

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
O.A. No. 200/2014**

IN THE MATTER OF:-

M.C. MEHTA

APPLICANT

VS.

UNION OF INDIA & ORS.

RESPONDENTS

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DELHI-110032**

**DATE: 10.12.2019
PLACE: DELHI**

Status Report on behalf of CPCB

In compliance to Hon'ble NGT Order dated 14-05-2019, OA No. 200/2014 in the matter of M.C. Mehta Vs. Union of India & Ors

Hon'ble NGT vide its Order dated 14th May, 2019 in O.A. No. 200/2014 in the matter of M.C. Mehta, has directed:

"21. The CPCB along with MoEF&CC to develop guidelines for setting up of bio-diversity parks. The CPCB can take the services of an external expert who has successfully guided DDA to set up bio-diversity park in Yamuna flood plain near Delhi. It would be appropriate if MoEF&CC and respective States examine handing over of such flood plain to the respective Forest Department of States for such activities. Such guidelines may be followed with respect to all the rivers in the country which may be monitored by Director General of Forest in MoEF&CC. Time bound Action Plans be furnished by the NMCG and the States."

2. Subsequently, vide its Order dated 22nd August, 2019 Hon'ble NGT further directed:

"20. There is need to issue guidelines by the MoEF&CC for setting up of biodiversity parks for handing over flood plains of the rivers in the country to the Forest Department, for the purpose, within four months in terms of Para 21."

3. In compliance of above said Hon'ble NGT orders, CPCB entrusted the work of preparation of guidelines for setting up of Biodiversity parks to Prof. C.R. Babu Prof. Emeritus, CEMDE, University of Delhi. He agreed to prepare the guidelines within four months. Also, MoEF&CC through letter dated 31.05.2019 nominated Director, BSI as its representative.

4. The Interim report (**Annexure-I**) on the guidelines was prepared by Prof. C.R. Babu which was discussed by the committee on 27.09.2019 and 6.12.2019. In the meeting, Prof. C.R. Babu requested further time of 4 months to submit the final guidelines. The committee recommended to submit the interim report in Hon'ble NGT seeking extension of time.

5. As a case study, an action plan has been prepared to rejuvenate the East Kali river, a tributary of river Ganga through development of constructed wetlands and biodiversity park along the river stretches, which is also enclosed alongwith the guidelines.

6. It is submitted that Hon'ble Tribunal vide its Order dated 6.08.2018 in O. A. No. 200/2014 in the case of M.C. Mehta Versus Union of India & Ors., has directed that:

"34. The action plan should also include creation of Biodiversity Parks created by the Centre for Environmental Management of Degraded Ecosystems (CEMDE) of University of Delhi, a Centre of Excellence of the Ministry of Environment and Forest & Climate Change, Government of India

6. Also, in the matter of Doaba Paryavaran Samiti Vs. State of U.P. & Ors in Original Application No. 231 of 2014 (M.A. No. 1219/2018) and Original Application No. 66 of 2015 Hon'ble NGT, vide its order dated 8th August, 2018 directed:

“25. The action plan should also include creation of Biodiversity Parks created by the Centre for Environmental Management of Degraded Ecosystems (CEMDE) of University of Delhi, a Centre of Excellence of the Ministry of Environment and Forest & Climate Change, Government of India.”

7. A survey of East Kali river conducted by Prof C R Babu along with officials of CPCB, UPPCB and Irrigation Department, Govt. of U.P. for Rejuvenation of East Kali river through in-situ remediation using constructed wetlands and a DPR, “Rejuvenation of East Kali River through in-situ remediation, using constructed wetland systems as a part of Biodiversity Parks.” for the same is prepared and enclosed as annexure in the interim report.

Now, this Interim draft guideline for “Development of Biodiversity park in the flood plains of rivers” is submitted for consideration by Hon'ble NGT with a request to grant further time of 4 months for submission of final guidelines. Also, appropriate order may be passed with regard to implementation of the action plan for rejuvenation of river East Kali.

*Revised***Interim Report on the "Guidelines for setting up of Biodiversity Parks in the flood plains of the Rivers of India" including river Ganga****Background**

Hon'ble NGT took the cognizance of the degradation of river systems and directed the authorities to rejuvenate the rivers across the countries. One of the orders of NGT of 14th May 2019 (OA No. 200/2014) directs CPCB to formulate guidelines for setting up of Biodiversity Parks in the flood plains of the rivers of India including Ganga with the Expert who was involved in the development of Yamuna Biodiversity Park. It also included one member from MoEF&CC, Government of India.

Accordingly, CPCB called a meeting where it was decided that Professor C. R. Babu would submit a proposal for the preparation of guidelines for setting up of Biodiversity Parks. Professor C. R. Babu submitted the proposal and asked four months to submit the final Guidelines as it involves taking of photographs from riverscapes as representatives of some river systems. A meeting of the committee was held on 27th September to discuss the progress achieved. Professor Babu explained the work done and outlined the chapters to be included in the proposed guidelines. Dr Vidyarthi pointed out that the guidelines should be self explanatory and should facilitate the stakeholders to develop Biodiversity Parks on the ground without much difficulty. He suggested that the Introductory paras of the Interim Report should include the treatment of waste waters (including sewage and industrial effluents) and restoration of self purification systems of rivers. Dr Mao (Director of BSI- a nominee of MoEF&CC in the committee) was present and informed that BSI would extend any help that is needed for finalizing the guidelines.

River systems and Riparian ecosystem

Riparian ecosystems form one of the major landforms of the planet Earth and is critical for sustenance of Biosphere. The rivers are the part of earth that supports life. The river system or riverscape includes the water courses (channels), the floodway on either side of the main water course and the embankments that contain flood waters and encloses floodplains, together with entire stream network including interconnection with ground water flow pathways embedded in terrestrial setting with considerable human and animal modification of flow paths likely along. The flood plain forests and grasslands, the riverbed with boulders, stones and pebbles provide a mosaic of habitats ranging from pools of water to marshy and to wetlands that support rich biodiversity. The embankments usually support terrestrial plant communities with rich wildlife. The margins of water courses support a vegetation that purify water. These ecologically diversified habitats with characteristic flora and fauna constitute riparian ecosystems and the area is known as the riverscape. These riparian ecosystems render a wide range of ecological services that are critical for sustenance of quality of water, productivity of ecosystems and ground water availability to humans, regulate river flows, distribution of sediment, nutrient release and serve as habitat for a wide range of animals. The

Biodiversity Park along rivers includes the entire river stretch as well as the surrounding terrestrial habitats.

Biodiversity and Ecosystem: Definition, Categories, and Functions of Biodiversity

Biodiversity is critical for the existence of life on the planet earth. The different gross landforms that include mountains, plains, rivers and oceans together with their rich ecological diversity support a myriad of life forms. The life forms and their environment and interactions among life forms and between life forms and environment constitute biodiversity.

The Biodiversity is broadly classified into three categories - (i) the genetic diversity (ii) the species diversity, and (iii) Ecosystem diversity; cultural diversity evolved by humans is also often considered as a component of Biodiversity. The genetic diversity includes diversity from gene level to population level; the species diversity include the kinds and number of species at species level and the ecosystem diversity encompass diversity at community and ecosystem levels of biological organisation.

It is at the ecosystem level, where all the four environmental components / natural resources (soil, water, air and living organisms) interact and generate a wide range of ecological services.

Ecosystem Services

The different ecological services rendered by ecosystems are classified into four categories: (i) the provisioning services that includes the food that we take, the water that we drink, the shelter where are live in , the clothes that we wear and the drugs that we take for curing our diseases, all of which are derived from ecosystems; (ii) life supporting services like nutrient cycling, soil formation and primary productivity; (iii) regulatory services that include climate regulation, flood and drought regulation, disease control and water purification; and (iv) cultural service that include aesthetic , spiritual, educational and recreation values. All these services contribute to human wellbeing.

Biodiversity Parks includes wetlands and other riparian ecosystems found along rivers of India and render the following services : (i) purifying water, (ii) bioremediate the sewage and industrial pollutants that enter into rivers (iii) stabilize the flood plains , (iv) reduce the erosive transport force of flood waters (v) enhance the rate of sedimentation of suspended solids (vi) enhance biological productivity, including fish production and support rich diversity (vii) store flood water and (viii) recharge groundwater. It is through these functions the Biodiversity Parks contribute to rejuvenation of rivers.

The Biodiversity Parks involves the recreation of diverse ecological niches that harbour a wide range of microbial, plant and animal groups that revive the lost critical ecological process essential for rejuvenation of dead or highly polluted rivers. The key success outcome indicators of the development of Biodiversity Parks including the constructed wetland system in the river systems are as follows:

- **Enhancement of DO from zero to more than 5 mg/l (upto 8.5 mg/l)**
- **Reduction of BOD from 400 mg/l to <10 mg/l**
- **Reduction of COD from high levels to the levels below the permissible limit**
- **Reduction of total pollution load from high levels to below permissible limit**
- **Appearance of aerobic microbial communities and high densities of phyto- and zoo-planktons and also invertebrates**
- **Change in the trophic structure and community**

Changes in Ecosystems and their Degradation

Humans have been changing the ecosystems, and human induced changes that took place during the last 50 years exceeded all those changes that took place in the entire human civilization. Some changes (food production systems) benefited humans but most of the changes have adverse effects on ecosystem and manifested 21st century environmental challenges. Loss of biodiversity is the major 21st environmental challenge and is threatening human survival and existence of Biosphere. The River systems form the lifeline of human societies evolved over centuries, and today these life supporting systems are threatened with extinction. About 87 percent of wetlands were extinct due to land degradation. 100s of springs were dried up. Many Indian 3rd order tributaries were either vanished or become sewers or filled with solid waste. In fact, many rivers in urban stretches have become open sewers and lost their self purification abilities due to absence of microbial, algal, phyto and zooplankton and macrophytic and benthic faunal communities, all of which were extinct due to heavy pollution load. The loss of flood plains and their wetlands and riparian ecosystems also led to degradation of river ecosystems.

Proposed Contents of the Guidelines

Contents of the proposed Guidelines

The Guidelines will have the following chapters:

1. Background
2. Introduction to River systems and their ecology
3. Functions of Floodplains of rivers and river embankments
4. Concept of Biodiversity Parks
5. Functions of Biodiversity Parks
6. Structural Components of Biodiversity Parks
7. Functional Biodiversity Parks of DDA as models for replication in the floodplains of rivers of India
8. Size of Biodiversity Parks

9. Planning, designing and development and management of Biodiversity Parks (Step wise procedure for the development of Biodiversity Parks)
10. Key success outcome indicators for monitoring
11. Preparation of DPR for the development of Biodiversity parks
12. Institutional set up for the development, management and sustenance of Biodiversity Parks.
13. Sources for funding
14. Schematic layouts of Biodiversity Parks for some potential areas in the flood plains of Ganga and Yamuna
15. References
16. Figures

Concepts of Biodiversity Parks

Biodiversity Parks are unique landscapes/ riverscapes of wilderness where ecological assemblages of native species are recreated over marginal / degraded landscapes / riverscapes. Biodiversity Parks are based on the ecological restoration principle and the underlying principle is to establish self sustaining ecosystems that have biodiversity and function that generate ecological services that contribute to well being of humans.

The Biodiversity Parks of flood plains of rivers include the restoration of wetlands and their connecting channels, development of flood plain forests and grasslands along embankments, treatment of sewage and industrial effluents through constructed wetlands.

The Biodiversity Park approach is innovative approach or model for recreation of lost biodiversity or natural heritage and it is a conservation approach. It involves conservation of ecosystems, communities, species, populations, and simulate National Parks/ Wildlife Sanctuaries / Nature Resources/ Wilderness.

Functions of Biodiversity Parks

Biodiversity Parks have wide range of functions and encompass almost all the four categories of ecosystem services rendered by Biodiversity Parks, and include:

(i) Enrich human microbiome as the Parks harbour rich environmental microbiome, and this in turn reduce the human health risks and public health burden, (ii) serve as filters for point and nonpoint source of air pollutants; (iii) store flood water and recharge ground water (iv) prevent soil erosion and stabilize flood plains; (v) reduce flood water velocity; (vi) serve as hub for conservation , educational and cultural activities; (vii) promote ecotourism; (viii) connect the city and its citizens to nature, and biodiversity; (ix) provide livelihoods to local communities; (x) serve as living museum for understanding ecosystem processes and function; (xi) sequester CO₂ and impart climate resilience, buffer local weather and even cause local precipitation; and (xii) serve as habitat for vanishing flora and fauna (xiii) purify water,

(xiv) enhance biological productivity , (xv) sustain riparian ecosystem and (xvi) rejuvenate rivers through treatment wetland.

Structural Component of Biodiversity Parks

A Biodiversity Park can have wide range of landscape / riverscape elements and depends upon the space availability, nature of the ecosystems that used to exist before degradation, topography and what the community needs, besides the main goal of bringing back the lost pristine glory of the area: An ideal Biodiversity has two zones - (i) the Nature conservation zone and (ii) the visitor zone. The nature conservation zone consists of terrestrial and aquatic ecosystems of the area where the natural forest ecosystems, flood plain wetlands, forest and grasslands, river channels and their banks and their interconnections with wetlands and river embankments. The visitor zone will have a number of elements such as representative ecosystems of the area, a herbal garden, an aquatic garden to preserve the aquatic resources, wetlands, butterfly conservatory, green ways along the embankment, diverse wetlands that attract diverse group of birds, NIC, constructed wetlands, natural bathing sites for local community on specific festivals and Recreational Parks.

Size of Biodiversity Park

The size of Biodiversity Park depends upon the amount of land/riverscape available. The minimum land required for biodiversity park is 100 acres, but 50 acres patch can also be developed into Biodiversity Park. 10 patches of 10 acres each that are located in a cluster can be also used for development of Biodiversity Park. The Biodiversity Parks can be developed in linear fashion along Highways or rivers with stretches of 0.5-5.0 km wide. The upper limit of Biodiversity is similar to that of National Park (i.e. few hundred km²) with respect to riverscapes, a linear, strip of 1 km to 100 km long and 0.5 -50 km wide or even more can be developed into Biodiversity Parks.

Biodiversity Parks that are already developed and fully functional

The concept of Biodiversity Park was successfully implemented for the first time in the world by Delhi Development Authority (DDA) in joint collaboration with the Centre for Environmental Management of Degraded Ecosystems (University of Delhi). DDA has notified so far 7 Biodiversity Parks (the Yamuna, the Aravalli, the Neela Hauz, the Tilpath Valley, the Northern (Kamla nehru) Ridge, Tughalaqabad and South Delhi Biodiversity Parks, besides the recent order for setting up of Riverfront Biodiversity Parks by DDA. Of these 7 Biodiversity Parks, the Yamuna and Aravalli Biodiversity Parks are fully functional and have become Nature Reserves of Delhi. Both the Biodiversity Parks have become global models for conservation of natural heritage and environmental sustainability. The Yamuna Biodiversity Park model is an appropriate model for replication in the floodplains of the rivers across India.

Yamuna Biodiversity Park

The Yamuna Biodiversity Park is located over an area of 457 acres in the upstream of Wazirabad reservoir across Yamuna and has inactive and active flood plains. The Biodiversity Park includes wetlands, marshes, flat active flood plains, salt bushlands, and landscaped inactive flood plains. These different landscapes are interconnected by trails and support some 1200 species of plants that thrive in 30-35 communities and have three trophic levels including secondary carnivore (Leopard). The visitor area has several different landscape elements.

The Yamuna Biodiversity Park has two zones – “the Nature Conservation Zone and the visitor zone.

Nature Conservation Zone

The Nature Conservation zone has biological communities interspersed with wetlands and grasslands. There are altogether 25-30 biological communities, some of which are given below:

- (i) *Mitragyna* dominated communities (Figure 1a)
- (ii) *Terminalia chebula* dominated communities
- (iii) *Adina* dominated community
- (iv) *Acacia catechu* dominated community (Figure 1b)
- (v) *Holoptelia* dominated community (Figure 2b)
- (vi) Teak dominated community
- (vii) *Terminalia tomentosa* dominated community
- (viii) *Acacia nilotica* dominated community
- (ix) *Dalbergia sisso* dominated community
- (x) *D. lanceolata* dominated community
- (xi) *Albizia* dominated community (Figure 2a)
- (xii) *A. lebbeck* dominated community
- (xiii) *Cordia* dominated community
- (xiv) Jamun dominated community (Figure 2c)
- (xv) Amla dominated community
- (xvi) Grasslands communities (that include short, intermediate and tall grasslands) (Figure 2b)
- (xvii) Mixed deciduous forest (Figure 3a)
- (xviii) Wetlands ecosystems (wetlands are fully functional and biologically rich and attract 1000s of migratory birds during winter months) (Figures 4a,b,c&d)

Communities have diversified food web and three trophic levels. These riparian forest communities provide a wide range of ecological services and harbour rich wildlife (Figure 7b, 8a&b).

These diversified riparian ecosystems: (a) buffer ambient temperature, (b) prevent evaporation by keeping the water cool, (c) provide detritus (organic matter) to the biota that live in the river water and purify the water more effectively than RO plants, (d) prevent erosion / gully formation on the flood plains, (e) enhance recharging potential of the flood plains, (f) serve as filter for both point and non point source air pollution, (g) act as shelter belt, (h) reduce the flood water velocity that ensure protection of infrastructure and communities in the downstream, and (i) harbour rich wildlife having three trophic levels.

The wetlands alone store flood water of several million gallons and recharge ground water and even provide lateral flow to the river during lean period, clean waste water if it enters into river system (treatment wetlands) through storm drains. The wetlands also serve as habitat for a wide range of animal species that form a rich trophic life. These wetlands attract 1000s migratory birds during winter months.

Visitor Zone

The purpose of Visitor Zone in the Biodiversity Park is to connect rivers to the people by walk through different riparian ecosystems and expose them to the services rendered by biodiversity to the people and the city. A butterfly Garden (Figure 5a), a herbal garden (Figure 5b), representative riparian ecosystems (Figure 6a), a small ponds showing characteristics aquatic fauna and flora (Figure 7a), threatened plants conservatory, amphitheatre, a nature interpretation centre, a field gene bank, and a fruit yielding plant conservation (Figure 6b) and recreational park were developed on the inactive flood plain.

About 0.2 million students visit the visitors zone every year as a part of environmental education curriculum. Several 100s of visitors from India and outside India visit the Park. Many Judges from different countries also visit park.

A greenway with walkways and cycleway also developed.

The model of Yamuna Biodiversity Park can be replicated along the flood plains of rivers in India. In fact, in some hilly areas and river valleys, the rivers may not have flood plains, and for such rivers, the Biodiversity Parks can be developed outside the embankments and .in catchments/ water shed.

Work yet to be completed

Based on the Yamuna Biodiversity Park model, a step wise procedure would be outlined for development of Biodiversity Park. DPRs for development of Biodiversity Parks, Institutional set up for the development and management of Biodiversity Parks and their long term sustenance, sources of funding will be provided in the final Report, and it takes some time to

work out the details. The Report will also include some examples to illustrate, how some of the potential sites along Ganga and Yamuna can be made into Biodiversity Parks that provides a wide range of services including rejuvenation of river Ganga and its tributaries. Schematic layouts for these Biodiversity Parks will be included in the final Report. There is a need for the extension of duration of project. To complete this work at least 4 months.

Test Case

As a test case, it was proposed to rejuvenate the dead Kali river stretch of 200-300 km from Khatauli to the Aligarh-Diwai Railway Bridge (at Chhatari village) where the Kali river exits from Bulandshahr District.

The reasons of selecting Kali river is that it is dead river with zero DO, 400 mg/l BOD level, and high total pollution load. Most of the vegetable crops grown in the fields close to the river have been irrigated with highly polluted (toxic) water from Kali river. Consumption of such vegetable might be a serious health hazards. Further, the agricultural run-off from vast agricultural fields is also contributing to high levels of pesticide residues and nitrates and phosphates, all of them have serious toxic effects on humans.

The detailed Action Plan for rejuvenation of Kali river through in-situ remediation using constructed wetland system as a part of Biodiversity Park is annexed along with the Interim Report.

Figures



Figure 1a: *Mitragyna* dominated community.

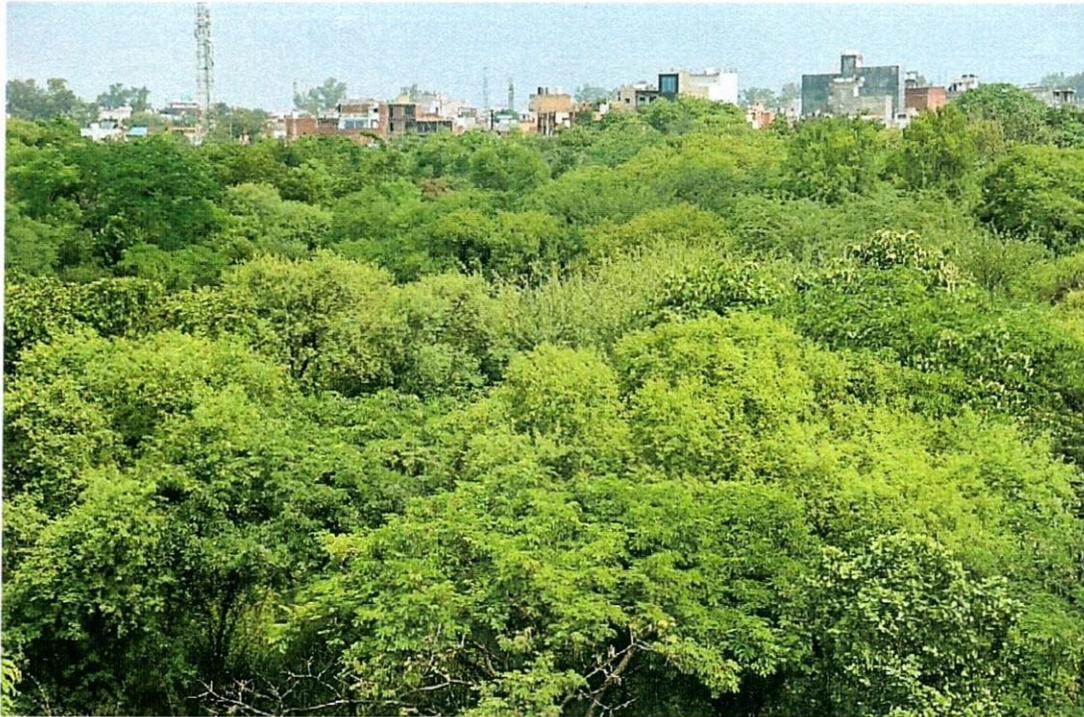


Figure 1b: *Acacia* dominated community.



Figure 2a: *Albizia* dominated community.

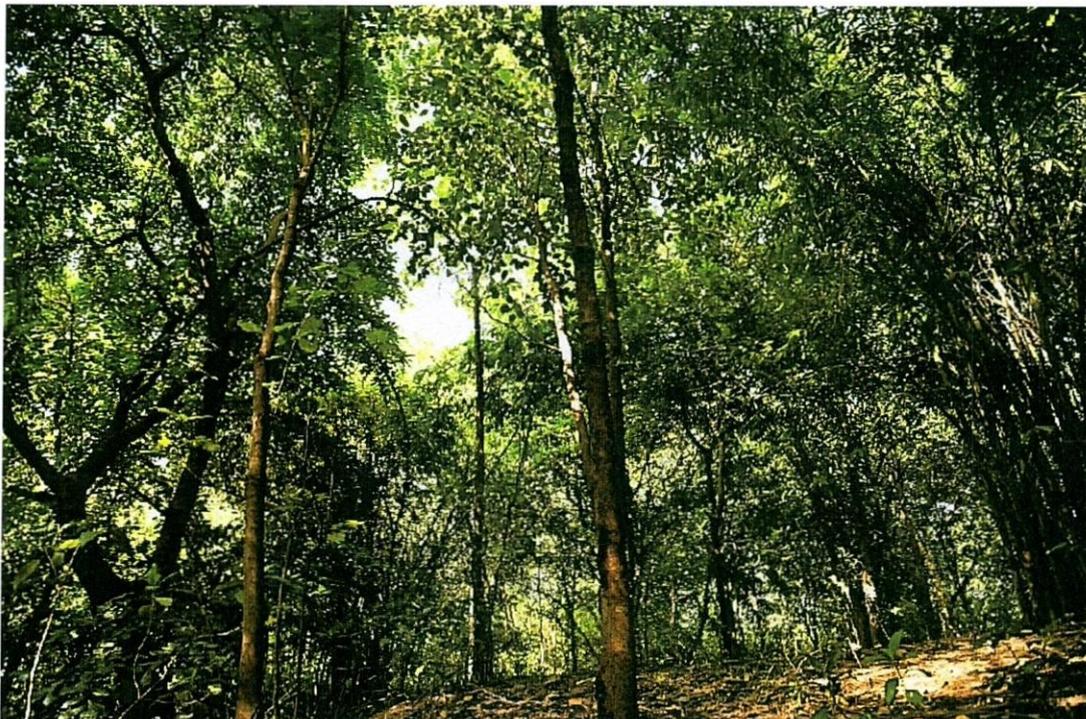


Figure 2b: *Holoptelia* dominated community.



Figure 2c: Jamun dominated community.



Figure 2b: Grassland.



Figure 3a: Mixed deciduous forest.



Figure 4a: Wetland in Yamuna Biodiversity Park Phase-I.



Figure 4b: Floodplain wetland in Yamuna Biodiversity Park Phase-II.

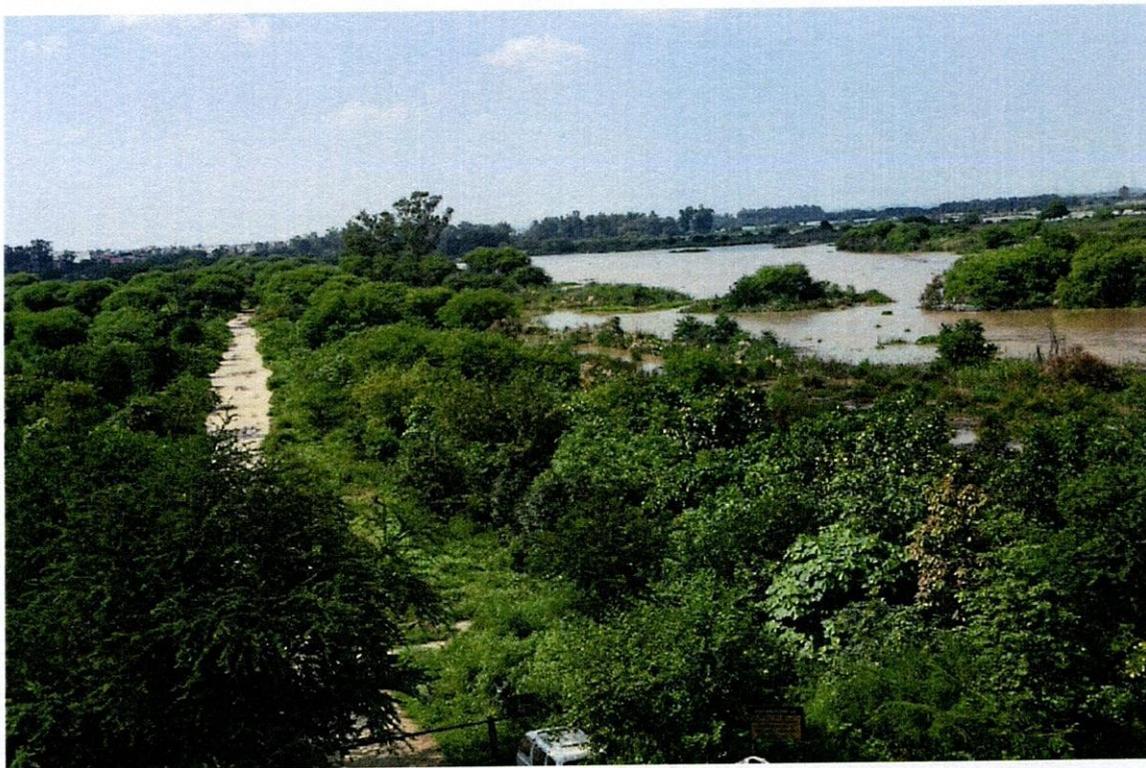


Figure 4c: Floodplain wetland showing impounded flood water.

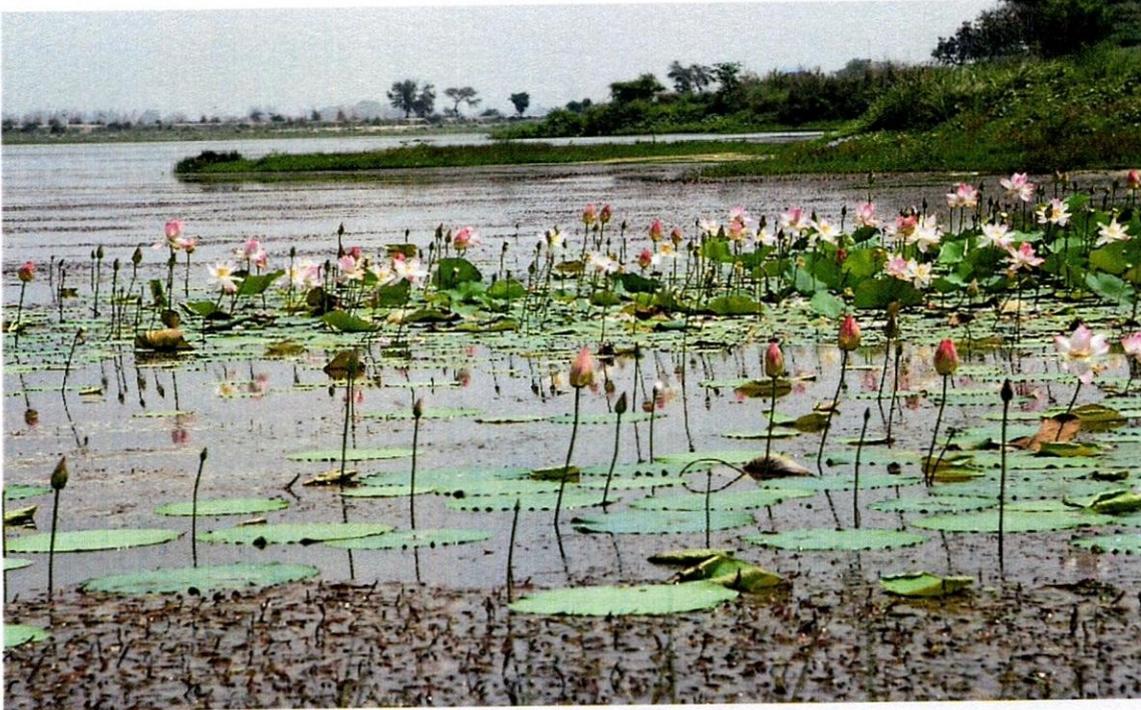


Figure 4d: Floodplain wetland showing Lotus.



Figure 5a: Butterfly Garden at Yamuna Biodiversity Park.



Figure 5b: Herbal Garden at Yamuna Biodiversity Park.



Figure 6a: Overview of riparian ecosystems.



Figure 6b: Fruit yielding conservatory.

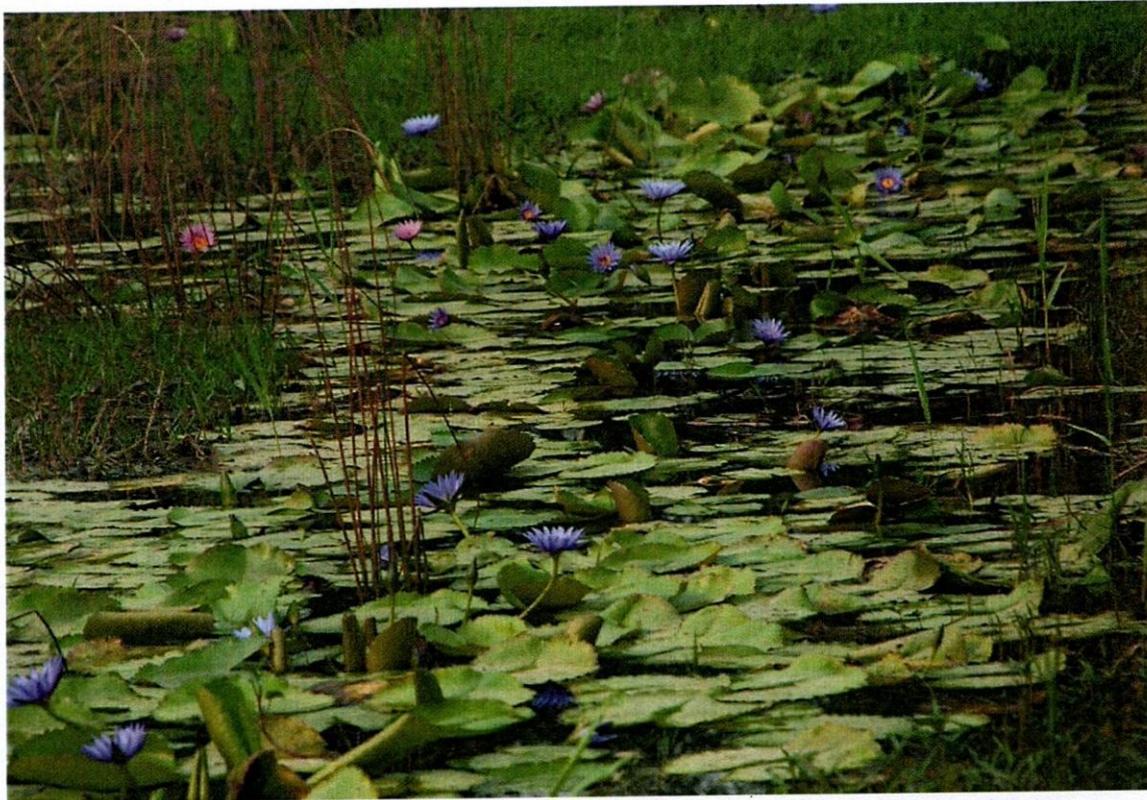


Figure 7a: Water lily pond.



Small Indian Civet



Wild Boar



Jungle Cat



Indian Hare

Figure 7b: Mammals of Yamuna Biodiversity Park.



Figure 8 a&b: Herbivores and Carnivores in Yamuna Biodiversity Park.

Rejuvenation of East Kali River through in-situ remediation, using constructed wetland systems as a part of Biodiversity Parks

Status of River Kali

The Kali river travels a distance of 550 to 600 km cutting across 8 districts of UP (Figure 1). The river Kali-east originates from a pond at Chitora in Muzaffarnagar district as a narrow drain and collects the catchment from the area and reaches Antawara in Muzaffarnagar. This stretch is about 20 km and most probably the natural drain vanished due to encroachment and the pond itself might have also vanished due to encroachment. In this stretch the river is called Chitora drain. From Antawara, the drain travels over a distance of 22.4 km up to Mamuri and the river is called Nagin Nadi in this stretch and it is dry except for monsoon season. From Mamuri the river travels upto 24.50 km and reaches Khatauli where it receives discharge from sugar mill effluent and Saini drain. After crossing Muzaffarnagar, it runs over a distance of 70 to 80 km in Meerut-Hapur districts where 3 drains from Meerut and two drains from Hapur and one drain from Ghaziabad discharge their contents into Kali river; at Gulaothi, another drain joins the Kali river and then it enters in Bulandshahr and runs over 107 km and exits the district at railway bridge of Aligarh to Diwai railway line at 382 km point (Kalyanpuri village).

Within Bulandshahr zone, there are as many as 12 drains that discharge untreated/treated sewage of 90-100 mld. In the upstream of Bulandshahr, more than 700-800 mld untreated / treated sewage and industrial waste water are discharged into Kali river.

It travels more than 250 -300 km stretches in the districts of Muzaffarnagar, Meerut, Hapur, Ghaziabad and Gulaothi and Bulandshahr districts. The total length of river is 550-600 km and half of the stretch in downstream of Bulandshahr is in the Kasganj where one drain, (4.84 mld) one nallah (dry) and lower Ganga canal discharge their contents into Kali river; Just above Kasganj, upper Ganga canal (Bulandshahr district) joins Kali river and also one drain (3.4 mld) discharge their contents; and at Kannauj the river joins Ganga (Figure 1). Before its confluence with Ganga at Kannauj, there nallahs (10 mld) discharge their contents into Kali river. Figure 2 gives the schematic representation of river Kali and the drains that discharge

their content from each of 8 districts of U.P. The CPCB monitored the quality of water in the drains during 2018 and 2019.

Upstream of Bulandshahr (upto Khatauli), the river take several meanders and pass through vast tracts of Gangetic fertile plains and the drains originating from villages/towns/cities and industries situated along the Kali river discharge their contents into the river. The river channel width varies from 10 m to 30 m; in some stretches there are flood ways of about 5 to 10 m on either side; there are no flood plains along the stretches examined and there might be some flood plains where the riverbed has been widened due to human activities.

The depth of water in the channel varies from 1 m to 2.5 m; in some stretches the depth may be less due to high rate of sedimentation. At some stretches the water level is the same as the level of adjacent agricultural fields. The height of embankments vary from 3 m to 10 m from the riverbed level and is rather narrow in some stretches; and in some stretches the height of embankment is the same as the level of agricultural fields. The river receives the catchments from vast tracts of agricultural fields which abut the river all along its course. The river is dead and carries sewage and industrial effluents and agricultural runoff containing pesticides and high amount of nitrates and phosphates, and possibly heavy metals. The CPCB monitoring data reports that BOD levels in one drain is as high as 1067 mg/l and in other drains it varies from 20 to 35 mg/l and in still others the BOD levels vary from 89 mg/l to 311 mg/l, DO levels were zero in all the drains. The CPCB also monitored the levels of BOD, DO and total pollution load in the Kali river (Figure 4). Interestingly the DO levels are zero at all the sampling sites in the Kali river starting from Khatauli to Bulandshahr. The BOD levels are also very high in this stretch ranging from 30 mg/l to 400 mg/l. The sediment is mostly composed of sludge and the bed is mostly composed of alluvia.

The farmers of the fields located along the bank of Kali uses the highly polluted (perhaps toxic) water to irrigate the crops, including vegetable crops. The crops usually grown are paddy (monsoon), wheat (winter), mustard, potato, sugar cane, cabbage, cauliflower and cucumber and pulses.

The challenge is how to rejuvenate the river Kali in the most polluted stretch of 250 to 300 km (i.e. upstream of Bulandshahr). The only way to rejuvenate the river is to develop a series of in-situ, horizontal flow, free surface constructed wetland systems across 250 to 300 kms stretch of Kali river and development of 4 Biodiversity Parks as a part of rejuvenation of Kali river.

Site visit

Keeping this in view, a site inspection was conducted to Bulandshehr, Meerut/ Hapur and Muzaffarnagar on 25th- 26th November 2019. The team consists of Professor C. R. Babu (Project Incharge, Biodiversity Parks Programme of DDA, University of Delhi) and Mr. Rakesh Ahuja, Dr. Swati Singh and Mr. Vipin Kumar of CPCB and accompanied by officials of an irrigation department of U.P. State Pollution Control Board Zonal Offices. The team travelled along the Kali river course and identified 8 stretches for the development of constructed wetlands and 4 sites for development of Biodiversity Parks as a part of rejuvenation of river Kali.

Sites selected for Constructed Wetlands

After assessing the topography and site characteristics, the following sites were identified for the development of Constructed Wetlands system. Each constructed wetland system consists of two oxidation ponds of 250 m long separated by three gabions, two physical treatment units of 150 m long each and one 200 m long constructed wetland system. The entire stretch of 1000 m is contiguous and separated by gabions of different widths, heights and length depending on the flow rates and volume of water.

A schematic layout of one in-situ constructed wetland system of 100 m long is also annexed. Slight variations in the layout may be needed as the width of riverbed and depth of water levels varies along the Kali river.

Details of Sites selected for setting up of Biodiversity Parks is given below:

S. No.	District	Name of drain that enters into Kali river	Deviations in the constructed wetlands if any from typical layout
1.	Muzaffarnagar (near Sugar Mill)	Downstream of the culvert of Khatauli-	Vertical channelization of riverbed into 3 to 4

		Mirapur Bridge Coordinates: 29°27'42" N and 77°78'78.37" E	channels is needed
2.	Meerut-Hapur (near Jalalpur village)	Hapur-Kithore road Bridge (Figure 3a) Below Abu Nallah and Odean Nallah Coordinates: 28°81'16.9" N and 77°81'20.84" E	Vertical channelization upto 8 channels is a must
3.	Ghaziabad (near Jhandapur Road Bridge)	Jhandapur Road Bridge (Below Kadrabad Drain) Coordinates: 28°62'04.53" N and 77°82'51.06" E	Vertical channelization with 6 channels is must
4.	Gulaothi (Gulaothi-Saidpur Road Bridge)	Gulaothi-Saidpur Road Bridge (Below Gulaothi Drain) Coordinates: 28°59'13.84" N and 77°82'49.71" E	Vertical channelization with 3 channels is needed
5.	Bulandshahr-Maman Kutti (Maman Road Bridge)	Mohan Kutti-Maman Road Bridge (Below Maman Road Drain) (Figure 3b) Coordinates:	Vertical channelization with 5 channels

		28°39'17.79" N and 77°86'41.95" E	
6.	Bulandshahr (near Kiryawali village)	Kiryawali village (Downstream of the drain and bridge) (Figure 3c) Coordinates: 28°33'01.5" N and 77°90'27.94" E	Vertical channelization with 4-5 channels
7.	Bulandshahr near Surjawali village (Below Bamba Gando Nallah)	Surjawali village (Below Bamba Gando Nallah) Coordinates: 28°20'57.37" N and 78°04'39.42" E	Vertical channelization with 4 channels is needed
8.	Bulandshahr, Chhatari village, Aligarh-Diwai Railway Bridge	Chhatari village (Below Aligarh- Diwai Railway Bridge and downstream of the drains) (Figure 3d) Coordinates: 28°20'57.37" N and 78°04'39.42" E	Vertical channelization with upto 8 channels

If the water is very deep, i.e. more than 3 m depth, it is important to channelize the riverbed into 3 to 8 channels separated by vertical gabions of 1 m wide and 1.5 m high within the riverbed . The depth of water in the channel should be 1 to 2 feet. This vertical channelization of river bed is confined only to two physical treatment units. If the depth of water is only 30 cm it does not require any channelization of riverbed.

Design of Constructed Wetland System

A schematic representation of in-situ, linear, 1000 m long constructed wetlands system to be developed in Kali river is annexed.

Biodiversity Parks

One of the limitations for setting up of Biodiversity Parks along Kali river is lack of well-defined floodplains except in small stretches, and also lack of public lands near the rivers/drains. Most of the area along the embankments of the river is under cultivation. In fact, at some places, the embankments form the bunds of the agricultural fields. There appears to be encroachments along the river.

The following four sites can be developed into Biodiversity Parks:

- I. The first Biodiversity Park will be located at Mohan Kutti, near Maman Bridge close to Bulandshahr town. There are long stretches of low-lying areas along both the banks in the upstream and downstream of the Bridge. Some of these areas are encroached. The Municipal Corporation/ State Government (Irrigation Department) may make these lands available for the development of Biodiversity Park which not only rejuvenate the river in Bulandshahr but also provide environmental sustainability to the town and also facilitate nature and environmental education among the students in the District. The Biodiversity Park will also serve as Recreational Park for the citizens of the city. It may be noted that natural heritage of the river and the town was extinct and the Biodiversity Park will recreate the lost natural heritage.
- II. The second Biodiversity Park will be located close to Meerut and near the river. The drains from Meerut discharges their contents into Kali river. It may be noted that Meerut has also lost its natural heritage and the environmental quality of the city is fast deteriorating. As a measure to bring back the lost natural heritage and to enhance the environmental quality and rejuvenate Kali river and to create environmental awareness among the public, a Biodiversity Park is proposed. The site will be decided in consultation with local authorities and the Industry which is polluting the water, air and soil.

- III. The third Biodiversity Park will be developed at Khatauli (Muzaffarnagar) near Sugar Mill where highly polluted drains joins Kali river. The site may be selected in consultation with local Governing Body or with Sugar Industry for developing Biodiversity Park for not only bioremediating the highly polluted drains that discharge polluted water into the Kali river but also for bringing back the natural heritage of the area and for enhancing environmental quality.
- IV. The fourth Biodiversity Park may be developed close to Hapur-Ghaziabad zone which also discharge raw sewage into Kali river. The site has to be selected in consultation with local body or industry. The purpose of the Biodiversity Park is to remediate the polluted drains and river, to recreate lost natural heritage, to provide recreational value to the citizens of both the cities and also create environmental awareness among the public.

Greenway Development

Greenway Development along both the embankments of Kali river right from Khatauli to the Aligarh-Diwai Bridge across Kali river near Chhatari village will be developed. This greenway will have 3-storeyed forest and will connect all the four Biodiversity Parks. It will have walkways, cycleways and motor-bikeways. The greenways will be developed as a part of Biodiversity Parks.

Action Plan, Key Success Outcome Indicators of Action Plan and Approximate Cost Estimates

The East Kali river stretch from Khatauli to Aligarh-Diwai Railway Bridge at Chhatari carried both sewage and industrial waste water of more than 800 mld (CPCB) and agricultural run-off enriched with pesticide residues and high levels of nitrates and phosphates. The river is practically dead as it has no DO and high levels of BOD (400 mg/l) and total pollution load, and this toxic water is used for irrigating the vegetable crops which are health hazards. This is one of the tributaries that contribute to the pollution load of river Ganga.

It was decided, after field visit, to take up the rejuvenation of the river Kali in 200-300 km stretch in the upstream of Aligarh-Diwai Railway Bridge at Chhatari, Bulandshahr District. The Action Plan proposed involves the use of constructed wetland systems and development of Biodiversity Parks which include the in-situ remediation of polluted stretches of rivers and its tributaries. Each constructed wetland system designed cover 1000 m stretch and there are 8 such constructed wetland systems. These 8 stretches are located at 8 different sites in the downstream of the outfall of the major drains. The Action Plan also proposes 4 Biodiversity Parks which involve the in-situ remediation for rejuvenation of Kali river, preserve embankments and floodplains if any and maintenance of ecological integrity besides connecting the people to the river. The four Biodiversity Parks are proposed to develop close to the river and the townships devoid of tree cover.

The key success outcome indicators of the development of Biodiversity Parks include in-situ remediation through constructed wetland system are as follows:

- (i) Enhancement of DO from zero to more than 5 mg/l.
- (ii) Reduction in BOD from 400 mg/l to <5 mg/l.
- (iii) Reduction in total pollution load from high levels to levels below permissible limits.
- (iv) Appearance of beneficial microbes, phyto- and zoo-planktons, invertebrates and benthic fauna that hasten the process of remediation leading to clean the water that promotes fish production.

The approximate cost of each constructed wetland system for 1000 m is about 50 lakhs and there are 8 such systems and the total cost of 8 constructed wetland systems will be about Rs. 4 crores. Each Biodiversity Park (100-200 acres) will cost about Rs. 75 lakhs to 1 crore and there are 4 Biodiversity Parks and the total cost for Biodiversity is Rs. 3 to 4 crores. The approximate budget required to rejuvenate Kali river is about 7 to 8 crores and on the higher side it may go upto 10 crores.

The source of funding should be from NMCG/ U.P. Urban Development Department/ Industries that are polluting the river/ local Government bodies.

Figures

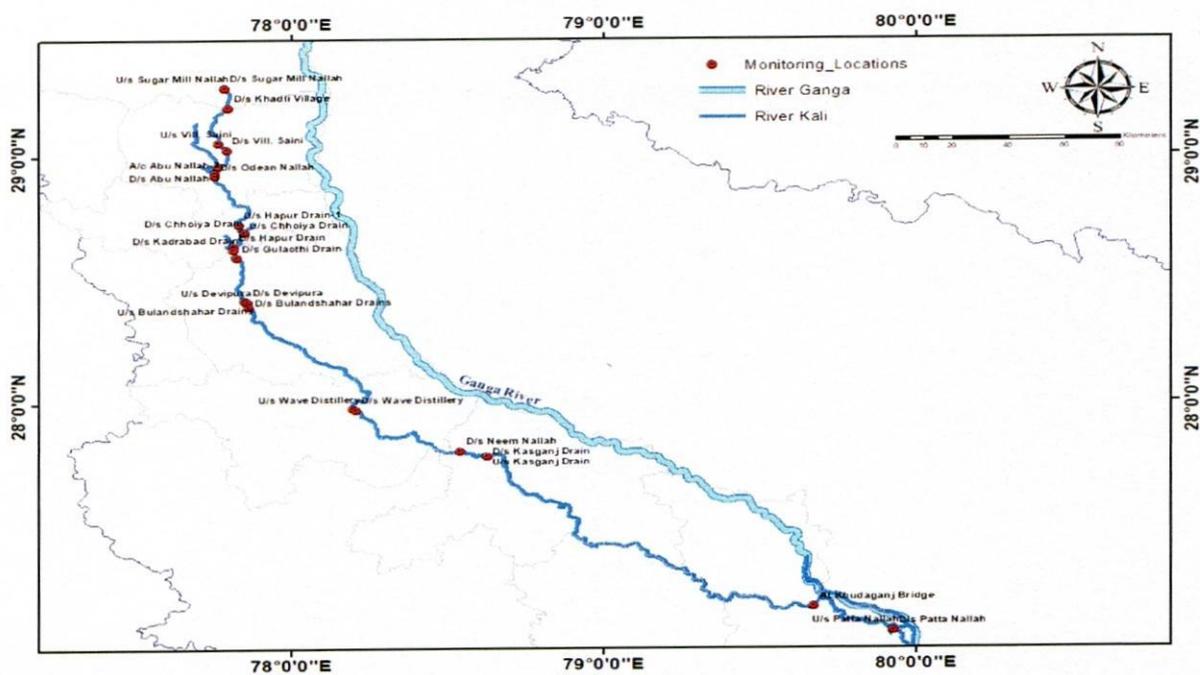


Figure 1: Map of water quality monitoring locations on the river Kali-East (Source: CPCB)

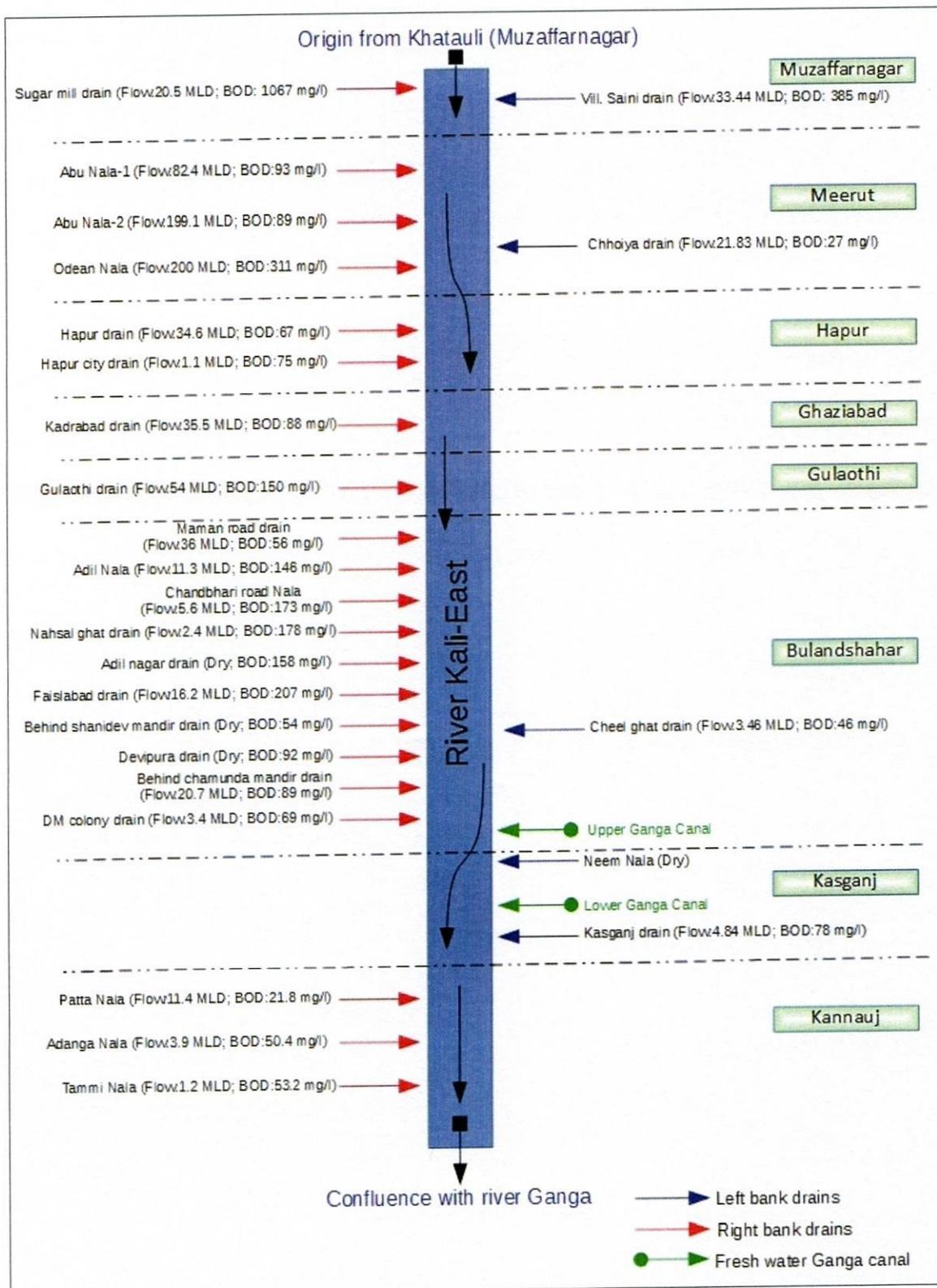


Figure 2: Schematic representation of district-wise pollution load contributed by drains to the river Kali-East in 2019 (Source: CPCB)



Figure 3a:Hapur Kithaor road bridge, Near Jalalpur Village, 2 Km downstream of the Abu Nala

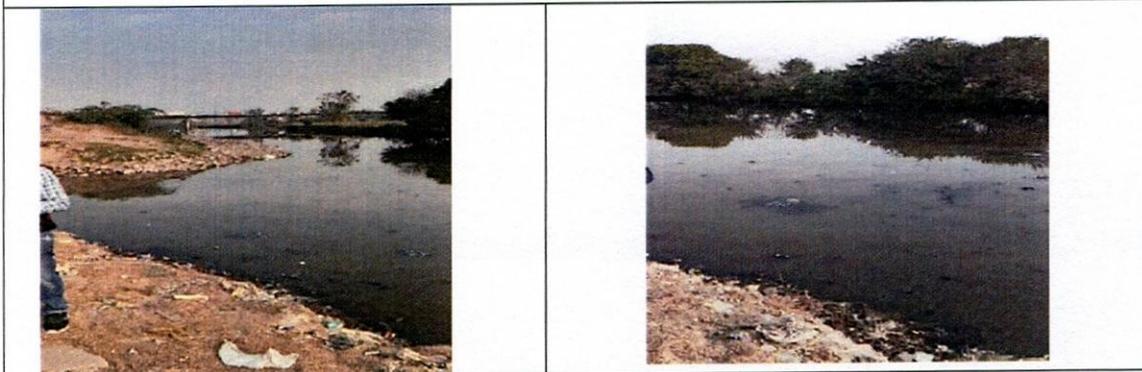


Figure 3b: Mohan Kutti, Maman Road Bridge



Figure 3c: Near Kiryawali Village

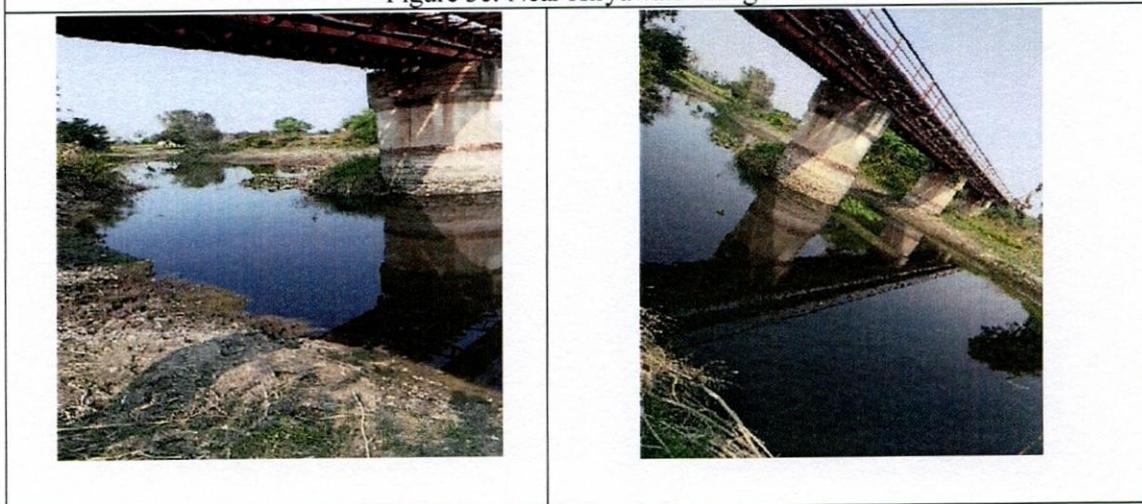


Figure 3d: Aligarh Diwai Railway Bridge, Chhatari

Figure 3: Photographs of selected location in Meerut, Hapur and Bulanshahar District

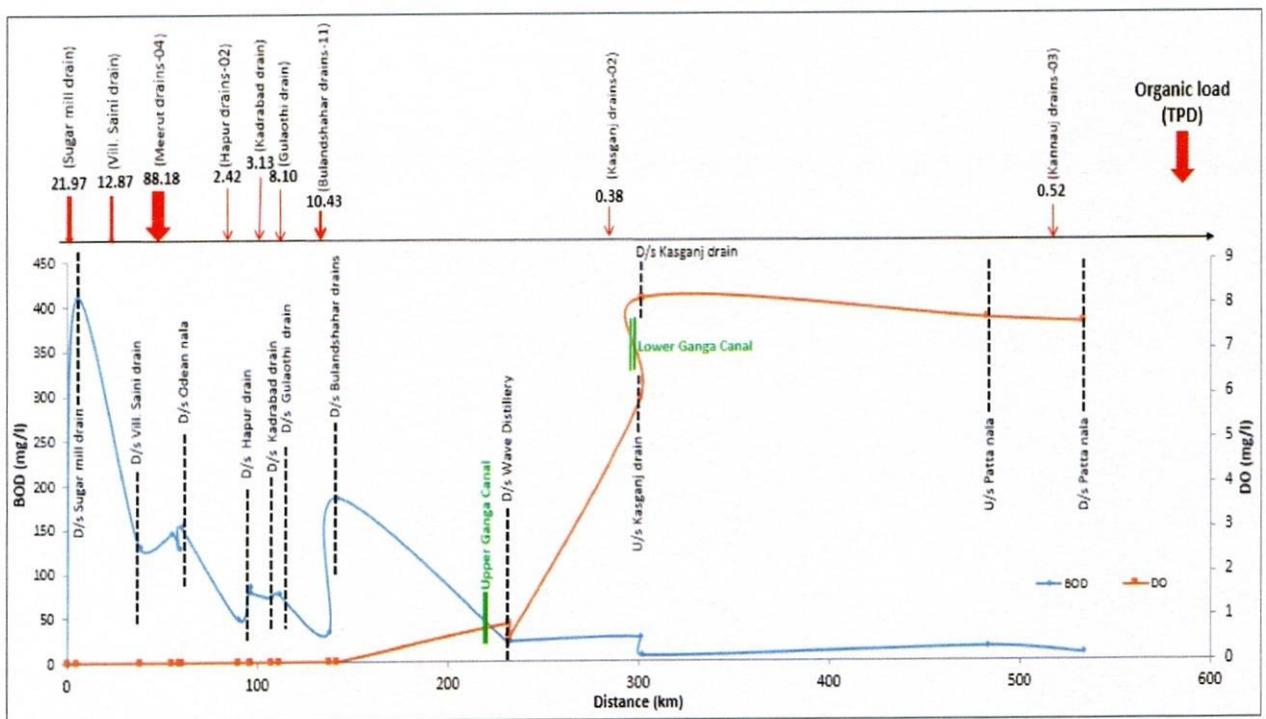


Figure 4: Longitudinal water quality profile of river Kali-East w.r.t. DO, BOD and pollution load (Source: CPCB)

Item Nos.01 to 05

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

Original Application No. 200/2014
(M.A. No. 254/2018 & M.A. No. 872/2018)
(C.W.P. No. 3727/1985)

WITH

Original Application No. 668/2017
(Earlier M.A.No.923/2017 IN O. A. No. 200/2014)

WITH

M.A. No. 141/2016 & M.A. No. 337/2018

IN

Original Application No. 10/2015

WITH

Original Application No. 390/2018
(Earlier O.A. No. 44/2017 (EZ))

WITH

Original Application No. 34/2018

M.C. Mehta

Applicant(s)

Versus

Union of India &Ors.

Respondent(s)

With

M.C. Mehta

Applicant(s)

Versus

Union of India &Ors.

Respondent(s)

With

Indian Council for Enviro-legal Action

Applicant(s)

Versus

National Ganga River Basin Authority &Ors.

Respondent(s)

With

Tribunal on its Own Motion (SuoMotu)

Applicant(s)

Versus

State of Bihar &Ors.

Respondent(s)

With

Vikrant Tongad

Applicant(s)

Versus

Union of India &Ors.

Respondent(s)

Date of hearing: 14.05.2019

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE S.P. WANGDI, JUDICIAL MEMBER
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

For Amicus Curiae: Ms. Katyayni, Advocate and
Mr. Aishani Singh, Advocate for Applicant

For Respondent(s): Mr. Varun Thakur and Mr. Brajesh Pandey,
Advocates and Dr. Praveen Kumar, Director
(Technical) for NMCG
Mr. Rahul Verma, AAG for State of Uttarakhand
Mr. Mukesh Verma, Advocate for UEPPCB
Mr. Pradeep Misra, Advocate for UPPCB
Mr. Santosh Kumar, Advocate for UPSIDC
Mr. Manish Paliwal, Mr. Vikas Kumar and Mr.
Aman Modi, Advocate in MA 872
Mr. Rashi Saeed, Advocate for CETP Banthar and
Unnao
Mr. Ruchir Batra, Advocate for Sitarganj CETP
Mr. I.K. Kapila, Advocate

ORDER

1. The issue for consideration relates to execution of directions of this Tribunal dated 10.12.2015 and 13.07.2017 with regard to prevention and remedying of pollution of river Ganga and action against the polluters. The said order dated 10.12.2015 divided the project of cleaning of river Ganga as follows:

Phase-I – Segment-A: Gomukh to Haridwar,
Segment-B:

Haridwar to Kanpur.

Phase-II: Kanpur Border to Uttar Pradesh Border.

Phase-III: UP Border to/till Jharkhand Border.

Phase-IV: Jharkhand Border to Bay of Bengal (West Bengal).

2. Order dated 10.12.2015 dealt with Phase-I-Segment-A. Remaining area has been dealt with by order dated 13.07.2017.
3. Main problem considered in the above orders is continuous illegal discharge of untreated sewage and industrial effluents in Ganga and its tributaries and the connecting drains, apart from the dumping of solid waste, bio-medical waste, hazardous waste, plastic waste, muck and other wastes. In addition to such discharge and dumping, there are issues of illegal encroachment, illegal sand mining, absence of steps for conservation of ground water, reuse of treated water and restoration of water bodies besides maintenance of e-flows. On testing of water samples, huge amount of pollution was found at several hotspots. The Water (Prevention and Control of Pollution) Act, 1974 requires stringent measures, including immediate closure of any polluting activity, prosecution and recovering compensation from the polluters for restoration of the damaged environment but the said provisions are not being fully enforced. Either the sewage or effluents are not being treated or the treatment equipment are not adequate. Though Uttarakhand Flood Plain Zoning Act, 2012 had been enacted, the same was not fully implemented. The Tribunal in its order dated 10.12.2015 noted that though the proceedings were pending since 1985 and various initiatives were taken at the government level, the pollution of river

Ganga continues. Ganga Action Plan Programme was not a success on account of lack of proper implementation. It was noted that there were 143 drains and nalas in Segment-A of Phase-I. 77 drains were to be trapped. Hotels, Ashrams, etc. in the flood plains were serious source of pollution on account of waste being put into the river directly or through the sewage pipelines which were not treating the sewage. Directions in the order dated 10.12.2015 include collection and disposal of sewage, closing down of polluting industries, closing of hotels, dharamshalas and ashrams being run without STPs and without consent of the Pollution Control Boards, if they were releasing domestic waste or sewage into the river, prohibiting dumping of plastic and municipal waste, zoning of flood plains, treating 100 meters from middle of the river to be eco-sensitive and prohibited zone for any permanent or temporary activity, area from 100 meters to 300 meters to be treated as regulatory zone in hilly terrain, for plain terrain the area will be 200 meters and 500 meters instead of 100 meters and 300 meters, prohibited unregulated river bed mining, mechanized mining, prohibited dumping of bio-medial waste. General directions required collection of environmental compensation from defaulting industries, hotels, and even households depending upon the size and capacity of the establishments and use that fund for environmental restoration.

4. With regard to Segment-B of Phase-I, it was noted that 86 drains were joining the river Ganga directly or its tributaries which were being polluted by discharge of sewage or industrial waste. The matter of river flow was considered in view of need for maintaining

aquatic bio-diversity, recharge of ground water, purification of rivers and other allied issues. The Tribunal also discussed the issue of flood plains, Continuous Emission Monitoring System (CEMS), Online Monitoring System (OMS) and deficiencies of the regulatory bodies. Final directions vide order dated 13.07.2017 broadly relate to preventing discharge of untreated effluent in 86 drains. Specific directions were issued with regard to Jajmau, Banthar and Unnao where Common Effluent Treatment Plants (CETPs) were required to be properly operated to prevent any pollution. Flood plains were required to be identified and demarcated with restrictions against any development or construction within 100 meters from the edge of river and identification of no development/construction zone, regulatory zone, etc, prohibition against dumping of waste and recovery of compensation. Directions were also issued that minimum E-flows of river Ganga should not fall below 20% in the average monthly lean season, prohibiting extraction of ground water for industrial or commercial purposes without permission of the Central Ground Water Authority (CGWA) with total prohibition and regulation in critical, semi-critical or over-exploited areas. Though the orders specify the Committees to monitor the said orders with the prescribed timelines, such compliance has not taken place even after three years of passing of first order and about two years after passing of the first order.

5. The matter has also been monitored by this Tribunal from time to time in the last more than three years with regard to Phase-I -

Segment -A and for almost two years with regard to Phase-I - Segment B and other Phases.

6. Vide order dated 19.07.2018, status report furnished by the State of Uttarakhand was considered with regard to Phase-I, Segment-B. The National Mission for Clean Ganga (NMCG) is the nodal agency to implement the rejuvenation of river Ganga which includes compliance of directions of this Tribunal along with other concerned authorities. The Tribunal directed that District Magistrates heading the District Ganga Committees may furnish reports to the Executive Committee every fortnight and the Executive Committee may furnish its report to the Supervisory Committee once in every month. The Supervisory Committee may meet once in two months. The Principal Committee may meet once in three months. Any member of public may give their views to the said Committees and response to such views may be placed on the websites (of NMCG).
7. With regard to Phase-I Segment-B, vide order dated 27.07.2018, the Tribunal noted that the progress was inadequate inasmuch as tanneries were not meeting the standards of effluent discharge. 14 out of 86 drains have not been cleaned, issue of e-flows has not been addressed, ground water extraction was a matter of concern, water quality was getting deteriorated. The Tribunal directed the CPCB/SPCBs to regularly display the result of analysis of water samples drawn at various locations atleast at one place within 100 km and also display information of places where water is fit for consumption or fit for bathing. The Tribunal also noted that water from Haridwar to Kolkata was reported to be neither fit for

consumption nor for bathing and it was found that the situation at Jajmau, Unnao and Banthar had not been improved, all the drains have not yet been trapped. The Tribunal held that the progress was not upto expectation and considered it appropriate to constitute a Monitoring Committee headed by a former Judge of Allahabad High Court to take stock of the actions taken so far with clear measurable indicators of progress and success. The action plan may include creation of bio-diversity parks. The Committee may involve educational institutions for awareness. NMCG was directed to take action plan from the concerned States with regard to Phases-II, III and IV from the States of Bihar, Jharkhand, West Bengal and remaining part of Uttar Pradesh. Such Action Plan should cover interception and diversion of drains carrying sewage to STP, laying of sewage network, utilization of treated sewage, securing compliance from industries in the catchment of the drains, ground water regulation, flood plain regulation, rain water harvesting system, good irrigation practices. SPCBs were to furnish list of industries having potential for causing pollution of river Ganga in Phases II to IV.

8. On 29.11.2018, the Tribunal considered progress with regard to Phase-I, Segment-A and Segment-B on STPs, CETPs, tapping of drains, compliance of MSW Rules, setting up of bio-digesters and sewerage network, improvement in water quality, unregulated ground water extraction, e-flow, public involvement and awareness. The Tribunal observed that decentralized processing facility should be provided close to the source of generation of waste. Issues of

scientific disposal of waste, protection of flood plains, checking illegal mining etc may be monitored for which a Monitoring Committee for the area falling in Segment-A of Phase-I was to be headed by Justice U.C. Dhyani, former Judge of Uttarakhand High Court.

9. On 11.03.2019, reports received from the Committees with regard to Segments A and B of Phase-I were considered. It was specifically noted as follows:

"8. We also note that directions of the Tribunal dated 13.7.2017 relating to interception of drains, construction of sewage treatment plants, setting up of common effluent treatment plant at Jajmau, Unnao and Banthar remain un-complied till date. CETPs at Jajmau, Unnao and Banthar are not meeting the stipulated standards which is deemed to be violation by all the tanneries. Since NMCG and UP State have failed to ensure setting up of CETP at Jajmau and upgradation at Unnao and Banthar, we direct NMCG, CPCB and UPPCB to examine whether tanneries who are members of such CETP are to be closed till compliant CETPs are set up. The directions of this Tribunal are clear. Unless and until the sewage and industrial effluents are diverted for their treatment and e-flow is maintained, water quality improvement in Segment 'B', Phase-I cannot be achieved. Therefore, failure in execution of plan for the segment in time may call for coercive action."

10. It was noted that Action Plans with regard Phases-II, III and IV had not been filed and the affidavit filed by the NMCG presented a dismal picture. There was no justification for delay in filing the action plans. Last opportunity was given to take further steps and file action plans indicating interception and diversion of drains to the STPs, utilization plan for treated sewage, demarcating flood plain zones, preventing encroachments, specifying e-flow applicable to UP,

Bihar, Jharkhand and West Bengal. The Tribunal referred to a study on sanitation status of 97 Ganga Towns. The Tribunal directed NMCG to take steps to rectify the deficiencies.

11. Today's hearing is focused on the issue of consideration of further progress in Segments A and B of Phase-I as well as other Phases.

SEGMENT-A, PHASE-I

12. Report dated 09.05.2019 received from Justice U.C. Dhyani shows steps taken for tapping of drains. It is stated that some STPs are still under construction and STPs at some important locations are non-compliant.

13. In view of the said report, Uttarakhand Pollution Control Board needs to prohibit discharge of any sewage or industrial effluents either directly into river Ganga or its tributaries in view of statutory prohibition under the Water (Prevention and Control of Pollution) Act, 1974, apart from orders of this Tribunal. Any failure must result in deterrent compensation being recovered from the persons/authorities responsible for discharge of untreated sewage/effluents into the river. Such compensation must be deterrent and adequate to recover the cost of restoration. This is necessary to ensure that polluting of river Ganga is no longer a profitable activity. Repeated directions of the Hon'ble Supreme Court and this Tribunal in the last 34 years should not remain on paper. The Committee constituted by the Tribunal may identify persons responsible for failure including the officers and authorities of the State Government.

14. Wherever STPs are non-compliant, stringent action must be taken and every polluting activity must be stopped till adequate remedial steps are taken.
15. NMCG may ensure compliance with regard to prevention and removal of encroachments, maintenance of e-flows, afforestation and setting up of bio-diversity parks, ground water regulation, sand mining regulation. State of Uttarakhand may ensure that no illegal camping takes place on the banks of river Ganga and its tributaries. We may make specific mention of alleged illegal camping at Piyani village in District Pauri Garhwal towards Neelkanth road. Policy of e-flows may be clearly spelt out by the State of Uttarakhand. The State may have its own effective mechanism to monitor e-flows.

SEGMENT-B, PHASE-I

16. Report dated 30.04.2019 shows that all the 86 identified drains have still not been trapped. There is overflow/leakage at Kanpur. Chromium and other metals are still being discharged by the leather industries at river Ganga at Jajmau, Banthar and Unnao. CETPs are not meeting the stipulated standards. Activities of members of CETPs must be straight-away closed till CETPs are compliant and only treated effluents should be allowed to discharge into river Ganga or its tributaries after reuse of treated effluents.
17. Report received vide e-mail dated 01.05.2019 shows that while the CPCB suggested closure of non-compliant units, the UPPCB and the NMCG opposed the same. We are surprised at the attitude of the UPPCB and the NMCG which is in violation of orders of this Tribunal and the mandate of law. Concerned officers of the UPPCB

and the NMCG are liable to be proceeded against by way of coercive measures. Accordingly, we overrule the views of the UPPCB and the NMCG and upheld the view of CPCB and direct immediate closure of all the polluting discharges by such industries into the river Ganga or its tributaries. Compliance of this direction may be ensured by the UPPCB. The Member Secretary of the UPPCB may remain present in person before this Tribunal on the next date along with compliance report and explanation for violating the directions of this Tribunal and not carrying out the responsibilities statutorily required under the Water (Prevention and Control of Pollution) Act, 1974.

18. As already directed, all the 86 drains falling in Segment-B of Phase-I may be tapped so that no untreated effluent goes into the river Ganga. Action may be taken against any individual or establishment discharging pollutants in the drains/river by way of closure of such activity, prosecution and recovery of deterrent compensation which is adequate to meet the cost of restoration.
19. We also direct the State of UP to provide requisite funds to the CPCB for remediation of Chromium dumps at Kanpur Dehat, Khanpur and RakhiMandi. Proper e-flows may be ensured from the Narora Barrage by the NMCG and the State of UP and a compliance status may be furnished.

PHASES-II TO IV

20. Affidavit filed by the NMCG on 30.04.2019 annexing action plans for the States of UP, Bihar, Jharkhand and West Bengal does not show concrete plans with prompt timelines and action for prohibiting

pollution and taking punitive and remedial action against the polluters. It was directed that NMCG in co-ordination with State Governments of Bihar, Jharkhand, West Bengal and part of Uttar Pradesh to file Action Plan for river Ganga and its tributaries with firm timelines after carrying out detailed field assessments of pollution loads. It was also directed that action plan to cover interception and diversion of drains carrying sewage to STP, utilization of treated sewage, securing compliances from industries located within catchment area of river system, ground water regulation, flood plain regulation, rain water harvesting, good irrigation practices to conserve water, etc. The NMCG has not filed the precise information about the status of projects planned and executed between Kanpur to Ganga Sagar. Thus, the affidavit of the NMCG is of no assistance. Learned Counsel appearing for the NMCG is not ready and is merely dependent on Dr. Praveen Kumar, Director (Technical), NMCG who is also not competent to assist this Tribunal. During the interaction, we find his approach to be to help the polluters instead of remedying the pollution which is the mandate of law and the orders of this Tribunal. The NMCG may take remedial action so that assistance of a suitable person is provided to this Tribunal with precise information failing which this Tribunal may consider coercive measures against the NMCG. The concerned States may also take the matter seriously and ensure assistance to this Tribunal with precise information either through senior officers or through Counsel. No Counsel is present on behalf of the States of Bihar,

Jharkhand and West Bengal. It is the responsibility of all the five States to ensure that water quality at every point meets the standards and if there is a violation, the violators are proceeded against in accordance with law by way of prosecution, closure of polluting activities and payment of compensation for the damage to the environment.

21. We direct the States of Uttarakhand, Bihar, Uttar Pradesh, Jharkhand and West Bengal to place the status of water quality in the respective States on their websites and update the same on monthly basis indicating fitness of water at various places for drinking/bathing purposes. The CPCB may indicate water quality of river Ganga at boundaries of the said States on its website. As already directed, flood plains may be duly demarcated; encroachments prohibited and removed, bio-diversity parks set up and afforestation undertaken. The CPCB along with MoEF&CC to develop guidelines for setting up of bio-diversity parks. The CPCB can take the services of an external expert who has successfully guided DDA to set up bio-diversity park in Yamuna flood plain near Delhi. It would be appropriate if MoEF&CC and respective States examine handing over of such flood plain to the respective Forest Department of States for such activities. Such guidelines may be followed with respect to all the rivers in the country which may be monitored by Director General of Forest in MoEF&CC. Time bound Action Plans be furnished by the NMCG and the States. The same may also be placed on the respective websites for information of the

citizens who have attachment with the river Ganga for social or religious or development reasons.

22. Before parting with this order, we may note that river Ganga has been declared to be National River and has distinct significance for the country. Even a drop of pollution in the river Ganga is a matter of concern. Attitude of all the authorities has to be stringent and depict zero tolerance to pollution of river Ganga. 'Precautionary' principle needs to be in full play for preventing and prohibiting any polluting activity. No amount of wealth generation or commercial or industrial activities can get priority over cleanliness of river Ganga. Any individual or establishment violating the environmental norms with respect to river Ganga must be strictly dealt with under the law and special cells must be created in the concerned States to monitor such action on daily basis. Such action can be a model to deal with the pollution of all other rivers in the country. It is a matter of regret that as per report of the CPCB, 351 river stretches are polluted in the country which is a matter being dealt with by this Tribunal in O.A. No. 673/2018, News item published in 'The Hindu' authored by Shri Jacob Koshy Titled "More river stretches are now critically polluted: CPCB". The Tribunal has directed the Chief Secretaries of all the States/UTs to monitor this aspect along with other important issues and appear before this Tribunal in person with the progress reports. Till date, the Chief Secretaries/Administrators of 32 States/UTs out of 36 States/UTs have appeared in person. This Tribunal has directed highest level monitoring to deal with the situation at the State level as

well as National level. Vide order dated 08.04.2019, this Tribunal has directed setting up of Central Monitoring Committee comprising senior representatives of the Central Government with all the Chief Secretaries of States/UTs. River Ganga needs attention at highest level. We hope that this seriousness will be realized by the concerned States, NMCG and Ministry of Water Resources and steps will be taken in right earnestness in compliance of order of this Tribunal dated 10.12.2015 with regard to Segment-A of Phase-I (in State of Uttarakhand), and 13.07.2017 with regard to Segment-B of Phase-I (in the State of UP), Phase-II (in the State of UP), Phase-III (in the States of Bihar and Jharkhand) and Phase-IV (in the State of West Bengal) as enough time has already passed after the orders of this Tribunal. Every time the progress has been found to be unsatisfactory. The Tribunal will now have no option but to take more stringent measures unless satisfactory remedial action is taken.

Copies of this order be sent to the concerned States and the NMCG by e-mail for compliance.

List for further consideration on 29.05.2019.

Adarsh Kumar Goel, CP

S.P. Wangdi, JM

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

May 14, 2019
Original Application No. 200/2014
(M.A. No. 254/2018 & M.A. No. 872/2018)
(C.W.P. No. 3727/1985) and other connected matters
A



49.