

Namami Gange - Program Management Consultants

Tour Report- Muzaffarpur, Bihar for Kadane River & other RFD Projects in Patna, Bihar

Proposal for protection of Kadane River in Muzaffarpur, Bihar & RFD Projects in Patna, Bihar

Date - 10.03.2025 to 12.03.2025

Site Visit/ Trip Title		Proposal for protection of Kadane River in Muzaffarpur, Bihar & RFD Projects in Patna, Bihar	Location	Muzaffarpur & Patna, Bihar
Date/Time:		21.01.2025 to 24.01.2025		
#	Agenda items for the site visit/trip			
	1. To explore the possibility of providing technical support from NMCG to the local administration in their submitted proposal for the rejuvenation and restoration of the Kadane River in Muzaffarpur, Bihar & other RFD proposals in Patna, Bihar			

Site Visit / Trip Attendees		
#	Organization	Name
1	NMCG	Ms. Kriti Varma, Project Officer
2	PMC	Mr. Harish Kumar Mahavar (Small River Rejuvenation Expert)
3	NMCG	Mr. Anuj Kumar Kushwaha, Civil Engineer-II (YAP-III)

1 Introduction

1.1 Background and purpose of the visit

As per the letter received dated 26.02.2025 from Shri Abhay Kumar Singh, I.A.S. Secretary, Urban Development & Housing Department (UD&HD), Government of Bihar regarding administrative approval of 12 River Front Development Projects for technical evaluation to DG, NMCG, New Delhi.

The Small River Rejuvenation (SRR) Team of NMCG proceeded for the site visit and with the Local Administration to understand the submitted project proposal & visit the project locations, check feasibility of projects & discuss the project issues and suggest an Action Plan in the above-mentioned matters. SRR team visited the following mentioned projects:

- 1) River Front Development work at Digha, Ganga river Patna (Patipul, Minar & Janardan Ghat)-1350 mtr
- 2) River Front Development work at Patna City, Ganga River Patna (Jhawganj Ghat, Kangan Ghat, Kachi Talab Ghat)-200 mtr
- 3) River Front Development work at. Muzaffarpur, Budhi Gandak River (Extension of Ghal near newly constructed Sidhi Ghat, Mukti Dham Ghat and Ashram Ghat)- 1000 mtr and Development of Sewerage System to protect the Kadane River by Sewege in Muzaffarpur.

1.2 Key officials met during the site visit

1. Shri Abhay Kumar Singh, I.A.S. Secretary, Urban Development & Housing Department (UD&HD), Government of Bihar
2. Shri Manoj Kumar, Joint Secretary, Urban Development & Housing Department (UD&HD), Government of Bihar

2 Overview of the site visit/trip

2.1 Details of visit- Agenda

ED, Projects, NMCG directed the Small River Rejuvenation (SRR) team to visit the proposed sites to view the current situation of rivers, feasibility of the project and understand the need of the project.

2.2 Key Observations during the visit & report

1. The whole stretch of the Kadane River is polluted with several drains carrying domestic waste that ultimately merge into the river.
2. Solid waste in the river was found to be a major issue.
3. Some stretches were observed to be highly silted, and also encroachment on the river bank was evident at multiple sites causing the non-point source pollution.
4. Nature-based solutions (NbS) may be considered for pollution abatement.
5. Project proponent has not submitted the details of the river water quality, drainage maps, details of drains, origin and catchment details, sewerage system details, detailed design, drawings & BOQ estimates.
6. At all the RFD locations, some of the old small ghats are already existing at different locations & BUIDCO has proposed to construct one complete ghat so that the ghats situated at adjacent locations can be connected.

2.2.1 Key Issues Identified

1. There is a lack of proper data availability. Topographic Map with watershed delineation and identification of drainage contributing to the river is required.
2. Hydrogeological study all along the river and its catchment area is required with monitoring station.
3. Village and town effluent and waste water are discharged into the river due to the absence of sewerage network. This needs to be treated before discharging into river system.
4. There is a point and non-point pollution in the river with prominent presence of solid waste that adds to the pollution.
5. Water availability through the canal and diverting excess water from nearby catchment areas, need further study.
6. Sedimentation during monsoon in the river bed needs to be assessed.
7. Local administration has done some conservation works like excavation & deepening of river land, free encroached river land, plantation and public awareness etc, but without proper catchment area, discharge calculations & hydrological studies, achieving long-term results for river rejuvenation is difficult.

2.2.2 Way forward

- a) Kadane River is silted at Samastipur and invaded by Water Hyacinth at Khabra. The Hyacinth needs to be removed which can further be used for composting, biofuel, or fodder.

- b) The whole stretch of the Kadane River is polluted with several drains carrying domestic waste that ultimately merge into the river. We have identified the drain at location Rewaghat falling into Kadane river, where Nature-based Solution like Constructed wetland/Soil based treatment/ bio remediation may be explored and can be taken up as an immediate intervention.
- c) Muzzafarpur city, with a population of around 5.67 lacs and generating a sewage of ~60 MLD, is polluted with liquid and solid waste throughout the stretch of the river. This may be considered as an immediate intervention for the management of liquid waste through nature-based solution while solid waste management by improving waste collection, segregation, and disposal systems involving separation of biodegradable and non-biodegradable waste and also encouraging recycling and composting, with the involvement of state.
- d) At some places, the very economical measures like small bunds on the drains may be constructed, which reduce the flow and increase the retention time for the treatment of liquid waste.
- e) UAV-based LIDAR mapping may be carried out for the whole catchment area of the river basin for the large-scale 3D map of the catchment area for hydrological and hydrogeological modelling for a better understanding and establishing the aquifer system in the river basin.
- f) For the pollution abatement, nature-based solutions like Soil-Based Treatment, constructed wetlands, etc. may be considered

to rejuvenate the river in terms of quality and quantity along with ecological restoration. Further to this, a hybrid mode of treatment with inclusion of conventional as well as NbS may also be considered for rejuvenation in a sustainable manner.

- g) Geographical survey of the whole river stretch is required so that the capacity or volume of water collected by the catchment area, design pond area, river cross sections and design their CD structures accordingly. Based on the analysis, the design of catchment area treatment to increase clean water inflow in river just like proper channelization, catch drains, silt traps etc.
- h) Gated bunds/ gated regulator/check dams are required at regular intervals for maintaining base flow in the river at lean periods of rainfall and for groundwater recharge.
- i) The Revenue Department & Local Administration need to identify, demark, and secure the river boundary through fencing or boundary wall to prevent future encroachment. This will also prevent animal & human accidents.
- j) Increase the capacity of the river by deepening, excavation, de-weeding and de-silting. Provide embankment protection, strengthening the bank of river in mild slope to reduce scouring and accidents.
- k) Village or town-level committees should take proactive and appropriate action along with mass awareness to ensure proper disposal of village sewage & solid waste. People's participation in river conservation has to be designed for long-term effectiveness.

- l) Since river is small in nature & primarily seasonal, the lack of data availability requires a detailed scientific study & DPR preparation for the interventions proposed.

Day-1: Visit to Muzaffarpur, Bihar for reviewing proposal site of Kadane River & extension of river front development works on Budhi Gandak River



Kadane River



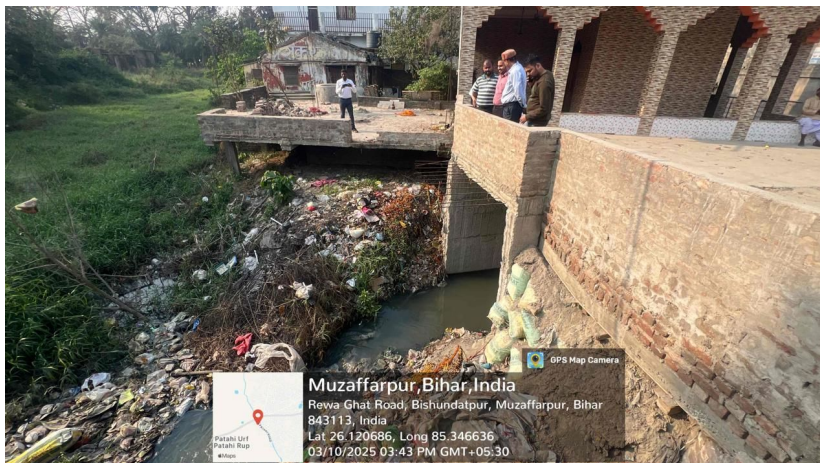
Kadane River



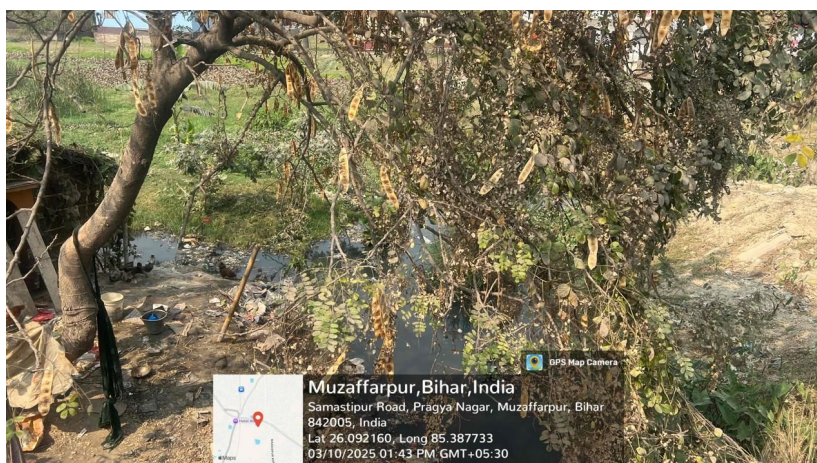
Kadane River



Drain outfall into Kadane River



Drain outfall into Kadane River



Drain outfall into Kadane River



Kadane River



Proposed location for extension of ghat (Sidhi Ghat, Mukti Dham Ghat and Ashram Ghat of 1000 m) on Budhi Gandak River Bank at Muzaffarpur, Bihar

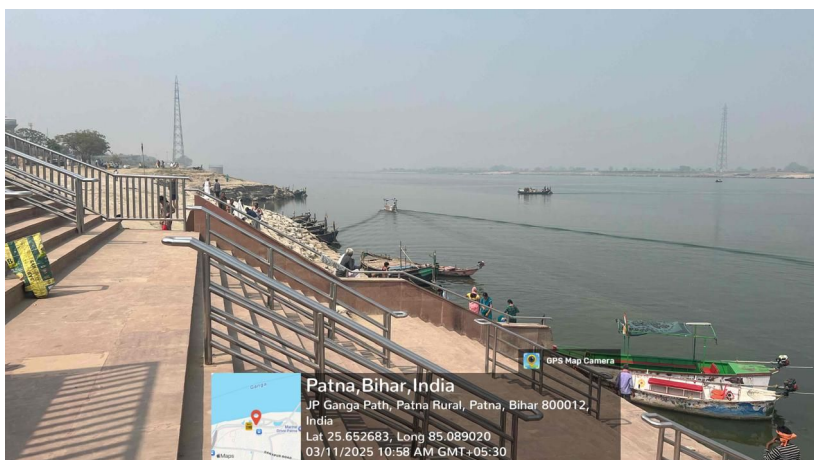
Day 2: River Front Development work at Digha, Ganga river Patna & River Front Development work at Patna City, Ganga River Patna



Proposed location for River Front Development work at Digha, Ganga river Patna (Patipul, Minar & Janardan Ghat)- 1350 mtr



Proposed location for River Front Development work at Digha, Ganga river Patna (Patipul, Minar & Janardan Ghat)-1350 mtr



Minar Ghat - proposed location for River Front Development work at Digha, Ganga river Patna (Patipul, Minar & Janardan Ghat)-1350 mtr



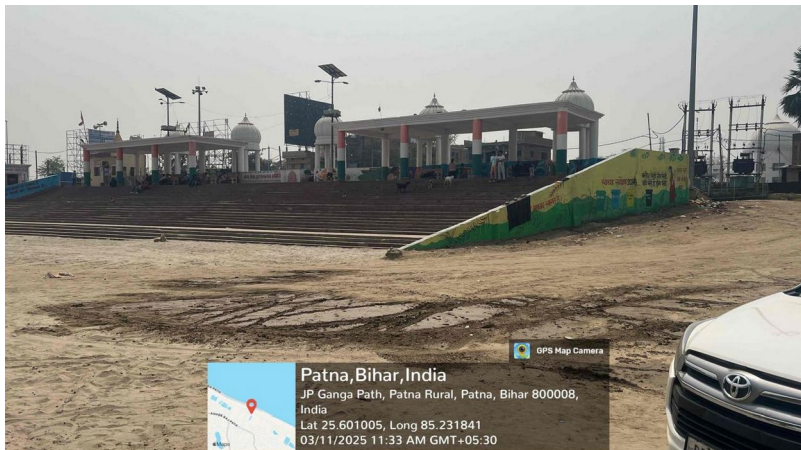
Minar Ghat - proposed location for River Front Development work at Digha, Ganga river Patna (Patipul, Minar & Janardan Ghat)-1350 mtr



Kangan Ghat for River Front Development work at Patna City, Ganga River Patna (Jhawganj Ghat, Kangan Ghat, Kachi Talab Ghat)-200 mtr



Kangan Ghat for River Front Development work at Patna City, Ganga River Patna (Jhawganj Ghat, Kangan Ghat, Kachi Talab Ghat)-200 mtr



Kangan Ghat for River Front Development work at Patna City, Ganga River Patna (Jhawganj Ghat, Kangan Ghat, Kachi Talab Ghat)-200 mtr

Day 3: Meeting with Shri Abhay Kumar Singh, I.A.S. Secretary, Urban Development & Housing Department (UD&HD), Government of Bihar & Joint Secretary, Urban Development & Housing Department (UD&HD), Government of Bihar