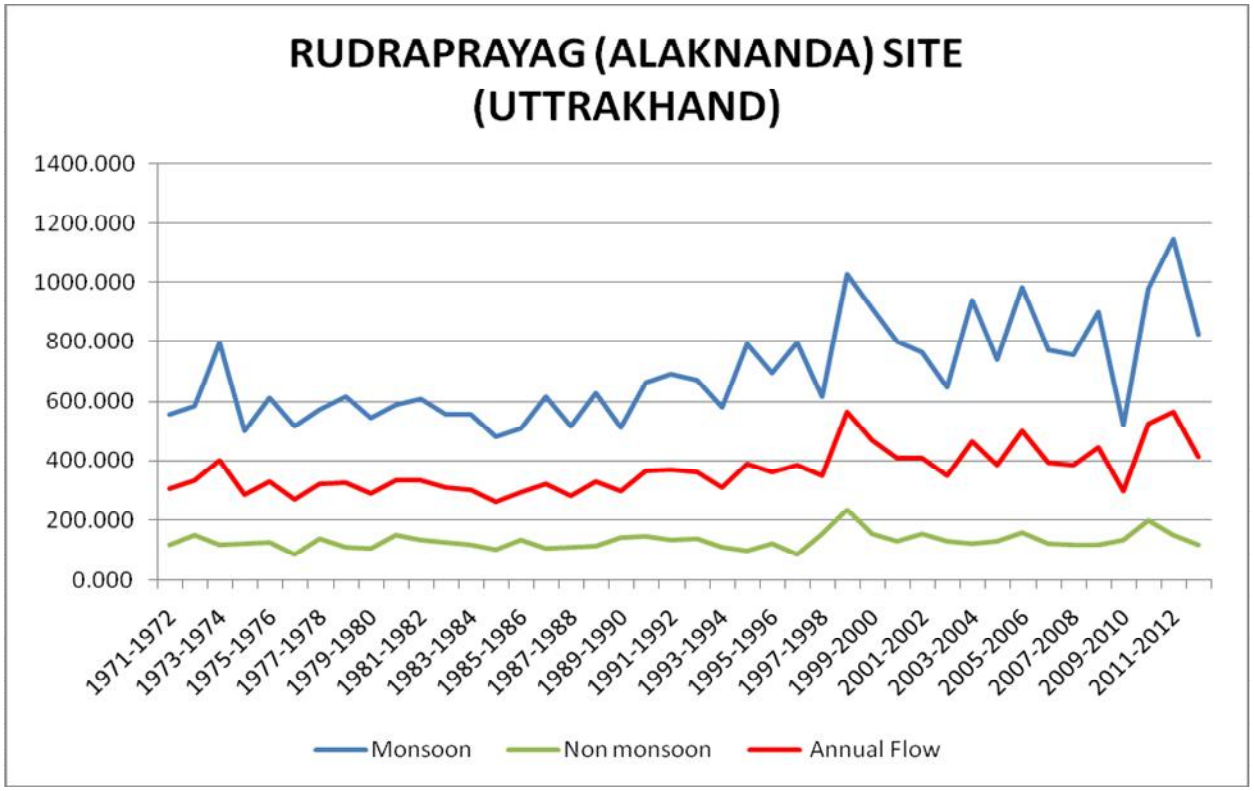
Devprayag, Haridwar, Kanpur, Allahabad, Patna on the river Ganga Yamunanagar, Delhi and Agra on Yamuna), the ministry of Power in their post evidence replies submitted as follows:

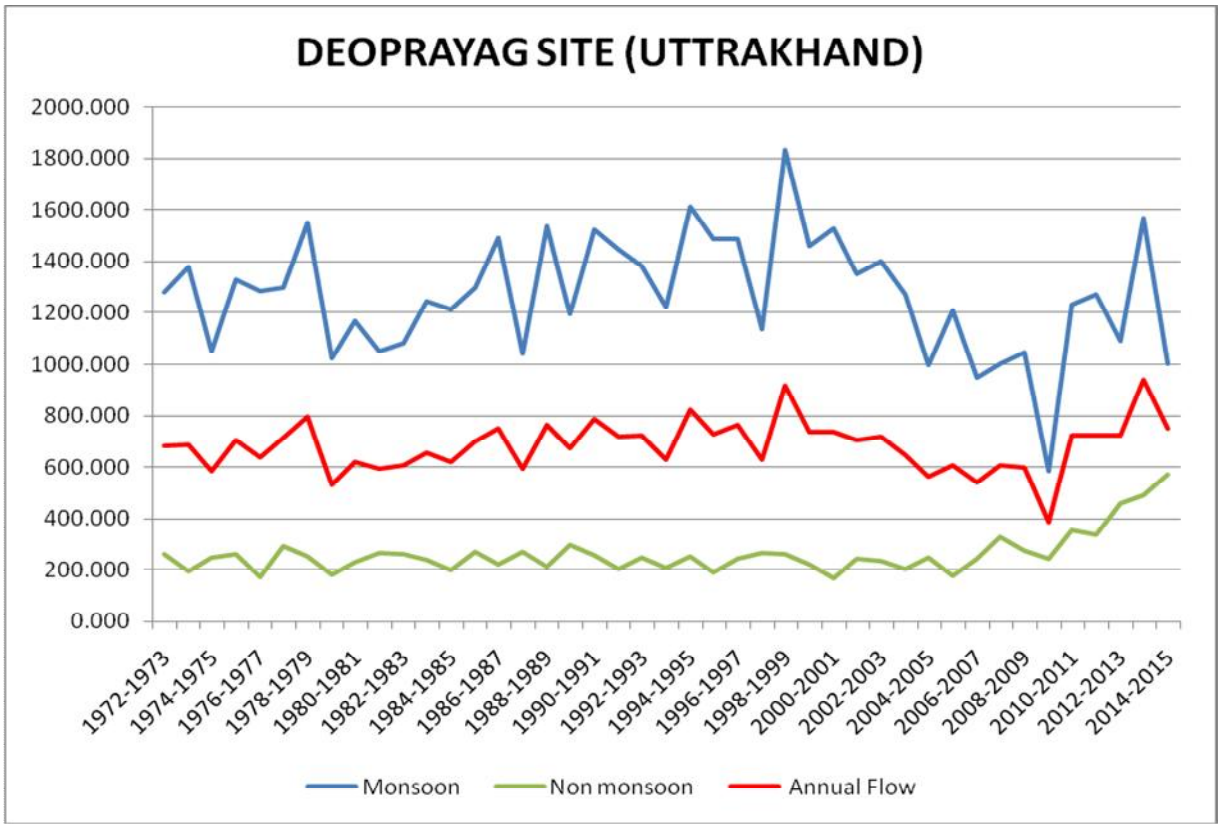
> "The details of flow in the form of graph at Karnaprayag, Rudraprayag, Devprayag, Haridwar, Kanpur, Allahabad, Patna on the river Ganga, Yamunanagar, Delhi and Agra on river Yamuna, during monsoon (June to October - Peak season), non-monsoon (November to May - Lean season) and annual average is enclosed (at Chart 6.10.1)
>
> Daily discharge data for monsoon and lean period from 1964-65 to 2005-06 at Tehri site (pre commissioning) is enclosed at Chart 6.10.2). Further, daily inflow and outflow data for monsoon and lean period from 2006-07 to 2014-15 (after commissioning) at Tehri Project is also enclosed (at chart 6.10.3) (Source: CWC)"

Details of water flow in River Ganga & Yamuna

(Monsoon: June to October, Non-Monsoon: November to May)



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200.000
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1972-1973
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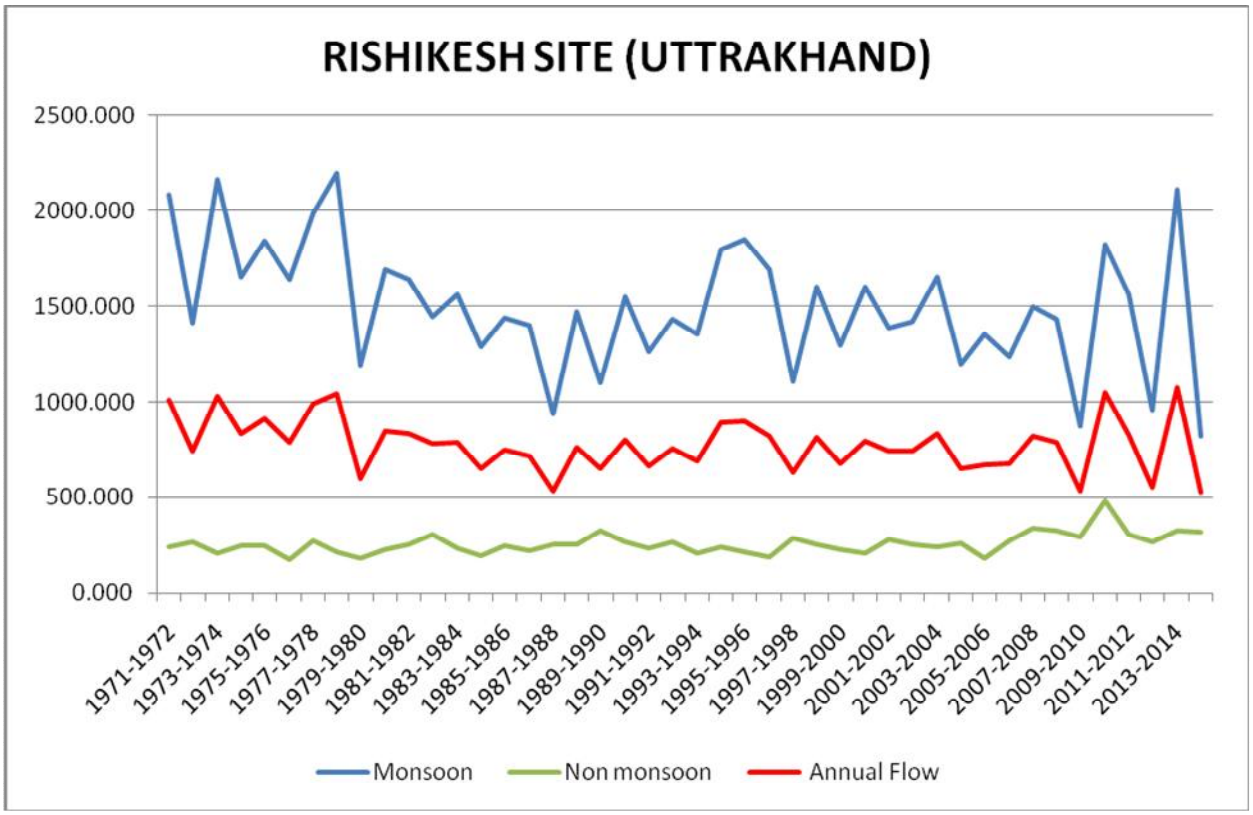
2012-2013
2014-2015
Monsoon
Non monsoon
Annual Flow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1971-1972
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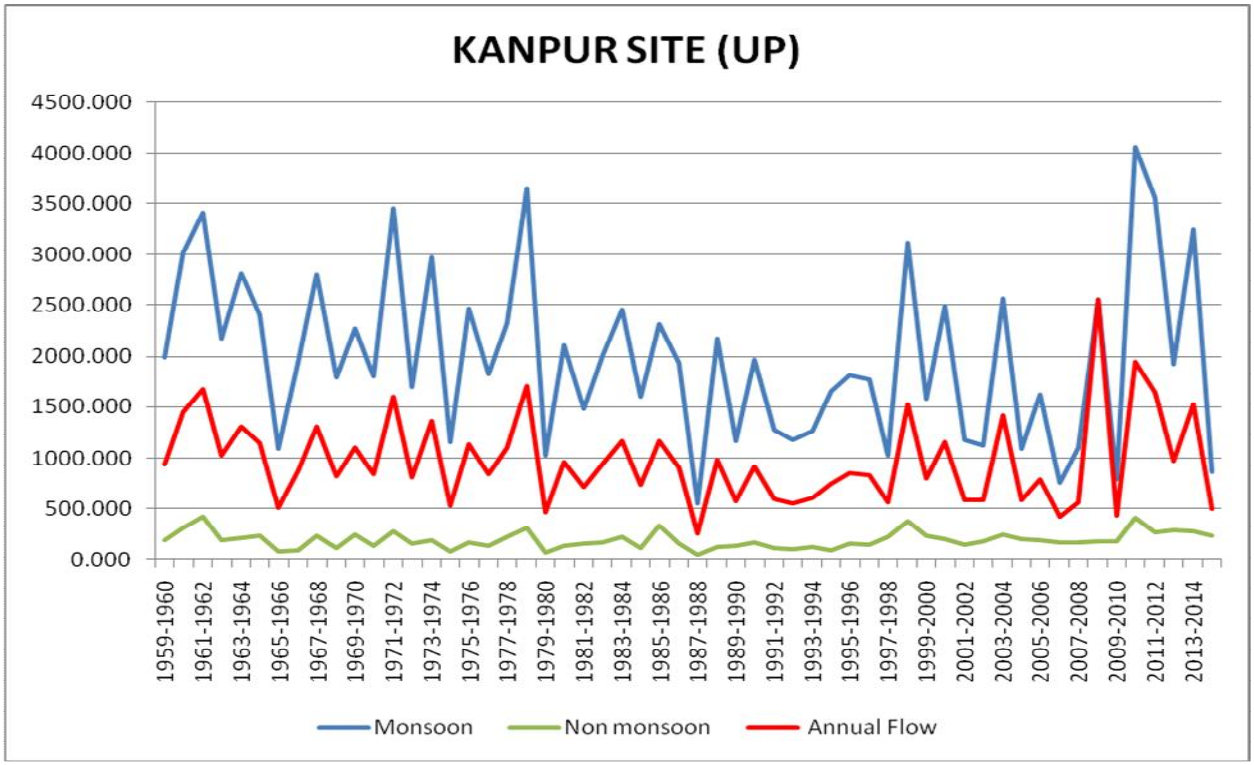
2011-2012
2013-2014
Monsoon
Non monsoon
Annual Flow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1959-1960
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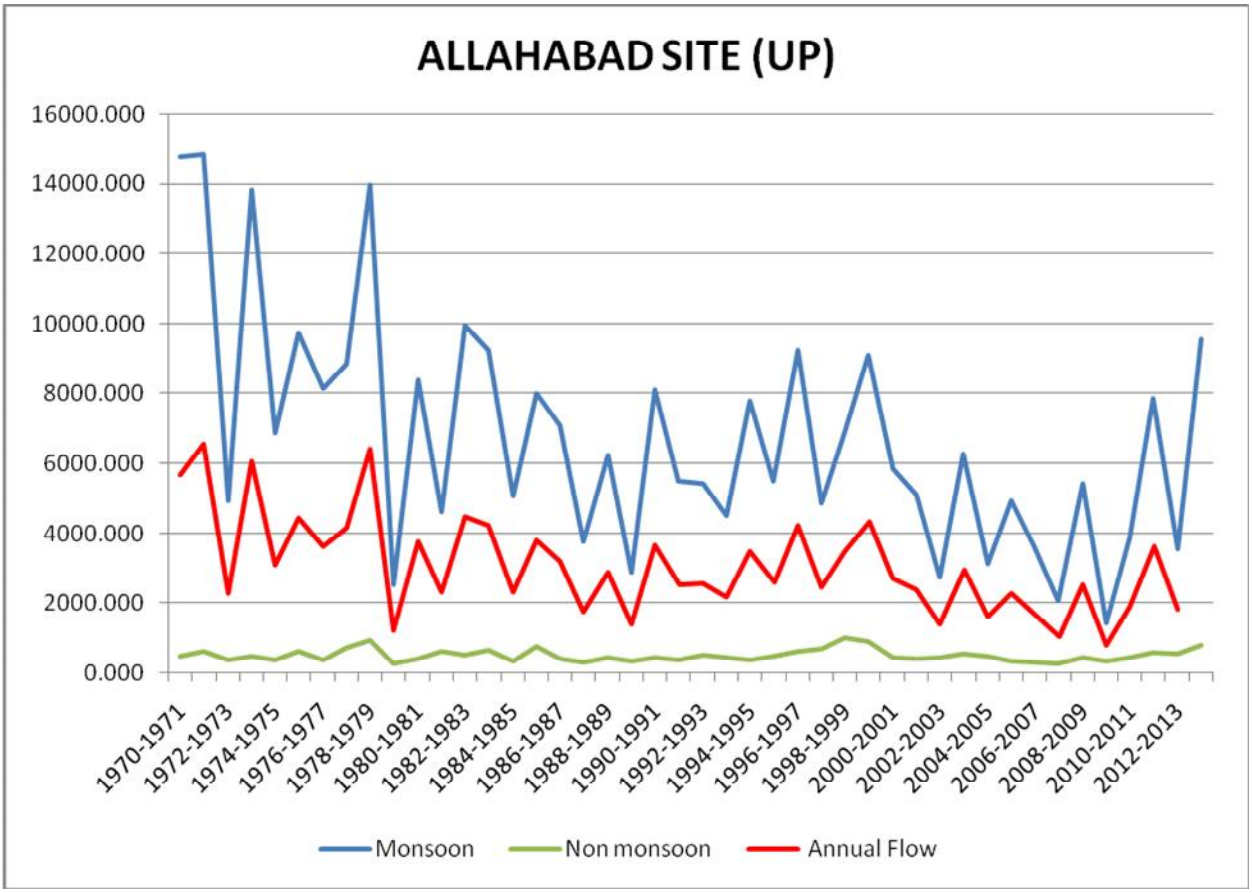
Monsoon
Non monsoon
Annual Flow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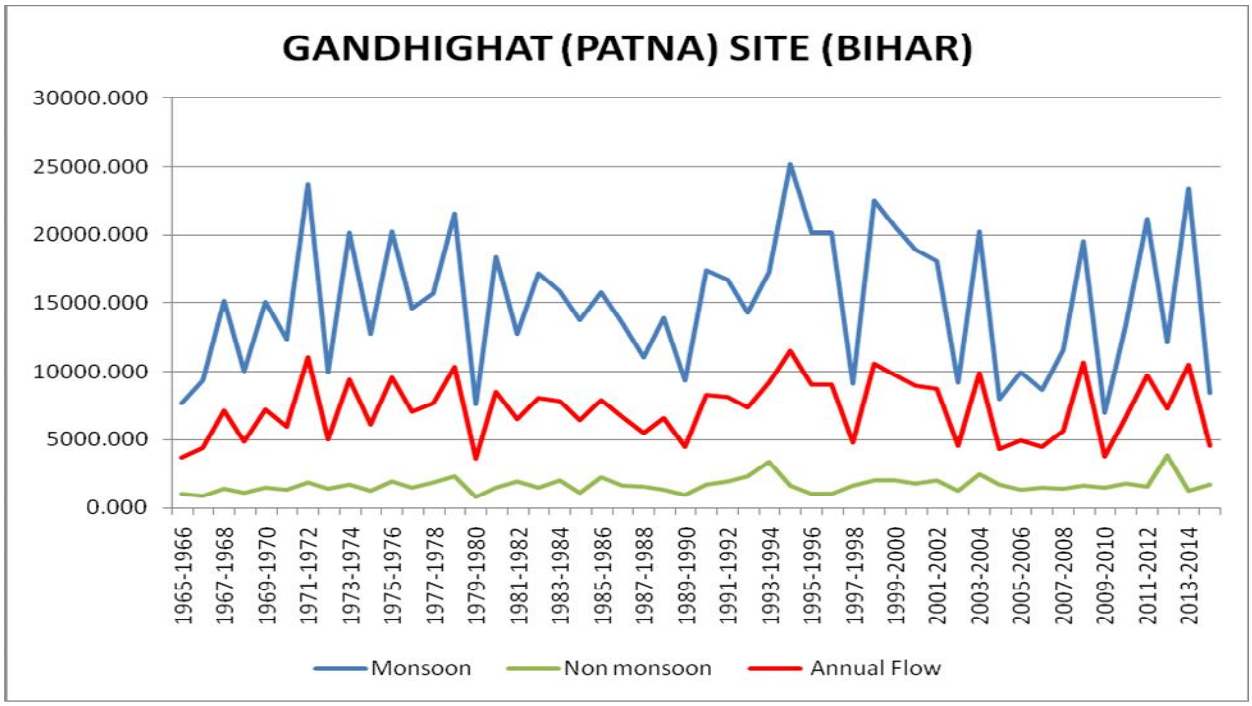
2010-2011
2012-2013
Monsoon
Non monsoon
Annual Flow


GANDHIGHAT (PATNA) SITE (BIHAR)
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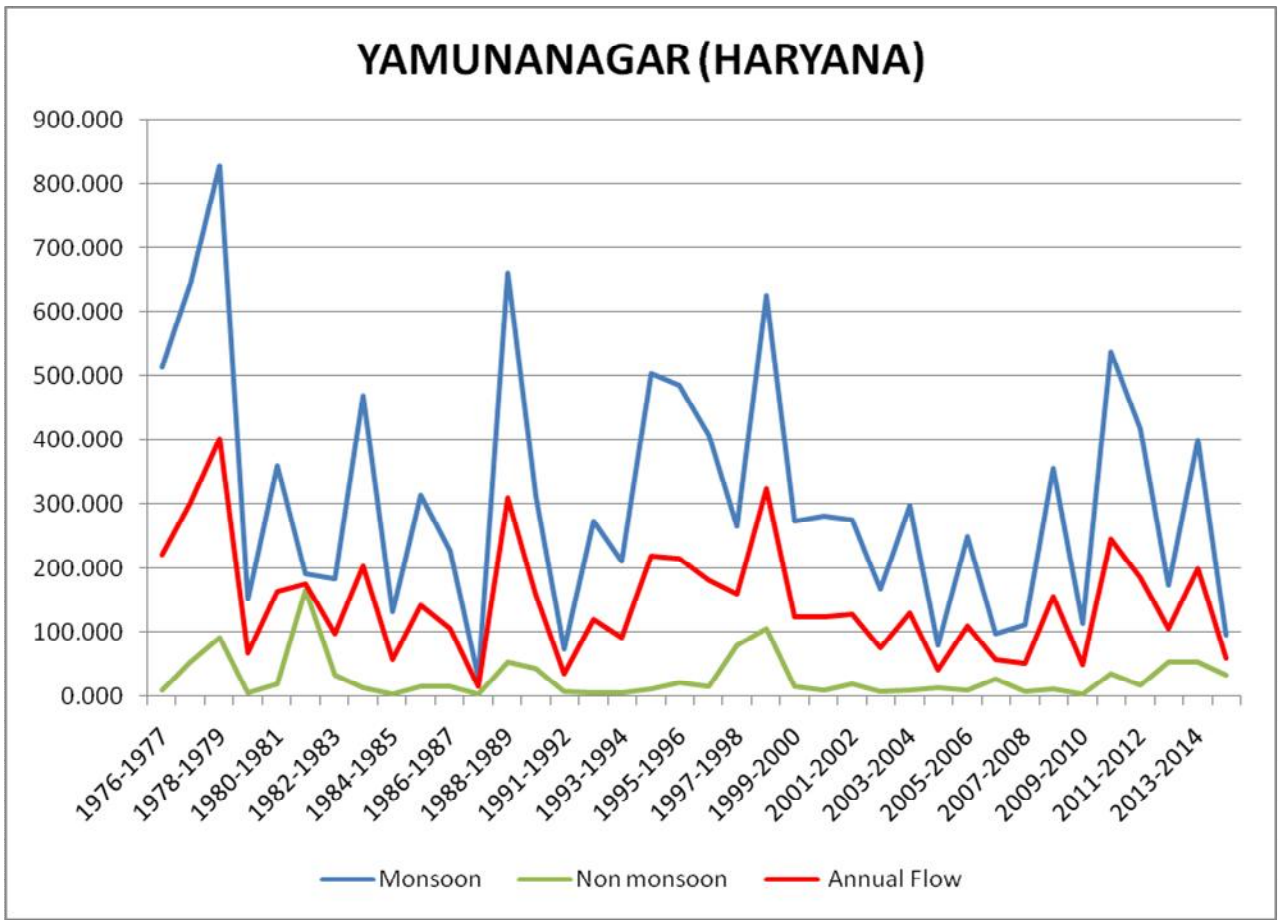
2013-2014
Monsoon
Non monsoon
Annual Flow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700.000
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300.000
200.000
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1976-1977
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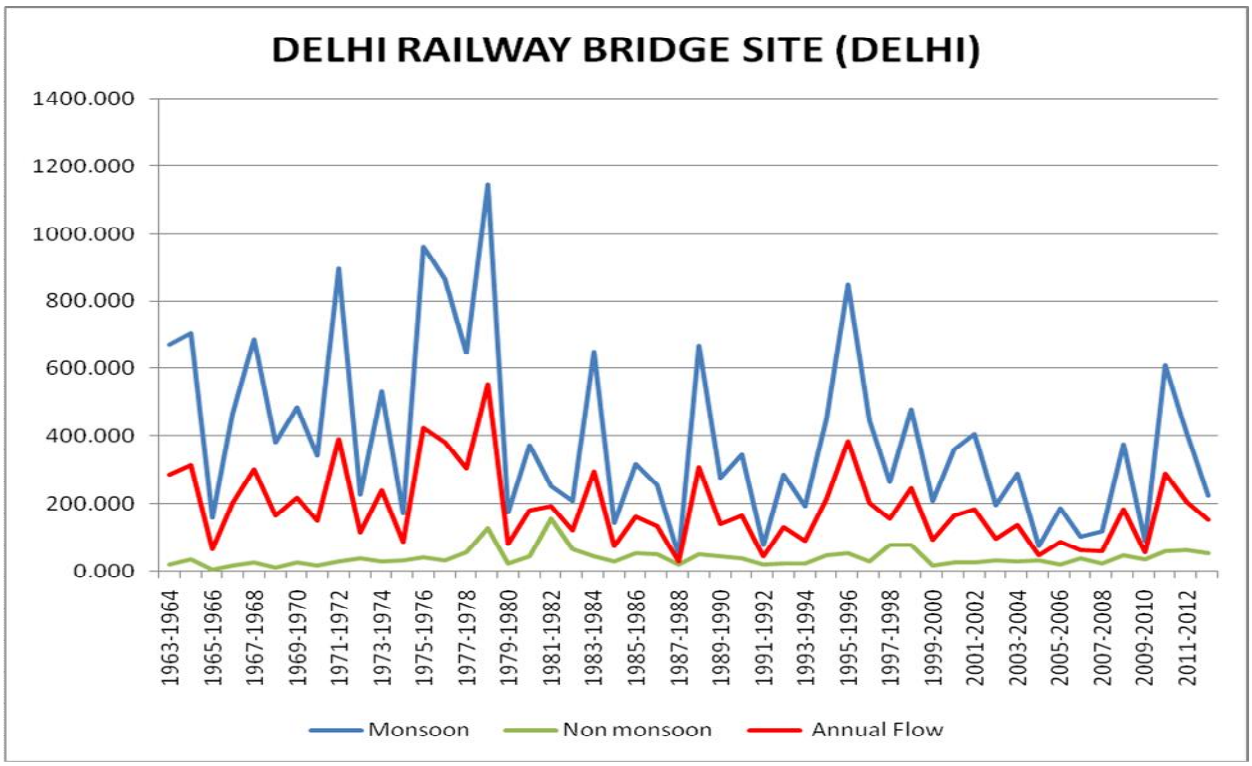
Monsoon
Non monsoon
Annual Flow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1963-1964
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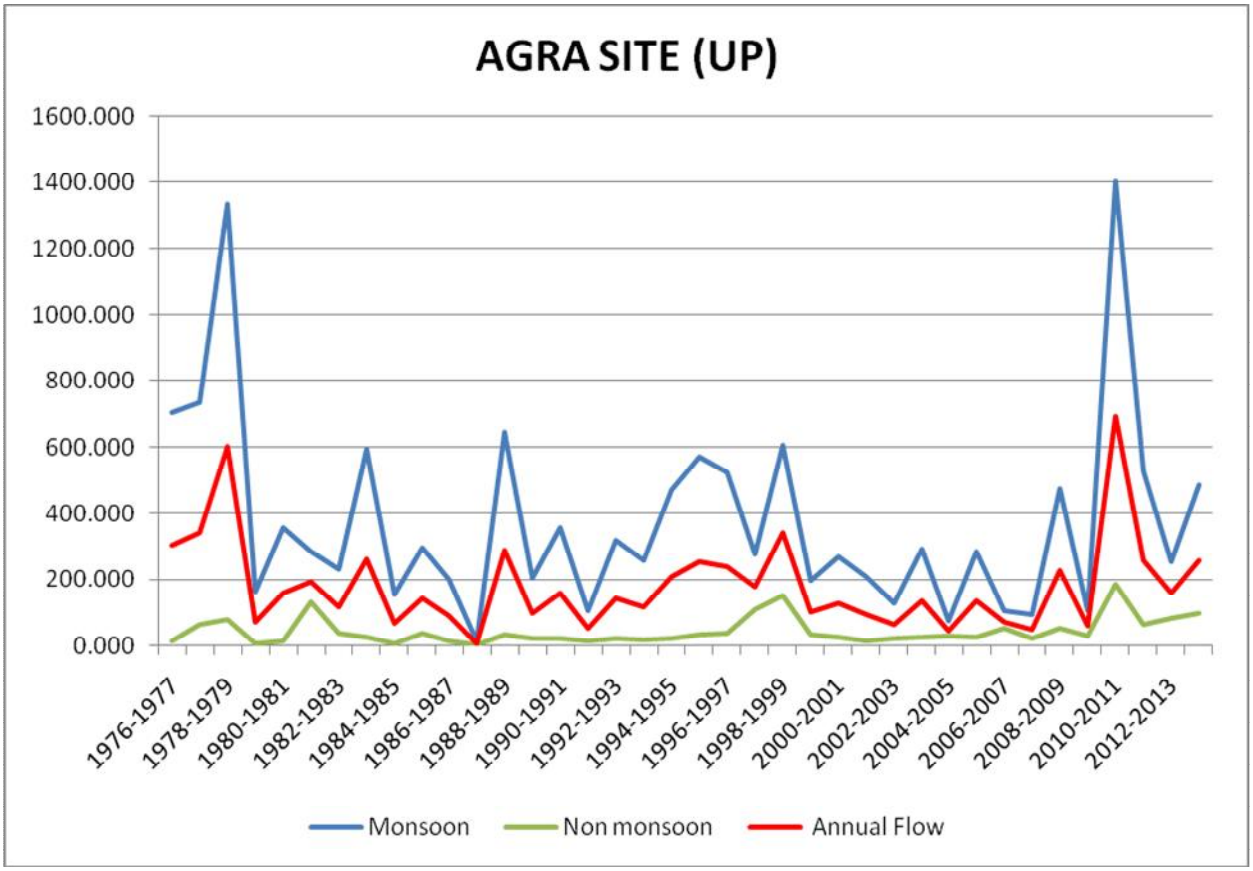
Monsoon
Non monsoon
Annual Flow


AGRA SITE (UP)
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Monsoon
Non monsoon
Annual Flow

6.11 **Monitoring water flow in river Ganga**: Keeping in view large dams and HEPPs constructed on river Ganga, the Committee asked whether the water flow was being monitored if not holistically but at least intermittently, a representative of Ministry of Power testified that:

> "The discharge data is centrally pooled in the Central water Commission. Individual developers also give data but CWC has also installed stations in many points. They are maintaining all these data .They are maintaining it in the data base of the Central water Commission"

6.12 **Inadequate flow in Ganga/Diversion of water from Ganga**: Responding over the serious concern over shrinking of river Ganga and losing its vitality due to ever increasing flow of pollutants into the river ganga and hence the need for setting timelines for its cleaning, Secretary, Ministry of water Resources, River Development and Ganga Rejuvenation deposed *inter alia* as under:

> "We have actually identified seven thrust areas and 21 action points which cover most of the points , ecological points, bio diversity issues, plantation issues, and several of the things .We have tried to make it very Comprehensive list. We have got a plan in which we will set timelines also."

6.13 In reply to a question whether maintaining the minimum flow of water is one of the seven thrust areas and 21 actionable points, the M/o WR, RD &GR submitted that maintaining the minimum flow of water is one of the seven thrust areas and 21 actionable points. The details as given by them are as follows:

> "Maintenance of Environmental-flow
>
> A. Continuous and uninterrupted flow and river connectivity is the immediate priority for river Ganga. A river with substantial flow only, can dilute the pollutants and sustain the ecological diversity. Numerous interventions like hydroelectric projects and diversions in canal have significantly affected river flow. Therefore maintenance of environmental flow in the River requires a Policy for environmental-flow regulation in river Ganga highlighting the major issues like:
>
> - Minimum flow discharge from all the physical barriers to be complied by all the established hydroelectric projects and the upcoming projects.
> - The Inter Ministerial group headed by Shri BK Chaturvedi has given its adhoc recommendations regarding the environmental flow till the finalization of the report of the consortium of IITs. As part of the preparation

of the Ganga River Basin Management Plan, the consortium of IITs have finalized the environmental flow for Uttarakhand stretch of Ganga in their interim report, arriving at specific recommendations at specific points for different seasons.

- A policy decision has to be taken on the following matters:

-Policy decision on environmental flow

-Provisioning of River Passes in all the established physical structures for free movement of aquatic life

-Mandatory inclusion of river passes in all the upcoming structures

-Considering to discontinue the intervening dams and power projects that are not yet commissioned based upon this analysis while working out a compensation mechanism for state, investors and public.

B. Reduction in water abstraction

-Mechanism for efficient water withdrawal and distribution from water diversion structures in River Ganga

-Renovation of damaged irrigation structures to prevent water wastage.

-Encouraging water use efficiency in agriculture aiming to reduce water requirement and hence freeing some water for the river."

6.14 **Reasons for inadequate flow**: With regard to inadequate flow in Ganga, Secretary, M/o Environment, Forests, and Climate Change (MoEF&CC):

> "Water extraction for irrigation, industrial as well a drinking purposes is leading to inadequate water flow and that is compounding the problem"

6.15 The Committee sought written information from the M/o WR, RD &GR regarding impact of irrigation on e-flows. However, the ministry could not furnish the same despite reminders.

6.16 **Shrinking of Ganga**: When asked about the reported shrinking of the Ganga and the specific efforts made to arrest the trend, the M/o WR,RD &GR admitted:

> "Yes. The River is shrinking due to over extraction of river water, construction of Dams/Barrages, encroachment of flood plain, degradation of wetlands etc..,"
>
> As regards the steps taken to arrest the shrinking trend, the representative submitted that:
>
> - "The Ministry of Environment Forest and Climate Change has constituted a committee (vide F No 27-1/2011-SICOM (Vol. II) dated 26th

March 2014) for formulation of guidelines for management of river fronts including the flood plains for evolving a River Regulation Zone (RRZ) on both sides of the river.

- Under the Namami Ganga Programme, it has been proposed to regulate the sand mining through suitable guidelines for protection of river banks.

- The Ganga River Basin Management Plan prepared by IITConsortium, proposed/recommended for

  - Detailed mapping of the River Space, its active floodplain and valley margin at a scale less than 10,000 (using high resolution satellite imagery and field verification

  - Delineation of RRZ
  - Notification for River Regulatory Zones
  - Formulation of well-defined rules, regulations and policies pertaining to River Regulation Zones that has been delineated. This should include defining prohibited & regulated activities for each of the RR Zone."

6.17 **Dams and HEPPs on River Ganga:** A representative of a Non Government Organisation (Ganga Ahwaan, Ms. Mallika Bhanot) expressed their views before the Committee on 20 January, 2016 as follows:

"Basically, the larger issue in the State of Uttarakhand is the construction of hydro power projects. Around 450 big and small hydro power projects have been proposed. Few are under construction and few already exist. [---]. Immediately after the Maneri Bhali Reservoir, you see an absolute dry stretch of the river. You would see there is no water in the river Gangotri.

This slide shows a typical design of a run-of-the-river project which is what has been recommended in the entire State of Uttarakhand. These are bumper to bumper projects which means another headrest tunnel starts at the end point of the power house of the first headrest tunnel. This is the status of Ganga after Maneri Bhali-II resorvoir. The river Bhagirathi has an absolutely dry stretch after Maneri Bhali-II resorvoir. Downstream further of Maneri Bhali II, you see absolutely dry stretches of the river. Immediately after it is the Tehri lake stretching up to 46 kms and after it is the Koteshwar dam with 400 kilowatt power.

Because of these back to back dams, 53 per cent of River Bhagirathi is completely affected, impacted and gone. There are different type of committees. We have been engaged in the research work for the last few years because we belong to this very valley. We ourselves live 60

kilometers below the Gangotri in Uttarkashi where the natural shape of Ganga is still in a conservative form. We are trying our level best to conserve it. I can tell you that if Bhagirathi has changed its course 33 per cent due to these four dams, then there are different type of committees, they say that there must not be diversion of water more than 60 per cent. Sir, 53 per cent of the Bhagirathi, the original state of the Ganga, has already gone and you do not have any scope. Even then, the proposals and under construction projects continue till date. That is our bigger challenge which we wanted to convey.

[---].This is the condition of Mandakini and Alaknanda after Vishnu Prayag Hydro Power Project here. The same fate is with the Alaknanda. It is absolute dry river bed. There is zero flow after Vishnu Prayag Hydro Power Project. We keep on hearing all the scientists and their interesting aspects on environmental flows, e-flows and ecological flow. We know that for them minimum ecological flow means maximum water extraction. That is what is actually there. Who is defining this?

The major social impact point is that water is not available for us, not for the bath of Makarsakranti and nor for any rituals."

6.18 The representative further added :

"There are some local impacts which have been excluded from Environment Impacts Assessments Report. I have studied many EIS wherein broad points have been mooted, but local impacts are missing from there. Basically point is that it is not a matter of flow of water only, but whenever any project is drawn up, all type of things such as cutting, crushing, blasting, tunneling, mining are incorporated. This is high landslide and high land subsidence zone. It is an area belonging to seismic zone 4 and seismic zone 5. When Lohari Nath Pala, Pala Maneri, Bhairon Ghati these three projects were being constructed in Gangotri area, I can only tell you about the first hand experience of Lohari Nath Pala, Pala Maneri, I can also tell you that blasting was taking place there and cracks have developed in nearby houses. The tunneling experts say about this that blasting should be done from that much of hertz's but it is been noticed on ground that if blasting is being done from that much of hertz's, then cracks are also developing in our houses and thus the condition of our houses are becoming like pressure cookers there."

6.19 **Status of Migration**: The Committee asked the representatives regarding the status of migration after the construction of dams. A representative (Shri Govind Pokhriyal) of the organization (Ganga Ahwaan) replied as under:

> Its systematic study was to be conducted by the Government, but it could not be because Supreme Court had taken a sue moto cognizance after disaster in 2013 wherein it was stated that no clearance be given to all these dams. It had given the direction to the State and Central Government and asked the Central Government to constitute an expert body. That body will probe into the matter whether environment degradation has caused the Ganga basin due to these projects and whether these projects have played any role to aggravate this disaster and this flood or not. The same study was concluded and submitted in April 2014 and when this study submitted the present Government filed an affidavit in the Supreme Court on 5 December 2014 on the basis of all reports and committee reports. You are also saying like that. I can give you some excerpts of the same. It has directed which is on page No. 58 of MOEF , "Opinion on environment degradation caused by hydro-electric projects in Ganga, Bhagirathi and Alaknanda basins.
>
> Its next para reads it is clear from the report submitted by the Expert Body which is inclusive of the findings of many researchers committees that with the construction of hydro power projects, the local ecology is certainly over-burdened. There are clear sightings of irreversible damages of environment in terms of loss of forest, degraded water quality, geological social impact and that they enhance land slides and other disasters."

6.20 With regard to particulars of existing dams and Hydro Electric Power Plants (HEPPs) on river Ganga, their capacity in terms of water storage and electricity generation (project wise), the area that these projects encircle, the Ministry of Power in their post evidence replies submitted that 7 Hydro electric Schemes on river Ganga and its tributaries in Uttarakhand as under mentioned (Table 6.19) with an aggregate installed capacity of 2668MW are in operation.

Table: 6.20. Dams and HEPPs on the Ganga in Uttarakhand

Sl. No.	Project	River	Installed Capacity (MW)	Design Energy (MU)	Type	Live Storage (MCM)	Submergence Area (HA)
1	Tehri-I THDCIL	Bhagirathi	1000	2797	Storage	2615	4200
2	Koteshwar THDCIL	Bhagirathi	400	1155	ROR	47	290
3	Chilla UJVNL	Ganga	144	725	ROR	5	NA
4	Maneri Bhali-I UJVNL	Bhagirathi	90	395	ROR Pondage	0.56	80
5	Maneri Bhali-II UJVNL	Bhagirathi	304	1566	ROR	0.76	11.7
6	Vishnu Prayag JPVL	Alaknanda	400	1774	ROR Barrage	Barrage	
7	Shrinagar AHPCL	Alaknanda	330	1382	ROR	8	324.1
		Total	**2668**				

6.21 **Dams and HEPPs being built or Planned in the near future**: With regard to the data on dams and Hydro Electric Power Projects (HEPPs) being built or are being planned in the near future on river Ganga, their capacity in terms of water storage and electricity generation (project wise), the area that these projects encircle/ likely to encircle, etc., the Ministry of Power furnished the following details:

"14 Nos. of Hydro Electric Schemes with an aggregate installed capacity 4798 MW are under construction or proposed to be taken up for construction on river Ganga (Bhagirathi and Alaknanda and its tributaries). Out of these 14 Hydro Electric Schemes, 6 Nos. of Hydro Electric Schemes with an aggregate installed capacity 2310 MW are under construction, 6 Nos. of Hydro Electric Schemes with an aggregate installed capacity of 2077 MW are cleared & yet to be taken up for construction. DPRs of 2 Nos. of Hydro Electric Schemes with an aggregate installed capacity 408 MW are under examination in Central Electricity Authority / Central Water Commission / Geological Survey of India. Details are given at **Annexure-XV** (Source: CEA)"

6.22 The Committee sought to know whether Central Water Commission (CWC) is consulted before the approvals are given for construction of dams on the rivers in Ganga Basin, the Ministry is yet to provide the reply.

6.23 On the number of HEPPs having less than 25 MW capacity presently under operation on river Ganga and its tributaries along with their capacity (project wise) the Ministry of Power furnished that 'there are 10 operational small hydro power projects (< 25 MW) on the tributaries of river Ganga. Details are given at **Annexure-XVI.**

6.24 The data on number of HEPPs having less than 25 MW capacity being built or are proposed to be built in the near future on river Ganga and its tributaries along with their capacity is given below:

> "There are 21 small hydro projects (< 25 MW) are being built or are proposed to be built in the near future on the tributaries of river Ganga. Details are given at **Annexure-XVII."**

6.25 With regard to the data on the number of Dams and Hydro Power Plants (HPPs) operating, under construction and proposed on Ganga and its tributaries, their capacity, the quantum of water used/diverted for the purpose, the M/o WR,RD &GR submitted the following information :

> "After 2006, 11 HEPs have been accorded Environmental Clearance in the State of Uttarakhand(**Annexure-XVIII**). However, as per record 70 HEPs have been allocated in upper reaches of Ganga and its tributaries (**Annexure XIX**)."

6.26 **Impact of Dams on Flow of Water in Ganga:** Responding to a query as to whether more damming of the river would be useful for controlling the pollution or it will enhance the pollution or will reduce the capacity of the river itself to keep its own health, Secretary, MoEF&CC appearing before the Committee on 13th July, 2015 candidly deposed:

"Sir, I do not think I am in a position to give a definitive answer on this because much depends on the terrain, the topography and the kind of ecology which exists. So, there are instances in the world where dams have been made. Even in India, as you would know, that when the power policy was initially made it was said that India will have at least 40 per cent of hydel power in the country but today, I think, we are not even 20 per cent. But certainly there has to be a balance which will have to be established. In the Ministry of Environment, for example, we have undertaken river basin studies to assess the cumulative impact of hydel power stations, or hydel power potential in these basins. We have undertaken in the North-East some studies, we have undertaken some studies in the Himachal Pradesh. Some of them have been completed and some of them are undergoing."

6.27 **Dams and HEPPs on Ganga and Environmental Impact**: About the availability or otherwise of an institutional mechanism/systemic arrangement to have constant watch on the impact on environment due to operations of HEPPs, Ministry of Power submitted as under:

"For the purpose of monitoring of impact of construction/ setting up and operation of HPPs, the Regional Offices of the Ministry of Environment, Forests & Climate Change are mandated to undertake periodic monitoring to the units / entities to ensure compliance by themselves, maintain records and submit six monthly compliance reports to the Ministry. The State Pollution Control Boards also undertake similar monitoring and they are the authorities to issue consent to operate to the Developers. Special Committees / Experts are also deputed to undertake such review and monitoring if situation so demands. Thus, institutional mechanism for impact monitoring of HPPs exist at both Central Government and State Government level.

Apart from above, post impoundment faunal survey, post floristic survey and water quality studies were conducted through HNB Garhwal University (Central University), Srinagar, Uttarakhand, Botonical Survey of India, Dehradun and National Environmental Engineering Research Institute (NEERI), Nagpur respectively. All these reports indicate that Tehri reservoir has no adverse impact on the ecology of surrounding area."

6.28 Furnishing the impact of dams on the river Ganga, Ganga Ahvaan, A NGO working for preserving the natural and cultural flow of Ganga , in a written representation submitted *inter alia* that:

> "Due to projects like Maneri dam (1) and (2) tehri and Koteswar dams 115 kms of Ganga is diverted into tunnels and lakes .People do not get even glimpse of the Ganga in her origin valley. To make matters worse , people have to plead to the companies constructing these dams to release some water so that they can do the last rites of their deceased dear ones or other religious ceremonies'
>
> Wherever these dams have been constructed or being constructed, massive blasting for tunneling and other activities are drying up the water resources in the surrounding areas. Incidents of landslides and land sinking in these areas are becoming more frequent and destructive every time. Due to the construction of Maneri Bhali, in dozens of villages around the construction site the age old water resources have dried up and in the year 1991, when the earth quake hit Uttarkashi, Jamak village which is situated right above the tunnel for Maneri Bhali 1 experienced the maximum number of casualties as tunneling weakened the very foundation of the village. One can easily see similar impacts –dried water resources landslides and land sinking, in all other areas where tunnel and reservoir projects are being built."

6.29 With regard to the impact of dams and barrages on the fertility of Ganga basin, Ganga Ahvaan submitted as under:

> "Due to construction of these dams the immensely important silt being carried by ganga which makes the Ganga basin the most fertile is being compromised with . While the silt in Ganga is a boon for all the downstream path of Ganga – the same silt is the biggest hurdle for proper functioning of the already existing hydro power projects on the upstream path of Ganga. As per the data obtained from Maneri Bhali and tehri ,efficiency of these power plants is merely 30-40% The RTI from Maneri Bhali 1 clearly states that due to the excessive silt , the turbines gets choked thereby reducing the production .As per study published in 2011 by NEER, 90% of this fertile silt is de silted /obstructed in tehri due to which the original quality of Ganga is being compromised. By tampering with the waters right at the source the most important significant quality of the ganga is being destroyed and therefore the ganga jal after rishikesh is no longer the same jal that we are consuming since centuries."

6.30 The Committee has sent the study report received from an Ngo (Ganga Ahwan) which showed the obstruction caused to flow of the river Ganga and reducing the river to a river of pebbles. The committee sought the comments of the Ministry. However, the reply is awaited.

6.31 The M/o WR,RD &GR was requested to furnish their written comments on the points/issues raised in the memorandum submitted by the NGO Ganga Ahwaan. The Ministry *vide* their OM no. GKC/01/2015-16/1133/NMCG/ECLS dated 17.02.2016 with out giving the point wise reply simply stated as under:

> "NMCG ,which is mandated to fund and execute pollution abatement measures in river Ganga, does not directly deal with the issues raised in the memorandum as it is mainly concerned with the decision of the Government on the construction of dams on river Ganga''

6.32 With respect to the Environmental Impact Assessment (EIA) carried on all HEPPs on the Ganga and its tributaries and adherence or otherwise to such stipulations/requirements, the Ministry of Power stated that:

> "As per EIA Notifications, 2006, and its subsequent amendments, all Hydro Electric Projects (HEPs) above 25 MW installed capacity are required to obtain Environment Clearance (EC) through concerned authorities. For obtaining EC, the Project Authority is first required to obtain Terms of Reference. Thereafter, Environment Impact Assessment (EIA) study is conducted and an Environment Management Plan (EMP) is prepared to address and mitigate adverse environmental impacts, if any. Public Hearings are conducted before finalizing EIA/ EMP Reports for individual projects as an integral component. Based on the EIA, EMP and Public Hearing Reports, the projects appraised and necessary recommendations on granting EC are made to the Developers for strict compliance. The compliance and adherence of the same is monitored through Regional Centers of this Ministry. "

6.33 In written reply to a post evidence query as to whether the study on impact of hydel power stations on Ganga river basin has been completed, the findings thereon and the action taken or proposed to be taken on such findings, the M/o WR,RD & GR submitted as under:

> "The Expert Body constituted in pursuance of the order of Hon'ble Supreme Court is in the process of assessing the impact of hydroelectric power projects on river Ganga. However, the impact of hydroelectric power projects in upper reaches of river Ganga has been examined by IIT-Roorkee, Wildlife Institute of India- Dehradun, Expert Body chaired by Dr. Ravi Chopra.
> A gist of MoEF& CC affidavit filed in Hon'ble SC on 5.12.2014 and action taken by MoEF& CC since the SC order dated 13.8.2013 in respect of various HEPs in Uttarakhand (in chronological order) is placed at **Annexure-XX**. A Status of river basin wise carrying capacity and cumulative impact studies (CC & CIS) taken-up in the country is placed at **Annexure-XXI** also responded as chart 6.31)"

6.34 **Tehri Dam – Impact on free flow of water in the Ganga**: In reply to a specific query as to whether any Committee appointed by the Ministry of Power or any other ministry studied the impact of Tehri dam on free flow of Ganga (Aviral Ganga) and if so, the salient recommendations of the Committee and acceptance or otherwise of the same and implementation thereof, the Ministry of Power submitted as follows:

> "A committee under the chairmanship of Dr. Murli Manohar Joshi was constituted to inter-alia study the impact of Tehri Dam on Self Purification Quality of Ganga Jal. A copy of the Govt. order regarding constitution of the Committee is place at **Annexure-XXII**.
> As regards the free flow of Ganga (Aviral Dhara), the Committee had considered various options. The Committee in its report noted that the option presented by THDC involved laying of a pipe of dia 400 mm with discharge of 1 cumecs, off taking from Tehri Reservoir through Intermediate Level Outlet (ILO). The water from Tehri Reservoir will flow unobstructed and discharge in the downstream of Tehri Dam. This scheme could be made functional along with commissioning of the Tehri Dam Project.
> In its recommendations, the Committee had concluded that the possibility of passing some uninterrupted portion of the fair weather flow of the Bhagirathi river past Tehri Dam be investigated by an expert technical

committee. Based on this, an appropriate techno-economically feasible scheme may be designed and considered."

6.35 In accordance with the recommendations of the Committee headed by Dr. Murli Manohar Joshi, the M/o Power constituted an Expert Technical Committee headed by Member (D&R), Central Water Commission, and having Member (Hydro), Central Electricity Authority, Additional Director General, Geological Survey of India and an expert, ex-Managing Director, Chukha Project as members. A copy of order dated 09.07.2002 is placed at **Annexure- XXIII.**

The Expert Technical Committee in its recommendations had concluded:-

(i) The findings of mathematical modeling study of hydrodynamics of Tehri Reservoir carried out by CWPRS, Pune, have shown that the water in Tehri Reservoir remains in circulation, throughout the year. Therefore, the water for uninterrupted flow could be drawn from the Tehri Reservoir, which has been established as flowing water at all times.

(ii) An average discharge of the order of 35 cusecs (1 cumec) is considered to be an appropriate quantum of discharge for some uninterrupted portion of fair weather flow of Bhagirathi river past Tehri Dam.

(iii) Considering the technical merits, geological considerations and satisfactory operation, alternative of providing 400 mm dia steel pipe within the lining of ILO is found suitable and is recommended. The Committee further recommend that there shall be two intake points at different locations (say 2m apart, connected to the single pipe). The Committee found that with this arrangement about 35 cusecs of water shall be released uninterruptedly.

6.36 The recommendations of the Expert Technical Committee were accepted by the Govt. of India as per Office Memorandum dated 22nd Sept., 2003 (**Annexure- XXIV),** stating that:

"Considering the technical merits, geological considerations and satisfactory operation, alternative of providing 400 mm dia steel pipe within the lining of ILO is found suitable and is recommended. The Committee further recommend that there shall be two intake points at different locations (say 2 m apart, connected to the single pipe). The Committee found that with this arrangement about 35 cusecs of water shall be released uninterruptedly".

Accordingly, as recommended by the Expert Technical Committee, a 400 mm dia pipe with discharge of 1 cumecs (35 Cusecs), offtaking from Tehri reservoir has been provided by THDC for uninterrupted (free) flow of Ganga (Aviral Ganga)."

6.37 **Expert body of environmetnl impact of HEPPs in Uttarakhand**: Consequent upon the Judgment dated 13th August, 2013 of Hon'ble Supreme Court in Civil Appeal No.6736 of 2013 (SLP (C) No.362 of 2012), with Appeal No.6746-6747 of 2013 (arising out of SLP (C) No. 5849-5850 of 2012) and T.C (C) No. 55-57 of2013, Ministry of Environment & Forests constituted an Expert Committee under the chairmanship of Dr. Ravi Chopra, Member, NGRBA and Director, Peoples' Science Institute, Dehradun, to make a detailed study as to whether Hydroelectric power projects existing and under construction in the river basins of Alkananda, Bhagirathi and their tributaries has contributed to environmental degradation and, if so, to what extent and also whether they have contributed to the tragedy that occurred at Uttarakhand in the month of June, 2013. The Committee has also examined the impact of the proposed 24 hydropower projects on the Biodiversity of Alaknanda and Bhagirathi river basins. The summary of Recommendations for Immediate and medium term actions are enclosed at **Annexure XXV**.

6.38 The Committee received a written memorandum from an NGO Viz. Ganga Ahvan. The crux of the issues raised there in is as follows:

"Point 1 covers various reasons for cancellation of dam projects on Himalayan region of Ganga.

Point 2 talks of the June 2013 disaster in the Himalayan Region and Hon'ble Supreme Court directing Centre to study the damage caused to the environment due to constructed/ under construction dams on Ganga. The Hon'ble Supreme Court had also stopped construction on 24 proposed dams.

Point 3 deals with the constitution of the Chopra Committee by the MOEF&CC in October, 2013. The point 3 also says that the Central Government, vide affidavit submitted in the Hon'ble Supreme Court on 5th December, 2014, has also accepted the finding of the report that irredeemable damages has been caused due to dam projects in the Himalayan regions of Ganga and that dam projects were directly/indirectly responsible for the June 2013 disaster.

Point 4 speaks of a surprising change in the attitude of the MOEF&CC after filing the affidavit in December 2014. It points out the intervention of Prime Minister Office in the matter, A meeting held on 13th January, 2015 chaired by PMO chief Secretary and attended by all chief / other secretaries, Ministry of Power, Ministry of Environment, representatives of Uttarakhand Government. It goes further to say that it was decided that the Government would lobby in favor of the power projects citing energy requirement of the country as a priority, putting aside the aviralta-nirmalta aspect of Ganga rejuvenation. sought more time from the Hon'ble Supreme Court.

Point 5 talks about the Hon'ble SC directing the Centre to decide on 6 dams (out of 24 proposed dam projects recommended for closure/cancellation by the teams of experts)

Point 6 says that the Central Government's stance was exposed on 17 February 2015, when the Attorney General's made a statement to the Hon'ble court that the Centre can go ahead with the construction of the 6 dams, quoting the findings of another 4-member committee which was constituted in the end of December 2014.

Point 7 says that the report referred above was leaked to the media before being presented before the Hon'ble court, and it was revealed that the members /scientists had discussed the damage caused by the 24 darns in the Ganga-Himalaya region, and questioned the approval of the 6 dams.

Point 8 says that MOEF&CC sought time from the court to analyse the report and construction of the 6 dams.

Point 9 talks about MOEF&CC forming another Expert Group (DAS-Committee) in June 2015 to explore means to give go-ahead to these E-dam projects ignoring prior studies and reports.

Point 10 deals with Dams - committee submitting its report justifying the construction of these 6 dam projects. The Centre submitted an affidavit to the Hon'ble court in November 2015 in favor of the report and submitted that inter-ministerial group will soon decide on it.

Point 11 says that MOEF&CC submitted an affidavit giving the green signal for construction of dams on river Ganga in January 2016."

6.39 The M/o WR,RD &GR, in a written reply submitted that :

"NMCG, which is mandated to fund and execute pollution abatement measures in river Ganga, does not directly deal with the issues raised in the memorandum as it is mainly concerned with the decision of the Government on construction of darns on river Ganga''

6.40 **Rubber Dams :** The Ministry were requested to furnish the replies to the following on rubber dams:

(i) the details of study, if any, conducted on rubber dams
(ii) how the rubber dams are different from conventional dams particularly in terms of safety, security and viability
(iii) the extent to which maximum river flow will be maintained from these dams

The ministry have not responed to the queries despite several reminders.

6.41 **Tehri dam – Change in Hydrodynamics of Ganga** - Asked whether the Tehri dam has resulted in change in the hydro dynamics of the Ganga and if so, the details including its impact on ecology of the region, Ministry of Power submitted as under:

"Any seasonal/over the year storage across a river always modifies the flow characteristics of a given stream in terms of its pattern and quantities. In order to assess the impact of Tehri reservoir on river Ganga downstream a comparison of average monthly flow at Rishikesh in pre and post Tehri scenario has been made. The detail of average monthly statistics is given in the following Table-6.41."

Table- 6.41: Average monthly flow ratio

Month	River Ganga at Rishikesh		
	36 years (1970-2005) Pre Tehri flow (cumec)	7 years (2006-12) Post Tehri flow (cumec)	Post to Pre Tehri flow Ratio
Jun	897.2	731.7	0.8
Jul	2064.4	1678.7	0.8
Aug	2681.4	2369.7	0.9
Sep	1524.6	1609.5	1.1
Oct	500.0	603.7	1.2
Nov	275.7	353.4	1.3
Dec	198.2	270.3	1.4
Jan	168.8	254.9	1.5
Feb	164.7	290.4	1.8
March	195.6	338.7	1.7
April	257.1	406.2	1.6
May	419.9	502.4	1.2

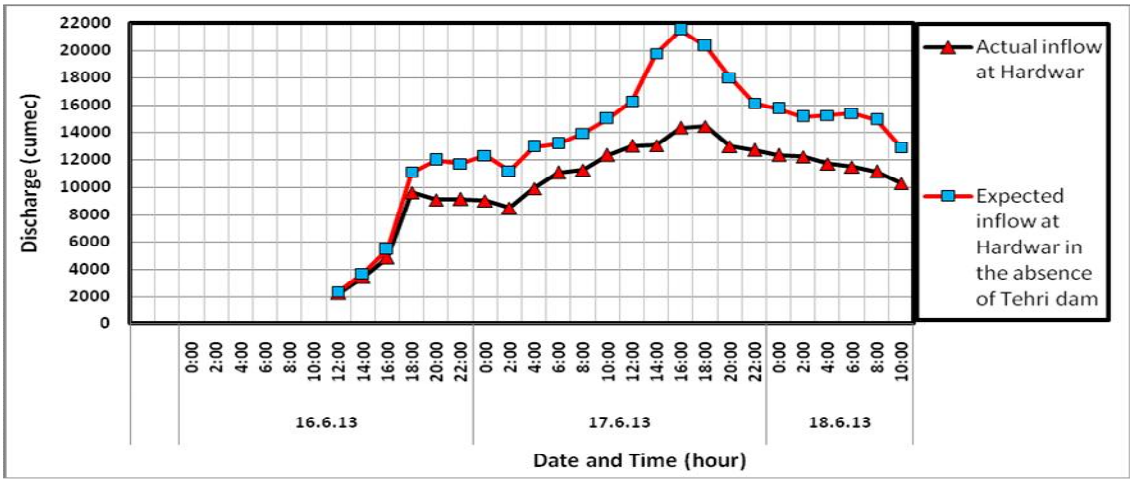
6.42 Based on above analysis the Ministry has drawn the followings conclusions:

- "The average flows during the lean period has been augmented during all the lean months (Nov-Apr) which reflects the special characteristics of storage type reservoir. It is worth mentioning that the minimum flow of Ganga river have been augmented by 1.2 times to 1.8 times at Rishikesh.
- The typical lean period (Nov-Apr) flow augmentation shows the way how this type of reservoir may increase the river flow during lean months of a year.

  The attenuation of flow peaks during monsoon period simply indicates that Tehri reservoir is helping in reducing the peak flood impacts in downstream reaches of river Bhagirathi and Ganga. A plot of actual flood hydrograph of June 2013 flood and expected flood hydrograph at Hardwar in the absence of Tehri dam is shown, where it can be seen that in the absence of Tehri dam the flood peak at Hardwar would have been about 21500 cumec in the place of actual observed peak of about 14500 cumec. Hence, due to Tehri dam the flood at Hardwar was mitigated by about 7000 cumec."

6.43 The Ministry also submitted that following hydrograph (chart 6.43) indicating the actual inflow and expected inflow at Hardwar in the absence of Tehri Dam;

Chart: 6.43: Plot of actual inflow hydrograph and expected inflow hydrograph at Hardwar in the absence of Tehri dam



6.44 The Ministry also submitted that:

> "Mathematical Model Studies to investigate hydrodynamics of the Tehri Reservoir was conducted through Central Water and Power Research Station (CWPRS), Pune. The study revealed that, during the monsoon period the inflow volume of water, nearly equal to the storage below Minimum Draw Down Level (MDDL), is added to reservoir in just 17 days thus replenishing the whole storage below MDDL in 17 days whereas, the gross storage volume is input into reservoir within 67 days of active monsoon. Hence, Tehri reservoir completes the cycle of replenishment of storage every year. "

6.45 **Hydrodynamcis of the Ganga**: The Committee inquired whether any study has been done of the hydrodynamics of the Ganga and its water vis-à-vis the hydrodynamics of the water of other major rivers like Nile, Amazon, Thames, Mississippi, Danube, Brahmaputra, Yangtze, Hwang Ho and if so, the findings thereof. The Ministry replied as under:

> "The data of the above international rivers like Nile, Amazon, Thames, Mississippi, Danube, , Yangtze and Hwang Ho is not available with CWC. However, the average annual and non-monsoon (Nov-Apr) water availability of river Ganga at Rishikesh has been compared with some of the important tributaries of river Brahmaputra at their foothill location. The findings are as under:

	Lohit at Demwe Lower Location	Dibang at Dibang Multipurpose Project Location	Subansiri at Subansiri Lower HEP Location	Ganga at Rishikesh
	(Catchment area-20174 sq.km)	Catchment area-11276 sq.km)	(Catchment area-26387 sq.km)	(Catchment area-21794 sq.km)
Avg annual yield (MCM)	38980	26950	43430	24630
Avg yield during Nov to Apr (MCM)	9810	6940	8370	3480
Avg annual yield per sq.km (MCM)	1.93	2.39	1.65	1.13

From the above finding it can be seen that the average annual yield in Himalayan Ganga is even less than the average annual yield of Dibang having the drainage area about 50% of river Ganga drainage area at Rishikesh. This is because of difference in average annual rainfall. The average annual rainfall in Himalayan Ganga is about 1600 mm, while the same in the Eastern Himalayas of Brahmaputra basin is more than 3000 mm. Further, the average annual rainfall of Ganga basin is about 1050 mm against the average annual rainfall of about 2600 mm for Brahmaputra basin, resulting per sq.km average annual yield of about 0.56 MCM for Ganga and about 1 MCM for Brahmaputra.(Source: CWC)"

6.46 **Energy forms of Ganga**: An expert (Prof. U.K. Choudhary) expressing his views on Ganga Rejuvenation before the Committee on 19 January, 2016 stated as under:

"[---- the origin point of Ganga is Gomukh which is the highest point of all rivers origin of the world that is why energy potential of the Ganga river system is unique. This potential energy is converted into Kinetics energy. There is a difference of approximately 75 kilometers between the origin points of river Ganga and Yamuna, the colour of Ganga jal is completely whitish and water of Yamuna is blue. It simply signifies that quality, quantity and dynamics of every river body system as in the human body system is different. The major problem is that the works have been started without any knowledge of anatomy, morphology, cross section of the river, etc. Ganga system is created by sedimentary rocks, we should know the fundamental concept. xxxx xxxx xxx. Our Himalayan rocks are sedimentary and these are lose and have deep slopes. For example the height of three Gorges Dam of China is 181 meter and our Tehri Dam is 260.5 meter, the reservoir of TGP is 660 kilometer and Tehri is 44 km. This means that the slopes of our Himalayan mountains are 18 time more than the TGP Dam. The slope defines the energy, the power generation of TGP dam is 18 thousand megawatt and Tehri is 750, 800 or 900 megawatt. Our problem is that we have deep reservoir, about 90 meter draw down is there, these are fill by soil post, rock post. All of a sudden, landslide is taking place. Due to Kinetic energy of rivers, flood situation aggravated in Uttarakhand, Kashmir. It is very simple that if you will not stop or convert the Kinetic energy it will create flood. Our Kinetic energy is so high gradient due to which flood came in Kedarjee, drag force has increased due to sedimentation, landslides, etc. The origin point of Ganga is from Himalayan region, to control the development of pore presser of river we should set up micro dam which have four to five meter of height.

On the rate of sedimentation and its impact on reservoir water quality, the witness deposed:-

> "Due to this the landslides will not intensify, rate of sedimentation of reservoir will be reduced. Due to sedimentation, the density of water increases and changes the colour of water, reduces oxygen content which deteriorate river water quality in the reservoir. This also induces self-induced seismicity.
>
> We should fundamentally understand that our Himalaya, river Ganga are not suitable for large dams, we should asses this, the quality of water has been deteriorating due to sedimentation load, landslides, etc. You can draw conclusion by assessing the drag forces which have been increasing in the cross section of rivers at different places."

6.47 With regard to the effects of dams and HEPPs on the ecological health of the river Ganga and its tributaries, the Ministry of Power in their background stated as follows:

> "In case of hydroelectric projects there is no consumptive use of water. The water is diverted from the diversion site of the project and after power generation the same is discharged in the river near its Tail Race Tunnel (TRT) outfall. Hence, the affected river reach is generally between the diversion site and TRT outfall, where adequate flow needs to be ensured as environmental flow release. This aspect is primarily being examined by MoEF&CC. For a hydroelectric project, project-specific EIA Study is carried out which inter-alia includes environmental flow studies and the same is presented before EAC for Environmental Clearance of the project.
>
> The projects proposed to be set up on the river Ganga are of Run of the River (RoR) type, involving minimal pondage just adequate for daily operation of these plants. Therefore, it is felt that after having complied with all the prescribed environmental safeguards, development of these hydroelectric projects would have minimal effects on environmental / ecological health of the river. While according clearances to projects on the basis of Environmental Impact Assessment (EIA) studies mitigation measures are prescribed in Environmental Management Plan (EMP). They are implemented by the developers, so as to avoid/minimize any adverse impact."

6.48 When the attention of the Ministry of WR, RD & GR was drawn to the view that dams and barrages are draining the tremendous, unsustainable amounts of water from Ganga causing parts of the riverbed to go dry, and whether in view thereof Government propose to revisit the policy of allowing dams and barrages on Ganga and its tributaries with stipulations such as allowing continuous flow of water the Ministry, submitted as follows:

"(a) Power is one of the most important inputs for the development and growth of the country. One of the sources of power generation is through hydroelectricity which requires construction of dams. However, there is hydropower generation in run of the river method that permanently does not allow impounding of the river water. The hydro power generation is an integral part of the power system for years together in this country. Ecologically when compared to thermal power, hydro power does not cause any air pollution. However, the construction of dams for hydro power generation results in impounding and displacement of human settlements and having impact on flora and fauna. All the proposals for construction of dams for hydro power generation are subjected to an exhaustive environment impact study which takes into account likely impounding, displacement, inundation of settlements and impact on flora & fauna. An appropriate environmental mitigation plan is designed to minimise such impacts. The MoEF&CC has a business allocation to consider and grant environment clearance and approval for the diversion of forestland in accordance with the provisions laid down in Environmental Protection Act , 1986 and rules made thereunder. Of late, concerns have been raised on the problems likely to be caused and caused by hydroelectric projects on downstream flow and associated impact on sediment movement, biota movement and others. However, these issues are addressed through the tools of minimum environmental-flow in different seasons. MoEF&CC in pursuance of the orders of Hon'ble Supreme Court in the subject matter of Alaknanda Hydro Power Vs. Anuj Joshi has constituted an Expert Body in the past and currently another Expert Body is examining the impact of hydroelectric power projects in upper reaches of river Ganga…"

6.49 **Steps taken to maintain adequate flow in river Ganga:** On the issue of steps to be taken / proposed to be taken to maintain adequate flow of water in the river Ganga, the Ministry of Power made the following submission:

"The Ministry of Environment, Forests and Climate Change ensures a minimum flow of water, technically known as Ecological Flow or Environmental Flow (E-Flow) while clearing the Hydro Electric Projects. The concept of Environment flow is followed for sustenance of aquatic life and downstream user needs. Based on this, the EAC from time to time has been recommending a site specific study to be carried out for establishing the proper environmental flow during monsoon, non-monsoon and lean months. Water withdrawal for power generation is regulated subject to release of prescribed environmental flow.

As mentioned above, continuous flow in the form of environment flow as recommended by MoEF&CC is maintained in a hydro-electric project to

provide required flows during different seasons and to mitigate impact on biodiversity, cultural and heritage values of river. The developer is under obligation to release the environmental flow mandated by MoEF&CC for different seasons.

A project is designed for certain installed capacity and expected production of energy subject to prescribed e-flow. If the norms of e-flow are revised after clearances or revised e-flow is to be applied retrospectively, then the projects suffer heavily because of consequent change in design and energy, which may render projects unviable."

6.50 Government of Bihar *vide* their letter dated 21.04.2016 , is maintaining that better silt management in Ganga results in 'Avirlta' and 'Nirmalta' of the river submitted as under:

"The Government of Bihar is continuously raising the issue of developing a National Silt Management Policy. On the one hand, intensive deforestation in the catchment area of Ganga resulting in increased inflow of silt, on the other hand, the adverse impact on outflow of silt due to Farakka barrage has resulted in rise of bed level, reduction in carrying capacity, rise of meandering and breading tendencies and formation of shoals in the Ganga. The then Minister of Water Resources, Shri Pawan Bansal had undertaken an aerial survey of the Ganga fromChausa to Farakka and realising the precarious situation had assured the study of the adverseimpact by the Central institution CWPRS, but no concrete steps have been taken at the levelof the Government of India. The change in morphology of the Ganga due to Farakka barrageand deposition of silt in the upstream has also resulted in increase of flood fury in NorthBihar. Hence, it is essential to develop an effective Silt Management Policy at the nationallevel, which will help in silt management of not only the Ganga but also other rivers and shallcontribute towards maintenance of "Aviralta" and "Nirmalta" of the rivers."

6.51 Maintaining that rejuvenation of large Ganga basin with limited water availability especially during lean season requires comprehensive integrated management approach, Spring professional Services Pvt. Ltd, Delhi, in a written memorandum submitted as under:

"NRGB is the largest river basin of India, covering more than 26% of her geographical area with 525km3/year capacity. Our experience has been that about 50% of the water during monsoon drains out of the Bay of Bengal. The water storage can be created using different methods in a comprehensively integrated time based schedule manner by deploying different engineering mechanisms using the following concepts:

(1) Increasing the canal network and using the canal network also for storage of water. All canals must have regulators for storage and regulated release of water.

(2) Small scale reservoirs shall be created.

(3) Desilting or dredging or Canal Systems e.g. The Upper Ganga Canal system is about 7000 km long and is reportedly silted by to 2 m. By desilting and putting the material on the sides of the canals to increase its capacity. By this the storage capacity of the canals will increase by 30-40%.

(4) Using inflatable barrages in the Ganga basin, tributaries after the peak flow.

(5) Rejuvenating the ox bow, secondary channels, and dormant back water and holding water in them by using inflatable barrages or flaps or temporary weirs.

(6) Creating levies using the desilted or dredged material parallel to existing bank to act as double flood barriers.

(7) Construction of temporary or movable weirs can be used to store the data

(8) Interlinking of different canal systems.

(9) Creating additional sewage and flood water drain channels next to existing sewage drains for use during flood period.

Aviral Dhara

To maintain Aviral Dhara in the river it is required that the water so stored in the canals and reservoirs is released in a planed manner. A management agency to manage the release water from the reservoirs, canals in a planned manner is required for co-coordinating with all the agencies working in the State and Central Government on the use of Ganga Water. The water flow shall be regulated to maintain the minimum sustainable flow.

Aviral dhara will improve the least Available Depth in the Ganga Basin and national Waterway 1 hence facilitating transporting of cargo through Inland Water Transport mode. IWT mode is efficient, economical and environment.

Nirmal Dhara

The additional reservoir created will improve the quality of water in the Ganga Basin as the overall capacity has increased, thus diluting the pollution. Moreover if the canals are used for storage of water then the canals will not be used for duping solid wastes in them that pollutes the Ganges when water gets released in it. This in addition to the other methods of reducing pollution in the river through prevention, treatment and reuse of treated water.

Movement of barges/Inland Vessels for Inland water transport through the canals and rivers improve the BOD by agitation of the water. And the paddle wheel boats as tourist boats will further improve the BOD by churning /oxygenation of the water."

6.52 **Nirmal Dhara, Aviral Dhara & Connected Issues**: One of the man features of GRBMP, being prepared by consortia of seven IIT is to suggest comprehensive measures for restoration of the wholesomeness of the Ganga river system and improving its ecological health taking into account the issue of competing water uses in the river basin. The plan shall be the basis for taking up all future projects under the programme for rejuvenation of river Ganga.

6.53 **Water Quality in River Ganga**: Furnishing the impact of the money spent on GAP I & II on the quality of water in Ganga, the M/o WR, RD &GR in a written reply submitted as under:

"Water quality monitoring done by reputed independent institutions indicates some improvement in the water quality over pre-GAP period. The water quality analysis of samples collected at 16 stations on River Ganga during 1986 and 2008 shows improvement in DO levels at 4 locations namely up and down streams of Allahabad and Varanasi. All the 16 stations except Patna downstream and Rajmahal show reduction in BOD values. The BOD level show marked reduction in Allahabad and Varanasi indicating improvement in the water quality over pre-GAP period (Table 4.48). However, at 7 of these 16 sites, BOD level does not meet standard for bathing water. The situation is much better for DO for which at only one site the bathing standard is not met. On the other hand, in terms of total coliform count only at one place the bathing standard is met."

Table 6.53 :Water Quality Data for River Ganga (Summer Average i.e. March to June)

Stations	DO (MG/L)		BOD (MG/L)		Total Coliform	
	1986	2008	1986	2008	2002/2003	2008
Rishikesh	8.1	8.1	1.7	1.2	115	23
Haridwar D/S	8.1	7.9	1.8	1.4	400	1600*
Garmukteshwar	7.8	7.8	2.2	1.9	851	7500*
Kannauj U/S	7.2	6.5	5.5*	2.9	919**	75000*
Kannauj D/S	NA	6.2	NA	3.1*	1478**	75000*
Kanpur U/S	7.2	4.9*	7.2*	3.4*	1089**	93000*
Kanpur D/S	6.7	6	8.6*	4.1*	4911**	240000*
Allahabad U/S	6.4	8.4	11.4*		1202	9000*
Allahabad D/S	6.6	7.7	15.5*	3.2*	1607	17000*
Varanasi U/S	5.6	7.5	10.1*	2.2	12417	NA
Varanasi D/S	5.9	7.3	10.6*	3.0*	148333	NA
Patna U/S	8.4	6	2	1.7	1589	30000*
Patna D/S	8.1	5.9	2.2	2.4	3019	90000*
Rajmahal	7.8	6.2	1.8	2	1480	NA
Palta	NA	6.9	NA	2.2	99545	220000*
Uluberia	NA	5.3	NA	3.6*	50333	500000*

* Quality not suitable for bathing

6.54 **Water Quality Monitoring System for Ganga**: The CPCB has been executing a project – Water Quality Monitoring System for River Ganga (WQM) funded by World Bank and coordinated by NMCG. The objectives and other details of the project furnished by CPCB are as follows:

i. "The World Bank funded project was sanctioned on 19th July, 2013 and has been allotted an amount of Rs. 94.45 crores .One of the component under this program is development of a Real Time Water Quality Monitoring network of 113 stations in the Ganga states. The network would be developed on data purchase concept where monitoring system will be installed, commissioned and operated by vendors and CPCB would purchase data of water quality.

ii. The network has been designed in a manner that once it gets operational; it would help to identify the sources of the pollution and their impact on the river water quality through online system.

iii. In addition to this, the project involves Bio monitoring at all 113 locations besides 28 physicochemical parameters being monitored online which will show the impact on the aquatic life of the river. This would reflect the true water quality and health of the river.

iv. The projects also envisages the concept of community monitoring which will be carried out with the involvement of the organizations, institutions, schools, colleges and universities and other reputed activists. Through this program organizations will be trained and make them feel responsible for water quality monitoring."

6.55 An expert (Shri Subhajyothi Das) in a written submission, on the deteriorating water quality of river Ganga stated as under:

> "The Ganga River is famous for its purity and its unique capacity for self purification due to high dissolved oxygen contents and radioactive radon reported in the river water by some workers. The river also supports a large population of macrophages- parasites, which according to some, multiply exponentially by attacking bacteria. But reduced flows of the Ganga and Yamuna with diminished dissolved oxygen, discharge of untreated industrial and municipal waste and effluents into the river, as also agricultural runoffs have much to do with degraded Ganga's self cleaning capacity and river water quality. There is technology to clean water, but the technology is ineffective if the riverine eco system is vandalized.
>
> DO, Biochemical Oxygen Demand (BOD), COD, fecal Colifor count (FCC) are some of the determinants of the river water quality. Sewage and Industrial wastes containing oxidisable organic matter exert a demand on dissolved oxygen, thereby reducing DO content of the river. BOD indicates biochemically degradable organic content at the expense of DO. COD indicates total organic content of water. Adequate reserve of Oxygen (DO) in the river water supports biochemical oxidation. , while lack of it triggers anaerobic breakdown of organic matter and septic condition of the river." (p.127 subhojyothi Das)

6.56 **Historical agreement on flow of water in Ganga**: Asked about historical agreement of 1916 between the provincial Government of Benarus (Varanasi) and the then British Government to maintain minimum water flow in river Ganga, the M/o WR,RD &GR stated as follows:

"(i) Apprehensive of the possibility of the British completely damming the flow of Ganga at Bhimgauda in Haridwar, Mahamana Pandit Madan Mohan Malviya raised a massive public protest against the damming of river Ganga. As a result in 1916 an agreement was entered into with the British government so that:

- In future, the uninterrupted flow of Ganga will never be stopped. (the 1916 Agreement, clause 32, para-I)
- No decision on Ganga will be taken without the consent of the Hindu community. (the 1916 Agreement, clause 32, para-2)

Under Mahamana's leadership the- Lala Sukhbir Singh, the general secretary of Hindu Mahasabha, signed this agreement. This agreement is even today preserved under Article 363 of the Indian Constitution. (Source: website of Ganga Mahasabha-http://gangamahasabha.org/)."

6.57 The Complete text of the agreement referred to above is reproduced and marked as **Annexure:XXVI**

6.58 **Impact of activities of M/o Shipping on Ganga's flow:** In written response to a query as to whether the extant activities of the Ministry of shipping are helpful or neutral or harmful for rejuvenation of the Ganga especially for improving uninterrupted flow of water, the Ministry of Shipping in a written reply submitted as follows:

"As mentioned above, navigation is a non consumptive use of water. Therefore, activities of IWA/Ministry of Shipping for developing and using Ganga for navigation are neither helpful nor harmful for rejuvenation of Ganga. It does not have any significant impact on the flow of water. Hence, IWAI's activities are neutral to rejuvenation of Ganga River."

6.59 Shri U. K. Chaudhury, a domain expert and Founder and Director, MMIT for Management of Ganga expressing his views on navigation in river Ganga stated as follows:

"In regard to navigation, I have to mention here that river will immediately react and fill the gap which you will create by removing mud in the corner of sedimentation of river. So you cannot navigate ship. [---] if we fill out ground water reservoir the river Ganga will became rich and thereafter you can navigate ship. It is very simple to fill the Ganga basin, I have seen areas where farmers have created four to five feet heights of their fields due to which water of the field remains in the field this concept can be implemented in the Ganga basin. For fertility of land it is necessary to check sediment

erosion, we have to increase ground water reservoir capacity, In Banaras all the ghats are facing erosion problem because there is 12 feet sand bank high have developed. I have analysed that a large part of Banaras will be eroded by 2025. Sand bed is the nucleus of geology."

6.60 Shri Anupam Mishra, Gandhi Peace Foundation, Delhi, furnishing his comments to the Committee on 19 January , 2016 on navigation in Ganga, stated that-

"if there will no flow in the river because there is no depth, the silt of the river will increase if forest are not there. The silt have also reduced the life of our existing dams. To check the increase of silt in our rivers we have to develop our forests. Only after developing forests we will be able to check the silt in rivers and thereafter we can think to navigate ship in river Ganga."

6.61 Government of Bihar *vide* their letter dated 21.04.2016, apprehending the adverse impact of the proposed barrages for making stretch from Allahabad - Haldia navigable, submitted as follows:

"The Government of India had declared the reach of Haldia to Allahabad as National Waterways-I in the year 1986. Recently, it has been widely published in print and electronic media that the Central Government is planning to construct a series of barrages between Allahabad and Haldia for navigation purpose. It is important to mention that Bihar is already facing the adverse impact of the construction of Farakka barrage. In this background, construction of barrages shall obstruct the continuous flow of the Ganga, as a result of which, this pious river shall be converted into series of large ponds, which will destruct the environmental and ecological balance. Any such plan of construction of barrages must not be thought of without undertaking detailed impact study on the continuity, "aviralta" and "nirmalta" of the Ganga. Bihar believes that under the "Integrated National Water Ways Transportation Grid (INIWTG)", the required draft of may be achieved mainly by deepening and dredging of River bed."

6.62 **Dredging in Ganga**: About the need for dredging certain stretches of the Ganga to enable navigation for the purposes of cargo movement, the input output analysis done Ministry of Shipping submitted that -

"Between Haldia (Sagar) and Nabadweep (280 km) river is tidal and more than targeted LAD of 3 m is always available in this stretch naturally. Hence, IWAI does not require to do any dredging in this sector.

In Nabadweep and Farakka Stretch (280 km) also, because of controlled flow from Farakka barrage, the river is quite stable and shoals (Shallow patches) crop up only at a few places during lean season. In these places, the extent of dredging done by IWAI in nominal ie., 200-300 m in length, 30-40 m width and depth of cut well below 1.0 m. The dredged sand is thrown back to the river at a suitable place. Between Farakka and Patna (460 km), the targeted LAD is reduced to 2.5 m. In this region, because of the alluvial nature of the river a lot of silt is eroded and deposited naturally. However, more number of shoals crop up in lean season from time to time. On these shoals, IWAI undertakes maintenance dredging during lean season only for maintaining target LAD thereon. The average length of each shoals is 200-300 m, width of dredging 30-40 m and depth of cut about 1 m. It may, however, be noted that IWAI does dredging on these shoals only in a width of 30-40 m whereas the total width of the river even in the lean season in generally 2-3 km and the river is highly braided (multiple channels). Further, the main aim of IWAI is to increase depth in the main navigation channel which generally reduces because of braiding of channels (formation of multiple channel). IWAI tries that even such a nominal extraction of sand by dredging is put back into the river in one of the secondary channels which aids nominal increase of flow in the main channel inducing increase in velocity in the main channel which also induces erosion therein resulting in increase of depth. Thus, in typical IWAI's dredging it tried to use natural conditions of water to improve navigability parameters of the river. IWAI, in effect, does not do any large scale capital dredging on the river. All its dredging is basically of maintenance dredging type.

In short, maintenance dredging undertaken by IWAI of navigation purpose in totality does not effect significantly the hydro morphological parameters on the river.

IWAI also use an age old indigenous nature friendly technique called bandalling using bamboo pains and bamboos mats to induce more flow in the main navigation channel. This technique is totally in tune with the nature."

6.63 The Committee in a written questionnaire asked the Ministry regarding proposals, if any, for making Ganga navigable especially for the stretch between Varanasi to Haldia. The ministry could not furnish the replies to the Committee.

6.64 In reply to a query whether any scientific study has been done on the desirability or otherwise of dredging of the Ganga, the Ministry of Shipping stated as under:

> "In the upstream stretches of Ganga of NW-1 i.e., Patna-Allahabad (600 km) stretches, IWAI does not undertake any dredging mainly because the number of shoals, average length of each shoal and average depth of cut required on shoals of maintaining to 2.5 m LAD increase manifolds of which IWAI does not have adequate dredging capacity. [---] They have however, suggested 4 barrages between Buxar and Allahabad (400 km) for maintaining 3m LAD all around the year. However, considering other ecological, environmental, sociological and hydro morphological issue associated with construction of barrages on river like Ganga, it is felt that it may not be desirable to construct these barrages. Accordingly, as mentioned earlier, a technical Consultant under World Bank aided Jal Marg Vikas Project is exploring other feasible means for increasing the depth for more viable navigation. [---]. The details of technical interventions needed for developing reliable navigable channel for navigation by more commercially viable cargo vessels will be decided and acted upon based on the outcome of the study, which is likely to be available by mid 2016."

6.65 **Need for restoration of water bodies in Ganga region**: Explaining the need for recharge of ground water in Ganga basin, Shri U.K. Chaudhury, stated:

> "During 1915 Mahamana Madan Mohan Malviya had invited all Kings and raised the issue of creation of Bhimgoda barrage and all Kings have discarded the proposal. Today one Blue flow (dhara) which is releasing 600 cubic feet per second water from the gate. This is the efforts of Malviya jee otherwise all water would have been finished. Ganga river basin has approximately 10 thousand kilometer. Reduce the Ganga water level to 20 meter at Haridwar from there all basin in going to downstream, you may be irrigating 1 lakh square kilometer, you have reduced the ground water level of 9 lakh square kilometer. You have provided water only to Uttar Pradesh but remaining four states have become dry zone."

6.66 Another expert (Shri Anupam Mishra) expressing his views before the Committee on 20 January, 2016, on the role of ponds and other water bodies In making rivers flow perennially stated as follows:

> "the country had 25 to 30 lakh ponds before British came to India. During that era there was no engineering college as well as no engineers but the society had developed pond system and created big ponds which were used for irrigation, drinking and all other purposes. Now, in the modern era we have changed the concept of ponds and using river water for our needs, after using that water for irrigation, drinking, industry, etc, we return the used contaminated water to the river. The system which we have adopted will not be able to clean the river Ganga even after incurring huge expenditure."

6.67 The expert further referred to the ancient systems of 'tals' and 'khals' in the Himalayas, thus:

> "it is not only that river will get pure water only from rain water, it is recharged by various form like Ponds, Zheels, Khals etc. situated in the upper catchment through ground water. We have heard about word, Tal like Nanital and Khal, there was thousands of tals, khals in the Himalayan region. Now we have forgotten these words. These water bodies played important role not only to provide water for our day-to-day needs but contributed to checking the floods. Now these days the rivers are not being recharged from such water bodies and we are thinking to clean the river Ganga and also make it aviral. A large number of small rivers have dried."

The witness also gave example of a Pauri Garhwal district of Uttarakhand where due to restoration of water bodies a dead rivulet was revived after 70-80 years. He deposed:

> "We should concentrate on this and start work on creating the things which we have lost over a period of time. There is a place in Pauri Garhwal where one can find 30 thousand 'chals' and 'khals' due to that a dense forest has been developed around those chals and khals, these chals and khals reserve so much water due to which flood situation in the area are also controlled. This system slowly releases water to rivers, there was a place named Sukharola. The name of the village is Gardkarak, after developing these chals and khals that river has became alive after 70 - 80 years which merges on river Ganga the people have named it Gadganga. Like this other new rivers will rejuvenate Ganga without rolling back to our previous system we would not be able to rejuvenate river Ganga we should released the pressure on rivers in the country. We have to develop a mechanism under which the water available in a particular place is used there itself. We have been diverting water of Himalaya to Punjab and Jaisalmer, etc. all this will became a big challenge for us in future."

6.68 Prof. Vinod Tare, IIT Kanpur, appearing before the Committee on 20 January, 2016 submitted as follows:

> "When we talk about the Ganga, we will have to add the mainstreams to the Ganga. As the Ganga is called Tripadgamini, Vishnu enumerated Alaknanda, Mandakini enumerated from matted hair of lord Shiva and percolated down to the Kamandal of Bharama – these are three mainstreams but the rest are also with them such as Mandakini, Dhauli Ganga and Panch Prayag and Maha Prayag are called in Allahabad being associated with it. It is called a holistic Ganga there. When we talk of Ganga, the entire water catchment of Ganga is called Ganga basin and Ganga basin is generally witnessed in three parts. First part we can say that it is Haridwar where it traverses through the hills. Its challenges and conditions are somewhat different there. As soon as Ganges percolate down to the Haridwar, there are different circumstances from Hardiwar to Varanasi or just downwards Varanasi because the circumstances of these two places are different in today's perspective and when you go down from Varanasi, the entire basin, catchment area is divide into three parts and all these three parts have their own circumstances and problems. Basically it traverses through the mountains in the upper areas and the biggest challenge of today is potential of hydro power as the Hon'ble Chairman has also upheld the same."

The witness admitted that the biggest challenge was how to keep the Ganga flowing. He submitted that:

> "Today, the biggest challenge is as to how the Ganga be kept ever flowing and whether ever flowing of Ganga and hydro power can go hand in hand. I do admit that a considerable change is needed in the construction of dam and projects in today's circumstances. In today's circumstances what we are doing that will certainly affect the ever flowing of Ganga. For example, we take the project of Tehru Dam. You please see that Ganga divides into two parts from here. There has been no connection between the Ganga flowing upwards and flowing downwards. If anyone is to move from upwards to downwards, it is all impossible even today. There are fishes like snow trout and we cannot think that these fishes can swim across from Haridwar to Uttarkashi. We are to certainly bring about changes in their planning and designing and there have been a lot of such projects. As long as we don't bring about sea change therein, there will be no flow of water in the Ganga. I admit that these two can go hand in hand. But we will have to take care of this thing that ever flow of Ganga be maintained. It is my imagination and I have also been told and I have also learnt from people that whenever our Hon'ble President or Prime Minister has to go somewhere, a safe route is searched for them, similarly we will have to search a way for it because as long as we don't take out a safe course to the Ganga, there will be no flow of Ganga."

6.69 He further clarified:

> "I admit that we should certainly make the structure of anything, but the course of Ganga should be left as it is. After that, whatever excess water is available be diverted and dammed somewhere. We will ahdve to take out the mainstream of the Ganga in a most protective way like the way or route searched for the Prime Minister and President. As long as we don't make an arrangement for the same, we won't be able to do the same whatever river projects we have. In my own opinion, it is possible today and we can do it. The second point is about percolating down of Ganga from Haridwar. Bhim Goda barrage to Varanasi are the biggest challenges there and this work has been going on more than hundred years and even it is going on from the time of Britishers that almost 80-90 per cent water of the Ganga is taken out from Ganga canal for irrigation. Thus there is always paucity of water in the mainstream of the Ganga."

6.70 The Committee when desired to know his expert opinion regarding co-relation between the old ponds and rivers and the extent to which that system was effective for recharging of water and also how the system can be revived, Prof. Tare submitted :

> "I do admit that whatever rivers we have, they all the connected to the tanks and rivers. The water of river is not any separate water. If we are to restore the Ganga, we will have to restore allt he rivers and nallahs associated with it. Our efforts should be started from here. Today known as nallahs are actually tributaries of the rivers. Today when a nallah is talked about, a picture of dirty drain comes up in our mind. But this is very important nallah because we have made it a dirty drain today. It is our inherent tendency to cover it. After covering the same, either an encroachment is made or something other is done there. We have mentioned all these issues in the Ganga basin management plan in an adequate way. Today whatever rivers we have, sewerage is dumped into them. This is the condition of all the rivers. You won't view even the water if you view above from Okhla barrage in Delhi, you will view only water hyacinth all around. When water hyacinth is visible, it means we have chocked the river. When a little rain falls, there is a water logging problem in our cities and one more problem regarding urban flooding which was not a problem earlier, has become a problem and due to which there is flood in our cities. Whatever nallahs we have, they all fall into the rivers, there must be a carrying capacity gradually and due to which the water which should have flowed down from cities to villages is not flowing. Thus water gets accumulated and a new problem takes birth by name of urban flooding."

6.71 The Committee sought a written reply from the M/o WR, RD &GR as to whether ther is any proposal to rejuvenate ponds, lakes, rivulets, etc to improve the entire aqua system of Ganga. However, the reply is awaited from the Ministry despite several reminders.

6.72 The Committee sought from the M/o WR,RD &GR the impact of water guzzling crops on the groundwater table in the ganga basin. The Ministry are yet to submit the reply in this regard despite granting several extensions.

CHAPTER-VII

Other Issues

Impact of Flora and Fauna: Asked about the overall impact of the rise in pollution on the riverine ecology indirectly its flora and fauna, Secretary, MOEF&CC, submitted:

> "Sir, basically the river must have water which keeps flowing and the quality of that water has to be acceptable both for the ecological health of the river as well as for the human activity which is dependent on the river "

7.2 The M/o WR, RD & GR also informed the Committee about the steps taken to conserve the flora and fauna in Ganga river basin as follows:

> "NMCG has initiated or in the process of initiating the following projects immediately-
>
> 1. A Programme to Conserve Ganga River Dolphin (*Platanistagangeticagangetica*) in Ganga and its tributaries in Uttar Pradesh.
> 2. Proposal of Revival activities for Gharial and Turtle Breeding programmes and for strengthening the protection mechanism of the biodiversity of Ganga
> 3. Proposal of Conservation of Biodiversity programme in Vikramshila Gangetic Dolphin Sanctuary under NMCG NGRBA programme.
> 4. A Programme to Conserve Ganga River Dolphin (*Platanistagangeticagangetica*) in Ganga and its tributaries in the state of West Bengal
> 5. National Dolphin Survey 2014-Outline Work Plan for Bihar.
> 6. Assessment of fish and fisheries of the Ganga river system for developing suitable conservation and restoration plan
> 7. Preparation of DPR for Forestry Interventions for Ganga Rejuvenation"

7.3 **Sand Mining Policy**: Government of Bihar vide their letter suggested that Sand Mining Policy for the River Ganga and its tributaries should be clearly defined and effectively enforced. Current practices of sand mining in the River Ganga and its tributaries are seriously damaging aquatic flora and fauna.

7.4 **Dams and the Movement of fish** : The existing dams have created hurdles/ obstacles on the movement of fish from downstream to upstream due to which ecological imbalances is stated to have been created. The Ministry were asked to furnish the names of the species extinct due to such imbalances.However, the Ministry are yet to respond to the query.

7.5 **Community participation/Public Awareness**: In response to a query as to whether the communities living along Ganga were involved in GAP I & II and the impact of such community involvement in cleaning Ganga and also the strategies adopted for involving Communities in keeping Ganga clean, the M/o WR, RD & GR submitted as follows:

> "Yes, the communities living along Ganga were involved in GAP I & II. The impact was in the form of improved awareness and sense of belongingness for the river Ganga along with better cremation, dobhighat facilities. A comprehensive communication and public outreach component has been included in Namami Gange Project for greater awareness creation and people participation. Ganga Task Force - a battalion of Territorial Army will also be involved in awareness and afforestation activities and it is envisaged that local communities will be motivated enough to contribute and act as responsible citizens in clean Ganga program."

7.6 The M/o WR,RD &GR also apprised the Committee that:

> "….events like Ganga Manthan, Nirmal Ganga Sahbhagita, have been organized in the recent past for involvement of for ULBs, NGOs, religious leaders etc., Apart from this Namami Gange Pavilion were set up at Pravasi Bharathi Divas, Vibrant Gujarat and India Water week for raising awareness among the ULBs, Elected representatives, academicians and public etc. As the mission proceeds, more such initiatives are likely to be taken up."

7.7 Erosion in Ganga and Afforestation: Assuring the Committee of the steps being taken to deal with the problem of erosion in the Ganga Basin, the M/o WR, RD & GR submitted as follows:

"Afforestation programmes were taken up at the cost of ₹ 94.8 lakhs under various programmes to resolve the problem of erosion in Ganga, the details of which are as follows:

1) GAP-1: ₹ 34.28 lakhs

- 11.02 lakhs for water-shed management & Afforestation of Mansadevi Hills, and
- 24.26 lakhs for soil conservation scheme for Baag Rao &Sukh Rao in Haridwar

2) GAP-II: ₹ 58.25 lakhs for West Bengal

3) Gomati Action Plan: ₹ 2.27 lakhs

Under 'Namami Gange' Programme, a massive afforestation drive is planned. Forest Research Institute has been entrusted with the work of preparation of a DPR and ₹ 96 Lakhs has been sanctioned for the purpose."

7.8 In view of the soil erosion in river Ganga , the M/o WR,RD and GR was requested to state as to whether any study/ projection of the same soil erosion in Ganga was made and the details thereof including the protection measures taken in this regard. However, thereply of the Ministry is awaited despite multiple written and verbal reminders.

7.9 The Committee have asked the Ministry of Water Resources to furnish the measures taken for Flood management System and study/projection of soil erosion problem in the river Ganga, reply of the Ministry was awaited.

7.10 **Coordination**: Referring to various aspects of Ganga Rejuvenation falling under the jurisdiction of different Ministries of Central Government and also the state Governments concerned, the Committee sought to know the existence or otherwise of any Co-ordination mechanism. The Secretary, M/o WR, RD &GR, responding to the committee's query submitted as under:

"Actually, we have a coordination mechanism not only with Urban Development but with several other Ministries also which include Agriculture, Drinking Water, sanitation, etc."

7.11 In response to a query M/o WR,RD &GR submitted that recognizing the multi-sectoral, multi-dimensional and multi-stakeholder nature of the Ganga Rejuvenation challenge, the key Ministries comprising of (a) WR, RD&GR, (b) Environment, Forests & Climate Change, (c) Shipping, (d) Tourism, (e) Urban Development, (f) Drinking Water and Sanitation and Rural Development worked together through Group of Secretaries to arrive at an action plan, the final report of which was submitted on 28th August, 2014. Apart from development of action plan, the implementation of 'Namami Ganga' is also done through various Ministries with their roles and key mandates given below:

S.No.	Ministry	Mandate
1.	Ministry of Environment, Forests and Climate Change	Industrial Pollution Abatement through Central and State Pollution Control Boards
2.	Ministry of Urban Development	Development of sewer networks, and solid waste management
3.	Ministry of Drinking Water and Sanitation	Provision of sanitation facilities to rural areas for prevention of pollution through open defecation
4.	Ministry of Agriculture	Promotion of organic farming
5.	Ministry of Tourism	Development of tourism facilities at major ghats and management of major congregations

7.12 In reply to the query whether there is any proposal to set up a 'Tennessee Valley Authority, USA', type set up with statutory backing for the purpose and if so, the details thereof and the legal status of Ganga River basin Authority (NGRBA), M/oWR,RD &GR stated that-

> "NGRBA was constituted on 20th February 2009 under Section 3(3) of the Environment (Protection) Act, 1986 as an apex policy- and decision-making authority. The Prime Minister is ex-officio Chairperson of the Authority, and it has as its members, the Union Ministers Concerned and the Chief Ministers of states through which Ganga flows, viz., Uttarakhand, Uttar Pradesh, Bihar,

Jharkhand and West Bengal, among others. The objective of the Authority is to ensure effective abatement of pollution and conservation of the river Ganga by adopting a holistic approach with the river basin as the unit of planning. NMCG is the implementation wing of NGRBA under the Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR,RD &GR)."

7.13 The Committee were further informed that a High Level Task Force headed by Cabinet Secretary was constituted vide Cabinet Secretariat to achieve synergy amongst Ministries/Departments and State Governments to ensure effective coordination for achieving the final objective of clean Ganga.

7.14 **Need for comprehensive legislation for management of NGRMP:** A consortium of seven IITs was given the responsibility of preparing the GRBMP. The consortium in their Main Plan Document, on the need for comprehensive legislation for management of National Ganga River Basin (NGRB), stated that-

"Indian has failed to develop its water resources through integrated river basin development, and inter-State conflicts over rivers have become common. But the Constitution has provisions enabling the Union to regulate interstate rivers in public interest. The Constitution gives full control over waters of a river to a State (List II entry 17), but the State's rights are subject to any law made by Parliament for the regulation and development of interstate rivers to the extent the control of the Union is declared by Parliament by law to be expedient in public interest (list I entry 56). This means that Parliament can make a law taking over the regulation, development and management of an interstate river for the common benefit of the States in national interest. The prevailing condition of national river Ganga warrants the immediate attention of law-makers for such a law.

For enacting the proposed law, it is important to locate subject matters in List II which may be seen as being in conflict with entry 56 of list I. Article 246 (1) confers exclusive jurisdiction on the entre of enact laws on subject matters enlisted in List I, whereas clause 2 of Article 246 grants such exclusivity to the States to enact law on subject matters enlisted in List II. Now Entry 56 List I provides for "regulation and development of inter-State river and river valleys to the extent to which such regulation and development under the control of Union is declared by Parliament by law to be expedient in

the public interest." Thus, the matter of regulation and development of interstate rivers may not be in conflict with the legislative power of the state as the law refrains from impinging on matters within the competence of state legislatures.

The provisions of various existing legislation (enacted by the Union and the States) indirectly affecting rivers and river basins relate to subject on water, sanitation, irrigation, agriculture, pollution, fishing, ecology and biodiversity, environment, etc. Under most of these legislations, Authorities perform the necessary functions stated under the law, but interestingly no authorities are entitled to play a role in prevention of river pollution. In fact, no concerted effort has been made till date on the legislative front against exploitation of river in various ways. Many issued concerning river management do not fall within the present legislative frame, such as maintenance of environmental flows, protection of a river basin's ecology and biodiversity, maintenance of ground water table, consolidated plans for diversions of river waters in different stretches, discharge of sewage, obstructions to river flows and loss of connectivity, use of floodplains and active floodplains, etc. It desirable, therefore, to adopt an integrated river basin management plan approach that focuses on maintenance and restoration of wholesomeness of river of the Ganga basin. Accordingly, the proposed Ganga River Basin Management Act should aim to prohibit and regulate activities that affect the wholesomeness of river, and establish authorities or institutions to regulate the activities thereon."

7.15 **Presence of Arsenic in river Ganga:** The Secretary, MoEF&CC during the evidence held on 29.05.2015 admitted that the entire stretch of Ganga from Kanpur to Bangladesh is completely polluted by arsenic.

During evidence the Committee desired to know the source of arsenic in Ganga basin and results of scientific study, if any. An expert Prof. Vinod Tare stated as under:

"To the best of my understanding, arsenic is a part of sediment in the entire basin of the Ganga and when we change the environment there, it gets anoxic being it an oxygenated area when waste is dumped there from above. Arsenic is seated silently there is anoxic condition and it gets redcued and after being redcued its mobility enhances, creeps in water and water keeps on flowing. [---]

It is proven that arsenic is more or less part of sediments. It is a part of entire alluvial portion of Ganga basin."

7.16 He further added:

"You will find it only in ground water and generally in a little deeper water. xxxxxxxx the concern is obviously geomorphic but the geomorphic processes get enhanced by anthropogenic actions. This is what I tried to put. When you said the effluent actually changes the geochemistry, it gets into water because of anthropogenic actions. That is the point. We would be able to give some evidence."

7.17 The M/o WR,RD & GR were asked to furnish the information on the following :

(i) has any research been done by Council for Scientific and Industrial Research (CSIR) / Indian Council of Medical Research (ICMR) to identify the areas affected by arsenic contamination in the entire stretch of river Ganga

(ii) has any study been conducted on the mutual correlation and inter dependence between ground water level and river flow and the impact, if any, of polluted rivers on the ground water and the decadal data in support thereof ot data for the last thirty years.

(iii) whether any study has been done to find out the sources of arsenic , the reasons (geomorphicand homomorphic) and the steps required to teb atken to tackle the arsenic problem.

The Ministry could not furnish the reply despite getting several extensions.

7.18 The ministry were requested to furnish as to whether any study on the possible linkage or otherwise between urbanization and lehal &widespread arsenic problem in the Ganga basin or elsewhere especially in the light of the fact that 7 crore peole are adversely affected in the Ganga basin alone apart from affecteing the entire food chain ,drinking water and fisheries. However, the Ministry are yet to respond to the point despite several extensions granted.

7.19 **Ecological Battalions:- Daily News and Analysis**: The print media (DNA dated 9 July, 2015) reported that that the Government of India proposes to raise three ecological battalions *inter alia* to clean the Ganga at designated places. Furnishing the veracity of the contents of the afore mentioned press report, the M/o WR, RD&GR submitted as under:

> (i) As a part of Namami Gange programme, Eco Task force has been proposed. Following activities have been taken up -
>
> - Raising of 4 Battalions for Namami Gange Program of Ganga Task Force(GTF) has been approved in principle by Ministry of Defence vide letter dated 12th December 2014.
>
> - Initially, for a year, one existing Battalion with three companies to be posted in Kanpur, Allahabad and Varanasi. Letter of commitment given by NMCG vide letter dated 8th July 2015
>
> (ii) Mandate of the GTF is to carry afforestation, Pollution watch and Public awareness.
>
> Fund requirement for raising and recurring expenditure have been approved on 13th May 2015 in Cabinet approval of Namami Gange Program."

7.20 **Adequacy or otherwise of Enforcement Provisions**: Asked to apprise the Committee about the difficulties faced, if any, in controlling the pollution in rivers, the Secretary, MOEF&CC testified;

> "one is the existing law of pollution control, whether it is water Act or the Air Act or Environment Protection Act, one of the features of these acts is that the enforcement provisions are a little weak. In the case of polluting industries or polluting entities or those who violate the norms, there is a provision for prosecution, there is a provision for closure and there is a provision of penalty which can be imposed after prosecution.

7.21 The Secretary further submitted:

> "One of the thinking and several suggestions which we have received are to make the penal provisions more stringent. The Ministry is working on what penal provisions can be provided for and what should be the enforcement mechanism for those penal provisions, whether it is necessary to only deal

with these offences by criminalising these offences or there should be very stringent financial penalty on violators. This is an area which we are working on."

7.22 In reply to a query the Ministry M/o WR, RD &GR referred to the Acts of Parliament dealing with all kinds of pollutions;

"The Water (Prevention of Control Pollution) Act, 1974 and the Air (Prevention of Control Pollution) Act 1981 and the Environment (Protection) (EP) Act, 1986 have adequate provisions to deal with industrial pollution control. The Water and Air Act empowered State Pollution Control Boards to take the actions against erring industries which includes closure of their production processes by stopping of electricity and water supply. The Central Pollution Control Board have been delegated with the powers under Section 5 of the Environment (Protection) Act for prohibiting industries for operation if they found violating the stipulated standards. Processes have been laid down for their sample collection and analysis to verify complete stipulated standards.

7.23 The Minsitry further submitted that:

"The industries are granted with the consent to operate which is governed strictly by the standards notified under the (EP) Act. Every State Pollution Control Board is mandated with responsibility to ensure compliance by the industries and this required to be done by devising monitoring mechanism. However, with regard to imposition of financial penalties, under the existing status and to be determined by the courts. It is contemplated in the amendment to empower regulating authority to impose financial penalty also. Imposition of penalty would be governed by laying down appropriate norms and eliminating any subjectivity."

Ganga Knowledge Centre

7.24 The works sanctioned under NGRBA programme include setting up of Ganga Knowledge Centre. However, the details were yet to be furnished to the Committee.

OBSERVATIONS & RECOMMENDATIONS

1. Introductory : The Committee note that two main source tributaries, the Bhagirathi, originating from the Gangotri Glacier at "Gaumukh", and the Alaknanda, originating from the Satopanth glacier in the Himalayas confluence at Devprayag in Uttarakhand and form the Ganga. The Ganga, covering a length of 2525 km, traverses through the States of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal passing through 918 towns and 1649 Gram Panchayats taking the pollutants of all human settlements and 144 drains. The Yamuna is the largest tributary of the Ganga in terms of drainage area and accounts for 46% of the Ganga basin. The Ganga river basin inclusive of its all tributaries, is the largest river basin in India covering a landmass of 8,61,404 sq. km and sustaining 43 per cent of India's population, besides being the river of eternal faith from time immemorial for the people. Apart from providing water for drinking and irrigation, it has had great environmental, economic, cultural and religious significance for its water quality hailed as ambrosia and life sustainer. 'The story of the Ganga, from her source to sea, from old times to new', is indeed 'the story of India's Civilization'. However, with the growing uncontrolled urbanization, lopsided industrialization, environmental degradation, over drawl of water from the river and draining of polluting domestic sewage, dangerous industrial effluents and other hazardous anthropogenic interventions have rendered the Ganga as one of the top ten most polluted rivers of the world fuelling the apprehension that if urgent and strong prophylactic and preventive measures are not taken, it may become a dry-dead river in times not very far off.

The Committee also note that concerned about the health of the river, the Government of India launched, Ganga Action Plan I (GAP I) in 1985. To make up the shortcomings of GAP I, GAP II was launched in 1993, together incurring an expenditure of ₹ 4168 crore. Seriously concerned over the burgeoning pollution levels, Government of India set up the NGRBA in 2009 for conservation of the Ganga and for maintenance of environmental flows through a comprehensive river basin approach, which again proved far from adequate. The Government of India therefore constituted an Integrated Ganga

Conservation Mission, called the Namami Gange in 2014 with the resolute will to arrest the pollutants entering into the Ganga with component programmes of rehabilitation and upgradation of the existing STPs and interception and diversion of the drains falling into the river. The flagship programme, Namami Gange was approved on May 13, 2015 with a budget of ₹ 20,000 crores for the next 5 years, a significant four-fold increase compared to the entire expenditure of ₹ 4168 crore right from the launching of GAP I in 1985. The Namami Gange Programme, with a multi-layered and multi-Ministerial monitoring mechanism, is a convergence of all existing schemes and new interventions and includes its all tributaries including the Yamuna for Ganga rejuvenation. The repeated assertion of the Government to rejuvenate the Ganga by July, 2018*, gives a message of hope. The Committee now proceed with examination of the ongoing programmes and interventions to rejuvenate the Ganga.

2. Creation of an overarching and empowered authority for Ganga rejuvenation: The representative of Ministry of Environment, Forests and Climate Change (MoEF&CC) admitted that pollution load in river Ganga has been increasing over the years due to rapid urbanization , industrialization and increase in population. Extraction of water for irrigation, industrial, drinking purpose, etc. leading to inadequate flows is further compounding the problem. There is huge gap in sewage treatment capacity not only on the Ganga main stem but also in the entire Ganga basin covering 11 states. The total estimated sewage generation in five states (Uttarakhand, Uttara Pradesh, Bihar, Jharkhand and West Bengal) on the Ganga main stem is 7301 Million Liters Per day (MLD) where as the available treatment capacity is only 2126 MLD. Treatment capacity of 1188 MLD is under construction or at approval stage, leaving a gap of 3987 MLD. The consortium of Seven IITs which prepared Ganga River basin management Plan estimated that total sewage generation of 11 states is 12051 MLD as against the available treatment capacity of 5717 MLD leaving a gap of 6334 MLD. There are 764 GPIs such as tanneries, pulp & paper, sugar , textiles, chemicals, etc, generating 501 MLD of waste water, substantial part of which is being allowed to flow

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***assurance in reply to supplementaries to SQ No. 61 in Lok Sabha on 28.04.2016**

into the Ganga untreated. Eleven Ganga Basin states account for 45 % of the total chemical fertilizer consumption amounting to 10 million tons per year. Such high consumption leads to disposal of high levels of nitrogen and phosphorus which eventually drains into surface and subsurface water which is part of the Ganga river system. As per estimates, run off from arable lands contains up to 70mg/l of nitrogen and phosphorus ranging from .05-1.1 mg/l, with potential to raise the nutrient level to a considerable degree in stream waters. As per 2011 census, 33.64 Lacs households in the five main states do not have an access to toilet facilities and out of these 28.91 Lacs households defecate openly and 4.72 have an access to community toilets. In addition, an estimated 14,000 metric tons per day of Municipal Solid Waste generated from Class-I and Class-II cities/towns situated on the main stem of Ganga out of which substantial part was being dumped into the Ganga until the recent past.

Deeply concerned and worried that the Ganga has become one of the top ten most polluted reivers of the world owing to uncontrolled urbanisation, lopsided industrialisation over drawl of water from the river and discharge of extremely hazardous industrial pollutants and domestic sewage, alrmed due to the incalculable damage being caused to the 'Nirmalta' and 'Aviralta' of the river; taking note of the multiplicity of authorities both at the Union and States level, and having regard to lack of effective synergy between the stakeholders, the Committee recommend that an overarching and fully empowered authority, comprising of the representatives of all the concerned Union Ministries and State Governments be set up for securing the 'nirmalta' and 'aviralta' of the Ganga by July 2018. The Committee are quite sanguine that as assured by the Minister for WR, RD&GR in Parliament and solemnly affirmed by the Prime Minister, the Ganga will be reguvenated and restored to its prestine form by July 2018.

*** assurance in reply to supplementaries to SQ No. 61 in Lok Sabha on 28.04.2016**

3. Consultation with States about mode of execution and speedy approvals: The Committee observe that the objective of 'Namami Gange' Programme is to arrest the pollution entering into and to rejuvenate the Ganga. In order to achieve the objective, the programme proposes to undertake activities such as rehabilitation and upgradation of existing STPs; Interception & Diversion of all 114 drains falling into the river through 5 basin states (Uttarakhand, Uttar Pradesh, Bihar, Jharkhand & West Bengal) and creation of additional treatment capacity. The Committee also note that the programme will be executed in accordance with NGRBA Programme Framework through (a) the States in conventional mode, *i.e.* in the implementation arrangement (with current and other appropriate implementing agencies) and/or (b) PPP mode and/or (c) SPV mode (with up to 100 percent capital infusion by Government) and/or (d) Central Public Sector Undertakings/ Central Government Departments and/or (e) Academic Institutes / Research Institutes / Autonomous Bodies or any other appropriate mode for executing the activities of this proposal. On being enquired by the Committee, the State Government of Uttar Pradesh, vide their letter dated 26.11.2015, referring to their 23 project proposals sent to the 'National Mission for Clean Ganga' (NMCG), submitted that the proposals which have been sent to the GoI were yet to be approved even after a lapse of six months. The State government apprehended that Government of India was planning to implement these projects through PPP Mode which seems to be a remote possibility in the State of Uttar Pradesh. Further, State Government felt that abatement of pollution in river Ganga can be achieved with implementation of upgraded parameters for treatment of sewage schemes i.e. including sewage network in all main towns and with simultaneous upgradation of existing sewage treatment units under 'Namami Gange'.

The Committee are concerned to note that State Governments' views have, apparently, not been taken into consideration before finalizing the mode of execution of sewage projects under 'Namami Gange' as one of the major states (Uttar Pradesh) is not in favour of execution of the projects through PPP Mode. Since the rehabilitation, upgradation and construction of additional

sewage treatment projects under 'Namami Gange' is a time bound programme, and the Ganga has to be rejuvinated by July 2018, the Committee recommend that the views of the state Governments may be taken on board before deciding on the mode of execution of a sewage treatment project with the sole objective of commissioning of the projects as expeditiously as possible. Further, the proposals submitted by the State Governments may be approved with due dispatch and without further loss of time. Besides, simultaneous upgradation of the existing sewage works and provision of comprehensive sewage schemes including sewage networks in all major towns may be given urgent consideration by the Government of India and urgent and necessary policy corrections made under intimation to the Committee within six months of presentation of this report to the House.

4. Delay in setting up STPs : The Committee observe that the setting up of STPs at Badrinath and Karanprayag with a capacity of 3.0 and 1.4 MLD was sanctioned on 22.08.2008 and 24.12.2008 with an outlay of ₹4.62 and ₹3.49 crore respectively. However, construction of the same could not be commenced and not even a single rupee was spent even after a lapse of about seven years reportedly due to adverse weather conditions, natural disasters, dispute over lands, etc. Similarly, the projects for I&D of the sewage at Badrinath, Deoprayag, Karanprayag, Rudraparyag, Joshimath, were sanctioned in 2008/ 2009 /2010, the physical progress of these projects range from 13 - 40% only even after about 7 years due to delay in obtaining permission from the Border Road Organization (BRO), natural calamities, delay in land acquisition, etc. Even EAP such as JICA assisted Ganga Action Plan Phase - II project at Varanasi, witnessed massive delays. The project, though sanctioned on 14.07.2010, could not be completed even after about five years. Surprisingly, the physical progress of the project was 22 % only as at the end June, 2015 and no further progress was reported to the Committee. Similarly, the project - Sewage System & STP Works (Phase-II) at Kannauj, though sanctioned on 24.02.2011 , has seen physical progress of 22% only even after four years. Asked to furnish the reasons for the extremely tardy progress of these projects, the

Ministry of Water Resources, River Development & Ganga Rejuvenation, merely stated that original date of completion of JICA assisted Varanasi project and the sewerage system & STP works at Kannauj were 31.07.2015 and 31.03.2016 respectively and the cost escalation, if any, due to delay would be borne by the Government of Uttar Pradesh without intimating the Committee about the latest progress in the matter. Further, the projects for Sewer network, Sewage Pumping stations (SPS) and STP, funded by World Bank, at Begusarai, Buxar, Hajipur, Munger despite getting the sanction in 2010 as EAPs, could not be completed even after 5 years. Disturbingly, the physical progress of the projects range from 21-45%. Despite such a slow progress, the M/o WR, RD &GR assured that these projects are likely to be completed during 2015-16 and 2016-17. The ministry attributed the delays due to delays in land acquisition, court cases, introduction of new land acquisition bill and thereby changes of compensation eligibility of land owners, etc. The additional cost, if any, due to delay would be borne by the State Government.

The Committee note that without assessing the ground realities in acquiring the land for setting up of sewerage projects, sanctions/ approvals were given and funds allocated and allowed to lapse. Unfortunately, this is not confined to one / two projects but across the states such as Bihar, Uttar Pradesh and Uttarakhand. The Committee are deeply concerned to note that for want of approval from BRO, a sewer project got delayed badly. Such avoidable delays, the Committee believe, are due to absence of close coordination in keeping with the salutary principle of cooperative federalism and want of regular interventions by the authorities concerned. Undoubtedly, had there been effective coordination and synergy between the multiple authorities, delays in completion of the projects could have been avoided or overcome. Further, the committee were informed that many projects are scheduled to be completed / to have been completed during 2015-16. The Committee would like to be apprised of the status of these projects within next six months, State-wise, STP wise indicating clearly the cost and time overruns alongwith

the reasons for delays, the revised timelines for their completion and the authorities which would bear such escalated costs.

5. **Cost escalation in setting up STPs** : The Committee deplore that unconscionable inordinate delays in completion of the sewer projects resulted in continued emptying of untreated hazardous sewer into river Ganga. Further, the cost of the projects might have gone up manifold increasing the financial burden of the states already reeling under financial crunch. For instance, the State Government of Uttar Pradesh informed the Committee that implementing body (UP Jal Nigam) is already facing financial stress. Hence, the Committee are of the considered view that states may not be able to meet the cost of escalation of the projects thereby casting shadow on the completion of these projects. Some of these ongoing works fall under Component 'A' of the 'Namami Gange Programme' and are funded as Central Sector Scheme with contribution of GoI and States in the ratio of 70:30. **The Committee note that in order to ensure that the 'nirmalta' and the 'nirantarta' or 'aviralta' of the Ganga is attained by July, 2018, the GoI have made the Ganga Rejuvenation a Hundred Percent Central Sector Scheme as stated in reply to a supplymentary to SQ.No. 61 in Lok Sabha on 28.04.2016. The Committee, therefore, recommend that M/o WR,RD&GR may explore the possibility of treating the uncompleted projects as new initiatives and fund them entirely as Central Sector scheme under component 'B' of the 'Namami Gange' for the success of the Programme. Further, the Committee would like to be apprised of the expenditure incurred so far and to be incurred year-wise and State-wise during the years 2015-16, 2016-17 and 2017-20 (December).**

6. **Gap between installed and actual utilization capacity of STPs** : **The Committee observe that in the state of West Bengal STPs were set up at 31 locations in the cities/ towns situated along the River Ganga with a capacity to treat 355 Million Liters per day (MLD) under Ganga Action Plan-I&II. Out of these 31 STPs, two STPs with a capacity of 11.86 MLD are operating at 100%, 13 are operating at 50%, 4 are operating at less than 50% of the installed capacity. Five STPs are not commissioned at all and one STP has stopped functioning. As a result, out of 355MLD installed treatment capacity, operational / working capacity is 166 MLD (approx). In other words, the operational capacity is less than 50% of the installed capacity. The inescapable conclusion is that more than 50% of sewage, which the STPs are supposed to treat, is being allowed to flow into Ganga due to less than optimal functioning of these STPs. Similarly, in Bihar, the five STPs established at Beur, Saidpur, Pahari, Karmalichak and Bhagalpur under GAP I &II with an installed capacity of 120 MLD are operating at 65MLD (approx 50%) of the installed capacity. The Central Pollution Control Board carried out third party assessment of 51 STPs sanctioned by Ministry of Environment, Forests and Climate Change (MoEF&CC) in Uttarakhand, Uttar Pradesh, Bihar and West Bengal. The Committee note that the assessment by CPCB revealed that (i) as against the installed capacity of 1009 MLD, the actual capacity utilization is 602 MLD which is 59%, (ii) STPs are violating BOD parameters, 1 STP exceeded the COD for discharge and 14 STPs are found non operational. Surprisingly, the assessment is conspicuously silent as to the reasons for substantial underutilization of installed capacities, exceeding the COD and BOD limits and non operationalisation of 14 STPs. The Committee therefore, recommend that the specific reasons for sub optimal performance of these STPs may be ascertained and the problems rectified and the action taken in this regard may be intimated to the Committee within six months of the presentation of this Report.**

7. Optimum operation of STPs: **The Committee note that due to huge gap between the installed capacity and actual sub-optimal operation of the STPs in the riparian states of the Ganga, the quantum of sewage which the STPs are supposed to have treated, is being allowed to flow into river Ganga untreated. Further, the constantly increasing demographic pressure and expanding, industrial and commercial activities continue to exacerbate the pollution levels as more sewage is allowed to be emptied into the river Ganga untreated. Taking note of the huge gap between the installed capacity and actual operational capacities of the STPs and deeply concerned over the aggravated pollution levels and the shrinking of the river, the Committee recommend that:-**

(i) **specific reasons may be ascertained for the STPs operating at sub optimal capacities and since how long STP-wise and State-wise and the measures being taken to bridge the gaps;**

(ii) **responsibility be fixed for sub-optimal utilisation of STPs;**

(iii) **the capacities of existing STPs, SPSs and sewage networks may be suitably enhanced or new ones set up to cater to the increasing demographic pressure, expanding urbanisation, industrialisation and the shrinking river with a clear perspective plan for next two decades.**

(iv) **the approximate fund requirement to make the STPs operational at optimal levels and to set up new ones be worked out taking into account the rising pollution of at least for next two decades; and**

(v) **penalties be imposed for violating the COD and BOD limits by the polluting industries/cities.**

The Committee should like to be apprised of the tangible action taken in the matter within six months of the presentation of this Report.

8. **Setting up of STPs in all 118 towns, periodic testing of treated water and setting up of river hydrology institute**: The Committee note that Government have planned that the work of sewage treatment facilities in all 118 towns on the main stem of the Ganga will be tendered by June, 2016 and completed by 2019. It was also submitted that DPRs will be prepared for all the 118 priority towns by December, 2015. During field visit, it was brought to the notice of the Committee that there is a serious apprehension about the quality of agricultural products from the fields irrigated by treated industrial waste water. There have also been reports of the people in certain areas of the riparian States prone to specific life-threatening diseases. The experts who deposed before the Committee also underlined the need for setting up institutions of river hydrology and dynamics. **Taking note of the fact that the work of sewage treatment facilities in 118 towns on the main stamp of the Ganga are to be tendered by June 2016 and completed by 2019 and having regard to the assurance of the Minister for WR, RD&GR, the Commitee would like the work of construciton of sewage treatment projects to be expedited well before the deadline of June 2018. The Committee also recommend that the treated waste water be tested periodically so as to allay the fear of farmers and citizens about the fitness of the treated water for agricultural uses. The results of such tests should be available in public domain. Further, taking cognizance of the fact that there is no exclusive institution for river hydrology and river dynamics in the country, the Committee recommend that a national institute of hydrology be set up in the Ganga basin and the works being done in this regard in BHU and the Mahamana Institute of river hydrology, may be replicated or suitably financed by the Government to help understand river anatomy, river morphology, dynamics, biota and other**

allied aspects for speedy rejuvenation of the Ganga and other rivers of the country.

9. **STPs in Bihar** : The Committee note that CPCB assessment shows that there are 5 STPs in Bihar with an installed capacity of 140 Million Liters Per Day (MLD) and the actual utilization is 100 MLDs. However, the data furnished by the M/o WR,RD &GR on the status of STPs established under GAP I&II (Annexure-VII) shows that there are five STPs in Bihar with installed capacity of 120MLD only as against 140MLD stated by CPCB in their assessment. **The Committee, therefore, ask the MOEF&CC and M/o WR, RD and GR to reconcile the data and furnish the same to the Committee along with reasons for such discrepancies and the mechanism established to obviate such statistical mismatches which are critical to formulation of pollution control strategy.**

10. **O&M of STPs** : Many leading hydrologists and other domain experts, who tendered their valuable testimony to Committee, felt that the reasons for sub optimal performance of STPs and Sewage Pumping Stations (SPS) include non availability of funds for Operations & Maintenance (O&M) of sewerage works, Poor supply of electricity, unavailability of technical course material and lack of motivation for O&M staff. Further, the experts informed that postings to O&M plants are seen as punishment. They also admitted that there was dearth of funds for O&M of assets created for pollution control works. **The representatives of MoEF&CC conceded shortages of manpower and their inability to attract qualified human resource despite advertisement of the posts due to unattractive pay packages. Since, the O&M services are crucial for ensuring optimal performance of STPs and SPSs, the Committee recommend that -**

(i) **suitable provisions may be made to ensure that it is legally binding on the distributor of electricity to supply uninterrupted supply of electricity to STPs;**

(ii) **alternative energy options, such as wind and solar, may be explored for running STPs especially in those areas where there are frequent outages;**

(iii) **selected parameters need to be monitored through automatic monitoring instruments. Such instruments can be online to enable round the clock monitoring;**

(iv) **funds crunch should not be allowed to come in the way of O&M of sewage works; and**

(v) **to perk up the morale of O&M staff and officers and to attract new recruits to the posts, suitable attractive pay structure and adequate posts may be created for running the STPs effeciently and round the clock.**

11. **Ideal location for STPs** :The experts who deposed before the Committee suggested that STPs must be located on the sand bed site of the river only as this is the only site where inorganic, organic, & microbiological loads will be managed integrally at minimum cost on sustainable basis. The potential of the sand bed must be assessed taking example of Ganga Yamuna confluence site at Allahabad, where during the Kumbh Mela, pollutant load of more than 10 million people at a time is managed by the sand bed. **Taking note of the fact that sand is the nucleus of geology, the Committee recommend that due consideration be given to the location and use of sand beds in setting up of the STPs. The Committee further recommend that the feasibility of involving the corporate sector in setting up, operating and maintaining the sewage treatments plants and sewage networks on long term basis may also be**

explored so as to bring greater professionalism and efficiency to the working of STPs.

12. Lack of scientific and technical resources: **The Committee note that the responsibility of Operations & Maintenance (O&M)of Sewerage works set up in connection with Ganga Rejuvenation rests with the state Governments. The Government of Uttar Pradesh admitted that there was contamination of water bodies and that there was an urgent need for setting up state-of-the-art STPs and labs. The Committee also observe that the number of sanctioned posts for technical and scientific personnel are lying vacant in Central Pollution Control Board. Asked about the environmental research being carried out by the universities in the context of depleting sub-surface and surface water resources, rising pollutants and contamination of water bodies, the Secretary, Environment observed that the Committee had 'hit the nail on the head' and conceded the need for such studies given the 'enlarging responsibility' of the MoEF&CC. The Committee further note that MoEF&CC requested the Department of Expenditure for carrying out a study to assess the adequacy or otherwise of the extant manpower of CPCB in view of its enlarging responsibilities. The Committee were also apprised that despite advertisements for filling up of the posts in CPCB, there is no enthusiastic response probably due to the reason that the posts are far from attractive for the talents required for recruitment.**

The Committee expresses their serious concern over lack of sufficient technical and scientific manpower in the Central Pollution Control Board and in the State Pollution Control Boards entrusted with the responsibility of pollution control, water quality testing, etc. Further, it is still a matter of far greater worry and concern that the posts are lying vacant as the talent sought to be recruited find the pay and perquisites attached to the posts far from attractive. Considering the level of rising pollution and contamination of water bodies and the need for setting up state-of-the-art STPs and labs, the Committee recommend that -

(a) **the parameters and pay and perks for the manpower especially technical for STPs and Labs may be revisited to attract right talents;**

(b) **the Department of Expenditure should expedite the study to assess the manpower requirements of CPCB in view of its enlarging responsibilities and complete the same with in specified time and conclusive action be taken for filling up the posts without delay;**

(c) **suitable measures may be taken to ensure availability of appropriately qualified and suitably trained manpower in requisite numbers for surveys and investigation, project preparation, implementation, Operation and Maintenance(O&M) of sewerage works, financial, organisational, legal, regulatory implementation and monitoring strategies of the projects; and**

(d) **the parameters so established may also be shared with the States so that the SPCB also benefit from the action taken by the Union Government.**

13. Timeline for securing ZLD by industrial units : The Committee observe that apart from 144 drains spread across Uttarakhand, Uttar Pradesh, Bihar and West Bengal discharging 6614 Million Liters Per Day (MLD) of waste water into river Ganga, there are 13 drains discharging 853 MLD of waste water into tributaries of river Ganga viz. Ramganga and Kali –East. Further, hundreds of Pulp & Paper industries, distilleries, Sugar, textile plants and tanneries are emptying untreated industrial effluents into Ganga. The Committee are deeply concerned to note that 440 tanneries operating in the main stem of Ganga are discharging about 22 MLD of waste water, containing toxic chemical like Chromium (Cr6+), associated with birth defects, and carcinogenic into the river Ganga.

As a part of the drive to identify the industries discharging untreated industrial effluents in the Ganga, the Committee observe that under NGRBA programme, 764 GPIs have been identified and the Central Pollution Control Board has completed one round of inspections of 704 industries and has issued suitable directions. Reportedly, action has been taken against 165 non-complying industries under The Water (Prevention & Control of Pollution) Act, 1974 and The Environment (Protection) Act, 1986. Closure notices have been issued to 48 GPIs. Further, the Committee note that CPCB has issued direction to all the 11 basin SPCBs on 5th February, 2014 to ensure that the GPIs install real-time effluent monitoring system for effective compliance through self-regulatory mechanism before discharging effluents outside their premises.

The MoEF&CC in their presentation to the Committee submitted that distilleries and textile units discharging untreated effluents into river Ganga will be made Zero Liquid Discharge (ZLD) units by September and December, 2016 respectively. However, furnishing a different set of targeted dates for the same purpose, M/o WR, RD and GR in a written reply submitted that distilleries and textile units will be made ZLD units by March, 2016 and March, 2017 respectively. Similarly, as per the action plan furnished by MoEF&CC, tanneries are proposed to be made ZLD units within 2 years from DPR preparation (July, 2015) which is different from the targeted date (March, 2017) furnished by M/o WR,RD &GR. In respect of polluting pulp and paper units both the Ministries stated that by March, 2017 these will be made ZLD units.

The Committee also observe that the work on making the polluting units ZLD units is in incipient stage as the Ministries are still considering and evaluating the proposals received for CETPs and identifying the institutes for preparing DPRs for the purpose. Further, to minimize the water consumption and waste water discharge from the Pulp and Paper sector and to make them ZLD units , CPCB is still in the process of developing protocols in consultation with technical experts. The Committee find the deadlines prescribed for the grossly polluting units to become ZLD units rather unrealistic and far from practical. The Committee, therefore recommend that -

(i) **both the Ministries of EF&CC & WR, RD & GR should jointly have a relook at the targets set for completion of the said works and ensure that both the industries become ZLD by March, 2017; and**

(ii) **The evaluation of the projects be done on regular basis and position of the review reflected in the Report of the Ministry laid in Parliament annually.**

The Committee be apprised of the actual progress of the projects within six months of submission of this report to Parliament.

14. **Incentives to Small Scale Industries for ZLD :** The Committee observe that many of the GPIs are small scale in nature but employing substantial number of people put together. The government is yet to dispel the apprehension that these units may be using obsolete technology in their production processes which may not be treating the effluents resulting in their being discharged into the river Ganga or its tributaries. **The Committee are apprehensive that if hefty penalties are imposed on these small scale units or the units are closed down, many people will lose their employment and source of livelihood. The Committee therefore recommend that-**

(i) **tax and non tax incentives may be offered to the units which are adopting new technologies with considerable amount of investments to become Zero Liquid Discharge (ZLD) units;**

(ii) **the availability of easy finance may be ensured at affordable rates from the banks and or Interest Subvention and Viability Gap Funding (VGF) may be given expeditiously; and**

(iii) **these units may be provided technical knowhow from Government owned academic and research institutes at subsidised rates so that they become ZLDs.**

15. **Funding of STPs and O&Ms**: The Committee note that sewage infrastructure projects such as STPs, I&D, sewage pumping stations, etc., are awarded on the basis of competitive tenders under 'Namame Gange' programme. However, as stated by Government of Bihar, the Union Government provides funds for these projects on the basis of project approval cost. Further, the Committee note that U.P. Jal Niagam, the Implementing Agency for all pollution control works on behalf of Urban Local Bodies in U.P. do not have sufficient funds for Operation & Maintenance (O&M) of pollution control works. Similarly, the Government of Bihar stated that purchase of land for STPs and other sewage infrastructure works is creating a heavy burden on the state Government. **Since the STPs and I&D projects are awarded on the basis of open competitive biddings, the Committee recommend that the project proposals may be considered based on tendering cost by the Government of India. As any delay in creating required sewage infrastructure will result in delay in completion of 'Namami Gange Programme', the Committee recommend that suitable remedial action may be taken by the Government of India to address the financial constraints faced by the state Governments concerned at the earliest so that the laudable objective of the 'Namami Gange Programme are attained within the stipulated timeline, that is by July 2018.**

16. **Great rural-urban water divide and the need for biodigesters** : The Committee note the testimony of experts that the toilets being built under Swachh/Nirmal Bharat Abhiyan are not being used by the beneficiaries as they lack privacy, comfort and generate stinking smell forcing the family members to defecate in the open fields thereby defeating the very purpose of provision of the toilets at their homes. Further, lack of availability of water in sufficient quantities also seems to be one of the reasons for their abandoning the toilets at home and opting for open field defecations. The Committee were informed of the availability of biodigester toilets which are environmental friendly, long lasting, maintenance free and low cost. The experts who testified before the Committee suggested for provision of biodigester toilets in the towns /villages along the river Ganga to

ensure that the people in these areas do not defecate in the open and thereby save Ganga from pollution. Further and notably, as admitted by the experts, the human excreta if thrown in the soil it becomes manure and if discharged in water it poisons the water. Toilets need more water to flush the excreta and the flushed excreta pollutes the water in a big way and it involves a huge and recurring cost to convert the polluted water into pure or semi-pure water. Further, mass scale urbanization in the name of modernization has brought its own attendant problems which are likely to assume yawning proportions in the next few years as India may become water scarce country. The nation can ill-afford the luxury of water import, water being heavier than crude oil. The pace of uncontrolled urbanization has already created a situation where some people, especially poor people and rural folks do not get drinking water whereas people living in luxurious urban houses use excessive water for flushing, eventually contaminating the water bodies where it is discharged. Such a differential treatment and deprivation in the name of urbanization and modernization is not acceptable. .

Bearing in mind the expert testimony that human excreta if burried in soil, converts into manure and if discharged in the water poisons the water; taking note of the fact that toilets need water to flush and the flushed excreta pollutes the water in a bigway and considering the fact that it involves huge recurring cost to convert the polluted water into pure or semi-pure water and mindful of the alarming rural-urban disparity in water supply, the Committee recommend that suitable provision may be incorporated under 'Namami Gange' to provide biodigester toilets in all the villages and towns on the banks of Ganga and its tributaries in a time bound manner. Further, futuristic technologies be developed which can process all waste on site within hours at the household, colony, village levels with a view to eliminate or minimize the need for laying expensive trunk lines, STPs, and other cost prohibitive pollution control infrastructure. The Committee should like to be apprised of the outcome within six months of the presentation of this Report.

17. Use of bio-fertilizers, organic and less water consuming crops : The Committee note that conventional irrigation techniques need huge amount of water, much of which is lost to evaporation, causing over extraction of the water needed to sustain life elsewhere. The representatives of the Government also conceded that the runoff from chemical pesticides and fertilizers into rivers /aquifers is exceedingly detrimental to human health and to the already threatened eco system. **The Committee, therefore, recommend that:**

(i) **farmers may be encouraged to avoid cultivation of water guzzling variety of crops and incentivized to switch over to less water intensive methods of irrigation and less water consuming crops;**

(ii) **the farmers may be encouraged and incentivised by the M/o Agriculture and state governments for erecting dikes so that rain water is conserved in the fields;**

(iii) **optimal use of fertilizers and pesticides should be promoted by M/o Agriculture in consultation with tthe ICAR and excessive use avoided;**

(iv) **irrigation subsidies may be gradually eliminated to prevent use of water intensive agricultural practices and water saving techniques such as drip irrigation, etc be propagated and incentivised;**

(v) **organic and less water consuming crops should be propagated and grown in order to help ensure that more water is left in the Ganga and other key aquifers;**

(vi) **all farms located within specific distance of the Ganga and other important aquifers should become mandated organic farming zones. Producers should be incentivized suitably and also be educated about the advantages of organic farming in the long run;**

(vii) **special subsidies, lending assistance and help in securing access to markets, domestic and foreign, which have special interest in organic goods may be given to the farmers who switch over to organic farming and use drip irrigation or similar non water intensive irrigation technology; and**

(viii) **the benefits of organic fertilizers and the incentives being given to organic agriculture be effectively publicised so that farmers turn to organic agriculture in a big way.**

18. **Cost Effective Solid Waste Management and donations for Ganga cleaning**: The Committee note that effective solid waste management is becoming a stupendously challenging task in cities and towns. The Solid Waste, if not disposed of and treated properly, enters the water bodies and the rivers. There is, therefore, a paramount need for segregating the metalic, plastic and bio-degradable waste for their environment friendly disposal and re-use. The solid city waste and its harmful residue that enters the Ganga and its tributaries pollutes and chokes the rivers threatening the acquatic life. **The Committee note that solid waste management has become a stupendouly challenging task in megatowns, which for want of proper segregation and disposal, eventually enters, chokes and pollutes the rivers. The Committee, therefore, are of the considered view that treating pollution at source is a long term and enduring solution to combat and control the pollution in the Ganga. The Committee accordingly recommend that:-**

a) **segregation and proper treatment of household and institutional waste water /sewage and solid waste at source may be enforced strictly, if need be, by offering subsidy on effective waste management technology;**

b) **natural cleaning / treatment systems like bioremediation for drains flowing into rivers may also be tried out;**

c) **the crucial task of solid waste management may be taken up on Mini Mission Mode so as to ensure that rivers and water bodies do not become city waste dumping places; and**

d) **donations for the purpose of Ganga cleaning or setting up of 'Clean Ganga Fund' may be treated as permissible activity for Corporates under Corporate Social Responsibility (CSR) to ensure receipt of sizable sums for the purpose.**

Suitable action in consultation with M/o Corporate Affairs (MoCA) may be taken at the earliest and the Committee apprised.

19. **Environmental Flows**: **The Committee observe that the environmental flow is a water regime needed to maintain the ecological integrity of a river and is essential for survival of river biota from onslaught of human interference or river engineering. It helps in self purification of the river, sustains aquatic life and vegetation, recharges ground water and supports livelihood. Flows, the Committee note, are the soul of the river. A river and its biota become extinct if there is no flow, no current. Notably, as early as 1916, the Britishers were compelled by Pt. Mahamana Madan Mohan Malviya to secure release of 1000 cusec feet per second water continuously at Haridwar to ensure 'Aviral Ganga' (Annexure-XXVI). The river regime – its environment and its eco system – is solely dependent on its flow in different seasons. The Committee also observe that the concept of e-flow is still evolving and there is no universally acceptable norm for estimation of environmental flow. Different institutions / Committees have suggested different quantities of e-flows during lean and non lean seasons for river Ganga without any finality by the Government. For instance , IIT Roorkee , Wild Life Institute of India (WII), Inter Ministerial Group (IMG), Prof Ravi Chopra Committee and CWC have recommended 20%, 30%, 30%, 50 % &20 % during lean season and**

20-30%, 20%, 25%,30%&20% during non lean season respectively in river Ganga. However, neither the M/o WR, RD&GR nor the M/o Power nor M/o EFCC have specified the e-flow which is being followed currently. **The Committee are distressed to note that many species of acquatic life have vanished or are on the verge of extinction. The dolphins, turtles, trout and gold fish and other vital species have disappeared from large parts of the river due to life threatening pollution and obstruction in free aquatic movement caused by dams on the river. Notably, the dams have adversely affected the spawning in fishes of certain types leading to their disappearance. The hydrologists and experts who deposed before the Committee stressed the need for free aquatic movement as a barometer of the health of the river. The Committee, therefore, recommend that:**

(a) **e-flows be fixed for each river and for each place where dams/reservoirs/irrigation canals are built taking into consideration the mean figures of the last 50 years of the water flow during lean and non-lean season,**

(b) **the new dams be so constructed as to facilitate unhindered aquatic movement;**

(c) **the approved e-flows be measured by the CWC during lean and non-lean seasons at all stations including the places where the rivers have been dammed or where water is diverted and the reports submitted to Parliament as part of the annual report of the M/o WR, and**

(d) **a detailed report be submitted to the Committee about the presence of each reverine specie like dolphine, turtles, gold fish, trout and others every six month; and**

(e) **a third Party assessment of e-flows may also be considered periodically.**

20. Implementation and status of IMG recommendations on seven rivers : **The Committee observe that the Inter Ministerial Group (IMG) constituted in July, 2012 to study environmental flow of Ganga , noticed that the implementation of all the Hydro Electric Power Projects (HEPPs) on the Bhagirathi and Alakananda will lead to 81% of River Bhagirathi and 65% of River Alakananda getting affected with extensive implications for other needs of the society and the river itself. The expert Committee also noticed that there are a large number of projects which have very small distances between them leaving little space for river to regenerate and revive. They therefore had recommended that seven rivers, including Nayar, Bal Ganga river, Rishi Ganga, Assi Ganga, dhauli Ganga (upper reaches) , birari Gand bhyunde Ganga should be kept in pristine form, no further hydropower developments should take place in this region, and environmental Upgradation should be taken up in these basins extensively. The Committee would like to be apprised of the -**

(i) acceptance or otherwise of the IMG's recommendations by the Government of India;

(ii) specific steps taken to upgrade the environment in the said basins and the impact of these measures on the environment; and

(iii) approvals granted for hydro power projects, if any, contrary to the recommendations of IMG , along with the specific reasons for such approvals.

21. Nirmalta and Aviralta of the river: **The Committee note that in pursuance of Hon'ble Supreme Court's judgment dated 13.08.2013, MoEF&CC constituted an Expert body under the Chairmenship of Dr. Ravi Chopra, member, NGRBA and Director, Peoples' Science Institute, Dehradun (i) to make a detailed study as to whether Hydro Electric Power Projects(HEPPs), existing and under construction, , have caused environmental degradation and if so, to what extent , (ii) also whether such projects have contributed to the tragedy which occurred in the month of June, 2013 in Uttarakhand, and (iii) to examine the impact of**

the proposed 24 HEPPs on the bio diversity in Alakananda and Bhagirathi river basins as identified by Wild Life Institute of India (WII). The Committee note that having been dammed at Tehri in western Uttarakhand, the Ganga descends onto the plains, only to be robbed of its water by huge diversions through the Upper Ganga Canal at Haridwar, which reduces its discharge to mere 15 billion m^3/yr and then by the Lower Ganga Canal near Aligarh. That leaves so little water in the Ganga that the dry-season discharge at Kanpur is merely 90 to 386 m^3/ second, at Allahabad 279 to 997 m^3/ second, and at Varanasi 278 to 1160 m^3/second. Despite being joined by a number of tributaries, the Ganga is progressively polluted due to heavy discharges at the rate of 3000 million liters per day from towns and cities, despite of sewage treatment plants varying from 13.5% in small cities to 27.8 to 50.4% in big cities - 329 million kilolitres. Nearly 50% of waste waters are discharged untreated into this lifeline of the central Indo-Gangetic Plain. Over 1.3 billion litres of sewage, 260 million litres of industrial waste, runoff from 6 million tonnes of fertilizers and 9000 tonnes of pesticides used in agriculture, and very large quantities of solid waste are daily released into the Ganga. Taking into consideration these facts of pollution, the Ganga water can no longer be described as life-giving and holy. On the contrary the Ganga has been declared as one of the ten most polluted rivers of the world by WWF International, Switzerland. Notably, Secretary Water Resources candidly admitted the connect between 'nirmalta and aviralta' and stated that there could be no 'nirmalta' without 'aviralta'. Surprisingly, asked whether damming of the river would be useful for controlling pollution or it will help aggravate pollution, Secretary, Environment was not in a position to give a definitive answer as he felt that it would depend on multiple factors. Further, the Government could not furnish the decadal data of the lean and non-lean season flows in the Ganga right from 1951. The Committee are of the considered view that the Government in the CWC must collect and compile the data about the decadal flow, both of lean and non-lean period, at each station/city including the spots from where the water is diverted/impounded. To a pointed question whether the human ashes pollute the river, expert hydrologist made it

emphatically clear that the burnt human ashes instead purify the river. The Committee note that the expert body, appointed under the direction of the Hon'ble Supreme Court, has since submitted its report with regard to the impact of HEPP existing and under construction and their impact on environment including landslides and biodiversity, they would like to be informed of the action taken or proposed to be taken on each of the recommendations and the impact of acceptance & implementation on the Nirmalta and also Aviralta of the Ganga within six months of presentation of this report. Further, the Committee may be furnished the decadal data of the lean and non-lean season flows in the Ganga right from 1951 from points of origins to major towns and sites right up to Haldia.

22. Decision of Government on construction of new Dams in Uttarakhand: **The Committee take a serious note of the casual and evasive reply furnished by the M/o WR, RD &GR to the following important points contained in the memorandum submitted by the NGO Ganga Aahvan:**

(i) **acceptance *vide* the affidavit submitted to Supreme court of the findings of Ravi Chopra Committee that irredeemable damages has been caused due to dam projects in the Himalayan regions of Ganga and that dam projects were directly/indirectly responsible for the June 2013 disaster;**

(ii) **surprising change in the attitude of the MOEF&CC after filing the affidavit in December 2014. It points out the intervention of Prime Minister Office in the matter. A meeting held on 13th January, 2015 chaired by PMO chief Secretary and attended by all chief / other secretaries, Ministry of Power, Ministry of Environment, representatives of Uttarakhand Government. It goes further to say that it was decided that the Government would lobby in favor of the power projects citing energy requirement of the country as a priority, putting**

aside the aviralta-nirmalta aspect of Ganga rejuvenation, sought more time from the Hon'ble Supreme Court;

(iii) Hon'ble SC directing the Centre to decide on 6 dams (out of 24 proposed dam projects recommended for closure/cancellation by the teams of experts);

(iv) Central Government's stance was exposed on 17 February 2015, when the Attorney General's made a statement to the Hon'ble court that the Centre can go ahead with the construction of the 6 dams, quoting the findings of another 4-member committee which was constituted in the end of December 2014;

(v) Decision of the MOEF&CC forming another Expert Group (DAS-Committee) in June 2015 to explore means to give go-ahead to these E-dam projects ignoring prior studies and reports;

(vi) Committee submitting its report justifying the construction of these 6 dam projects. The Centre submitted an affidavit to the Hon'ble court in November 2015 in favor of the report and submitted that inter-ministerial group will soon decide on it; and

(vii) MOEF&CC submitted an affidavit giving the green signal for construction of dams on river Ganga in January 2016."

The Committee are anguished to note that the reply submitted by the Ministry to the Committee, simply stated that NMCG, which is mandated to fund and execute pollution abatement measures in river Ganga, does not directly deal with the issues raised in the memorandum as it is mainly concerned with the decision of the Government on construction of dams on river Ganga. Deprecating the casual reply, the Committee ask the Ministry to submit point wise replies, if necessary by collecting the information, to them within six month of the presentation of this report.

23. Preservation and construction of water bodies in the catchment areas : **The Committee observe that water bodies such as lakes, ponds, tanks and streams, play an important role in rejuvenating the rivers. These water bodies accumulate rain water, recharge the groundwater and the ground water in turn charges the river in lean months. A renowned activist (Shri Anupam Mishra) working in the field of water management and rejuvenation of water bodies testified that there were 25 to 30 lakh ponds before the British came to India. The Indian irrigation system was based on sound traditional water management techniques as there were no engineering colleges or certified hydro-engineers those days. The Committee were informed that excessive withdrawal of water from rivers for irrigation, industry and domestic use has depleted the flow of rivers and has also contaminated the rivers as all used/polluted water is discharged into the rivers. It was asserted that a lopsided, recurringly cost prohibitive system can't clean the rivers. The experts emphasized that the pure rain water must be stored into lakes, ponds and local water bodies, known variously in different parts of the country. An expert especially referred to the ancient system of water preservation in 'tals' 'khals' and 'chals' etc. in the Himalayan regions which collected rainwater, met local needs round the year, created forest cover and charged the ground water and, were a steady source of water to the tributaries of the Ganga. The expert also referred to examples of community work to revive these traditional water bodies of Pauri Garhwal district of Uttarakhand which revived the 'Gad Ganga' which was extinct for 70-80 years. Prof. Tare, IIT Kanpur, a renowned hydrologist was also of the considered view that all tanks, lakes and water bodies are an integral part of a perennial source of water supply to the river. These water bodies must be restored and conserved as all water bodies in the entire catchment basin are closely inter-linked and rejuvenate the river especially during the lean period. Besides, these water bodies serve the drinking water and irrigational needs of the surrounding towns and villages and also help controlling the effects of the floods. Having regard to the fact that the traditional time tested methods of water conservation like the lakes, ponds, tals, zheels, baolis, wetlands and flood plains have been abandoned or encroached upon; mindful of the fact that the Government's focus mostly remains on managing the**

droughts, and floods, and considering the fact that the surface and sub-surface water are an integral part of the hydrological cycle, the Committee recommend that;

(a) all big and small water bodies in the catchment areas of the rivers including the Ganga must be restored and new water bodies constructed with a view to harvesting water;

(b) all such water bodies must be inventorised district-wise as part of integral national strategy to conserve and augment water supply on perennial basis to local settlements, environment, aquifers and the rivers; and

(c) a massive programme of rejuvenation of water bodies and aquifers be undertaken after consulting the premier national organisations like CWC, CGWB, National Institute of Hydrology and also the district gazetteers about the ancient ponds, lakes, tals and baolis so that all the traditional water bodies are rejuvenated in a mission mode with the help of schemes like MNREGA or such or similar schemes.

They further stress that suitable measure may be taken urgently to protect and restore water related eco systems including the forests, wetlands, lakes, ponds, taals, zheels, etc. in the Ganga catchment basin as this will contribute in a big way to the perennial rejuvenation of the Ganga and the ground water which is an integral subsurface and surface part of the hydrological cycle. Further, a massive programme of rejuvenation of water bodies and aquifers be underaken after consulting the district gazetteers and even schemes like MNGRA should be in mission mode.

24. Impact of navigation on, and navigability of, the Ganga : On being enquired, the Committee were apprised by the Ministry of Shipping that navigation is a non-consumptive use of water and therefore navigation would neither be helpful nor harmful for rejuvenation of the Ganga. The Ministry also stated that maintenance dredging undertaken by IWAI for navigation purpose in totality does not affect significantly the hydro-morphological parameters of the Ganga. Asked whether the Government would be able to make Ganga navigable in the stretch between Varanasi and Haldia, the representative of the Ministry could not give any definitive answer but informed that the World Bank aided Jal Marg Vikas Project, a consultancy, is exploring the feasibility of developing reliable navigation channel for commercially viable cargo vessels and the outcome of the study would be available by mid 2016. According to one memorandum submitted to the Committee by an NGO, the movement of barges/inland vessels in the rivers improves the BOD by agitation of the water. The Committee would like the definitive reply of the Ministry of Shipping as to the stretches of the Ganga they wish to make navigable throughout the year and time frame thereof and the water draft that would be needed and the assurance that the spillage would not affect the water quality or the biota adversely. The Committee would also like to be apprised of the navigationable stretch of the Ganga prior to independence.

25. River front development and check on sand mining : The Government of Bihar stated that the current practices of sand mining in the river Ganga and its tributaries are seriously damaging the aquatic flora and fauna. Accordingly, they suggested that sand mining policy for Ganga and its tributaries should be clearly defined and effectively enforced. The Committee note that MoUD has a programme for river front development and beautification. An apprehension was raised about the possible aspect of cemented long embankment of the river.

The representative of IIT, Kanpur (Prof. Vinod Tare) when asked his view for channelizing of river Ganga, stated that there was no programme to channelize the river Ganga. He opined that the Ganga should flow in its natural form and as far as possible we

should channelize Ganga in short spans. He further clarified that channelizing means plastering of river Ganga, you can plaster small sections of the river but it will not good for the health of river to plaster its banks completely. The Committee were further informed that channelization will not be able to maintain natural flow of the river helps in natural purification when the flowing water comes in touch with natural sand and gravel embankments.

Keeping in view the considered advice of experts based on empirical studies that natural sand and gravel embankments help cleanse the river, the Committee wish to caution and counsel the Government especially the Ministries of Urban Development, Tourism and the municipal authorities to ensure that the natural sand embankments and the flood plains are not altered, damaged or encroached upon. The protection of flood plains from any encroachment, sand extraction and channelisation of the river must be prohibited at all cost to safeguard the natural cleansing and rejuvenation of the river.

26. Impact of dams on water quality of Ganga : The Committee note that the energy potential of the Ganga river system is unique since the Ganga originates from the highest point as compared to the origin point of all rivers of the world. An expert referred to the difference of 75 km between the origin points of the Ganga and the Yamuna and the material difference in the colour of their waters, Ganga water completely 'whitish' and the Yamuna water 'blue' and therefore asserted that this signifies that the quality, quantity and dynamics of every river system like the human system is different. His lament was that dams have been built without adequate knowledge of the anatomy, morphology, cross section of the river, etc. The Committee note that the Himalayan rocks are sedimentary, fragile and the region has steep slopes. For example, the height of the three Gorges Dam (TGD) in China is 181 meters and the Tehri Dam is 260.5 meters but the reservoir of TGD is 660 kms and of Tehri Dam – 44 kms. Statedly, the Himalayan slopes are 18 times more steep than the slopes

of TGD. According to domain experts, slope defines energy but due to high degree of sedimentation and landslides in the Himalayas, the energy generation is much less that is 800 Megawatt in Tehri as against 900 Megawatt in TGD. The Committee were informed that the recurring landslides and the high rate of sedimentation reduce the storage capacity of the reservoir very fast. Besides, the Committee were apprised that due to sedimentation of the dam reservoir, the density of water increases, it changes the colour of the water and reduces, more markedly, its oxygen content deteriorating the water quality – the 'nirmalta' of the Ganga it was known for and revered from hoary past. Also, creation of huge water bodies in active seismic zone of the Himalaya further induces seismicity, posing threat to the structure as well as to the human settlements both upstream and downstream.

Another closely related issue of serious worry is about the proposed construction of 450 big and small hydro power projects in the State of Uttarakhand, a matter of constant concern in Parliament. The representative of non-governmental organization, namely Ganga Ahwaan, in their presentation before the Committee pointed construction of bumper to bumper hydro projects and long dry stretch of the river bed due to water diversion. It was claimed that 53 per cent of river Bhagirathi is completely affected, impacted and gone, despite the assurance of ecological flow and 'aviralta' (continuity) of the Ganga. The representatives expressed grave anxiety and trepidation due to ongoing cutting, crushing, blasting, tunneling, mining in the sensitive-fragile Himalayas doing incalculable and irretrievable damage to the Himalayan ecology and sending shivers down the spine of local residents whose houses have developed cracks or have been pulverized by blasting of the Loharinath-Pala, Pala-Maneri and Bhairon Ghaati projects. Besides, due to blasting, the water springs have disappeared, aggravating water scarcity in the hills. The witness also quoted from the affidavit filed in the Supreme Court by the Government containing the findings of an expert Committee appointed by the Union Government under the direction of the Supreme Court. It was submitted that, according to such findings, 'the construction of hydro power projects in 'Ganga, Bhagirathi and Alaknanda basins has overburdened the local ecology' and that there are 'clear sightings of irreversible damages of environment in terms of loss of forest, degraded water quality, geological and social impact' and that these hydro

power projects' enhance landslides and other disasters.' Further, in the context of the imperative need to maintain the 'nirmalta' contingent upon the 'aviralta' of the Ganga, the Committee were shocked to learn from the testimony of the NGO who deposed before them that '115' kms of the Ganga has been diverted into tunnels and lakes, depriving the people of the glimpse of the Ganga over such stretches. It was also their lament that people have to plead with the construction companies to release some water so that they could perform the last rites of their deceased dear ones or perform other sacred religious ceremonies. They also submitted that by tampering with the waters right at the source, the most important, significant quality of the Ganga is being destroyed and therefore the Ganga jal after Rishikesh is no longer the same jal that we were consuming since centuries. However, the Ministry of Power submitted to the Committee that survey conducted by HNB Garhwal University, Botanical Survey of India and NEERI indicate that Tehri reservoir has no adverse impact on the ecology of the surrounding area. Having regard to the testimony of experts and the views of the local people and the submissions made by the Government representatives, the Committee recommend that:

(a) **construction of new hydro projects in the Himalayas may be halted, given the holocaust of Kedarnath, till the judgement of the Supreme Court and the entire hydro policy with respect to construction of hydro projects in the seismically active Himalayan zone be revisited;**

(b) **in order that the Ganga flows incessantly and eternally, every dam must release water at least in the same ratio as enshrined in the agreement of 1916 between Pt. Mahamana Madan Mohan Malviya and the Britishers. The GoI must abide by the agreement of 1916 which guarantees uninterrupted flow of Ganga, an agreement still in force in view of Article 363 of the Constitution;**

(c) **the flow of river must be measured during lean and non-lean seasons at all stations where the Ganga water including its**

tributaries is impounded or diverted, before and after such incidence and reported to Parliament annually by the MoWR,RD&GR;

(d) the water quality must be monitored during lean and non-lean season at all such locations before and after impounding and diversion; and

(e) the pollution caused in the cities and towns must also be measured city/town wise before and after draining of sewer/affluent and the statistics placed in Parliament annually and the monitoring being done on regular basis for preventing pollution of the river.

27. Need for framing Silt Management Policy: The Government of Bihar stated that on the one hand, intensive deforestation in the catchment area of Ganga has resulted in increased inflow of silt, on the other hand, the adverse impact on outflow of silt due to Farakka barrage has resulted in rise of bed level, reduction in carrying capacity, rise of meandering and breading tendencies and formation of shoals in the Ganga. The change in morphology of the Ganga due to Farakka barrage and deposition of silt in the upstream has also resulted in increase of flood fury in North Bihar. Hence, they suggested to develop an effective Silt Management Policy at the national level, which will help in silt management of not only of the Ganga but also of other rivers which would contribute towards maintenance of "Aviralta" and "Nirmalta" of the rivers. The Government Bihar have also informed that despite their raising the issue for so many years , the Government of India are yet to frame such a policy. **The Committee are in concurrence with the views of the Bihar Government and accordingly recommend that Government of India frame suitable National Silt Management Policy for the Ganga.**

28. **Community participation and publicity campaign**: The Committee find lack of effective and sustained community participation as one of the main reasons for not so encouraging success of GAP I&II. Community participation enhances the long term sustainability of a mission and enables people to feel connected and motivated towards working for the common goals. The experts who testified before the Committee also emphasized the importance of community participation on a sustained basis for the success of the massive and long term Programme of Ganga Rejuvenation. The Secretary W/R conceded that effective and sustained participation of the community leaders and the representatives of the people was a sine qua non for the success of the programme. **Considering the importance of mass scale participation of the community in Ganga Rejuvenation, the Committee recommend that an effective awareness generation programme for stakeholders be devised and duly publicised. The awareness generation should be efficacious enough to sensitise the officials in the towns and cities covered under NGRBA programme such as sarpanches of the Panchayats, City mayors, councilors, corporators, municipal officers, Town planners, officials of Urban Local bodies(ULBs) and associations of citizens. The objective of such a programme should be creation of public awareness and an informed civil society, in particular active involvement of the political leadership and the bureaucracy in the Urban Local Bodies (ULBs), that will participate in and own the rejuvenation programmes, aware of the objectives of National Mission for Clean Ganga and new developments in technology that can be used efficiently and effectively.**

29. **Formation of GPS : The Committee also recommend that the Government consider forming Ganga Protection Societies (GPS) at the ward level in urban areas and the gram sabha level in rural areas involving participation of men and women and students with specific functions**

assigned to them. Besides suitable and catchy advertisement campaigns in local languages in print and visual media, may be launched. Jingles for broadcasting in All India radio and FM radio may also be done. Further, publicly accessible and well publicized time tables and a daily updated website, featuring videos, photos, and peoples own stories regarding the revitalization of the ganga River system may be formulated and given regular publicity with the objective of Ganga rejuvenation as a test case.

30. Need for legislative framework for integrated river basin management: The Committee observe that as mentioned elsewhere in the report, there were inordinate delays in setting up of STPs , laying of sewage lines, putting up of sewage pumping stations, etc at many places in the basin states along the river Ganga under Ganga Action Plan-I and II, which resulted in huge cost escalation. The reasons stated for delay include delay in acquisition of land, obtaining statutory approvals, adverse climatic conditions, etc. These problems could have been well addressed had there been a robust coordination mechanism having representation from all the stakeholders. Realizing the need for such a body, the Committee observe that Government of India created National Ganga River Basing Authority (NGRBA) on 20 February, 2009 under section 3(3) of the Environment (Protection) Act, 1986 with a mandate for planning, financing, monitoring and coordinating with the Centre and State Governments in connection with Ganga rejuvenation. However, even after the formation of NGRBA, the delay in the afore mentioned sewage works continued, putting a question mark on the efficacy of the NGRBA for Ganga rejuvenation. The Committee also observe that many activities of Ganga rejuvenation fall under the domain of not only different Ministries/ Departments of the Central Government but also under the domain of state Governments. Further, and more important, many vital aspects of river management, the paramount need for securing the purity of river water, its continuous environmental flow, definition of environmental flow, protection of

river biota and its unhindered movement in the length and breadth of the river including construction of river passes, protection of river ecology, maintenance of ground water table and its connect with the river water, regulation of water withdrawal for industrial, agricultural and human use, imposition of fines on the polluters, impounding of river water, navigation protection of flood plains, etc. need to be regulated by law by Parliament in exercise of the legislative power conferred by article 246 read with entry 56, List I of the Seventh Schedule to the Constitution. The Ministry of Environment, Forests & Climate Change admitted that the existing laws of pollution control, whether it is the Water (Prevention of Control Pollution) Act, 1974 and 'the Air (Prevention of Control Pollution) Act 1981 or the EP Act, 1986, they are a little weak with regard to enforcement provisions. However, the M/o Water Resources, River Development and Ganga rejuvenation furnishing a different view stated that the afore mentioned enactments have adequate provisions to deal with industrial pollution control. Further, the Committee also note that MoEF&CC are working to make the penal provisions of the afore mentioned acts more stringent by way of criminalization of violation and also imposition of deterrent financial penalties. Mindful of the fact that the gargantuan task of Ganga rejuvenation, being a problem of life and development, cannot be accomplished through a piecemeal fragmented approach, the Committee recommend that the Ministry of MoWR,RD&GR take appropriate action expeditiously so that a strong, comprehensive and credible legislative framework is put in place envisaging, among others, the creation of an empowered overarching authority to deal with all aspects of the Ganga for ensuring that the Ganga remains 'nirmal' and flows incessantly. The Committee should like to be apprised of the outcome within next six months of the presentation of this report.

31. Arsenic in Ganga basin: The Committee in their 1st report (16th Lok Sabha) on Occurrence of High Arsenic Content in Ground Water pertaining to M/o WR,RD &GR, expressing concern over presence of arsenic in ground water in the Ganga- Brahmaputra plain, had recommended that a time bound programme be implemented for identifying the causes and to find effective remedies in arsenic release. The M/o WR,RD&GR in their interim action taken reply submitted that Inter Ministerial Group (IMG) has directed the National Institute of Hydrology (NIH), Roorkee to take up a study on the genesis of arsenic occurrence in Ganga-Brahmaputra Basin. The Committee would like to be apprised of time frame within which the study by NIH, Roorkee regarding the genesis of arsenic occurrence in Ganga- Brahmaputra basin would be completed. In the interim, the measures taken by the GoI to warn the people in the affected belts of the presence of arsenic in water and the precautions which should be taken to help minimise or avoid health hazards be given wide publicity.

In conclusion, having regard to the enormity of the challenges and taking note of the repeated solemn assertions of the Prime Minister to rejuvenate the Ganga and to make a Swatch Bharat, the Committee reiterate the imperative need for setting up an overarching and all empowered apex authority/body tasked exclusively with the responsibility of rejuvenation of the Ganga so as to restore its pristine form as expeditiously as possible. Ganga, around which grew Indian civilisation and legend, continues to be the lifeline of 43 per cent of India's population and a river of faith to millions of devouts within and beyond the shores of India. The rising demographic pressure, growing untamed urbanization and industrialization, continue to aggravate pollution in the Ganga rendering the Ganga not only non-potable, unfit for bathing purposes but also extremely hazardous over long stretches. The impounding of river water obstructing its flow, diversion of water for drinking, agricultural and industrial purposes and the pollutant load has rendered the Ganga dry and parch, and a sewer over long stretches in the up-stream areas. Renowned hydrologists and experts on river

dynamics and water management testified before the Committee that the Ganga bears no comparison with any river of the world because of its highest point of origin, steep gradient, kinetic energy and water quality. Indiscriminate anthropogenic interventions including indiscriminate construction of HPPs in the upper reaches of the highly fragile Himalayas coupled with 80 to 90 per cent of water diversion and discharge of affluents by 144 drains and entry of solid waste from non point sources have only aggravated the pollutant load of the Ganga. The Committee ardently hope that the Government would give earnest consideration to their recommendation and implement them expeditiously for rejuvenation of the Ganga, the life line of millions around which India civilization and culture grew, by July, 2018 without further time and cost escalation.

NEW DELHI ;
9 May, 2016
19 Vaisakha, 1938 (Saka)

DR. MURLI MANOHAR JOSHI
Chairperson
Committee on Estimates