BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

O. A. No. 200 of 2014

IN THE MATTER OF:

M. C. Mehta ..... Applicant

Versus

Union of India & Ors. ..... Respondent(s)

INDEX

Date: 30.07.2025
Place: New Delhi

Through

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Reply Affidavit on behalf of the National Mission for Clean Ganga in compliance of the order dated 15.10.2024

I, Anup Kumar Srivastava, S/o Late P. L. Srivastava, aged 58 years presently posted as the Executive Director, Technical in the National Mission for Clean Ganga (NMCG), D/o WR, RD & GR, Ministry of Jal Shakti, New Delhi and am duly authorized and hereby solemnly affirm and state as follows:

1. That I have gone through the order dated 15.10.2024 passed in the matter by the Hon'ble National Green Tribunal, Principal Bench, New Delhi and has understood the contents therein.

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2. That I have been authorized to swear this affidavit on behalf of NMCG by the Competent Authority. Further, it is stated that I have gone through the relevant files and records in the present case.

3. That the above noted matter related to prevention, control and abatement of pollution of River Ganga and its tributaries was listed for hearing on 15.10.2025, pertaining to the stretch of river in Bihar, wherein the Hon'ble Tribunal was pleased to consider the submissions made by the NMCG and inter-alia further directed the Executive Director, NMCG to file a fresh report in terms of the order dated 15.10.2025. The Hon'ble NGT also directed the Chief Secretary, State Government of Bihar to appear virtually on the next date to apprise the Hon'ble Tribunal about the progress made for the prevention and control of pollution of the river Ganga and compliance of the directions contained in the River Ganga (Rejuvenation, Protection and Management) Authorities Order 2016 (Ganga Notification 2016). That the present affidavit is in compliance of directions in the order dated 15.10.2024, passed by this Hon'ble Tribunal.

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4. In pursuance of the order dated 12.08.2024 and dated 25.11.2024, passed by the Hon'ble NGT, the following steps/measures have been taken:

A. Implementation of Flood Plain Zoning (FPZ) of River Ganga and its tributaries in the State of Bihar.

B. Issues regarding release of funds for the Digha STP that is siting in the flood plain zone of the river Ganga.

C. Issuance of siting guidelines for construction/installation of pumping stations (intermediate/final) and STPs/CETPs etc.

D. Monitoring/reviewing of pollution control measures including action undertaken against non-compliant STPs in the State of Bihar

E. Direction to the State Authorities under Clause 41(3) of the Ganga Notification 2016

F. Direction under Section 5 of EPA, 1986

G. Assessment of water quality of the river Ganga particularly with regard to *Faecal coliform*

H. Strategy/Prioritization of Activities in respect of Bihar

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A. Implementation of Flood Plain Zoning (FPZ) of River Ganga and its tributaries in the State of Bihar

a) In compliance of order dated 13.08.2020, a Joint Inter-Departmental Committee (Joint Committee) was constituted on 18.10.2021 for examining the issues relating to demarcation and protection of river flood plain in the State of Bihar headed by the Commissioner (Flood Management), MoJS with members from CWC, NMCG, CPCB, GFCC & NRSC. However, it is pertinent to mention that the State Govt. of Bihar submitted to the Joint Committee a Report on scientific study for establishing the feasibility of Flood plain zoning in Bihar wherein, it had been concluded that flood plain zoning is not feasible in the State. The Committee examined the above said report. The Joint Committee's proceedings were finally concluded with deliberations and discussions on the Bihar Government's Scientific Study Report and recommendations were made by the Committee vide its report dated 24.02.2023. Some of the recommendations are as under:

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(i) The basis of Floodplain Zonation could be using frequency of occurrence of flood events integrated with engineering criteria as well as perspective of ecological integrity;

(ii) Floodplains area may be sub-categorized based on frequency of occurrence of flood events (one in 25 years/one in 50 years/ one in 100 years) as old flood plains that are disconnected from river channel, elevated, cannot be inundated except once in 100 years flood and no longer contribute to the ecological integrity of the river system, in Urban Centres used for human settlements and in villages used for agriculture-plantation-orchards. Similarly, young flood plains that are disconnected from older floodplains, connected with current flow-regime of river, frequently inundated, have geomorphic units like abandoned channels, meanders, ox-bow lakes, wetlands, low vegetation cover and high moisture content, thereby contributing to the ecological integrity;

(iii)Through various directions of NGT, States have been directed that till such time States scientifically demarcate flood plains, as

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an interim measure certain buffer zone (defined specifically in the NGT directions) shall be notified respectively as no construction zone and regulatory zone to prevent encroachments into riverine flood plains and maintain a baseline. This interim measure shall cease upon scientific demarcation and notification thereof of floodplains by the States.

That the report of the Joint Committee was issued on 24.2.2023 and its copy was endorsed to the Secretary, Water Resources, Govt. of Bihar vide NMCG letter bearing No. TE-160019/3/2020-O/o AD (RD) Tech/ NMCG/895 dated 24.02.2023.

True copy of the report of the Joint Committee dated 24.02.2023 is annexed and marked as **Annexure – R1**

b) NMCG has also time to time advised all states in Ganga basin for demarcation, delineation and notification of river flood plains and removal of encroachment from river bed/floodplain of the river Ganga and its tributaries in adherence to the Ganga Notification, 2016.

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c) A meeting was convened with the State Govt. of Bihar on 05.05.2025 to discuss on the issues of flood plain zoning in Bihar on flowing lines:

(i) It was informed by the State that requisite DEM has been collected from Survey of India for FPZ study. It was suggested to get the study conducted on the flood frequency analysis approach for floods of Return Periods of 5-Yr, 25-yr and 100-Yr. In addition to these intervals, State Govt. may adopt any other frequency interval of its choice for the purpose of FPZ.

(ii) It was informed by the State that a FPZ Order for 'Embanked Rivers' has been issued by the State Govt. on 06.03.2025 which is based on the recommendations of a Committee formed for this purpose. Bihar Government was requested to clarify the basis of selecting a distance of 500 meters (from the non-embanked river edge) taken for demarcation of flood plain.

d) The State Government of Bihar provided a copy of the FPZ order for 'Embanked Rivers' dated 06.03.2025 wherein important points are as follows:

(i) It has been decided to implement Flood Plain Zoning for embanked rivers in the first phase in the state. Further action will be taken after necessary study for determining Flood Plain Zone for non-embanked rivers.

(ii) In view of the above-mentioned perspective, Flood Plain Zone is determined for embanked rivers under the State as follows:- (a) For rivers on which embankments are constructed on both banks, the area between the embankments constructed on both banks is determined as Flood Plain Zone; (b) For rivers on which embankments are constructed on only one bank, the area from the embankment to the other bank of the river along with the width of the river up to 500 meters is determined as Flood Plain Zone; and (c) The Flood Plain Zone determined in clauses a and b above has been kept under Prohibited Zone.

(iii) The activities related to implementation/regulation of Flood Plain Zoning will be monitored and coordinated by the concerned district administration. Also, for the purpose of acceptance of Flood Plain Zoning, the villagers will be encouraged/trained by the district administration to settle

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outside the embankment. The district level officers of all the concerned departments under the state will assist the district administration for implementation/regulation of Flood Plain Zoning.

(iv) The implementation of Flood Plain Zoning will be reviewed regularly and necessary action will be taken to strengthen it according to the changing environmental and socio-economic scenarios.

True copy of the FPZ order for 'Embanked Rivers' dated 06.03.2025 passed by the Bihar Govt. is annexed and marked as **Annexure – R2**

e) NMCG vide letter dated 27.05.2025, also citing Bihar Govt. letter dated 11.04.2025 (copy attached), has requested the Govt. of Bihar that the work of flood plain zoning be accomplished in Bihar in conformity with the recommendations of the Joint Committee in its report dated 24.02.2023 and provisions of the Ganga Notification, 2016.

True copy of NMCG letter dated 27.05.2025 is annexed and marked as **Annexure – R3**

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B. Issues regarding the release of funds for the Digha STP that is siting in the flood plain zone of the river Ganga

(i) NMCG approved the project for the development of STP at Digha in 2017, based on the DPR submitted by the State Government in 2016. Accordingly, funds have been released as per approved Administrative Approval & Expenditure Sanction.

(ii) The land identification and allocation for setting up a STP and related infrastructure are State Government domain and is dependent upon the location of the major drains which is evaluated during survey and preparation of project feasibly report.

(iii) As per joint inspection report of the Water Resources Department (WRD) and Urban Development and Housing Department (UD&HD), Govt. of Bihar, the STP location was about 500 m away from edge of the river Ganga at Digha and therefore, Consent to Establish (CTE) was granted by the Bihar State Pollution Control Board (BSPCB) on 17.02.2022.

(iv) State Government decide on the location of STPs considering the geographical terrain of the town. Hon'ble NGT judgement in the same matter (OA 200/2014) has guided that "End of pipe" treatment

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is one of the best solution for pollution abatement of river, and Digha STP location is at the end of drain.

(v) As per the extant practise of NMCG, the project was comprehensively technically appraised by third party institution namely IIT Roorkee at DPR stage and IIT Chennai vetted the technical design at execution stage for all aspects.

(vi) Further, the Digha STP is not in the middle of the River Ganga, but rather on its right bank. The site selected by the State Government is situated near the Lok Nayak Ganga Path (a 4-lane road), at the mouth of Kurji Nala. It is humbly submitted that the STP does not obstruct the main current of the river, and is away from the river's primary flow channel. Normally, river away from their main channel does not carry much discharge/velocity except flooding the area for a few days.

(vii) To ensure structural integrity and continuous operation during such events, plinth protection works have been undertaken. More importantly, the STP has been constructed above the highest flood level (HFL), which allows it to function safely even during the flood season.

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C. Issuance of siting guidelines for construction/installation of pumping stations (intermediate/final) and STPs/CETPs

(i) The Water Pollution SOPs/Guidelines are issued by the CPCB under the Water (Prevention and Control) of Pollution Act, 1974 and Rules therein and the related state level SOPs/Guidelines are framed by the respective State PCBs.

(ii) NMCG together with Indian Institute of Technology, Roorkee (IIT, Roorkee) has published "*GUIDELINES FOR PREPARATION OF DPRS FOR WORKS OF INTERCEPTION AND DIVERSION OF DRAINS AND SEWAGE TREATMENT PLANTS*" in 2018 which provide a guidance to state agencies for preparation of DPR including locations of treatment facilities which are responsible for planning and execution of pollution abatement works in the state.

D, E & F. Monitoring/reviewing of pollution control measures including action undertaken against non-compliant STPs in the State of Bihar, Direction to the State etc.

(1) NMCG has been continuously pursuing with the State Government of Bihar and authorities under it for monitoring/reviewing of pollution control measures including

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action undertaken against non-compliant STPs in the State of Bihar.

(2) NMCG issued direction to State Govt of Bihar under Section – 5 of the Environment (Protection) Act, 1986 to non-complying **Saidpur STP**. During an inspection carried out by NMCG on 28.12.2024, the 60 MLD STP at Saidpur, Patna was found to be non-compliant with respect to the stipulated discharge norms including non-operational chlorination system. Accordingly, the NMCG vide letter dated 29.01.2025 issued directions, to the State Government of Bihar, under Section 5 of EPA, 1986, for ensuring compliance of the stipulated norms.

True copy of NMCG's communication dated 29.01.2025 is annexed and marked as **Annexure – R4**.

(3) A meeting was held with the officials of State of Bihar on 28.02.2025 and further a review meeting on ongoing projects in Bihar was also held on 13.03.2025. In this meeting, State was directed to ensure that the existing STPs are being properly maintained and operated and corrective measures are taken for resolving the issue of non-compliance of the STPs.

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(4) BSPCB is the responsible agency monitoring the quality of treated effluent of all the operational STPs of the State and also taking action against non-complying STPs.

a) As per the data available from the state, an Environmental Compensation (EC) of Rs. 1,09,60,000/- (Rs. One Crore Nine Lakhs Sixty thousand) only has been imposed by the Bihar SPCB on the Saidpur STP, consequent to the directions issued by NMCG vide letter no- F. No. T-13/2013-14/283/Saidpur Network, dated 29.01.2025.

b) BSPCB has imposed and collected Environmental Compensation from the non-complying Industries as well.

c) Further, following measures were taken by the Bihar Urban Infrastructure Development Corporation Ltd (BUIDCO):

I. Managing Director, BUIDCo sought further details /clarification from Project Director (Saidpur), BUIDCo in respect of the non-compliance of the STP.

II. BUIDCo vide letter dated 28.02.2025, issued show cause notice, for negligence in the operation and maintenance of Saidpur STP, to the Contractor M/s Toshiba Water Solution Pvt. Ltd.

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III. BUIDCo vide letter dated 06.03.2025 directed District Magistrate, Patna to register Police compliant against the Contractor & the Technical service provider for negligence in the operation and maintenance of Saidpur STP and discharging untreated sewage into River Ganga.

IV. A Three-Member Committee comprising of officials of BUIDCO and Bihar-SMCG has been constituted for carrying out surprise inspections of the STPs, once every month for ensuring efficacy of the STP.

True Copies of letters dated 28.02.2025 and 06.03.2025 received from BUIDCo are annexed and marked as **Annexure – R6/colly**.

(5) Further, NMCG also issued direction again to State Govt of Bihar under Section – 5 of the Environment (Protection) Act, 1986 to non-complying **Danapur STP**. During an inspection carried out by NMCG on 19.06.2025, the 25 MLD STP at Danapur, Patna was found to be non-operational at the time of inspection and no sewage was being received in the STP. Accordingly, the NMCG vide letter dated 11.07.2025 issued

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directions, to the State Government of Bihar, under Section 5 of EPA, 1986, for ensuring compliance of the stipulated norms.

True copy of NMCG's communication dated 11.07.2025 is annexed and marked as **Annexure – R5.**

(6) The 20th meeting of the Central Monitoring Committee (CMC) constituted by Hon'ble NGT in the matter OA No. 673 of 2018 held on 17.07.2025 under the Chairmanship of Secretary, DoWR, RD & GR, Ministry of Jal Shakti (MoJS) also discussed the matters pertaining to the State of Bihar, and following decisions were taken:

"2.3 DG, NMCG remarked that the existing STPs in Bihar are funded under Namami Gange Programme. However, during random visits, these STPs have been found to be non-operational. Therefore, State must ensure that the STPs are operational and optimally utilized.

2.4 Chair directed State to take measures for improving the capacity utilization and compliance status of the existing STP infrastructure. Further, meetings of RRC needs to be convened regularly for reviewing the

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progress made by the State for addressing the pollution in the rivers in the State.

2.5 ACS (Environment), Bihar informed that CPCB has reported improvement in the water quality of the rivers. State PCB has issued directions against the non-compliant STPs. He added that the progress would be thoroughly reviewed at State level and appropriate action would be taken to address the issues."

(7) The Empowered Task Force (ETF), chaired by Hon'ble Minister for Jal Shakti, Government of India, in its 15th meeting held on 24.06.2025 reviewed the performance of STPs of Bihar and directed the State of Bihar to ensure proper operation & maintenance of the STPs.

G. Assessment of water quality of the river Ganga particularly with regard to Faecal coliform

(1) CPCB through BSPCB, is carrying out monitoring for assessment of River Ganga water quality at 33 locations on main stem of the river Ganga in Bihar on fortnightly basis. River water quality is assessed for notified primary water quality

criteria for bathing in terms of pH (6.5-8.5), Dissolved Oxygen (≥ 5 mg/L), Biochemical Oxygen Demand (≤ 3 mg/L), *Faecal Coliforms* (≤ 2500 MPN/100 mL) and *Faecal Streptococci* (≤ 500 MPN/100 mL).

(2) As reported by the CPCB on the basis of data for the period January 2025 to April 2025 (first round), the entire stretch of the river Ganga in Bihar in respect of Faecal Coliform (median value) is conforming with notified primary water quality criteria for bathing, except at three locations (out of 33 locations) with marginal variation.

True copy of CPCB's report on Ganga River water quality in Bihar (January-April 2025) is annexed and marked as **Annexure – R7**

(3) NMCG vide letter dated 01.01.2025 entrusted the work to IIT, BHU for 'Monitoring Study and mapping Faecal Coliform in River Ganga Water in downstream of Ghazipur (Uttar Pradesh) to Bhagalpur (Bihar)' for six months. Through this study, NMCG intends to get Faecal Coliform (FC) measured in the downstream of Ghazipur (Bihar stretch) so that the results and

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(4) trends so obtained help in understanding/ variation in river WQ behaviour (FC) over time and enable regulatory institutions in taking informed decisions and planning corrective measures accordingly. The study would also list out probable factors that influence measurement of FC, and precautions required to be adopted during sampling procedures to obtain reliable data.

H. Strategy/Prioritization of Activities in respect of Bihar state

The NMCG has been currently focusing its efforts on controlling pollution and rejuvenating the river Ganga by prioritizing towns and districts situated directly on the main stem of the river. In Bihar, NMCG has identified 12 such main stem districts that lie along the course of the Ganga. These districts have a higher potential for pollution due to concentrated urbanization, domestic waste discharge, and industrial activity.

Accordingly, the NMCG has directed the Bihar state government to prioritize all rejuvenation and pollution control measures in these 12 districts. This includes the construction and enhancement of sewage treatment plants, proper solid

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waste management, industrial pollution regulation, riverfront development, and public awareness campaigns. The rationale behind this focused approach is that any improvement in these districts will have a significant and immediate impact on the overall health and cleanliness of the Ganga River.

5. That the deponent is a responsible Government servant having the highest regard for the Hon'ble Tribunal and orders passed by them. The deponent has always made his sincerest efforts to carry out the orders passed by this Hon'ble Tribunal in its letter and spirit and shall continue to do so in future.

Deponent

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I certify the deponent Executant has signed in my presence
P/2365/115

VERIFICATION:

Verified at Delhi on this the day of 30 JUL 2025 July, 2025 the averments and facts stated herein above are true and correct to my knowledge and belief and nothing material has been concealed therefrom.

Certified that the foregoing statement was declared on solemn affirmation before me which has been read over to the deponent who has admitted it as correct

Notary DELHI

30 JUL 2025

NOTARY GOVT. OF INDIA Neha Tomar Advocate New Delhi Regn. No. 8913

Deponent

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नमामि गंगे

राष्ट्रीय स्वच्छ गंगा मिशन
National Mission for Clean Ganga

No.: TE-16019/3/2020-O/o AD (RD Tech/NMCG/895 Date: 24th February 2023

Subject: Report of the Inter Departmental Joint Committee on River Flood demarcation and Protection in Bihar (constituted in NGT matter O. A. No. 200 of 2014) – reg.

Please find enclosed Report of the Inter Departmental Joint Committee on River Flood demarcation and Protection in Bihar (constituted in NGT matter O. A. No. 200 of 2014) for information and necessary action.

Yours faithfully,

24.2.2023

(D. P. Mathuria)
Executive Director-Technical, NMCG
& Member-Convener of Inter Departmental Joint Committee
e-mail address: ed-technical.nmcg@nic.in

Encl.: As above

To,

1. The Secretary, Water Resources Department, Government of Bihar, Ist Floor, Sinchai Bhawan, Old Secretariat, Patna – 800 015
2. Member (P), Ganga Flood Control Commission, 3rd Floor, Sinchai Bhawan, Patna, Bihar – 800 015
3. Shri Ajay Kumar, Director Morphology & Climate Change Directorate, Central Water Commission, Wing – I, First Floor, West Block – II, R. K. Puram, New Delhi – 110 066
4. Dr. A. K. Vidyarathi, Additional Director and DH- WQM-II, Central pollution Control Board, Parivesh Bhawan, East Arjun Nagar, New Delhi – 110 032
5. Shri B V Rao, Group Head, Water Resource Division, National Remote Sensing Center, Indian Space Research Organization, Bala Nagar, Hyderabad – 500 037

Copy for kind information to:

1. PS to Secretary, DoWR,RD&GR, Ministry of Jal Shakti, Govt. of India
2. PS to DG, NMCG
3. PS to Commissioner – Flood Management, DoWR,RD&GR, Ministry of Jal Shakti, Govt. of India
4. PS to Chief Secretary, State Govt. of Bihar, Main Secretariat, Patna – 800 015

True Copy

Report of the Inter-Departmental Joint Committee (constituted in O. A. No. 200 of 2014) in compliance of order dated 13.08.2020 and dated 08.02.2021 passed by the Hon'ble NGT.

Dated: 24th February, 2023

NATIONAL MISSION FOR CLEAN GANGA
DEPT. OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION,
MINISTRY OF JAL SHAKTI,
GOVERNMENT OF INDIA, NEW DELHI

Index

A- Background:

1. The Government of India notified the River Ganga (Rejuvenation, Protection and Management) Authorities Order, dated 07.10.2016 for abatement of pollution, protection and conservation of River Ganga and its tributaries and constituted NMCG as an Authority for effective implementation of provisions of the said Order.

2. Para 4 of the Authorities Order, 2016 inter-alia provides certain principles for rejuvenation, protection and management of River Ganga and taking measures for the rejuvenation, protection and management of River Ganga, including that the bank of River Ganga and its flood plain shall be construction free zone to reduce pollution ingress into the river and to maintain its natural ground water recharge functions. In terms of para 3 (l) of the said order, "*flood plain*" means such area of River Ganga or its tributaries which comes under water on either side of it due to floods corresponding to its greatest flow or with a flood of frequency 1 in 100 years. Further, the order also mandated that the respective State Governments to identify and demarcate river flood plains in the concerned State.

3. Vide judgment dated 13.07.2017 in the matter of O. A. No. 200/2014, the Hon'ble NGT directed the State Governments for identification and demarcation of flood plain in river Ganga, based on 1 in 25 years cycle of Highest Flood Level (HFL). Till the said identification is completed, 100 meters from the edge of the river would be designated as *No Development/ Construction Zone*. The NGT in other matters has also been reiterating the compliance of direction by the State Governments with regard to identification, demarcation and protection of flood plain.

4. The State Government of Bihar approached NMCG on 13.09.2019, 04.05.2020 and 09.10. 2020 and sought exemption from compliance of the provisions of identification and demarcation of flood plain in terms of the Authorities Order, 2016 on grounds mainly stating that the land/areas in Bihar is extremely plain terrain and densely populated and further that all the major rivers are embanked. Therefore, the Government of Bihar requested for amendment in the Authorities Order, 2016 for a special provision applicable to the State of Bihar.

5. NMCG interregnum asked the State Government of Bihar on 31.07.2020,

10.12.2020, 06.01.2021 requesting for Scientific Study Report in terms of flood for different return period. Further it requested that extent of impact of inundation and designating a buffer zone of 500 -1000 meters as protective flood Zone till the time such study is completed may be done.

6. The State Government of Bihar, however, flagged the issues related to flood plain demarcation & protection in Bihar before the Hon'ble NGT on 13.08.2020 seeking relief/ exemption from compliance of directions related to flood plain demarcation & protection and claimed relaxation in respect of the definition of '*flood plain*' as described in the Authorities Order, 2016. A Report on Scientific Study on Feasibility of Flood Plain Zoning in the State of Bihar was also submitted by the Government of Bihar to the Hon'ble NGT with copy endorsed to NMCG on 10.08.2021 (Copy enclosed as Annexure-I). In its order dated 13.08.2020 passed in the matter, the Hon'ble NGT observed that

> *36. ... the State of Bihar has stated that there cannot be demarcation of flood plains of river Ganga in the Bihar as the State is over populated. Learned Senior Counsel for the NMCG submits that Bihar is not exempt from the statutory mandate requiring maintenance of minimum flow for which identification and protection of flood plains cannot be wished away. We find it difficult to accept the stand of State of Bihar. Demarcation of flood plains is absolutely necessary to maintain e-flow to which Bihar can be no exception. Moreover, the State of Bihar is frequently faced with floods, affecting lives and safety of the citizens. One of the remedies for handling floods is identification of the flood plains and their protection. Protection of flood plains may require control of unregulated construction activities, encroachments and unregulated mining.*

7. Thus, vide order dated 13.08.2020, the Hon'ble NGT constituted a Joint Committee of NMCG, MoJS and CPCB to look into the issue of floodplains demarcation and protection in the State of Bihar. Further, Hon'ble Tribunal in its order Dt. 08.02.2021 has observed as below:

> *"...(c) Bihar: That the State of Bihar in its report has submitted that considering the densely populated northern plain terrain and embanked river in the State, the directions pertaining to flood plain zonation is not applicable in case of Bihar and the State Government is contemplating to approach the Hon'ble NGT in this regard. That*

Hon'ble NGT in its order dated 13.08.2020 has passed direction for constitution of a Joint Committee of members from NMCG, MoJS and CPCB to look into the issue of river flood plains demarcation and protection in the State of Bihar. In this regard, this Hon'ble Tribunal is to be apprised that the State Govt. of Bihar requested for modification in the definition of flood plain as described in the Gazette Notification S. 0. 3187(E) dated 07.10.2016. The State Govt. of Bihar was asked to carry out a scientific study and report action taken based on such study and accordingly, letters dated 31.07.2020, 10.12.2020 and 06.01.2021 was issued to the Secretary, Water Resource Department Govt. of Bihar. Copies of aforesaid mentioned letters are placed at Annexure - II. No information in this respect has been furnished by the State Govt. of Bihar till date. The Joint Committee could look into issues pertaining to demarcation and protection of floodplains in State of Bihar once this study is in place and the requisite data is provided for examination."

8. In pursuance thereof, an Inter-Departmental Joint Committee was constituted on 18.10.2021 comprising of members as below:

i. Commissioner (Flood Management), MoJS:	Chairman
ii. Representative from CWC:	Member
ii. Executive Director(Technical), NMCG:	Member Convener
iv. Representative from CPCB:	Member
v. Representative from GFCC:	Member
vi. Representative from NRSC:	Member

9. The scope of work for the Joint Committee was as following:

(a) Review the '*Report on Scientific Study on Feasibility of Flood Plain Zoning in State of Bihar*' furnished by the Govt. of Bihar as well as any other report(s) made available to the Committee, in connection thereof.

(b) Examine the request of State of Bihar as regards their claim that (i) demarcation of floodplains of river Ganga in Bihar cannot be done, and (ii) Provisions of Flood Plain Zoning in *subsection (1)(l) of section 3* and *subsection (3) of section 6 of River Ganga (Rejuvenation, Protection and Management) Authority Order, 2016* needs revisiting

and amended thereof, for having special provisions for Bihar State,

(c) Provide recommendations on the request(s) of State Government of Bihar.

B- Details of Meetings held by the Inter Departmental Joint Committee Three rounds of meeting were held on 23.11.2021, 15.12.2021 and 25.01.2022. During the meetings, the report submitted by the State Government of Bihar was examined by the Committee members/Experts and for further deliberations, the State was asked to furnish information as following:

1- The State Government of Bihar through its agencies shall present extent of area liable to flooding during floods of 100-year return period from center of Ganga River as well as same for floods of different return periods as well. Satellite imagery for pre or post-monsoon for different years may also be presented. Imageries used for different years should be consistent for similar periods viz., either pre-monsoon or post-monsoon. It was also observed that large areas are depicted to be under inundation which may be due to rains and internal flooding because of low lying terrain of the State.

2- State shall also present figures indicating percentage of low lying areas that will be inundated due to floods of certain return periods. Ground-truth verification of imageries sent by NRSC as per advise of *Expert Committee for Scientific Assessment of Flood Prone Area* is still pending with State of Bihar. If the same is available, it may assist in flood plain zoning issue of Bihar.

3- As per NGT order in OA No. 200/2014, main objective is to protect geology and ecology of the River which is missing in the presentation made by State of Bihar. River system has different physical structures such as channels and other existing uplands, with each having different functions. As per ecology, flood plain zoning are of two types, Hydrological (Riparian) Flood plain and Topographical Flood plain.

i. Hydrological (Riparian) flood plain is missing from discussion and presentation.
ii. Assessment of such flood plain zoning could be worked upon stretch-wise. State shall also consult ecologist or ecological scientist for the same.

4 - *Para 6 (3) of the Authorities order, 2016* also provided for inventorization of already existing construction in flood plains and their review by *National Mission for Clean Ganga* so as to examine as to whether such constructions are causing

interruption in the continuous flow of water or pollution in River Ganga or its tributaries, and if that be so, it shall cause for removing them. Extent of inundation caused by floods of different return periods for river Ganga and its tributaries, therefore, needs to be identified and furnished to the Committee, on GIS or appropriate platform.

5- A blanket exemption that identification or notification of floodplain and its regulation is not possible due to peculiar settings in State may not be acceptable as requisite information has not been provided by State. Certain regulations should be there so that a baseline status for riverine right-of-way can be maintained especially in areas with high population pressure.

6- It is responsibility of State to inventorize the existing construction/ structures in flood plains and take appropriate view on such constructions. There are court cases for appropriate jurisprudence before Supreme Court also wherein brick-klins etc. and similar commercial structures, which are encroachments in the floodplains, have been constructed in the flood plains due to absence of any regulatory framework. Pending identification of flood plains and its zonation for regulatory purposes, it is also essential that State immediately brings in a regulatory framework for regulating certain buffer area along the river banks to avoid further encroachment and indemnify the river from avoidable anthropogenic activities.

9- As most of river in State are embanked, it may also segregate extent of flooding, river-wise and river stretch-wise, within embankments and that outside the embankments in years which did not have large areas under flooding.

10- Further studies required for scientific assessment utilizing the high resolution DEM is to be carried out by State as per timeframe following directions of Hon'ble NGT.

11- State may well consider carrying such studies river-wise and river stretch wise identifying those stretches, in first phase, where dense settlements exists. Results of such study may help in extrapolating the same in other stretches also.

C-Submission made by State of Bihar during Discussion in meetings:

1. Presentation was made by the State Government on "*Scientific study on: the feasibility of Flood Plain Regulatory Zoning in the State of Bihar*" covering various aspects related to satellite imageries based studies towards identification of low-lying and flood prone areas, their geographical extent and annual maximum inundation during historical years. State presented that terrain in the State is

2. markedly different from that in Uttar Pradesh or other States as rivers in Bihar have comparatively high terraces immediately along the river channels followed by low lying areas further away from channel supporting unique settlement patterns along the river banks and in their flood plains. Besides, the rivers happen to be largely embanked.

3. State Government of Bihar was requested to use high resolution DEM for scientific assessment and to provide results of such study both river wise and river-stretch wise and identifying those stretches, in first phase, where dense settlements exist. The Government of Bihar vide their letter dated 21.01.2022 provided list of 23 structures located on banks of River Ganga at Buxar, Patna, Barh, Gaya and Sultanganj identifying type of structures as administrative building, defence establishment, educational institutes, commercial and security considerations etc.

4. Further, it was submitted that as high resolution Digital Elevation Model (DEM) for said river flood plain and adjoining area are not available with the State of Bihar, hence, it is not possible to assess extent of inundation corresponding to flood of different flood frequency. It was also mentioned that Bihar Government in past had tried to obtain DEM for Kosi and Baghmati rivers in the State but effort was futile. However, they have identified list of 23 important structures which are within 100meters, 200meters and 500meters distance from banks of active river channel.

5. Bihar Government responded that the present study has been completed using data obtained from NRSC under *Disaster Management Programme*. As SRTM data have variations of 1-2 meters, therefore it is not possible to demarcate extent of inundation using SRTM DEM. For assessment of such extent of inundation, DEM (Digital Elevation Model) of specific higher resolution would be required. Therefore, for further study using DEM of high resolution, further time period would be required.

D-Committee's Observations:

1. The Committee observed that the Government of Bihar expressed their difficulty in identification of floodplain of rivers as they don't have maps or high resolution DEMs. The Joint Committee was apprised that in *1st Quarterly Report of Bihar* submitted to the *Central Monitoring Committee (constituted in O. A. No. 673/2018)* the State of Bihar had submitted as following:

a. The buffer zone at 100meters, 200meters and 500meters on either side from central line of the main stream of river Ganga was assessed and demarcated on GIS map and the area, including river portion was assessed as 183.89 Km2, 363.12 km2 and 875.31 km2 respectively.

b. The buffer zone at 100meters, 200meters and 500meters on either side from the central line of the main stream of river Gandak in Bihar was demarcated on GIS map and the area, including river portion has been assessed as 71.11 Km2, 139.28 km2 and 321.12 km2 respectively while for Ghagra in Bihar, it has been assessed as 15.76 Km2, 36 km2 and 71.00 km^2.

c. Based on HFL at Gandhi ghat, Patna; an inundation map of river Ganga (in Bihar) was prepared on GIS using satellite imagery of river Ganga. The map shows that 2126 villages in 13 districts spanning over 4830.70 km2 excluding the active river channel is affected.

d. Buffer zone for other tributaries of Ganga like Koshi and Mahananda is under progress.

The submissions made before the Hon'ble NGT by the State Government of Bihar in form of Quarterly Report(s) were not found to be consistent with their views before the Joint Committee. The State of Bihar has made assessment of extent of inundation based on Satellite imageries only without accounting for these figures scientifically from floods corresponding to different return periods and their impact thereof on flood plain zoning. However, it emerges that State Government of Bihar is in position to make a scientific assessment of inundated area due to flooding by carrying out studies.

2. As per data provided by NRSC to *FMISC (Flood Management Improvement Support Centre*) of the State contains those areas which are very low lying and completely inundated not only due to *fluvial flooding* due to river but also due to *pluvial flooding* due to rains in different years.

3. The Committee expressed that there have been examples of adoption of varied criteria for delineation of floodplain. For e.g.

(a) In case of Krishna River, flood plain of river is defined as zone betweenflood protection bunds of the river.

(b) For Yamuna River in Delhi, flood plains are corresponding to zone ofinundation for 1 in 25 years flood frequency.

c) For Yamuna River in Agra, flood level taken in year 2010 is taken as extent of flood plains.

While as per Authorities Order, 2016, the flood plain of the river Ganga is to be considered invariably on the basis of one in 100 years cycle of flood return period which warrants further study/data to prove rationality and practicability.

4. Moreover, NRSC has made *Flood Hazard Atlas* which are covering flood hazard for flood frequency of 1 in 2 years or 4 years. However, it is not possible to separate *fluvial* and *pluvial* flooding. A quick study can be undertaken by taking discharge data for period of 25 years and it was opined that modelling should not take much time provided data is available.

5. The mandate of Committee is to examine the submission made by Govt. of Bihar in form of Scientific Studies and made recommendations as regards relaxation in *Authority Notification, 2016*. Committee may not independently get into studies as such studies may be carried out by Government of Bihar and result presented to the Committee.

6. The Committee further observed that State Government of Bihar should take further study with objective of assessing extent of area under respective flood frequency and taking into consideration river cross-section required for safe passage of floods.

E-Recommendations:

- The basis of Floodplain Zonation could be using frequency of occurrence of flood events integrated with engineering criteria as well as perspective of ecological integrity.
- Floodplains area may be sub-categorized based on *frequency of occurrence of flood events* (one in 25 years/one in 50 years/ one in 100 years) as **old flood plains** that are disconnected from river channel, elevated, cannot be inundated except once in 100 years flood and no longer contribute to the ecological integrity of the river system, in Urban Centers used for human settlements and in villages used for agriculture-plantation-orchards. Similarly, **young flood plains** that are disconnected from older floodplains, connected withcurrent flow-regime of river, frequently inundated, have geomorphic units like abandoned channels, meanders, ox-bow lakes, wetlands, low vegetation cover and high moisture content, thereby contributing to the ecological integrity.

Therefore, criteria may be worked out for zonation that may be applicable

stretch-wise to ensure maximum integrity of floodplains using geo-morphological approach *i.e.* demarcation of younger floodplains as they are ecologically more active.

- Even in younger floodplains, the Land-Use Land-Cover may be considered while developing the criteria. If the protective bunds demarcate younger floodplains from the older floodplains, it can be used for zonation of floodplains but if it is located within younger floodplains it should be relocated close to the older floodplains.
- The existing SRTM Digital Elevation Model may not give exact results as the relief in floodplains in stretch of River Ganga in Bihar requires high resolution DEM data. Therefore, high resolution Digital Terrain Modelling is required for floodplain demarcation using simulation under different return periods.
- NRSC has prepared *Flood Hazard Atlas* of Bihar State using multi-mission satellite imagery data acquired during 1998 to 2019. This covers, recent extreme floods also. Upstream and downstream historic discharges of the said river stretch may be analyzed to compute flood magnitudes corresponding to 25 years return period. Recent Satellite based flood map nearest to correspond to computed 25-year flood discharge may be considered as 25 years return period map.
- As floodplains in the specified stretch is more than 300m wide, identifying structures within the buffer of 100m, 200m, 250m, 300m is not scientific.
- The area within the protective embankment is the river space where no development activity should be permitted. If the protective embankment is close to (100 meter) from river channel bank, the protective embankment should be relocated close to older floodplains.
- Identification of encroachments/unauthorized and illegal constructions in floodplain may be done using UAV/HRSI imagery for the flood plains of entire river network of Bihar.
- A comparative analysis between the cost incurred on the annual maintenance of flood protection works and the cost involved for relocation, rehabilitation of infrastructures and annual flood relief for area lying within the demarcated flood plain boundaries, as obtained from encroachment survey needs to be done.
- The satellite images provided do not separate the *fluvial* flooding from other types of flooding such as *pluvial*, drainage congestion etc. Also, instead of showing maximum flooding in a year, it will be better to indicate flood extent and depth separately for each river system based on range of flood exceedance probabilities i.e. return period from 2 to 100 years with overlay of all critical infrastructure & demography. Thereafter, damages against each return period may be derived.

- Vast wetland areas are available near various rivers and in different location in the State of Bihar which acts as detention basin to regulate flood and silt. The surveys of these areas are also required to be carried out by the State Government for restoration to its natural condition. The views of Bihar State Wetland Authority may also be taken.
- The State should assemble and collate city-wise data for flood frequency of river Ganga and its tributaries, cross-section of the river and cross-section of the river required for safe discharge of the floods the in river. thereafter, the requirement would be for identification and delineation of river area required to be reserved as flood plain zone devoid of any kind of news civic constructions.
- In City/town areas where there is pressure on land in floodplain, the State Government can honour whatever Hon'ble NGT has prescribed in its directions/orders and /or what has been provided under State bye-laws. But in rural areas with relatively low pressure on flood plain, the flood plain area should be protected in true spirit of *Authority Order, 2016*.
- Finally, as soon as DEMs would be available through the study, the State should complete the survey study.
- The process of LIDAR survey by Survey of India on stretch of Ganga for generation of high resolution Digital Elevation Model (DEM) for about 93000 sq.km. area in buffer of 10 km on both banks of river Ganga and its tributaries (Yamuna, Ghagra, Ram-ganga, Gomti and others) is in progress under Namami Gange Programme and National Hydrology Programme. DEM data so made available would be shared with concerned States for effective management of floods. Further that this DEM data would be available in different phases starting with effect from July-2023 after the validation of same by Survey of India is completed. This DEM data will help States to demarcate extent of inundation due to floods of various recurrence periods.
- The States must have computational facility in form of hardware and software for viewing the DEM data, various query tools and facilities for analysis of high resolution data.
- Under para 6(3) of River Ganga (Rejuvenation, Protection and Management) Authorities Order, of Oct-2016, *no person shall construct any structure, whether permanent or temporary for residential or commercial or industrial or any other purposes in the River Ganga, Bank of River Ganga or its tributaries or active flood plain area of River Ganga or its tributaries.* Further that *in case any such construction has been completed, before the commencement of this Order, in the River Bank of River Ganga or its tributaries or active flood plain area of River Ganga or its tributaries, the National Mission for Clean Ganga shall review such*

constructions so as to examine as to whether such constructions are causing interruption in the continuous flow of water or pollution in River Ganga or its tributaries, and if that be so, it shall cause for removing them. Further under para 3-Definition sub para (l) *"flood plain" have been defined as such area of River Ganga or its tributaries which comes under water on either side of it due to floods corresponding to its greatest flow or with a flood of frequency once in hundred years.* The definition doesn't mean to convey that entire zone corresponding to flood of recurrence interval of 1 in 100 years is to be declared as protected zone with no construction being allowed in such a zone. Instead the zone corresponding to flood with 1 in 100 years recurrence interval can be divided into three zones, with inner most zone as being active flood plain corresponding to flood of 1 in 5 year recurrence interval with no construction being allowed; next buffer zone as being regulatory zone corresponding to flood of 1 in 25 year recurrence interval and outermost zone can be zone in which various other category of activities can be permitted by mapping their vulnerability such thatrisk to flood hazards remain minimal. This eventually will help the States in minimizing the damages due to floods.

- Through various directions of NGT, States have been directed that till such time States scientifically demarcate flood plains, as an interim measure certain buffer zone (defined specifically in the NGT directions) shall be notified respectively as no construction zone and regulatory zone to prevent encroachments into riverine flood plains and maintain a baseline. This interim measure shall cease upon scientific demarcation and notification thereof of floodplains by the States.

****

Letter No.YoMo–04(Vividh) 07–372/2020– 296

Government of Bihar

Water Resources Department

From,

Arun Kumar Dwivedi
Joint Secretary (Engg.)

O/o ED (T), NMCG
Dy. No...2615.....
Date...10/08/2021.

To,

The Executive Director (Technical),
National Mission for Clean Ganga
Dept of Water Resources, RD & GR
Ministry of Jal Shakti, GoI
1st Floor, Major Dhyanchand National Stadium
India Gate, New Delhi-110002
E-mail:- ed-technical@nmcg.nic.in

)(RD Tech) NMCG-NATIONAL MISSION FOR CLEAN GANGA-Part(1) (Computer No. 260330)

Patna, dated :- 02/08/2021

Sub:- Reoprt on Scientific Study of Flood Plain Zoning in the State of Bihar regarding.

Ref:- NMCG letter no. TF-16019/3/2020/NMCG Part (I)/765 dated-29.07.2021.

Sir,

In reference to the above mentioned subject, I am directed to convey that the report on Scientific Study of Flood Plain Zoning in the State of Bihar is hereby enclosed for your kind information and necessary action.

Encl: As above

Your faithfully

02/08/2021

(Arun Kumar Dwivedi)
Joint Secretary (Engg.)

Memo No. 296 /Patna, dated 02/08/2021

Copy to Member Secretary, Bihar State Pollution Control Board, Bihar, Patna/Principal Secretary, Urban Development and Housing Department, Bihar for information and necessary action.

02/08/2021

(Arun Kumar Dwivedi)
Joint Secretary (Engg.)

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L. NATIONAL MISSION FOR CLEAN GANGA on 24/02/2023 12:37 PM

Report

on

)(RD Tech) NMCG-NATIONAL MISSION FOR CLEAN GANGA-Part(1) (Computer No. 260330)

Scientific study on the feasibility of Flood Plain Zoning in the State of Bihar

Prepared By:

Flood Management Improvement Support Centre (FMISC), WRD

Patna-800002

INDEX

List of Figures:

Acronyms:

DEM:	Digital Elevation Model
DMSP:	Disaster Management Support Program
ESA:	European Space Agency
FMISC:	Flood Management Improvement Support Centre
LANDSAT:	Land Satellite
NRSC:	National Remote Sensing Centre
RADAR:	Radio Detection and Ranging
SRTM:	Shuttle Radar Topography Mission
USGS:	United State Geological Survey
WRD:	Water Resources Department

A REPORT ON SCIENTIFIC STUDY ON THE FEASIBILITY OF FLOOD PLAIN ZONING IN THE STATE OF BIHAR

1. OBJECTIVE

Flood Management Improvement Support Centre (FMISC) under Water Resources Department (WRD), Government of Bihar is a pioneer organization having a Mathematical Modelling Centre (Research & Development wing) is entrusted to carry out a scientific study on Flood Plain Zoning in the state of Bihar vide letter no-गोममो-4 (विविध)7-372/2020-528 Patna, dated 30/12/2020 of Engineer-in-Chief (Headquarter), Water Resources Department, Patna. The main objective of this scientific study is to find out whether the Flood Plain Zoning in the state of Bihar is feasible or not.

2. INTRODUCTION

Floods have caused devastation and acute human sufferings too frequently since the dawn of civilization and the man has had to live with floods since his existence. The impact of flood was not perhaps felt to the same extent in the past as is felt now. This was due to the fact that much small number of people were living and pressure of industrial activities and other development works in the flood plains was far less compared to the present day.

Bihar is India's most flood-prone State, with 76 percent of the population, in the North Bihar living under the recurring threat of flood devastation. About 68,800 Sq. Km. out of total geographical area of 94,163 Sq. Km. comprising 73.06 percent is flooding prone. Bihar is also one of the States having lowest per capita income in India. It has shown signs of improvement in recent years. Recurrent floods are proving to be stumbling block in the resource generation/improvement efforts. Floods not only affect lives, livelihoods, productivity and security of existing investments, but are also a disincentive for additional investments in Bihar.

Bihar accounts for about 17% of the flood-prone area and 22% of the flood-prone population in India. 28 out of 38 districts of Bihar are flood prone. Bihar's vulnerability to floods is due to its very flat topography just downstream of the steep Himalayas, intense monsoonal rains (more than 2,500mm/year in the upstream catchment in Nepal and about 1,200 mm/year in the State; 80% rainfall occurs during the months of June to September), high sediment loads due to fragmented rocks of Himalayas, high population density (1102 per Sq.km., Census 2011), low-socio-economic development, inadequate water infrastructure to regulate flow (e.g., storage in Nepal or designated detention areas in upper catchments).

The plains of North Bihar, adjoining Nepal, are drained by a number of rivers that have their catchments in the steep and geologically recent Himalayas. About 65% of catchments area of these rivers falls in Nepal/Tibet and only 35% of catchments area lies in Bihar (*Figure-2.1*). The rivers that cause much of the flooding include the Ganges and its tributaries (BurhiGandak, Gandak, Bagmati-Adhwara Group, Kamla, Kosi and Mahananda from the Himalayas on its left bank and the lower reaches of the Sone, Punpun, Chandan and Badua rivers on its right bank). It is important to point out that only BurhiGandak originates from low hills of outer Himalaya or Shivalik in West-Champaran.

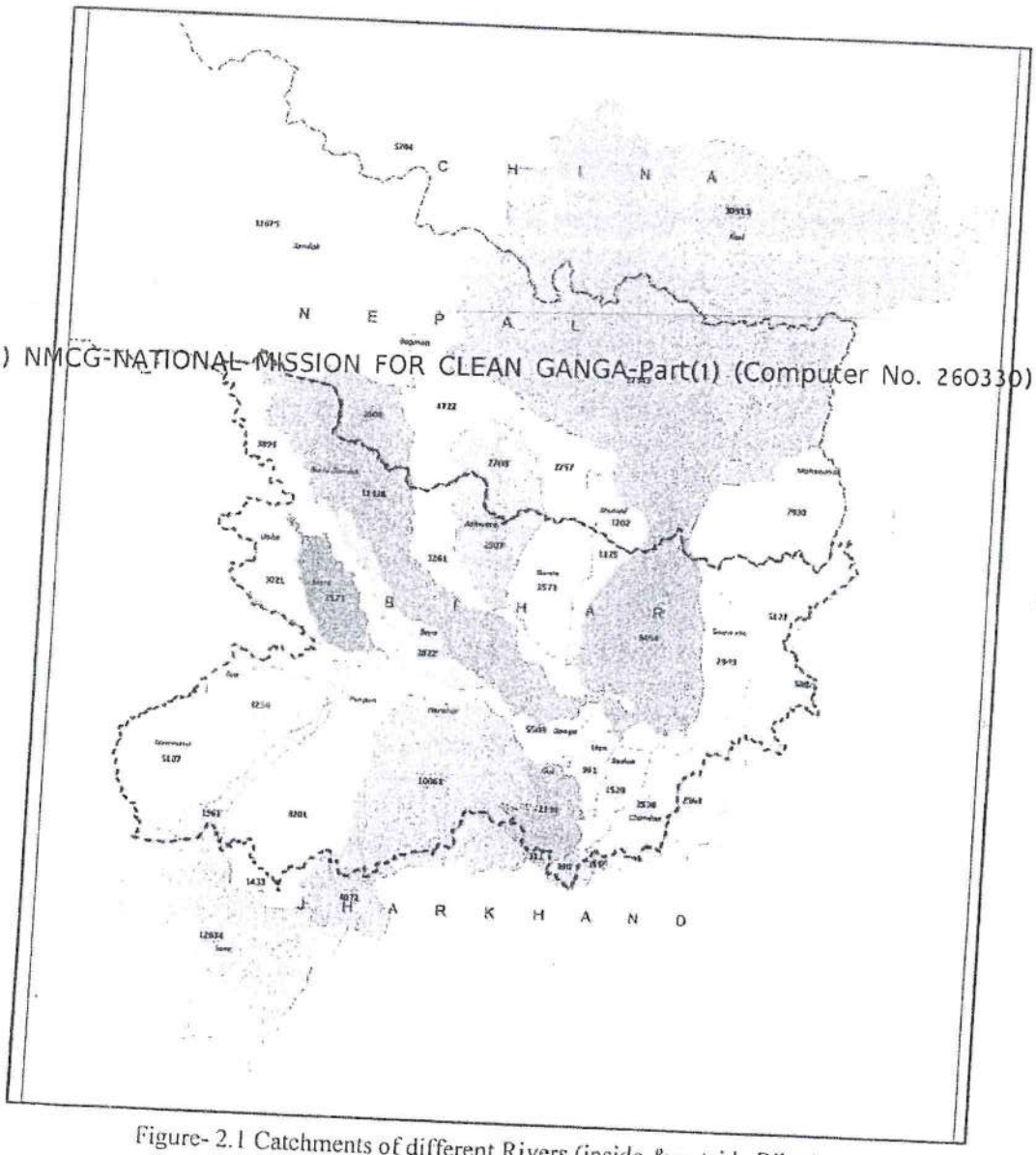

Figure- 2.1 Catchments of different Rivers (inside & outside Bihar)

The flood problem was accentuated due to ever increasing encroachments on the flood plains by the growing population to meet its requirements of shelter, food and fibre. The destruction of forests, reclaiming areas for occupation and fuel for their domestic requirements had also caused changes in river regime. All these have resulted in an anomalous situation where, in spite of protection measures carried out so far in the State with a substantial investment on flood management works, flood damages have gone on increasing instead of decreasing.

The plains of North Bihar are some of the most susceptible areas in India, prone to flooding. A review by Kale (1997) indicated that the plains of North Bihar have recorded the highest number of floods during the last 30 years. The total area affected by floods has also increased during these years. Drained by the two major rivers like the Kosi and Gandak and several smaller systems, such as Burhi Gandak, Baghmati and Kamla Balan, the plains of North Bihar have experienced extensive and frequent loss of life and property over the last several decades (Sinha and Jain,1998). The Kosi River (The Sorrow of Bihar) is well known in India for rapid and frequent avulsions of its course and the extensive flood damages it causes almost every year.

The Kosi is one of the major tributaries of the Ganga river, and rises in the Nepal Himalayas. After traversing through the Nepal Himalayas, it enters India near Bhimnagar. Thereafter, it flows through the plains of North Bihar and joins the Ganga River near Kursela, after traversing for 320 Km from Chatra. The river has been causing a lot of destruction by lateral movement and extensive flooding. As its waters carry heavy silt load and the river has a steep gradient, the river has a tendency to move sideways. Thus, in about 200 years the river has moved laterally by about 150 Km (Gole and Chitale, 1966; Wells and Dorr, 1987). To check the lateral movement as well as for flood control, embankments on both sides of the river were constructed, five to sixteen Km apart. Although this has confined the lateral shift of the river within the embankments, but the problem of flooding is still a challenge in this area. The problem of river flooding is getting more and more acute due to human intervention in the flood plain at an ever-increasing scale. Total length of embankment (flood protection works) till the end of ninth five-year plan (1997-02) was 3435 Km & now it is 3780 km (*Figure-2.2*).

River Kosi remains at the central stage as far as history of floods in Bihar is concerned. The oscillation of the river Kosi bed below Chatra (Nepal) can well be compared with that of a pendulum of a clock having a fixed point at Chatra and oscillating between the district of Purnia on the east and district of Darbhanga on the west. Dr. B. Hamilton about 165 years ago formed an impression that the Kosi during the remote past possibly flowed more towards the south east than towards the east and joined the Brahmaputra.

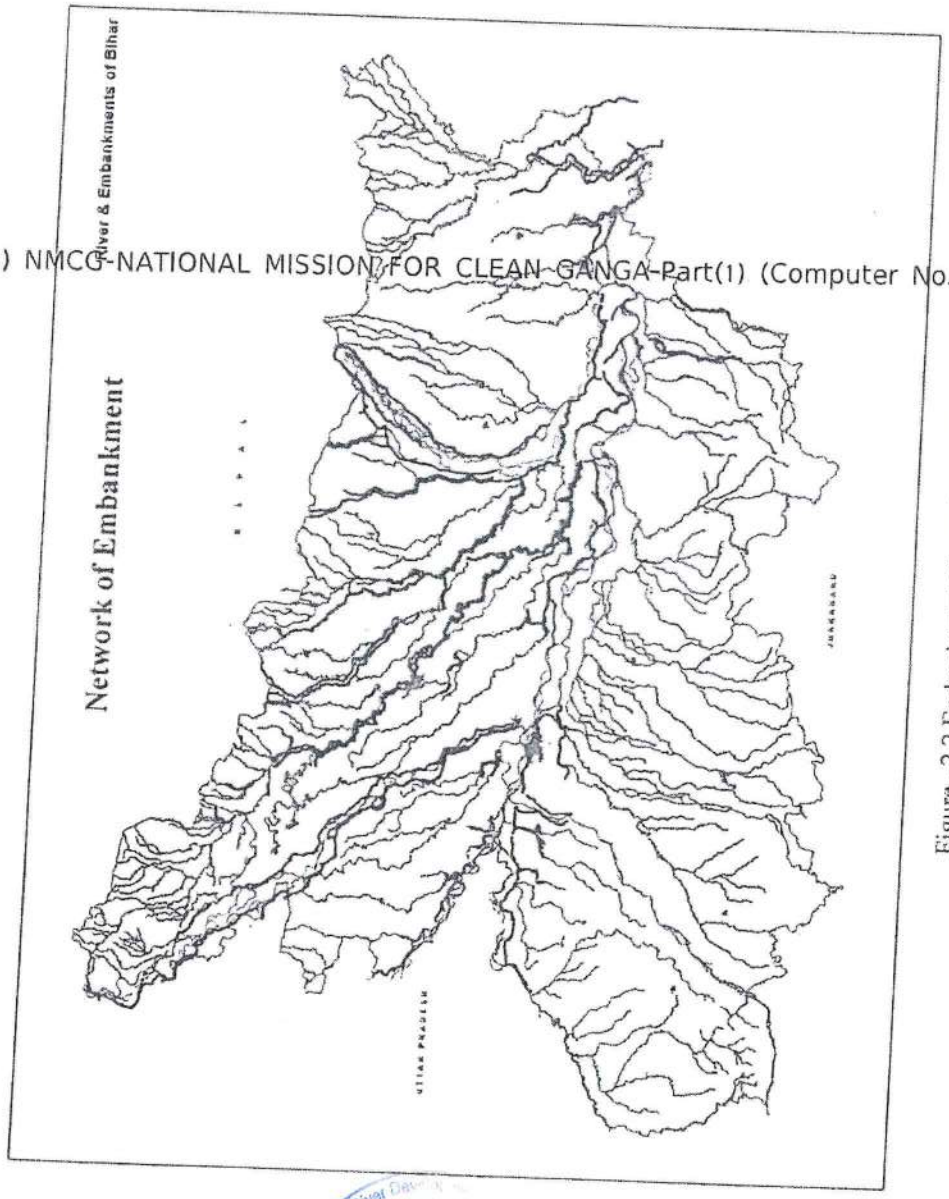

Figure –2.2 Embankment Networks of Bihar

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The views of M/S Leopold and Maddocks Jr. of United States Technical Co-operation Mission was sought by Govt. of India and the state of Bihar in connection with the finalization of the 1953 Kosi project. Dr. Kanwar Sain &Dr.Chitale gave reports about Kosi and its possible remedies which are based on sound logic. The history of past floods as available from the records of the district gazetteers of Saharsa and Purnia summarized by 2nd Bihar State Irrigation Commission.

Kamla Balan river basin is bounded by the Adhwara group of rivers on the west, the Kosi basin on the east, the Kareh river on the south and Mahabharat range of hills in Nepal on the north. The River Kamla and its tributaries used to cause flooding mainly in the districts of Madhubani and Darbhanga. The construction of embankment on its both banks from Jainagar to Jhanjharpur in 1958, Jhanjharpur to Darjia in 1962 and its subsequent extension up to Kotharam (1980) has checked flooding to a great extent in the middle reach of the river.

3. FLOOD MAPPING USING SATELLITE IMAGES

For the past 35 years satellite imaging has been used to map various earth resources as well as geographical features for better understanding of human nature interaction and its bearing on future of humanity. Natural disasters have been an integral part of our life and mankind has been trying to overpower natural forces wherever they find a chance to win.Flood seems to be the most damaging one as human settlement and their activities are found close to water bodies and rivers. Rivers which receive more water in the form of rain support more population density but have a greater risk in the event of a flood.

3.1 ADVANTAGES OF REMOTE SENSING AND ITS LIMITATIONS

In the beginning optical imaging cameras mounted on satellites used to capture astonishing pictures of the surface of the earth along with patterns of cloud. But the limitation of optical imaging during cloudy days; which is usual scenario during monsoon; hampered capturing most of the events. The advent of Radio Detection And ranging (RADAR) imaging during late 80's helped us in capturing a greater number of events as cloudiness was no limitation. These images, however were quite expensive and limited by availability due to orbit cycle design. Still, better and more numbers of RADAR imaging platforms were continuously providing pictures of flood events all over the world.

3.2 DATA SOURCE

For flood mapping of Bihar State, we are depending on processed extracts of RADARSAT images provided by NRSC under DMSP (Disaster Management Support Program). Besides we also purchase optical images from NRSC. Freely available sources like USGS (U.S. Geological Survey) and ESA (European Space Agency) also provide various images through their portal.

4. MAPPING METHODOLOGY

FMISC has procured and generated various thematic GIS datasets such as Administrative layer, Road, Rail, River systems, embankments and Canal. These layers are used to prepare a framework of study area under consideration. Satellite image or its extract is place in the background to generate a user-friendly map for use in field for decision making. Area of flood is generated on classified layer and is geo-processed to aggregate on District or Block level. It is to be noted that these images are available for a small area at a time. Satellite revisit period varies from 7 to 26 days. Since RADAR imaging satellites are steerable, their view can be changed on instructions from the operator. These advance multipurpose satellites [illegible] However, by employing a combination of various sensors and platforms a large number of flood events can be captured.

We have an archive of flood layers provided by NRSC. Every year's layers are put together on the state map to generate a mosaic, which sufficiently depicts maximum flood extent covered by satellites during that monsoon season. A composite map of Bihar based on satellite images from year 2007 to 2020 is prepared at FMISC *(Figure 4.0)*.

Here this also must be kept in mind that all the flood events and all flooded areas have not been covered on a particular date. ***The maximum flood extent may miss some major flood event due to non-availability of any satellite over that region. The image of the region might have been captured on a later date; but by that time flood water may have receded from a large area.***

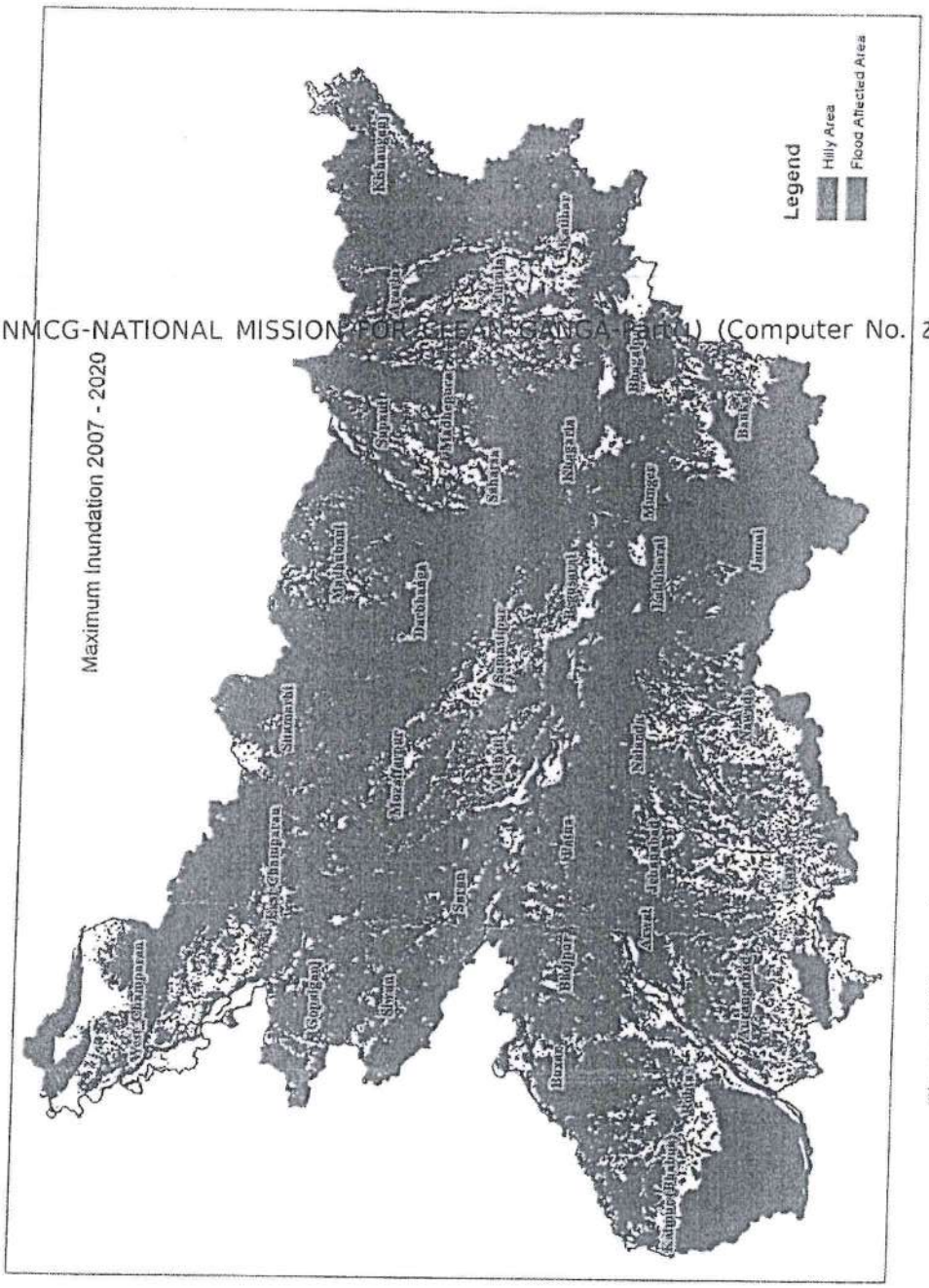

Figure-4.0 Composite Inundation Map of Bihar based on satellite images (2007-2020

5. HYDRO-METEOROLOGICAL FACTORS AND THE FLUVIAL PROCESS

Much has been said about the ferocity of Rivers of Bihar and the resultant flood devastation and economic miseries caused to State. Blame has always been placed on the rivers of North Bihar, mainly Kosi, Bagmati, Kamla and Mahananda. It is always said that these rivers carry a lot of water and sediment from Himalayan region and spread across plains of North Bihar. Pattern of rain during monsoon is such that rivers themselves find insufficient time and space to accommodate such a vast quantity of water in such a short time that too at close intervals. Due to insufficient capacity of the river to carry the discharge hence the surplus must find its way on its own causing either spill-over or breaches of embankment which ultimately causes loss of life and property. We must not forget that this insufficiency of capacity of river has resulted in formation of vast alluvial plains which has supported civilization since time immemorial.

The problem is further aggregated by the fact that Bihar plain lies near the lower end of the great Indo-Gangetic plains hence every bit of water received in upper and middle catchment must pass through this State with rivers having very gentle slope. It is wrong to consider flood and plain as separate contexts; rather treat it as ***flood plain*** with benefit of fertile land and miseries of flood.

Kosi has been considered as "Sorrow of Bihar" but in fact this river has created the biggest deposit of alluvium which forms a large part of Indo-Gangetic plain. The fan shaped convex dump created by this single river system is still undergoing development with the help of shifting channels from East to West and from West to East, spreading vast amount of sediment obtained from destruction of massive Himalayan mountains. Notably this fan is known as "Maize bowl" of Bihar.

6. FACTORS AFFECTING PATTERN AND INTENSITY OF FLOODS IN BIHAR

6.1 TOPOGRAPHICAL FACTORS – *LOCATION IN CATCHMENT*

While dealing with flood problem of Bihar we talk about rivers of Bihar and somehow ignore other big and small river systems of upper part of the great Indo-Gangetic plain. A catchment is an area over which rainwater is collected and directed towards downstream i.e., lower elevation in the form of river network, which merge together to form an axial drainage leading to final outlet i.e., Ocean. This means that the areas at lower elevation keep receiving water from upper part of the catchment even if there is no direct input in the form of rain. This causes a pile-up of water to be transported to sea. Notably the upper part of the catchment also has greater gradient hence rainwater moves faster on the land as well as in the channel. The velocity slows down as we move downstream in the catchment (*Figure- 6.1*). Moreover, sediments coming from upper catchment settles down in the channel itself due to drop in velocity as well as nears the sea. This seemingly slow process; over the years; has contributed a lot to upheaval of river beds resulting in increased submergence of Ganga Khadar even if the intensity of monsoon remains the same.

6.2 TOPOGRAPHICAL FACTORS – *LOCAL RELIEF FEATURES*

Flood plains are formed due to predominantly aggradation action of river systems. In course of transporting water and sediment the river tries to establish equilibrium between energy it has at its disposal and load it has to carry down to the sea. When energy is surplus the river etches out its edges to create more waterways and when load exceeds carrying capacity, it is deposited on the way. This action creates many shapes on the surface it has created, hardly perceptible to an untrained eye but visible during floods.

The SRTM Digital Elevation model clearly shows that the flood plain is entrenched in the plains and interfluvial areas are raised much above the flood plain (*Figure-6.2.1*). Thus, River flood prone areas lie at lower elevation in the form of a relatively narrow river play zone. The picture is just reversed in case of Bihar, it shows raised strip all along the River while areas lying away from River are flooded. The [illegible] (*Figure-6.2.2*).

This low relief feature is created in rivers carrying huge sediment load and episodic large volume of water; causing spill over. The heaviest material is deposited soon after the spill, on the edges while finer material is carried further from the river. This repeated action raises edges of rivers creating a raised bank all along. A satellite image acquired during monsoon months shows these features clearly in a part of North Bihar plains (*Figure – 6.2.3*).

Natural levee is one such feature which is hardly visible due to its subtlety (low relief) but these low ridges along the rivers are high enough that many ancient settlements have thrived on it, being protected from frequent floods. Many towns and cities serve as examples in our study area which are proven to be of great antiquity and find place in oldest Hindu scriptures. Many important cities and towns such as Buxar, Chapra Patna, Munger, Hajipur, Begusarai, Bhagalpur and Kahalgaon are situated on the bank of Ganga which is treated as Holy River from ancient times. ***This settlement pattern is strictly guided by topography (Figure- 6.2.4).***

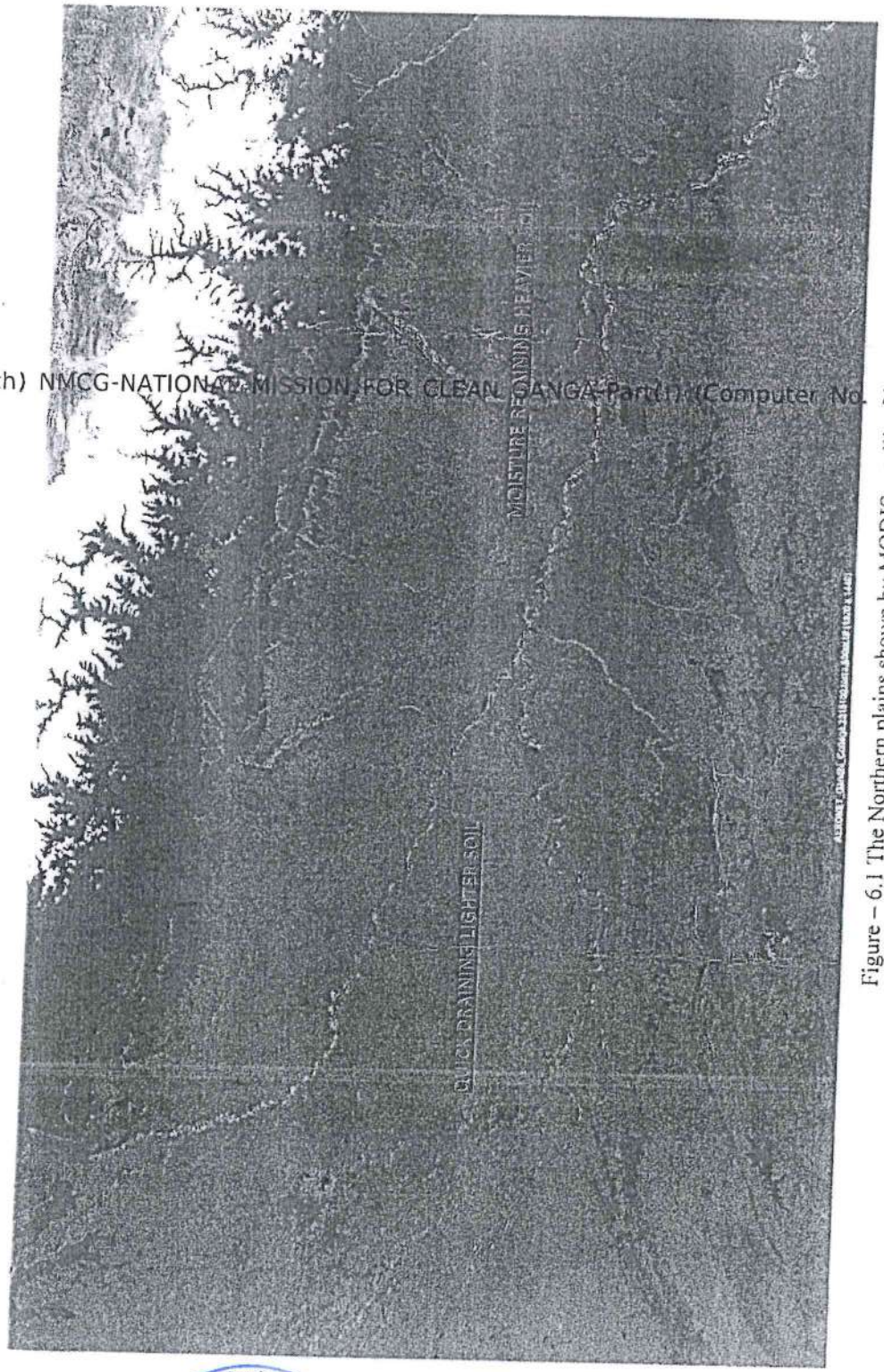

Figure – 6.1 The Northern plains shown by MODIS satellite

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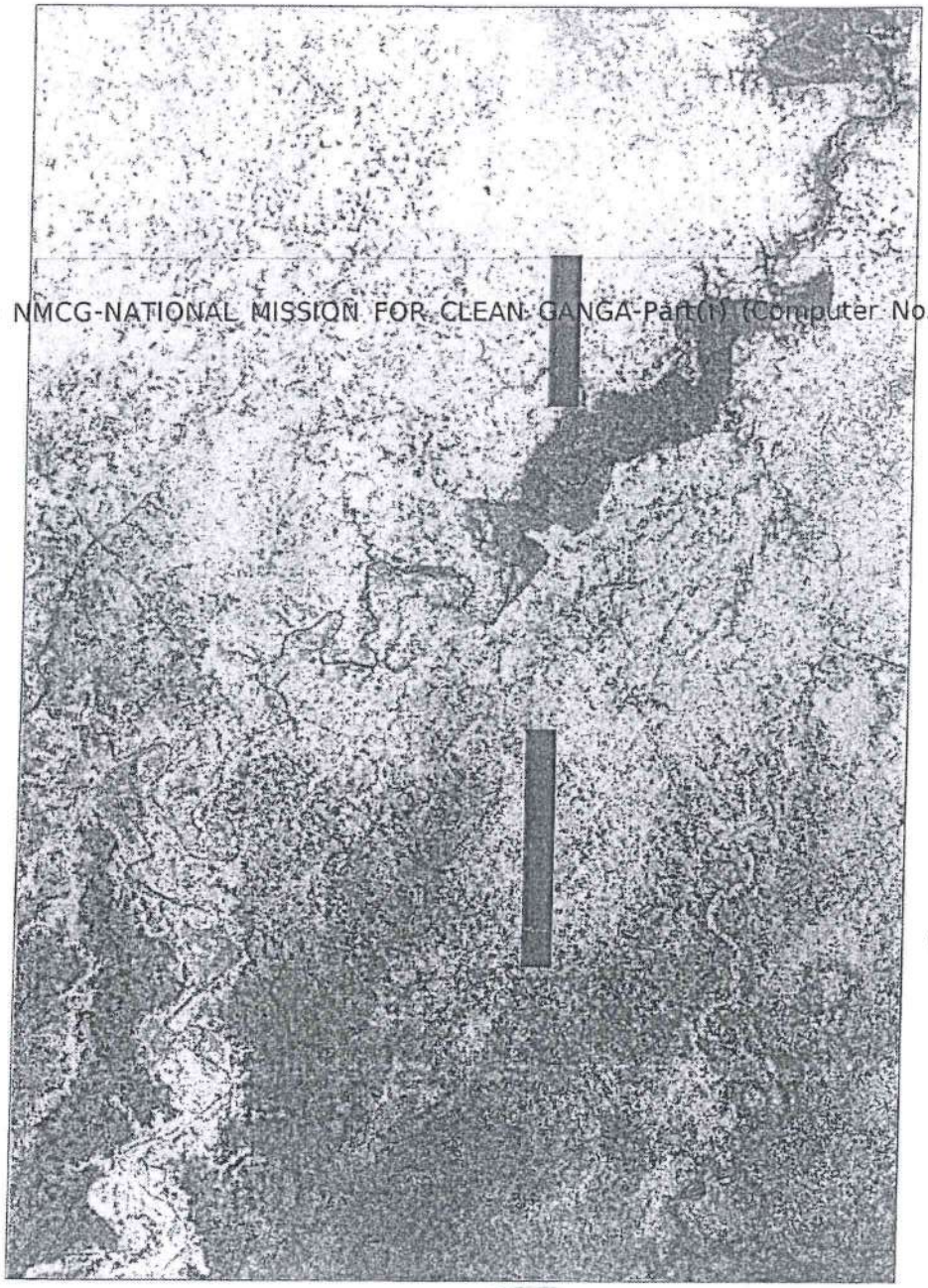

Figure- 6.2.1 Topography of U.P Plains(*Source SRTM, DEM)*

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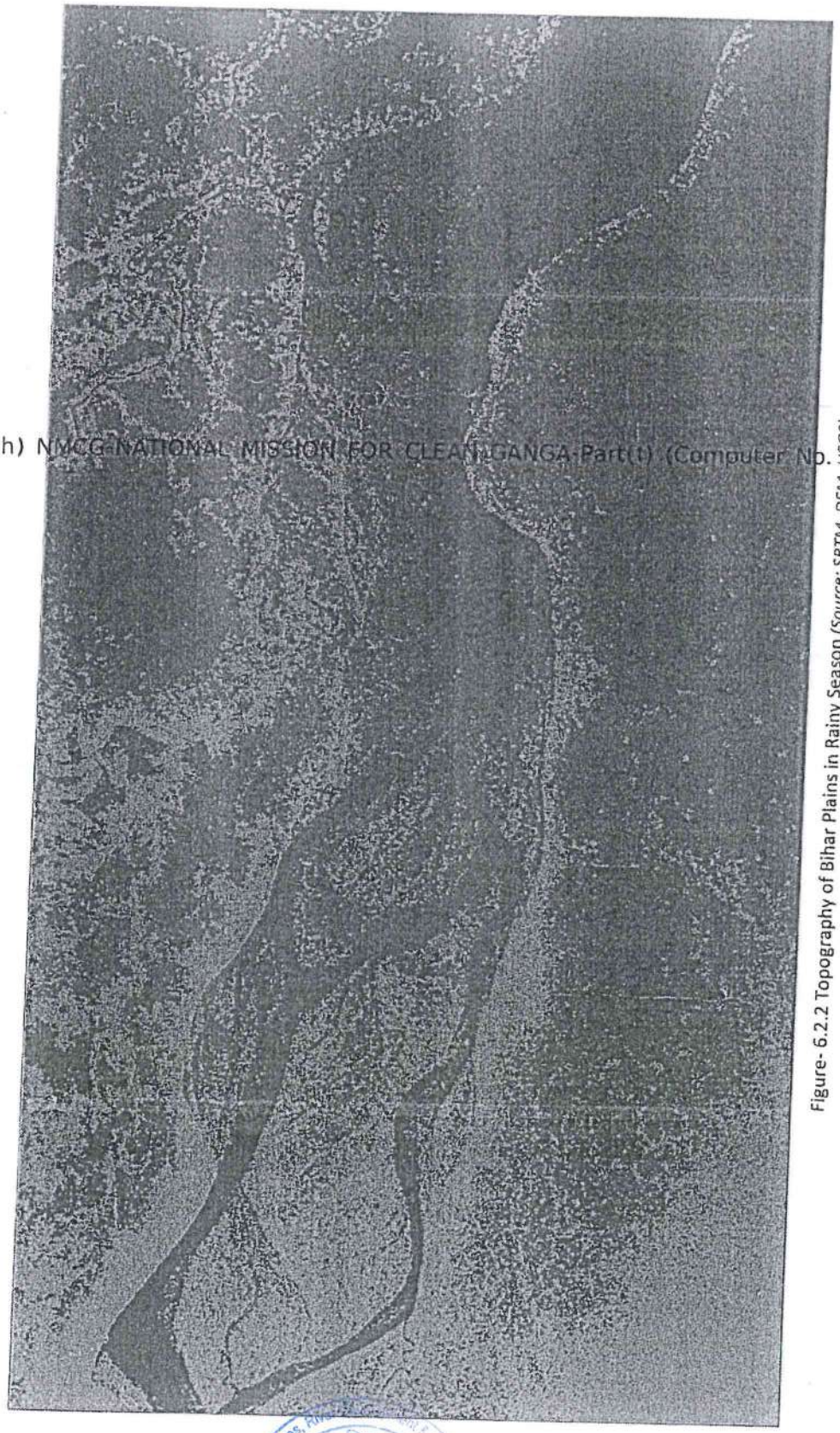

Figure- 6.2.2 Topography of Bihar Plains in Rainy Season *(Source: SRTM, DEM, USGS)*

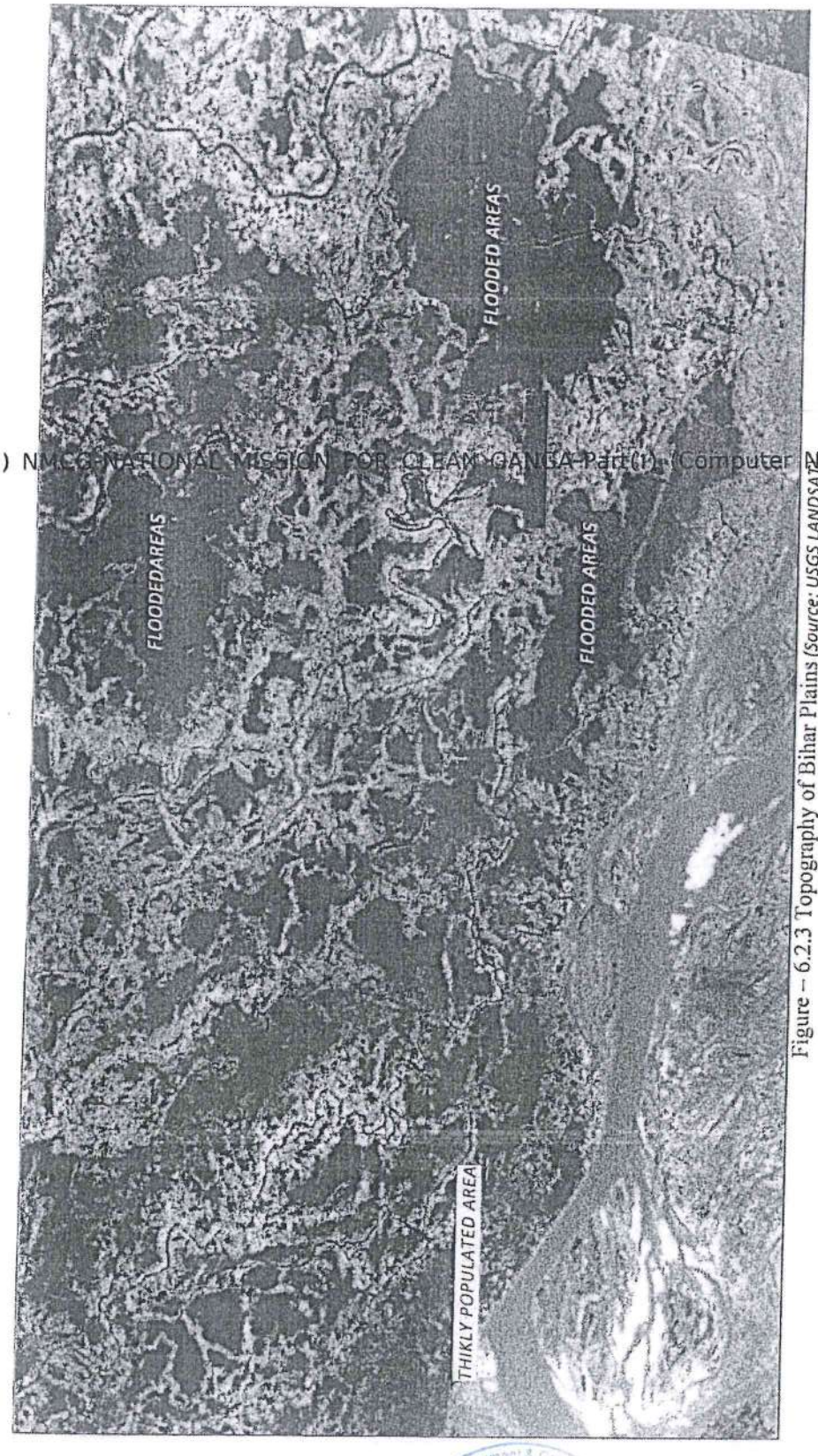

Figure – 6.2.3 Topography of Bihar Plains *(Source: USGS LANDSAT)*

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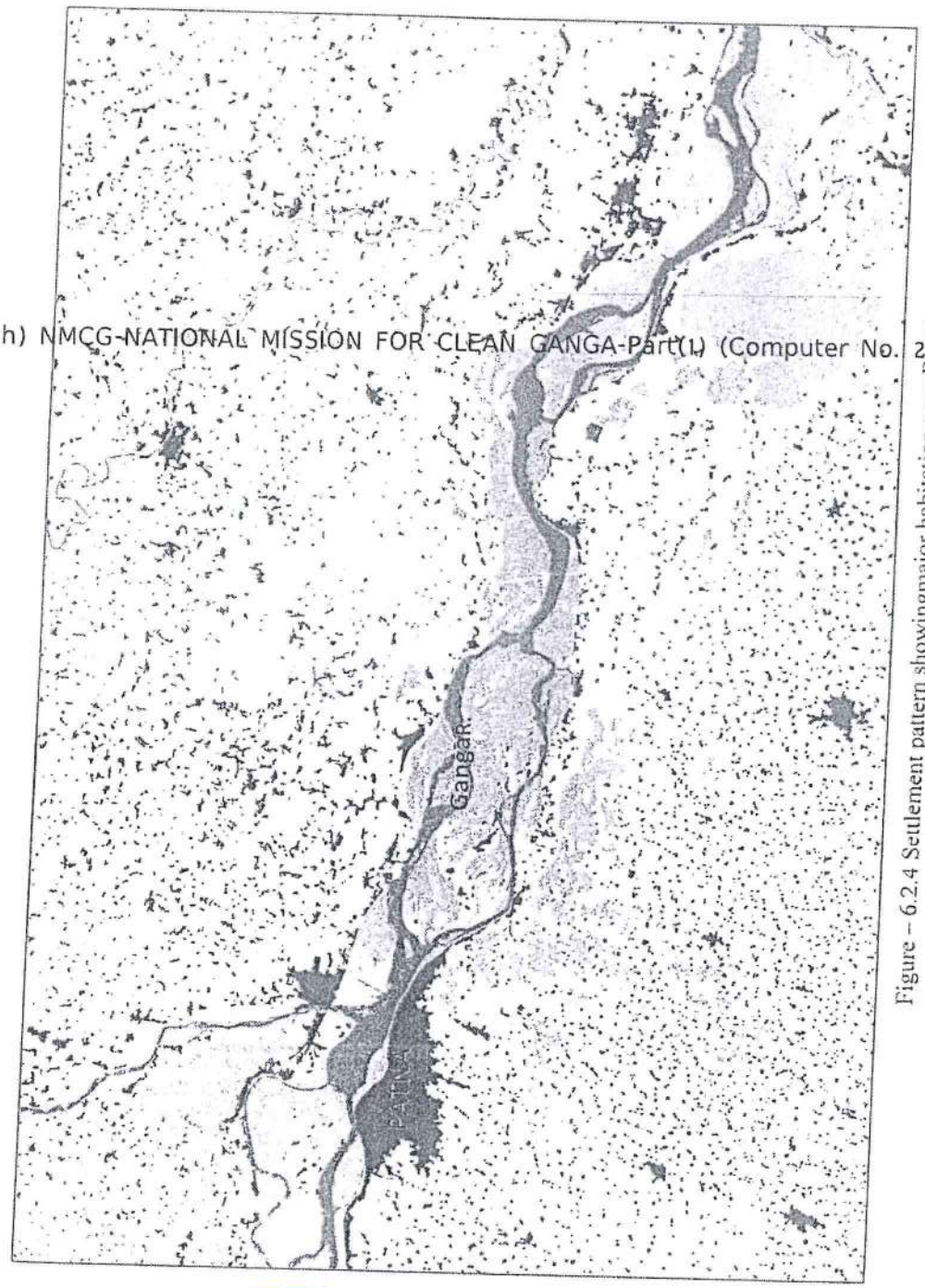

Figure – 6.2.4 Settlement pattern showingmajor habitation near River

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7.0 LAYOUT OF MAJOR CIVIL INFRASTRUCTURES

A look at drainage pattern of Bihar plains clearly shows a southerly slope in the North Bihar plain and a northerly slope in South Bihar plains, both leading to Ganga; the axial drainage of Bihar plains. While south Bihar rivers have a South to North orientation; North Bihar rivers show a tilt towards South East e.g., Gandaki, Bagmati, BurhiGandak etc. Kosi is an exception to this pattern as it has its own self-built terrain over which it has been wandering. The westerly bulge is due to a convex surface of the great alluvial fan formed just below Chatra in Nepal Himalaya. The river flows along the western edge of this massive alluvial fan. Supaul, Saharsa, Madhepura, Araria, Purnea, part of Kishanganj and Katihar districts lies over this alluvial fan.

Despite a well-defined natural topography favouring faster removal of flood water and lesser damage to life and property, the state suffers a lot of losses frequently on a routine basis. Fertile nature of soil and a favourable weather system has supported civilization since known long history. The region has witnessed rise and fall of many kingdoms and dynasties, all adding to infrastructural development across the plain. Ever increasing population and economic activities to support their livelihood has resulted in construction of Roads, Canals, Bridges and railway lines.

As the area is flood prone, most of these infrastructures have been developedconsidering flood hazards. This has resulted in a network of criss-crossing raised lines of "bunds", dividing a gently sloping plain in compartments of various sizes and "depth". Flood water, now has to negotiate through these ***compartments*** on its way down the plain. In most of the cases outlets provided in these "barriers" fall far short of requirement resulting in impeded drainage. Therefore, the flood has to wait longer to find passage, leading to longer duration of inundation. Many towns and cities are exposed to this problem and have constructed *Town Protection Bunds* to stay protected from flood water ingress in town areas.

Construction of a large number of bridges across the rivers has also affected transportation of sediment in traction (along River beds especially during non-monsoon months). Due to construction of these bridges, clear waterway gets obstructed impeding the free flow of water. All our efforts and engineering endeavours have given boost to our standard of living but now the adverse effects are being felt with more imposing vigour. Facing challenging nature head-on has taught us many lessons in the form of large-scale damage to life and property whenever nature sets its course right. For a short duration we have relished the feeling of *winning over* power of nature, now is the time to learn to live within the space provided by nature.

Rivers have always been lifeline of human as well as animal kingdom, hence we must begin to share only legitimate part of natural wealth, be it land, water or air.

Bihar is predominantly an agrarian economy, depending on its land and water. Long-time experience has supported agriculture till date and pleasantly we have not damaged our soil to the extent "progressive farmers" of the west have done. But the flip side is that we have failed to reduce pressure on land due to high population growth rate. Majority of farmers have small to very small holding which falls far less than sufficient to support livelihood. They are now

turning to intensive cultivation which require more of artificial irrigation, generating high demand of water from underground reserves. Farmland away from Rivers are more dependent on Ground Water for irrigation compared to those living close by Rivers.

It is pertinent to notice that civilization has begun from rivers. Large inhabitations lie onnearby the rivers or its tributaries because of large availability of alluvial plains and water suitable for agricultural food crops. Almost all-important towns of Bihar lie on the bank of either Ganga, Gandak, BurhiGandak, Bagmati,Kamla, Kosi, Mahananda and Sone. So, it is very difficult to demarcate flood zone on these rivers as this will affect the present scenario even though these towns are frequently affected by recurring floods.

Since the most towns of the State of Bihar are situated on/ near by the banks of rivers/ tributaries, a large population inhabit in the river adjoining area called flood plain. As population is also increasing very fast so the displacement of [illegible] population from these areas is not possible. On the other hand, the land available in non-flood plain are highly productive and the cost of land is high so practically not possible to do resettlement of these large population which are inhabiting since long period of time in the flood plain.

Almost all inhabitants of the State of Bihar are dependent on groundwater rather than surface water. The groundwater availability nearby river is higher and as we move away from rivers the ground water level lowers, which results in scarcity of drinking water. Therefore, in case of resettlement from flood plain will also create a great problem of drinking water availability. This will result in ecological imbalance.

8.0 YEARWISE FLOODING PATTERN MAPPED FROM 2007-2020

Year wise flooding pattern as captured by satellites on various dates during monsoon season have been assembled to generate year wise composite maps. These images have been provided by NRSC Hyderabad under Disaster Management Support Programme (DMSP) of Govt. of India. These maps can be seen from *Figure- 8.1 to 8.14.*

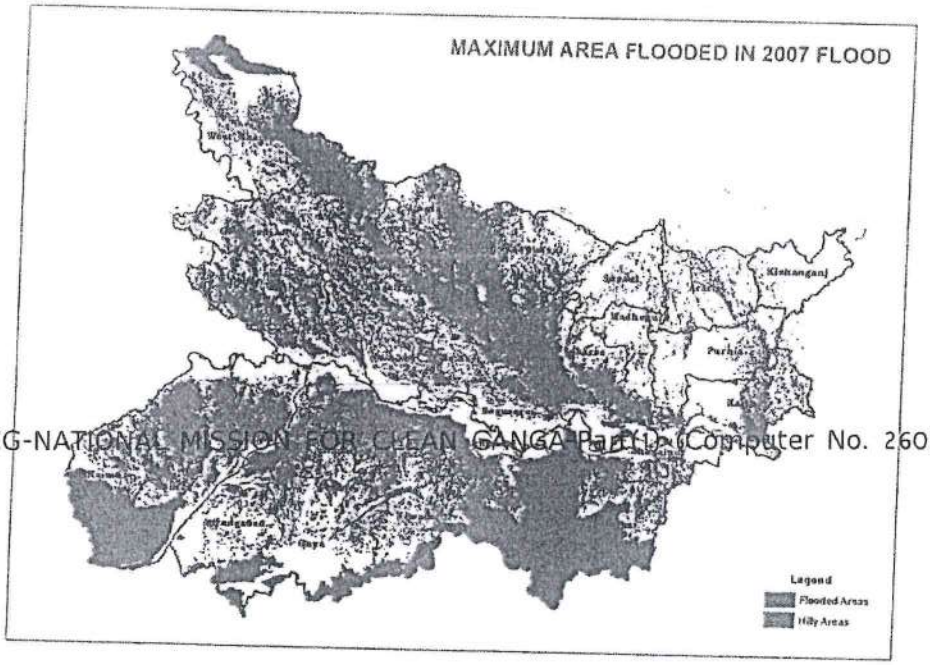

Figure - 8.1 Composite Inundation Map for 2007

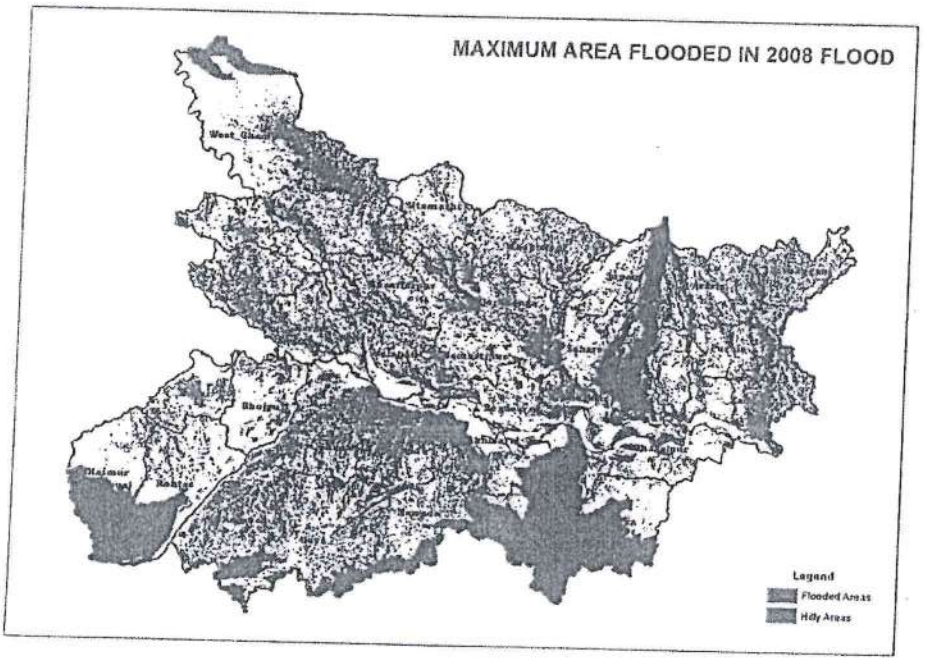

Figure - 8.2Composite Inundation Map for 2008

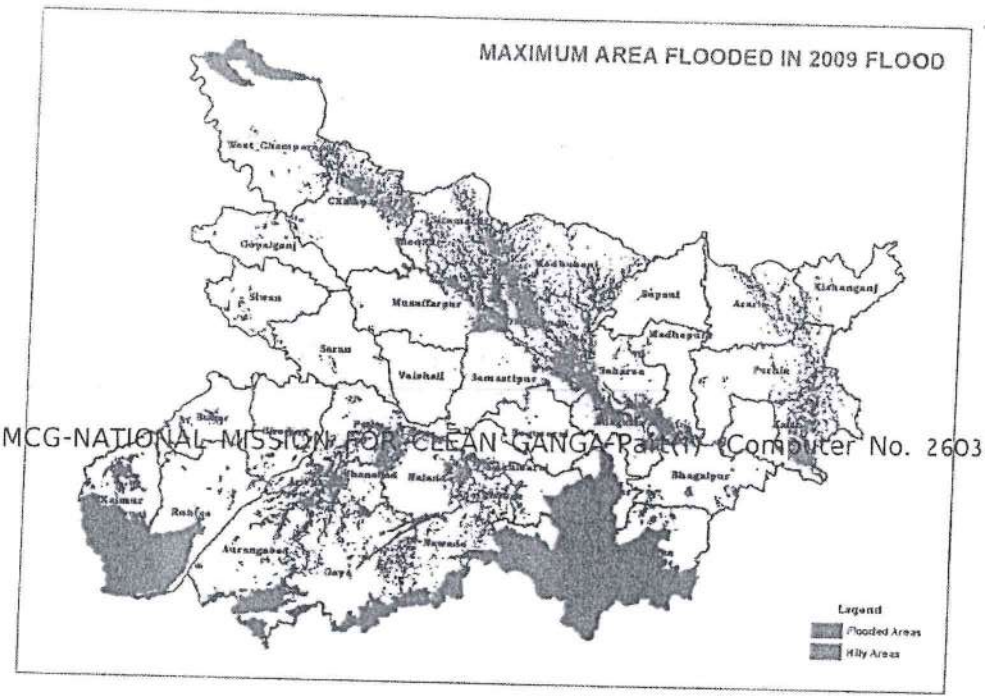

Figure- 8.3Composite Inundation Map for 2009

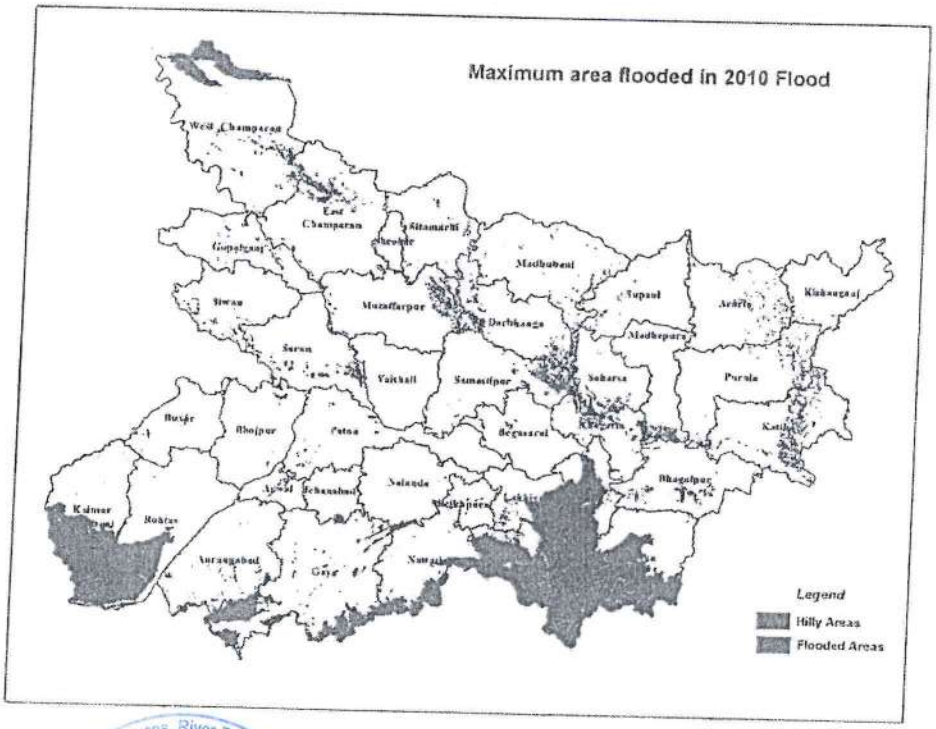

Figure- 8.4Composite Inundation Map for 2010

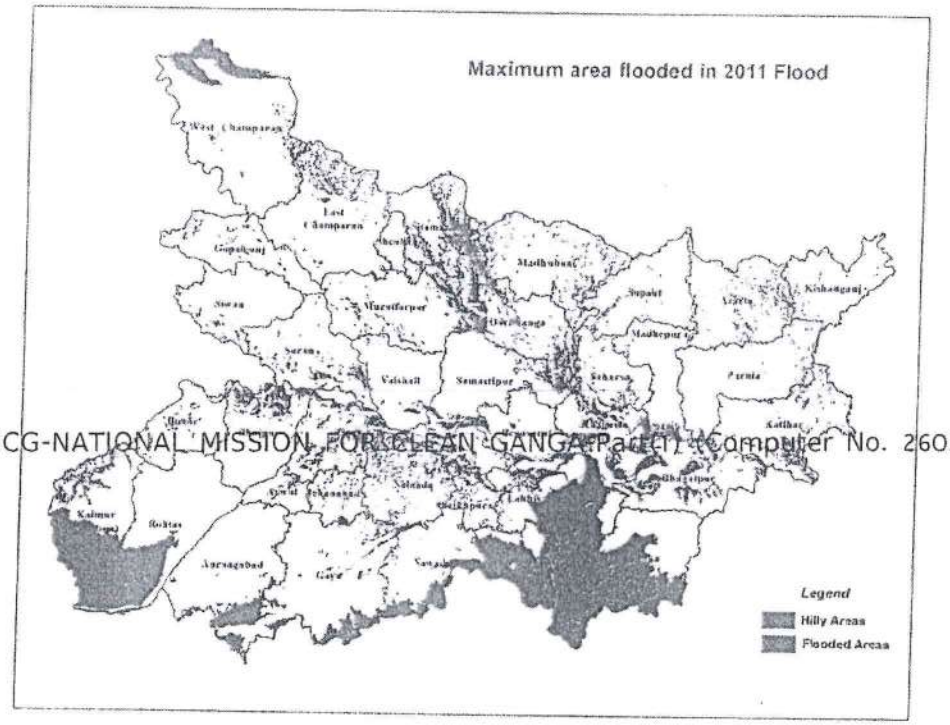

Figure - 8.5Composite Inundation Map for 2011

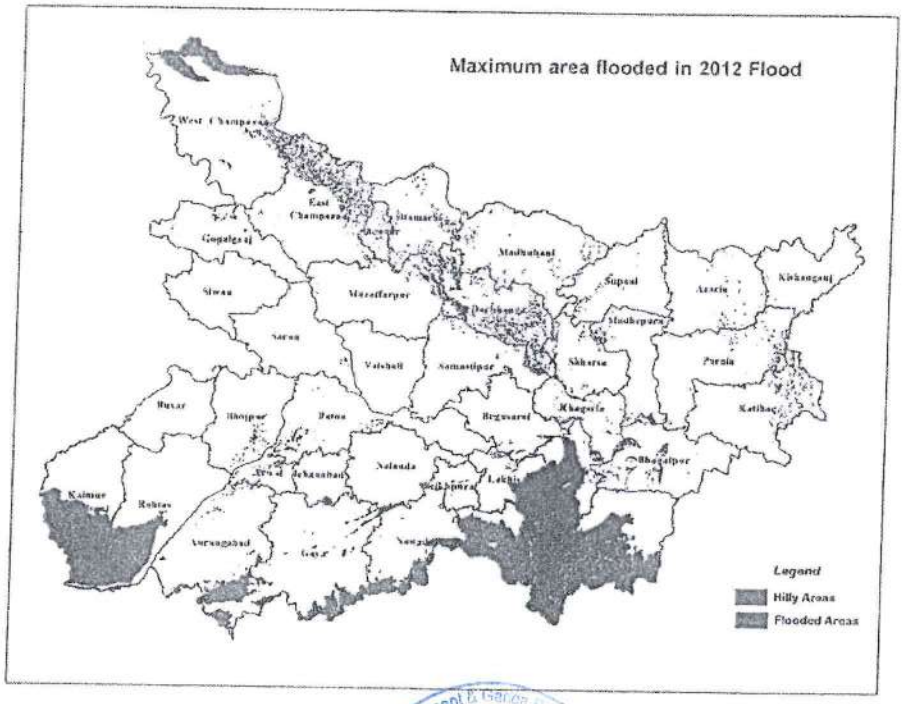

Figure - 8.6Composite Inundation Map for 2012

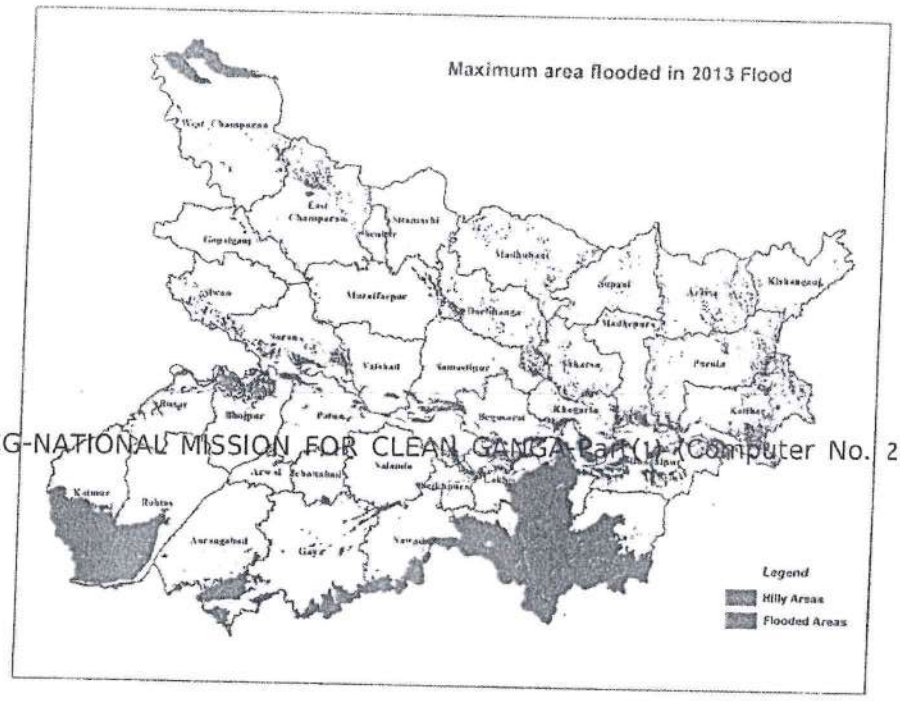

Figure - 8.7Composite Inundation Map for 2013

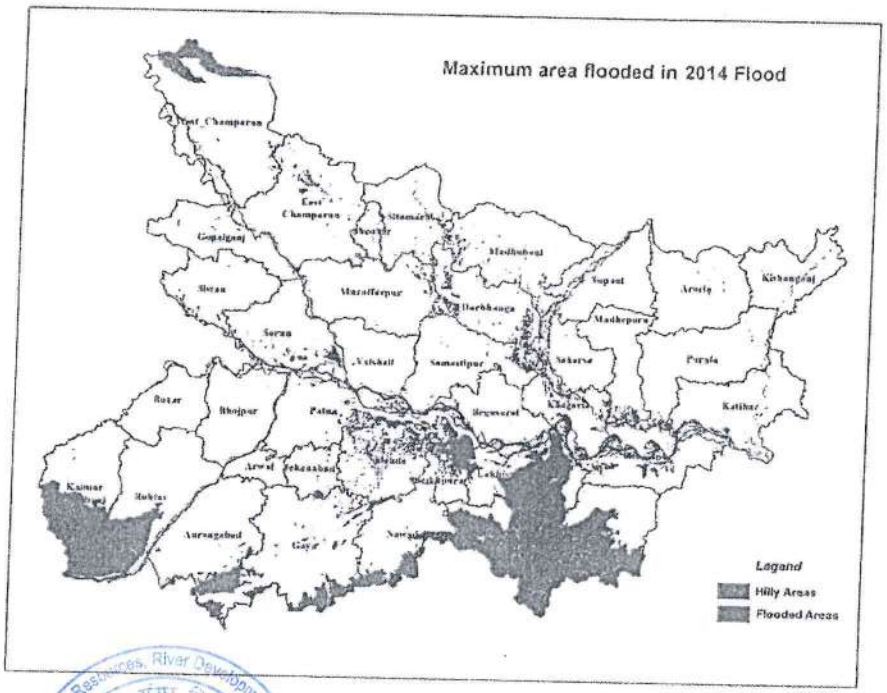

Figure- 8.8Composite Inundation Map for 2014

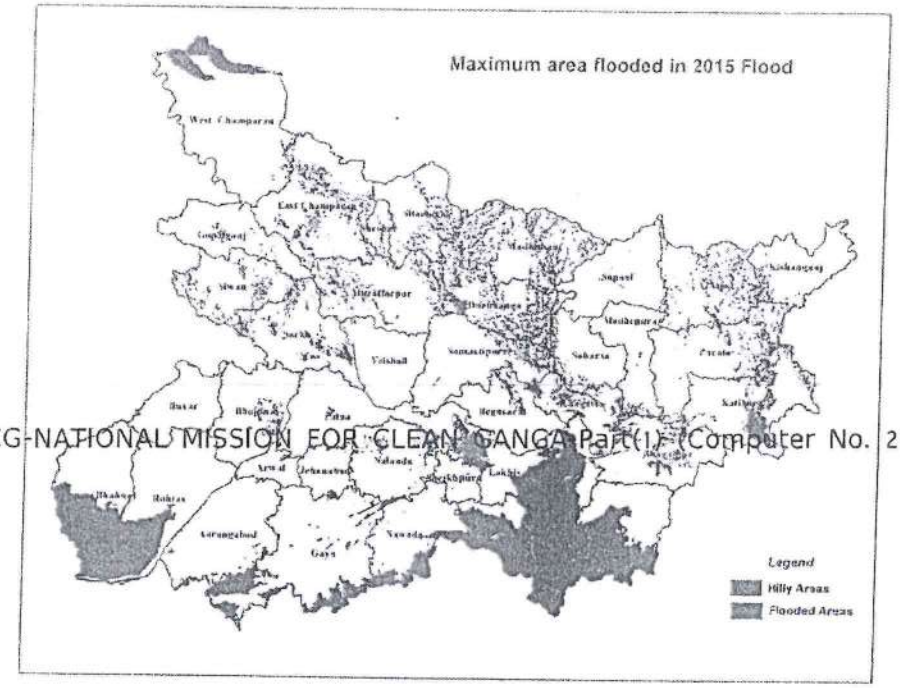

Figure - 8.9Composite Inundation Map for 2015

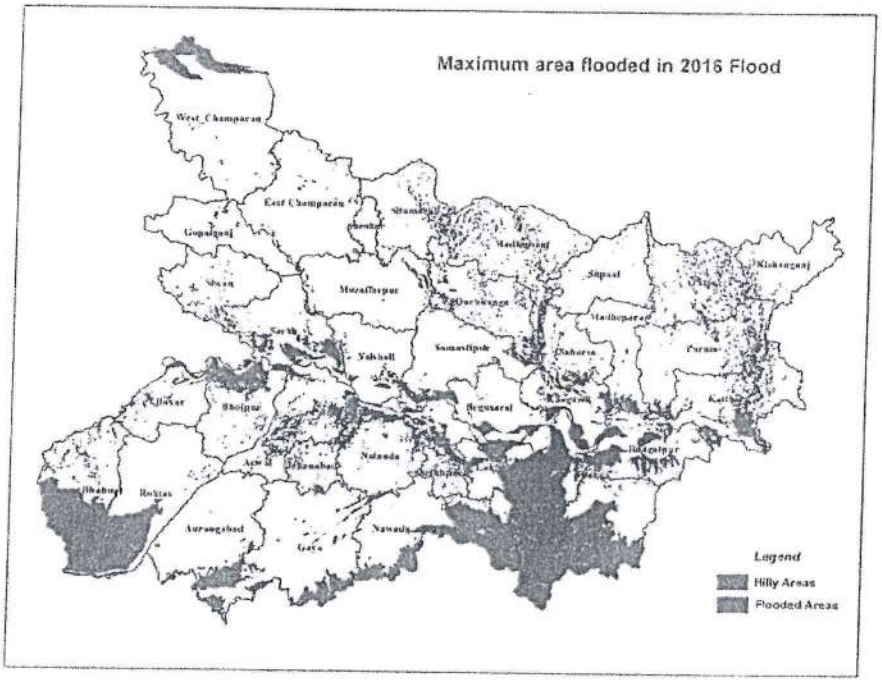

Figure - 8.10Composite Inundation Map for 2016

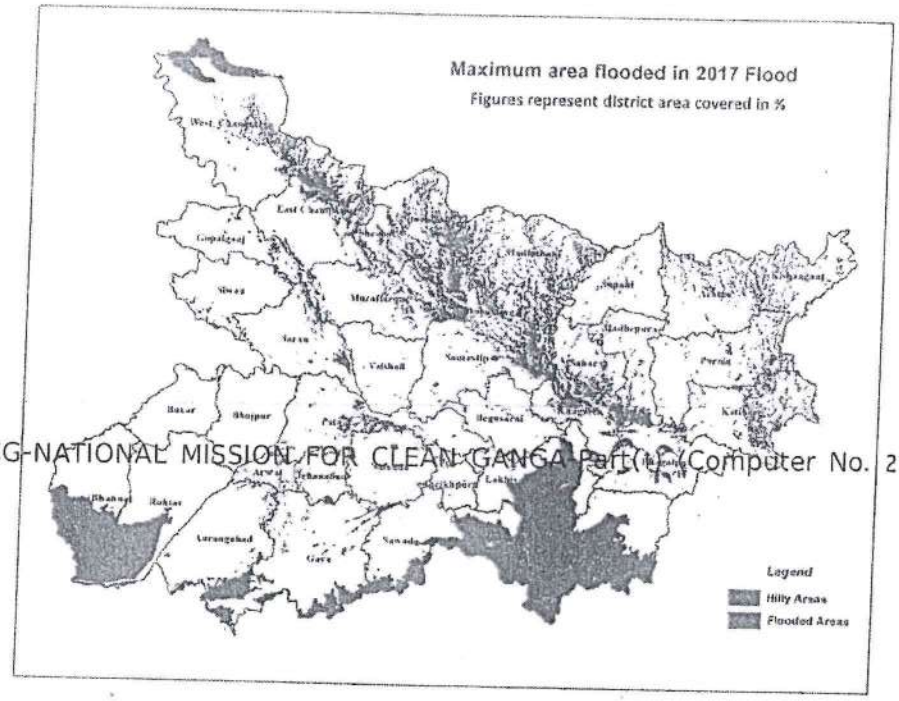

Figure - 8.11Composite Inundation Map for 2017

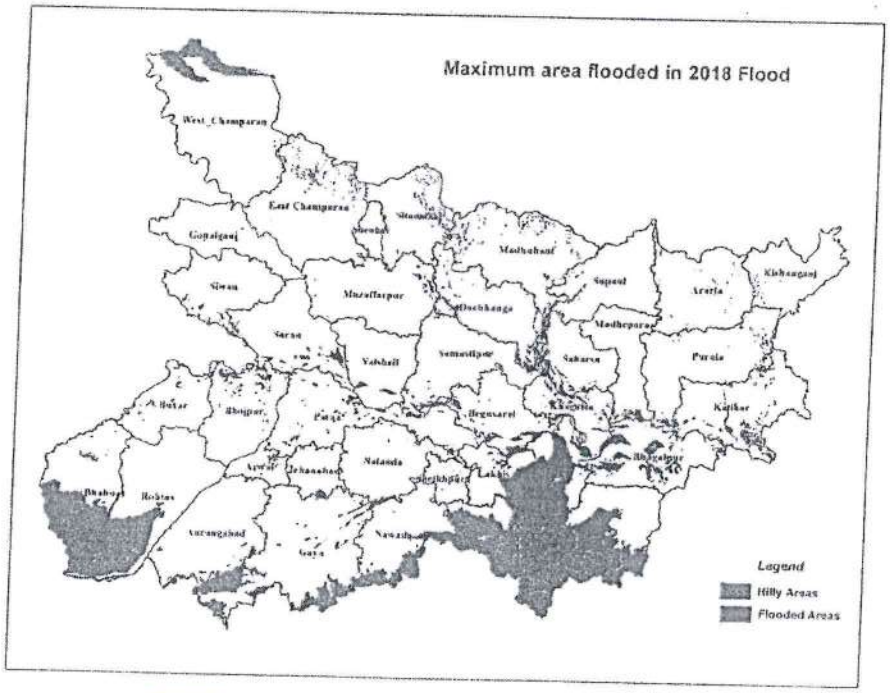

Figure - 8.12Composite Inundation Map for 2018

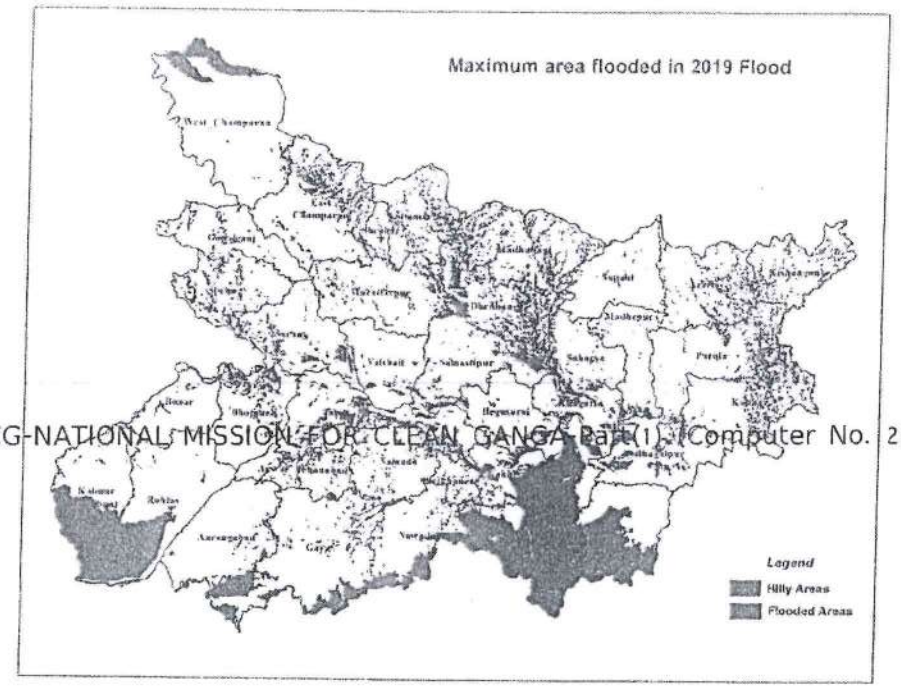

Figure- 8.13Composite Inundation Map for 2019

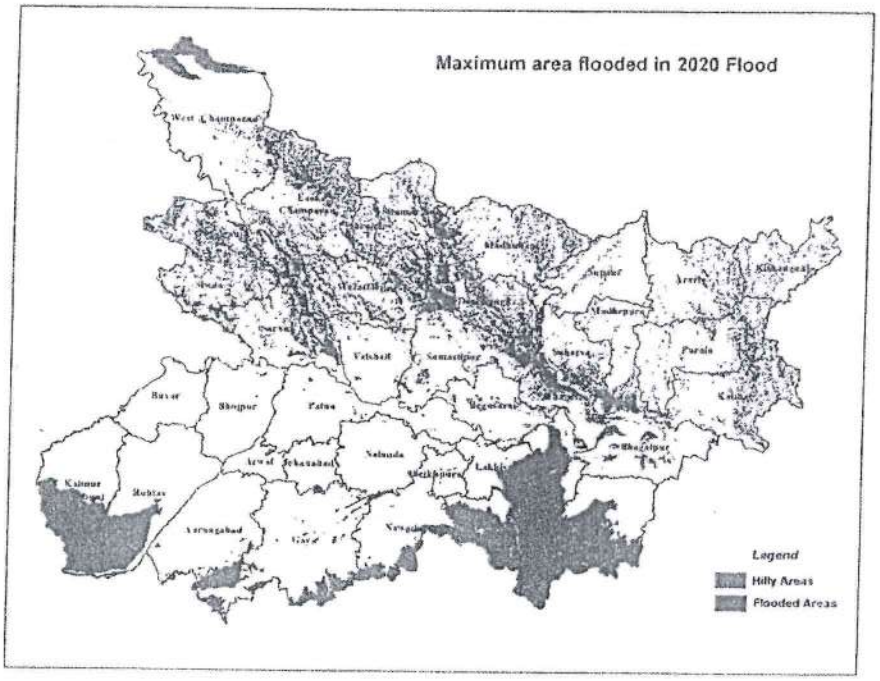

Figure - 8.14Composite Inundation Map for 2020

9.0 CONCLUSION

Land and water form the basis of human civilization. Since time immemorial man has been living close to rivers as availability of water is guaranteed. Even when cultivation was not organized as an activity to support survival, living close to water bodies was a necessity. Later on, cultivation practices developed and land from rivers were occupied for this purpose. In a climatic region where water pours down in plenty there were dangers of being washed away hence men learned to choose safer places for living and farming. Despite all efforts many civilizations have been partly or wholly obliterated by force of water. These experiences taught us first lesson of flood management, where staying away from furious water was the core theme. Later on; as men acquired assets in the form of permanent shelter and farmlands; they started making protective arrangements to minimize losses.

Fight between life giving river and poor management by man

We have now come to a phase where we are losing more battle than winning. Tremendous growth of population coupled with huge infrastructure development in all kinds of Geographies has pushed modern civilization in to an ever-continuing war with nature. Despite all kinds of technological development, water is prime need for our survival. So, we still try to live near water bodies causing problem of further accommodation. Any further encroachment will prove detrimental to society.

According to the draft River Conservation Zone (Regulation of Harmful Activities) Rules, 2012, an active floodplain is defined by high flood line (HFL), which in entrenched /embanked stretches of a river is the available space (including the river channel/s) in the valley of entrenched stretch, or between two embankments, or between existing roads on either side along a river acting as an embankment. In other stretches of the river HFL, active floodplain shall be the 100-year flood line.

Flood plain zoning regulations are becoming stricter and execution of other large projects for drinking water availability gets priority. Fortunately, we have realized importance of availability of clean water and started planning for ensuring its availability for future generations. Still there are regions where we can still survive and develop by establishing a balance with nature. Almost every part of the globe is thickly populated but all of them do not have advantage of water availability. Food is required by them as well, hence someone has to produce enough to ensure food for all. Bihar has the advantage of water availability so it can produce more food for future generations. We have left open agricultural land for cultivation while infrastructure and living space has been kept to a minimum. Flood protection and revival of time-tested old irrigation practices are being taken up keeping in mind the growing responsibility of ensuring food availability for the country and those in need.

Hence it is cleared that on account of existing topography near river banks, availability of fertile land, people's dependability on domestic use of water and the high cost of land in non-flood plain area; dense population in northern plain terrain are bound to settle within embanked river areas (Embankment length of 3780Km), which indicate the non-feasibility of flood plain zoning in the state of Bihar.

Annexure - R2

बिहार सरकार
जल संसाधन विभाग

संचिका संख्या– यो०मो०–4 (विविध)07–372/2020 पार्ट–II- 143 /पटना, दिनांक– 06/3/2025

–: आदेश :–

विषयः– बिहार राज्य अंतर्गत तटबंधित नदियों के लिए **Flood Plain Zoning** लागू किए जाने के संबंध में।

1. माननीय राष्ट्रीय हरित अधिकरण (National Green Tribunal), नई दिल्ली में विचाराधीन OA No-200/2014, OA No-673/2018 एवं अन्य मामले में पारित आदेशों के आलोक में नदियों के प्राकृतिक, आर्थिक एवं पर्यावरणीय लाभकारी मूल्यों का संरक्षण, प्रदूषण की रोकथाम तथा नदी पारिस्थितिकी तंत्र (River Ecosystem) का संरक्षण एवं जीर्णोद्धार के उद्देश्य से Flood Plain Zoning राज्यों द्वारा लागू किया जाना है।
2. जल शक्ति मंत्रालय, भारत सरकार द्वारा बाढ़ प्रबंधन कार्यक्रम (Flood Management Program) के तहत वित्त पोषण प्राप्त करने हेतु राज्यों को Flood Plain Zoning कानून अथवा किसी उपयुक्त कार्यकारी आदेश के माध्यम से लागू किये जाने की भी पात्रता निर्धारित की गयी है।
3. बिहार बाढ़ के दृष्टिकोण से अत्यधिक संवेदनशील राज्य है, जहाँ बाढ़ प्रवण क्षेत्र देश के बाढ़ प्रवण क्षेत्र का लगभग 17.2 प्रतिशत है। राज्य के कुल 94.16 लाख हेक्टेयर भौगोलिक क्षेत्र का 68.80 लाख हेक्टेयर क्षेत्र बाढ़ प्रवण है, जो कुल भौगोलिक क्षेत्र का लगभग 73 प्रतिशत है। बिहार के कुल 68.80 लाख हेक्टेयर बाढ़ प्रवण क्षेत्र में से 50.45 लाख हेक्टेयर बाढ़ प्रवण क्षेत्र उत्तरी बिहार तथा 18.35 लाख हेक्टेयर बाढ़ प्रवण क्षेत्र दक्षिणी बिहार में पड़ता है। यहाँ की भौगोलिक स्थिति तथा गंगा, कोसी, गंडक, बागमती जैसी प्रमुख नदियों के कारण राज्य को बार–बार बाढ़ की विभीषिका का सामना करना पड़ता है।
4. बाढ़ के संरचनात्मक प्रबंधन हेतु जल संसाधन विभाग द्वारा नदियों पर तटबंधों का निर्माण एवं मरम्मति/रखरखाव तथा आवश्यक बाढ़ सुरक्षात्मक कार्य कराया जाता है। बिहार राज्य में विभिन्न नदियों पर लगभग 3800.41 किलोमीटर तटबंध का निर्माण किया जा चुका है, जिसमें 3606.02 किलोमीटर उत्तर बिहार एवं 194.40 किलोमीटर दक्षिण बिहार में तटबंध का निर्माण किया गया है।

National Mission for Clean Ganga, Ministry of Jal Shakti, Department of Water Resources, River Development & Ganga Rejuvenation

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तटबंधों के निर्माण से कुल 39.96 लाख हेक्टेयर क्षेत्र को बाढ़ से सुरक्षित किया गया है।

5. राज्य अंतर्गत प्रथम चरण में Flood Plain Zoning तटबंधित नदियों के लिए लागू करने का निर्णय लिया गया है। गैर तटबंधित नदियों के लिए Flood Plain Zone के निर्धारण हेतु आवश्यक अध्ययनोपरान्त अग्रेतर कार्रवाई की जायेगी।

6. उपर्युक्त वर्णित परिपेक्ष्य के दृष्टिगत राज्याधीन तटबंधित नदियों के लिए Flood Plain Zone का निर्धारण निम्नवत् किया जाता है:–

(क) जिन नदियों के दोनों किनारों पर तटबंध निर्मित है, उन नदियों के लिए दोनों किनारे पर निर्मित तटबंध के मध्य के क्षेत्र को Flood Plain Zone निर्धारित किया जाता है।

(ख) जिन नदियों के एक हीं किनारे पर तटबंध निर्मित है, उन नदियों के लिए तटबंध से लेकर नदी की चौड़ाई होते हुए नदी के दूसरे किनारे से 500 मीटर तक की चौड़ाई के क्षेत्र को Flood Plain Zone निर्धारित किया जाता है।

(ग) उपरोक्त कंडिका– क एवं ख में निर्धारित Flood Plain Zone को Prohibited Zone अंतर्गत रखा गया है।

7. (क) Prohibited Zone में निम्नांकित गतिविधियां अनुमान्य होगी :–

i. पारंपरिक जैविक और प्राकृतिक खेती, जिसमें किसी भी प्रकार के कृषि रसायन या भारी मशीनरी का उपयोग न हो।

ii. पार्क, खेल के मैदान, बगीचे, मनोरंजक गतिविधियाँ आदि, जिनमें किसी स्थायी संरचना का निर्माण/अधिष्ठापन न हो।

iii. पारंपरिक मछली पालन, जिसमें रसायनों, विषाक्त पदार्थों, विस्फोटकों या बिजली के कनेक्शन का उपयोग न हो।

iv. पशुओं को चराने हेतु चारागाह।

v. घरेलू तथा अन्य गैर–व्यावसायिक उपयोग के लिए हैन्डपंपों से भूजल की निकासी।

vi. संबंधित सक्षम प्राधिकार से अनुमति लेकर डिफेन्स संबंधित अस्थाई/चलंत संरचनाओं का निर्माण।

vii. बाढ़ सुरक्षा संबंधित संरचनाओं का निर्माण।

viii. आवश्यक सेवाओं के लिए निर्माण जैसे गैस/पेट्रोलियम पाइपलाइन, बिजली लाइन ट्रांसमिशन टावर, जल आपूर्ति पाइपलाइन, पुल और बैराज।

ix. प्राकृतिक आपदाओं और आपदा प्रबंधन जैसी विशेष परिस्थितियों के लिए अस्थाई/चलंत संरचनाओं एवं आवासन का निर्माण।

x. शहरों या कस्बों से घरेलू अपशिष्ट जल का उपचारित होकर निर्धारित मानकों के अनुसार निस्सरण।

xi. धार्मिक और सामाजिक–सांस्कृतिक गतिविधियाँ (जैसे कुंभ मेला, पूजा अनुष्ठान आदि) और उनसे संबंधित पूर्ण रूप से अस्थाई/चलंत संरचनाएँ, लेकिन केवल गैर–मानसून मौसम में।

xii. अस्थाई/चलंत घाट एवं रिवरफ्रन्ट के निर्माण।

xiii. पर्यावरण–अनुकूल पर्यटन गतिविधियाँ, जिनमें स्थायी संरचनाओं का निर्माण न हो और प्रकृति अनुकूल प्रैक्टिस जैसे गैर–डीजल मोटरबोट का उपयोग शामिल हो।

xiv. पर्याप्त सुरक्षा के साथ रेलवे के आधारभूत निर्माण जैसे नए तटबंध/पुलों का निर्माण।

xv. स्थानीय वृक्ष/झाड़ का व्यावसायिक उपयोग के लिए वृक्षारोपण।

xvi. पर्यावरण, वन एवं जलवायु परिवर्तन, भारत सरकार के दिशा–निर्देशों तथा राज्य सरकार के समय समय पर निर्धारित नियमों के अनुसार Regulated Sand/ Stone/ sediment/ river borne material mining की अनुमति।

xvii. पूर्व से निर्मित भवनों का अतिआवश्यक मरम्मती का कार्य, परंतु इसमे कोई विस्तारीकरण/नवनिर्माण निषिद्ध होगा।

xviii. STP, Conservation तथा NMCG से संबंधित कार्य।

xix. नदी के वर्तमान किनारे को दृष्टिगत रखते हुए नदी–तट से 250 मीटर के दूरी को छोड़ कर बाकी चौड़ाई में ऐसे पूर्ण रूप से अस्थाई/चलंत भवन, आवास एवं संरचना का निर्माण जो अनफोल्ड कर अथवा यथास्वरूप स्थानांतरित किया जा सके।

(ख) Prohibited Zone मे निम्नांकित गतिविधियाँ प्रतिबंधित होगीः–

i. सभी प्रकार के स्थायी निर्माण।

ii. किसी भी प्रकार की किसी भी मौजूदा संरचना के फर्श क्षेत्र या ऊंचाई में कोई वृद्धि।

iii. ठोस अपशिष्ट का डंपिंग/लैंड फिल का निर्माण।

iv. अत्यधिक अस्थिर, ज्वलनशील, विस्फोटक, विषाक्त पदार्थों का भंडारण।

v. बड़े पैमाने पर वाणिज्यिक या औद्योगिक सुविधाओं की स्थापना।

vi. कंडिका 'क' में उल्लेखित अनुमत गतिविधियों को छोड़कर नदी चैनल के प्राकृतिक मार्ग को बाधित करने वाले निर्माण कार्य।

Prohibited Zone में मूलभूत सुविधाएँ यथा स्कूल, अस्पताल, सड़कें तथा आंगनवाडी केंद्र इत्यादि को स्थापित करने हेतु अस्थाई/चलंत संरचना, जो

अनफोल्ड / यथास्वरूप स्थानान्तरित किए जा सके को उपयोग में लाया जा सकता है।

9. Flood Plain Zoning के कार्यान्वयन / विनियमन से संबंधित गतिविधियों की निगरानी एवं समन्वय संबंधित जिला प्रशासन द्वारा किया जायेगा। साथ ही Flood Plain Zoning की स्वीकार्यता के उद्देश्य से ग्रामवासियों को तटबंध से बाहर बसने के लिए जिला प्रशासन द्वारा प्रोत्साहित / प्रशिक्षित किया जायेगा। राज्याधीन सभी संबंधित विभागों के जिला स्तरीय पदाधिकारियों द्वारा जिला प्रशासन को Flood Plain Zoning के कार्यान्वयन / विनियमन हेतु सहयोग किया जायेगा।
10. Flood Plain Zoning के कार्यान्वयन की नियमित समीक्षा की जायेगी तथा बदलते पर्यावरणीय एवं सामाजिक–आर्थिक परिदृश्यों के अनुसार इसे सशक्त बनाने हेतु आवश्यक कार्रवाई की जायेगी।
11. उक्त पर माननीय मंत्री का अनुमोदन प्राप्त है।

5/3/25

(संतोष कुमार मल्ल)
प्रधान सचिव
जल संसाधन विभाग

ज्ञापांक–यो०मो०–4 (विविध)07–372 / 2020 पार्ट–II-143 पटना, दिनांक– 06/3/2025

प्रतिलिपिः–सभी जिला पदाधिकारी को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

5/3/25

प्रधान सचिव
जल संसाधन विभाग

ज्ञापांक–यो०मो०–4 (विविध)07–372 / 2020 पार्ट–II-142 पटना, दिनांक– 06/3/2025

प्रतिलिपिः–अभियंता प्रमुख, मुख्यालय / सिंचाई सृजन / बाढ़ नियंत्रण एवं जल निस्सरण, जल संसाधन विभाग, बिहार सरकार को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

5/3/25

प्रधान सचिव
जल संसाधन विभाग

ज्ञापांक–यो०मो०–4 (विविध)07–372/2020 पार्ट–II-143 पटना, दिनांक– 06/3/2025

प्रतिलिपिः–अपर मुख्य सचिव, राजस्व एवं भूमि सुधार विभाग/पथ निर्माण विभाग/ ग्रामीण कार्य विभाग/ आपदा प्रबंधन विभाग/ सामान्य प्रशासन विभाग/प्रधान सचिव, योजना एवं विकास विभाग/ लोक स्वास्थ्य अभियंत्रण विभाग/ खान एवं भू–तत्व विभाग/सचिव, पंचायती राज विभाग/ नगर विकास एवं आवास विभाग/ ग्रामीण विकास विभाग/ लघु जल संसाधन विभाग/ भवन निर्माण विभाग/ पर्यटन विभाग/ उद्योग विभाग/ पर्यावरण, वन एवं जलवायु परिवर्तन विभाग/ विधि विभाग/अध्यक्ष, बिहार प्रदूषण नियंत्रण पर्षद का सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

5/3/25

प्रधान सचिव
जल संसाधन विभाग

ज्ञापांक–यो०मो०–4 (विविध)07–372/2020 पार्ट–II-143पटना, दिनांक– 06/3/2025

प्रतिलिपिः–मुख्य सचिव, बिहार को सूचनार्थ समर्पित ।

5/3/25

प्रधान सचिव
जल संसाधन विभाग

Ministry of Jal Shakti, Department of Water Resources, River Development & Ganga Rejuvenation
नमामि गंगे
National Mission for Clean Ganga

नमामि गंगे
राष्ट्रीय स्वच्छ गंगा मिशन
National Mission for Clean Ganga

File No.: L-25011(11)/2/2025-LME NMCG **Dated: 27th May, 2025**

Subject: Implementation of Flood Plain Zoning (FPZ) for embanked rivers within the State of Bihar – reg.

Ref: Water Resources Department, Office Order dated 6th March, 2025 (copy enclosed)

Kind attention is drawn towards above referred Order of Government of Bihar regarding *the implementation of Flood Plain Zoning for embanked rivers within the State.*

In this context, following points are submitted for kind consideration:

1. The Inter-Ministerial Joint Committee (IMJC) report, already shared with the State vide letter no. File No.: TE-16019/3/2020-O/o AD (RD Tech/NMCG/895 dated 24.02.2023 underlines the importance of FPZ in the State and, inter alia, recommends as *Through various directions of NGT, States have been directed that till such time States scientifically demarcate flood plains, as an interim measure certain buffer zone (defined specifically in the NGT directions) shall be notified respectively as no construction zone and regulatory zone to prevent encroachments into riverine flood plains and maintain a baseline. This interim measure shall cease upon scientific demarcation and notification thereof of floodplains by the States."* (***Annex-I***)

2. As informed by the State vide its letter dated 11.04.2025 in connection with Monthly Progress Report (MPR) in the NGT matter OA No. 673 of 2018, a study on Flood Plain Zoning for Ganga River from Chausa to Manihari, is being conducted by the National Institute of Hydrology (NIH), Roorkee.

   This approach aligns with the recommendations of the IMJC for a scientific study. However, it is imperative that ~~that~~ FPZ study cover the Flood plain as defined in the NMCG Notification, 2016, and divides flood plain zones based on floods corresponding to 5-yr, 25-yr and 100-yr return periods. This study is required to be completed in a time-bound manner.

3. The FPZ Order for 'Embanked Rivers' issued by the State on 06.03.2025 is based on the recommendations of a Committee formed for this purpose. However, the Order itself doesn't clearly specify whether the defined flood plain for embanked river is based on 100-yr return period flood or not. Secondly, other banks of the river as mentioned in para 6 (b) is also not clearly defined.

   Further, it may be noted that areas outside the embankments remain vulnerable

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to the fluvial flooding in the event embankment breaches, and hence, they share the similar characteristics and risk profiles to those areas within the embankments. In view of this, it is requested that the details of the Committee formed, their recommendations, process/methodologies adopted for FPZ for embanked rivers be shared with NMCG. In this context, minutes of the meeting held in NMCG may kindly be referred to. ***(Annex-2)***

In light of above, it is requested that the matter be reviewed accordingly, and the work of FPZ be accomplished in conformity with the recommendations of inter-ministerial Joint Committee and provisions of the River Ganga (Rejuvenation, Protection and Management) Authorities Order dated 07.10.2016.

This issues with the approval of the Director General, NMCG.

27.05.2025

Encl.: As above

(Anup Kumar Srivastava)
Executive Director –Technical, NMCG

To,

1. **The Chief Secretary,** Government of Bihar, Government of Bihar, Main Secretariat, Patna-800015 email: cs-bihar@nic.in
2. **Principal Secretary,** Water Resources Department, Bihar, **email:** wrd-bih@nic.in

Copy (with request to co-ordinate in the matter) to:

1. Project Director, SPMG, Bihar, Patna

Copy for kind information to:

1. Chief Engineer, P&D, CWC

राष्ट्रीय स्वच्छ गंगा मिशन
National Mission for Clean Ganga

Annexure – R4

F No. T-13/2013-14/283/Saidpur Network Dated: 29th Jan 2025

To,

1. **The Principal Secretary,**
   Urban and Housing Department,
   Government of Bihar,
   Patna

2. **The Managing Director,**
   Bihar Urban Infrastructure Development Corporation (BUIDCo),
   Patna, Bihar

3. **The Member Secretary,**
   Bihar Pollution Control Board, Patna, Bihar

WHEREAS National Mission for cleaning Ganga (NMCG) has been constituted as an authority vide Government of India Notification number S.O. 3187 (E) dated 7th October, 2016 under the provisions of Environmental (Protection) Act, 1986 to exercise powers and discharge functions conferred under the said notification for abatement of pollution and rejuvenation, protection and management of the River Ganga and its tributaries; and

WHEREAS, Para 39 of the notification provides function of the NMCG and amongst others, Clause (c) of the said para provides that NMCG shell identify or cause to be identified the specific threats to the river Ganga and its tributaries in areas abutting River Ganga and its tributaries, including the remedial actions to be taken for rejuvenation and protection of River Ganga and its tributaries; and

WHEREAS, Para 41 (2) and (3) Of the Notification empowers NMCG 2. Direct any person, authority, board or corporation to take such measures which may be necessary for prevention, control and abatement of pollution, rejuvenation, protection and management of River Ganga and its tributaries and.

WHEREAS, amongst others, under section 17 of the Water (Prevention and Control of Pollution) Act 1974, one of the functions of the State Pollution Control Board (SPCBs) and

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Pollution control committee (PCCs), constituted under the water (prevention and control of pollution) Act, 1974 is to plan a comprehensive program for prevention, control and abatement of pollution of water bodies in the state and to secure the execution thereof; and

WHEREAS, Honourable NGT in the matter of O.A no 1069/2018 - Nitin Shankar Deshpande Vs Union of India & Ors, dated 30.04.2019 has directed the discharge norms to be followed for Sewage Treatment Plants. Honourable NGT is seized of the issues related to the pollution control caused into the river Ganga due to non-functional, non-compliant STPs in the catchment of River Ganga and has given clear directions to the state of Bihar to take appropriate actions against the erring officers and remedial action for preventing untreated sewage being discharged directly into river Ganga, in violation of the mandate of the law.

WHEREAS, during a surprise inspection on **28th December 2024 of STP of 60 MLD capacity at Saidpur, Patna**, for the performance evaluation and monitoring in respect of notified discharge standard, the **STP was found to be non-compliant to stipulated discharge standard** and key technology equipment like **Decanters of SBR tanks were found out of order, the decanters were seen tied with chain, the chlorination system was non-operational**, resulting non-compliance of the Plant. The sludge dewatering machine was also found non-operational since the beginning, resulting in no sludge has been withdrawn since the beginning.

WHEREAS, it has been noted that, the private STP operator has been wilfully violating the environmental laws by discharging untreated / partially treated sewage into the river Ganga due to damaged and defective technology equipment.

AND NOW, THEREFORE, in view of the above and in exercise of power conferred to NMCG under the notification, following directions under Section 5 of the Environmental (Protection) Act, 1986 are issued for compliance.:-

A. Take effective and immediate Penal deterrent action under law, against the Owner/Private STP Operator/Occupier/Technology Provider of default STP and erring officials/Department, institution including assigning of liability to prevent such default in future;

B. State government of Bihar shall direct the district administration of Patna to register Police complaint against erring Contractor and Technology provider under section 277, 290, 425, 426 and 511 of the I.P.C. (relevant sections of B.N.S.) for polluting the river Ganga by discharging untreated sewage into it;

C. A complaint must also be registered against the Owner/Operator/Occupier of defaulter STP by Bihar Pollution Control Board under the relevant provisions of Water (Prevention and Control of Pollution) Act, 1974, apart from levying and recovery of **environmental compensation;**

D. State government of Bihar shall ensure strict vigilance and performance of the STPs by conducting surprise inspections through team of enforcement agencies and monitoring of efficacy and efficiency of all STPs through regular water quality assessments;

E. It is therefore, directed that appropriate action must be taken against the defaulting STPs and an action taken Report must be submitted to NMCG within **two weeks** from the date of receipt of the aforesaid directions.

(Rajeev Kumar Mital)
Director General, NMCG

Copy to:

1. PPS to the Secretary, Department of Water Resources, River development and Ganga rejuvenation, Ministry of JAL Shakti, Shram Shakti Bhawan.
2. The Chairman, Central Pollution Control Board, Parivesh Bhawan, New Delhi
3. The Executive Director (Projects/Finance/Technical) National Mission for Clean Ganga.

बिहार शहरी आधारभूत संरचना विकास निगम लि०
Bihar Urban Infrastructure Development Corporation Ltd.
(A Govt. of Bihar Undertaking)
RajaPurPul West Boring Canal Road, Patna- 800 001
Contact : +0612- 2558412
Email - mdbuidco@gmail.com, Website : http://buidco.in
CIN - U45200BR2009SGC014600
ISO9001:2008,14001:2004

पत्रांक- 779 दिनांक- 06/02/2025

सेवा मे,

संयुक्त सचिव,
नगर विकास एवं आवास विभाग
बिहार, पटना।

विषयः **नमामि गंगे अंतर्गत क्रियान्वित सैदपुर STP के संचालन में NMCG के टीम द्वारा पायी गई त्रुटियों के क्रम में कार्रवाई करने के संबंध में।**

प्रसंगः NMCG का पत्रांक–F No. T-13/2023-14-283/saidpur Network दिनांक– 29.01.2025

महाशय,

उपर्युक्त प्रासंगिक विषयक क्रम में कहना है कि NMCG टीम द्वारा सैदपुर एस.टी.पी. का दिनांक–28.12.2024 को औचक निरीक्षण किया गया था। निरीक्षण क्रम में अनेक त्रुटियाँ पायी गयी थी। प्रासंगिक पत्र द्वारा संबंधित संवेदक/पदाधिकारी पर कार्रवाई का निदेश दिया गया है। तद्नुसार बुडको द्वारा निम्नलिखित कार्रवाई किया गया है।

1. दोषी संवेदक से स्पष्टीकरण की माँग की गई है एवं कालीकरण की कार्रवाई की जा रही है। (Annexure-I)
2. प्रभारी परियोजना पदाधिकारी से स्पष्टीकरण प्राप्त करते हुए विभागीय कार्रवाई की जा रही है। (Annexure-II)
3. दोषी संवेदक पर Police Complain करने हेतु जिलाधिकरी, पटना से अनुरोध किया गया है। (Annexure-III)
4. STPs के सतत् निगरानी हेतु एक तीन सदस्यी टीम का गठन किया गया है। (Annexure-IV)

सूचनार्थ अग्रेत्तर कार्रवाई हेतु प्रेषित।

अनु0–यथोक्त।

विश्वासभाजन,

प्रबंध निदेशक,
बुडको, पटना।

ज्ञापांक- 779 दिनांक- 06/02/2025

प्रतिलिपिः–

1. महानिदेशक, नमामि गंगे को सादर सूचनार्थ समर्पित।
2. सचिव, नगर विकास एवं आवास विभाग, पटना को सादर सूचनार्थ समर्पित।

प्रबंध निदेशक,
बुडको, पटना।

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Annexure-I

बिहार शहरी आधारभूत संरचना विकास निगम लि0
Bihar Urban Infrastructure Development Corporation Ltd.
(A Govt. of Bihar Undertaking)
RajaPur Pul, West Boring Canal Road, Patna-800 001
Contact: + 0612- 2558412,E- mail – mdbuidco@gmail.com, Website :http://buidco.in
CIN- U45200BR2009SCG014600
Building Better Tomorrow

Letter No. ...647... / Date ...22/2/25

From,

Animesh Kumar Parashar, IAS
Managing Director
Buidco, Patna

To,

M/s Toshiba Water Solution Pvt. l td.
(Formerly known as M/s UEM India Pvt. Ltd)
Sector- 62, Gurugram, Haryana – 122098 (India)
Email – Contact@toshiba-water.com

Sub : **Show cause notice due to negligence in operation & maintenance of Saidpur STP under Namami Gange**

Ref : NMCG, New Delhi Letter No. - 283/Saidpur Network Dated- 29.01.2025

Sir,

With reference to above mentioned subject and referred letter, it is to state that ED (Project), NMCG and Technical Director, NMCG had made a surprise visit to Saidpur STP site and found many lapses in the operation and maintenance of Saidpur STP. NMCG vide referred letter mentioned as under;

The STP was found to be non-compliant to stipulated discharge standard and key technology equipment like Decanters of SBR Tanks were found out of order, the decanters were seen tied with chain, the chlorination system was non operational, resulting non-compliances of the plant. The sludge dewatering machine was also found non-operational since the beginning, resulting in no sludge has been withdrawn since the beginning.

It has been noted that, the private STP operator has been wilfully violating the environmental laws by discharging untreated/partially treted sewage into the river Ganga due to damaged and defective technology equipment.

It is evident from above that, you are not doing operation and maintenance of the plant properly, which is your extream negligence and regrettable. Your this act is against agreement condition schedule 3, O&M services.

In the above circumstances, why penalty should not be imposed for the amount equivalent to O&M bill amount for the month Oct to Dec 2024 and also due to unsuccessful O&M of the Plant, why your registration should not be blacklisted? Kindly submit your clarification within 3 days from issuance of this letter, failing which your registration will be blacklisted.

Enclosure – As attached.

Yours Sincerely,

Managing Director
BUIDCO

Department of Water Resources, River Development & Ganga Rejuvenation

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Annexure-II

बिहार शहरी आधारभूत संरचना विकास निगम लि0
Bihar Urban Infrastructure Development Corporation Ltd.
(A Govt. of Bihar Undertaking)
RajaPur Pul, West Boring Canal Road, Patna-800 001
Contact: + 0612- 2558412, E- mail – md.buidco@gmail.com, Website :http://buidco.in
CIN- U45200BR2009SCG014600

पत्रांक– बुडको/प्रo-588/2025-648 दिनांक– 28/02/20

प्रेषक,

अनिमेष कुमार पराशर, भा०प्र०से०
प्रबंध निदेशक।

सेवा में,

श्री राजीव कुमार देव,
परियोजना निदेशक,
सैदपुर एस०टी०पी० परियोजना,
बुडको, पटना।

विषय :– 60 MLD सैदपुर सिवरेज ट्रीटमेन्ट प्लांट (STP), पटना के रख–रखाव कार्य में NMCG एवं राज्य पर्यावरण नियंत्रण बोर्ड के दिशा–निर्देश का अनुपालन नहीं किये जाने के संबंध में स्पष्टीकरण।

प्रसंग :–1. NMCG का पत्रांक–T-13/2013-14/283/Saidpur Networ, दिनांक–29.01.2025
2. BGCMS का पत्रांक–276, दिनांक–16.08 2024 एवं पत्रांक–43, दिनांक–31.01.2025

महाशय,

उपर्युक्त विषयक प्रासंगिक पत्रों के संबंध में कहना है कि राष्ट्रीय स्वच्छ गंगा मिशन, नई दिल्ली के द्वारा प्रासंगिक पत्र के माध्यम से संसूचित किया गया है कि दिनांक–28.12.2024 को 60 MLD सैदपुर सिवरेज ट्रीटमेन्ट प्लांट (STP), पटना के रख–रखाव कार्य अन्तर्गत आपके द्वारा कराए जा रहे कार्यों का मुल्यांकन हेतु कार्यकारी निदेशक एवं निदेशक (तकनीकी), NMCG द्वारा संयुक्त निरीक्षण किया गया। निरीक्षण के क्रम में निम्नवत् तथ्य पाया गया :–

" The STP was found to be non-compliant to stipulated discharge standard and key technology equipment like Decanters of SBR tanks were found out of order, the decanters were seen tied with chain, the chlorination system was non-operational, resulting non-compliance of the Plant. The sludge dewatering machine was also found non-operational since the beginning, resulting in no sludge has been withdrawn since the beginning."

आपके के अधीन सैदपुर एस०टी०पी० के O&M कार्य के कार्यान्वयन अन्तर्गत उपचारित सीवेज का Discharge Standard के अनुरूप नहीं है, जिससे सैदपुर एस०टी०पी० द्वारा Treated Effluent को मापदण्डों के अनुरूप दूषित जल को शोधित किए बिना प्रदूषित जल गंगा नदी में प्रवाहित किया गया। यह भी पाया गया है कि सैदपुर एस०टी०पी० के इनलेट पर प्राप्त अनुपचारित सीवेज की बायोकेमिकल ऑक्सीजन डिमांड (BOD) से कम पायी गई। जिसके संबंध में कार्यस्थल पर उनके द्वारा आपसे पृच्छा किए जाने पर संतोषप्रद जवाब नहीं दिया गया एवं आवश्यक दस्तावेज भी नहीं प्रस्तुत की गई। साथ ही विषयांकित कार्य में NMCG एवं राज्य पर्यावरण नियंत्रण बोर्ड के दिशा–निर्देश का अनुपालन में लापरवाही के आलोक में अबतक संबंधित एजेन्सी के विरूद्ध आपके स्तर से कोई भी कार्रवाई नहीं की गई है, जबकि आपको उक्त के संदर्भ में BGCMS के प्रासंगिक पत्र – 2 के माध्यम से भी विभाग द्वारा निदेशित किया गया था।

यह भी उल्लेखनीय है कि माननीय NGT के वाद संख्या–1069/2018 नितिन शंकर देशपाण्डे बनाम सरकार एवं अन्य में दिनांक–30.04.2019 को बिहार सरकार को स्पष्ट आदेश पारित की गई है कि उपचारित सीवेज का Discharge Standard के अनुपालन नहीं किए जाने वाले एस0टी0पी0 से संबंधित पदाधिकारी/अभियंताओं के विरूद्ध दण्डात्मक कार्रवाई एवं संबंधित एजेन्सी के विरूद्ध विधि सम्मत कार्रवाई की जाय। साथ ही यह भी उल्लेखनीय है कि राज्य पर्यावरण नियंत्रण बोर्ड की धारा 1986 के Section-5 (A), B), (C) (D) एवं (E) के तहत संबंधित के विरूद्ध आवश्यक कार्रवाई अपेक्षित है। विषयांकित परियोजना के अनुश्रवण के दौरान घोर लापरवाही बरतते हुए जानबूझकर अनुपचारित/आंशिक रूप से उपचारित सीवरेज को गंगा नदी में प्रवाहित कर पर्यावरण को दूषित किया गया, जो कि नमामि गंगे परियोजना के मूल उद्देश्यों के प्रतिकूल है।

उपरोक्त तथ्यों से स्पष्ट है कि आपके द्वारा केन्द्रीय पर्यावरण नियंत्रण की संहिता 1986 के पारा–39, 41 (2) एवं (3) एवं The Water (Prevention and Pollution) की संहिता 1974 के Section-17 एवं राज्य पर्यावरण नियंत्रण बोर्ड की धारा 1986 के Section-5 (A), B), (C) (D) एवं (E) का अनुपालन नहीं किया गया है एवं संबंधित एजेन्सी के विरूद्ध आपके द्वारा कोई भी अपेक्षित कार्रवाई अबतक नहीं की गई है, जो आपके द्वारा कार्य में घोर लापरवारी एवं स्वच्छेचारिता का घोतक है।

अतः उक्त के आलोक में 03 दिनों के अन्दर अपना स्पष्टीकरण समर्पित करें कि विषयांकित कार्य में लापरवाही बरते जाने के आलोक में क्यों नहीं आपके विरुद्ध अनुशासनिक कार्रवाई करते हुए संविदा रद्द करने की कार्रवाई की जाय।

अनुलग्नक :– यथोक्त।

विश्वासभाजन

प्रबंध निदेशक,
बुडको, पटना।

ज्ञापांक :– 648 दिनांकः– 28/02/2025

प्रतिलिपि :–सचिव, नगर विकास एवं आवास विभाग को सादर सूनचार्थ समर्पित।

प्रबंध निदेशक,
बुडको, पटना।

बिहार शहरी आधारभूत संरचना विकास निगम लि0
Bihar Urban Infrastructure Development Corporation Ltd.
(A Govt. of Bihar Undertaking)
RajaPur Pul, West Boring Canal Road, Patna-800 001
Contact: +0612- 2558412,E- mail - mdbuidco@gmail.com, Website :http://buidco.in
CIN- U45200BR2009SCG014600
Building Better Tomorrow

Annexure-3

पत्रांक– ...../ दिनांक– ...../

प्रेषक,

अनिमेष कुमार पराशर, भा0प्र0से0
प्रबन्ध निदेशक,

सेवा में,

जिलाधिकारी,
पटना।

विषय :– **नमामि गंगे अन्तर्गत क्रियान्वित सैदपुर STP के संचालन में लापरवाही वरतने वाले संवेदक के विरूद्व कार्रवाई के संबंध में।**

प्रसंग– Director General, NMCG का पत्रांक– F No T-13/2023-14/283/Saidpur Network दिनांक– 29.01.2025

महाशय,

उपर्युक्त प्रासंगिक विषयक क्रम में कहना है कि दिनांक– 28.12.2024 को NMCG Team द्वारा सैदपुर STP का औचक निरीक्षण किया गया। निरीक्षण के क्रम में संवेदक M/s Toshiba Water Solutions Pvt. Ltd. and ENS Infracon (JV) द्वारा सैदपुर STP के संचालन एवं रख–रखाव में घोर लापरवाही उजागर हुआ है। उनके द्वारा सीवेज का समुचित ढंग से Treatment नहीं किया जा रहा था। उपचारित Sewage मापक के अनुरूप नहीं पाया गया। दुषित Treated Sewage नाले के माध्यम से गंगा नदी में प्रवाहित हो रहा था। यह नमामि गंगे परियोजना के मूल उद्वेश्य का उल्लंधन है। प्रासंगिक पत्र द्वारा दोषी संवेदक एवं तकनीकी सेवा देने वाले Agency पर Police Complain करने का निदेश प्राप्त है। प्रासंगिक पत्र के अनुसार "State government of Bihar shall direct the district administration of Patna to register Police complaint against erring Contractor and Technology provider under section 277, 290, 425, 426 and 511 of the I.P.C. (relevant sections of B.N.S.) for polluting the river Ganga by discharging untreated sewage into it;"

अनुरोध है कि प्रासंगिक पत्र में दिए गये अनुदेश का अनुपालन क्रम में संवंधित संवेदक एवं तकनीकी सेवा प्रदाता पर Untreated Sewage गंगा नदी में प्रवाह करने के लिए विभिन्न धाराओं के तहत Police Case दर्ज कराया जाय।

अनु0–यथोपरि।

विश्वासभाजन

ह0/–

(प्रबन्ध निदेशक)
बुडको, पटना।

ज्ञापांक 777 /दिनांक– 06/02/2025

प्रतिलिपि:–

1. महानिदेशक, NMCG को सादर सूचनार्थ समर्पित।
2. सचिव, नगर विकास एवं आवास विभाग, बिहार, पटना को सादर सूचनार्थ समर्पित।

6/2

प्रबन्ध निदेशक

(A Govt. of Bihar Undertaking)
Rajapur Pul, West Boring Canal Road, Patna-800 001
Contact: (0612) 25384...
CIN- U45200BR2009SGC014600

कार्यालय आदेश

पत्रांक– ..../ दिनांक– ..../

बिहार राज्य के अंतर्गत संचालित सभी STP के संचालन पर निगरानी हेतु निम्नवत् एक समिति का गठन किया जाता है।

1. **श्री सुरेन्द्र कुमार मेहत्ता,**
   महाप्रबंधक (असैनिक), बुडको, पटना।
2. **श्री मिथिलेश कुमार सिन्हा,**
   वरीय पर्यावरण योजनाकार
   जल संसाधन प्रबंधन/विशेषज्ञ
   एस0पी0एम0जी0, बुडको, पटना।
3. श्री सत्यव्रत
   वरीय पर्यावरण अभियंता,
   एस0पी0एम0जी0, बुडको, पटना।

उपर्युक्त समिति प्रत्येक माह कम से कम एक बार राज्य अंतर्गत संचालित सभी STP की Efficacy एवं Efficiency की जॉच औचक रूप से करेंगे। फलाफल से मुख्य महाप्रबन्धक, बुडको एवं अद्योहस्ताक्षरी को नियमित रूप से सुचित करना सुनिश्चित करेंगे।

अनु0–यथोपरि।

विश्वासभाजन

ह0/–

(प्रबन्ध निदेशक)
बुडको, पटना।

ज्ञापांक 778 / दिनांक– 06/03/2025

प्रतिलिपि:–

1. महानिदेशक, NMCG को सादर सूचनार्थ समर्पित।
2. सचिव, नगर विकास एवं आवास विभाग, बिहार, पटना को सादर सूचनार्थ समर्पित।

प्रबन्ध निदेशक

National Mission for Clean Ganga, Ministry of Jal Shakti, Department of Water Resources, River Development & Ganga Rejuvenation

नमामि गंगे
राष्ट्रीय स्वच्छ गंगा मिशन
National Mission for Clean Ganga

File No.: Pr-23024/2/2025 - O/o Dir(T-III) NMCG **Dated: 11th July 2025**

To,

1. **The Principal Secretary,**
   Urban and Housing Department,
   Government of Bihar, Patna

2. **The Managing Director,**
   Bihar Urban Infrastructure Development Corporation (BUIDCO),
   Patna, Bihar

3. **The Member Secretary,**
   Bihar State Pollution Control Board,
   Patna, Bihar

WHEREAS National Mission for cleaning Ganga (NMCG) has been constituted as an authority vide Government of India Notification number S.O. 3187 (E) dated 7th October, 2016 under the provisions of Environmental (Protection) Act, 1986 to exercise powers and discharge functions conferred under the said notification for abatement of pollution and rejuvenation, protection and management of the River Ganga and its tributaries; and

WHEREAS, Para 39 of the notification provides function of the NMCG and amongst others, Clause (c) of the said para provides that NMCG shall identify or cause to be identified the specific threats to the river Ganga and its tributaries in areas abutting River Ganga and its tributaries, including the remedial actions to be taken for rejuvenation and protection of River Ganga and its tributaries; and

WHEREAS, Para 41 (2) and (3) Of the Notification empowers NMCG to Direct any person, authority, board or corporation to take such measures which may be necessary for

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True Copy

prevention, control and abatement of pollution, rejuvenation, protection and management of River Ganga and its tributaries and.

WHEREAS, amongst others, under section 17 of the Water (Prevention and Control of Pollution) Act 1974, one of the functions of the State Pollution Control Board (SPCBs) and Pollution control committee (PCCs), constituted under the water (prevention and control of pollution) Act, 1974 is to plan a comprehensive program for prevention, control and abatement of pollution of water bodies in the state and to secure the execution thereof; and

WHEREAS, Honourable NGT in the matter of O.A no 1069/2018 - Nitin Shankar Deshpande Vs Union of India & Ors, dated 30.04.2019 has directed the discharge norms to be followed for Sewage Treatment Plants. Honourable NGT is seized of the issues related to the pollution control caused into the river Ganga due to non-functional, non-compliant STPs in the catchment of River Ganga and has given clear directions to the state of Bihar to take appropriate actions against the erring officers and remedial action for preventing untreated sewage being discharged directly into river Ganga, in violation of the mandate of the law.

WHEREAS, During a surprise inspection on **19th June 2025 of STP of 25 MLD capacity at Danapur, Patna**, for the performance evaluation and monitoring in respect of notified discharge standard, the **STP was found to be Non Operational** at the time of inspection and PLC SCADA system of SBR Technology was found out of order, resulting non-functioning of the Plant.

WHEREAS, It has been noted that no sewage flow from the pumping station was reaching the STP inlet. This raises serious concerns regarding the functionality and connectivity of the pumping infrastructure. The required number of trained and qualified personnel for Operation and Maintenance (O&M) was not present at the site during the visit. The operator deployed at the site appeared to be unskilled and did not possess the qualifications stipulated under ARTICLE 2.0, Clause 2.6 (Staff), Page 254 of 487 of the Contract Agreement. Upon enquiry, it came to notice that the operator was from a non-technical background and lacked knowledge to of how STPs operate, which is a violation of the contract agreement. This poses a risk to the effective operation of the plant. The PLC-SCADA system of SBR Technology was found to be non-functional and not up to the required technical standards. Such deficiencies affect remote monitoring, control, and plant automation.

AND NOW, THEREFORE, in view of the above and in exercise of power conferred to NMCG under the notification, following directions under Section 5 of the Environmental (Protection) Act, 1986 are issued for compliance.:-

I. A show cause notice (SCN) to be issued Operator/Occupier of the defaulter STP by Bihar State Pollution Control Board under the relevant provisions of the Water (Prevention and Control of Pollution) Act, 1974;

II. Provide a detailed explanation from the erring Officials / Owner / Private STP Operator / Occupier of default STP on the current status of the pumping station, reasons for non-receipt of flow at the STP, and the immediate measures being taken to restore flow;

III. Submit a clarification regarding the approved O&M staffing plan, current deployment status, and steps being taken to ensure full-time availability of qualified personnel as per contract norms;

IV. Provide a comprehensive explanation from the erring Officials / Owner / Private STP Operator / Occupier and SBR Technology Provider on the non-performing PLC - SCADA system status, including reasons for underperformance, scope of supply, and actions taken or planned to make the system fully operational and compliant with technical specifications;

V. Take effective and immediate action on root cause analysis of the observed issues, steps already taken and proposed for rectification and timeline for full compliance and resolution of each point including assigning of liability to prevent such default in the future;

VI. State government of Bihar shall ensure strict vigilance and performance of the STPs by conducting surprise inspection through team of enforcement agencies and monitoring of efficacy and efficiency of all STPs through regular water quality assessments;

VII. Take effective and immediate penal deterrent action under law, against the Owner/Private STP Operator/Occupier of default STP and erring officials/Department, institution including assigning of liability to prevent such default in future;

VIII. It is therefore, directed that appropriate action must be taken against the defaulting STPs and an action taken Report must be submitted to NMCG within two weeks from the date of receipt of the aforesaid directions.

(Rajeev Kumar Mital)

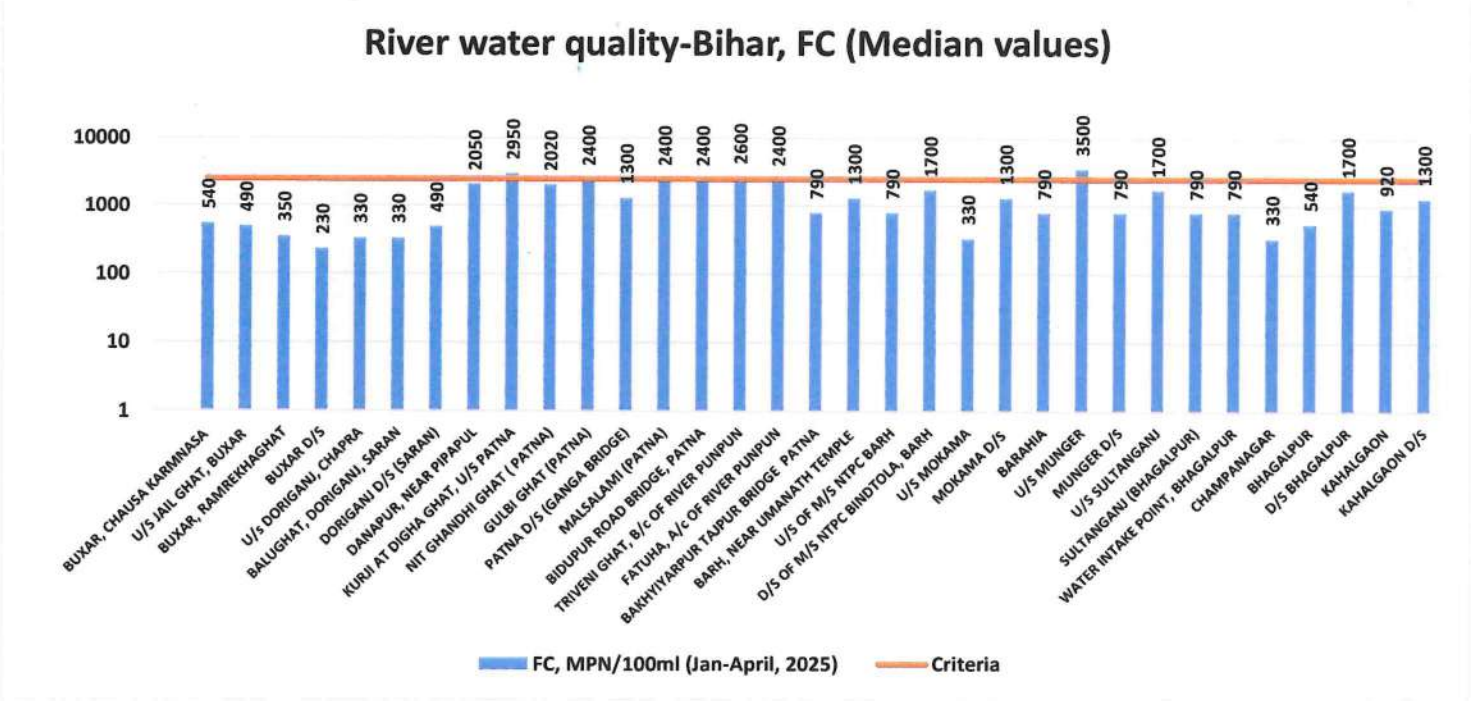
Copy to:

1. PPS to the Secretary, Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Shram Shakti Bhawan, New Delhi
2. PPS to the Chairman, Central Pollution Control Board, Parivesh Bhawan, New Delhi
3. Executive Director (Projects/Finance/Technical), National Mission for Clean Ganga.

(Rajeev Kumar Mital)

Annexure - R7

River water quality Bihar-Faecal coliform (FC)



- **Median values of Faecal coliform is given in annexure-I and raw data of manual monitoring locations of river Ganga in Bihar w.r.t. FC is given at Annexure-II**

42112

Annexure - R7

Annexure-I

Water quality data of river Ganga-Bihar (January to April, 2025) (median values)

Station Code	Station name	FC
1074	BUXAR, CHAUSA KARMNASA	540
10113	U/S JAIL GHAT, BUXAR	490
2551	BUXAR, RAMREKHAGHAT	350
3113	BUXAR D/S	230
10162	U/s DORIGANJ, CHAPRA	330
2564	BALUGHAT, DORIGANJ, SARAN	330
10114	DORIGANJ D/S (SARAN)	490
3114	DANAPUR, NEAR PIPAPUL	2050
1077	KURJI AT DIGHA GHAT, U/S PATNA	2950
2552	NIT GHANDHI GHAT (PATNA)	2020
10115	GULBI GHAT (PATNA)	2400
1079	PATNA D/S (GANGA BRIDGE)	1300
3122	MALSALAMI (PATNA)	2400
4297	BIDUPUR ROAD BRIDGE, PATNA	2400
10122	TRIVENI GHAT, B/c OF RIVER PUNPUN	2600
2553	FATUHA, A/c OF RIVER PUNPUN	2400
4301	BAKHYIYARPUR TAJPUR BRIDGE PATNA	790
3115	BARH, NEAR UMANATH TEMPLE	1300
10130	U/S OF M/S NTPC BARH	790
10131	D/S OF M/S NTPC BINDTOLA, BARH	1700
1817	U/S MOKAMA	330
1815	MOKAMA D/S	1300
3123	BARAHIA	790
3116	U/S MUNGER	3500
1818	MUNGER D/S	790
3117	U/S SULTANGANJ	1700
2554	SULTANGANJ (BHAGALPUR)	790
4398	WATER INTAKE POINT, BHAGALPUR	790
10138	CHAMPANAGAR	330
1819	BHAGALPUR	540
3118	D/S BHAGALPUR	1700
1816	KAHALGAON	920
10143	KAHAGAON D/S	1300

Annexure-II

Water quality data of river Ganga in Bihar-FC (January to April, 2025)

Station Code	Station name	January		February		March		April		Range
		First round	Second round	First round	Second round	First round	Second round	First round	Second round	
1074	BUXAR, CHAUSA KARMNASA	1700	1300	1300	540	240	49	330	-	49-1700
10113	U/S JAIL GHAT, BUXAR	1300	3500	330	490	540	79	230	-	79-3500
2551	BUXAR, RAMREKHAGHAT	9200	3500	5400	220	350	79	170	-	79-9200
3113	BUXAR D/S	490	1300	110	350	170	79	230	-	79-1300
10162	U/s DORIGANJ, CHAPRA	110	790	790	330	350	130	130	-	110-790
2564	BALUGHAT, DORIGANJ, SARAN	460	3400	3500	330	130	49	79	-	49-3500
10114	DORIGANJ D/S (SARAN)	490	1400	3500	490	130	350	2400	-	130-3500
3114	DANAPUR, NEAR PIPAPUL	1700	2400	5400	3500	79	49	-	-	49-5400
1077	KURJI AT DIGHA GHAT, U/S PATNA	9200	3500	2400	3500	49	79	-	-	49-9200
2552	NIT GHANDHI GHAT (PATNA)	54000	3500	3500	490	350	540	-	-	350-54000
10115	GULBI GHAT (PATNA)	17000	3500	5400	1300	350	110	-	-	110-17000
1079	PATNA D/S (GANGA BRIDGE)	3500	5400	2200	1300	240	220	540	-	220-5400
3122	MALSALAMI (PATNA)	35000	2400	3500	2400	240	170	-	-	170-35000
4297	BIDUPUR ROAD BRIDGE, PATNA	5400	2400	2400	5400	540	110	540	-	110-5400
10122	TRIVENI GHAT, B/c OF RIVER PUNPUN	1700	3500	3500	3500	240	220	-	-	220-3500
2553	FATUHA, A/c OF RIVER PUNPUN	35000	2400	2400	2400	220	220	220	-	220-35000
4301	BAKHYIYARPUR TAJPUR BRIDGE PATNA	24000	790	2200	330	2400	240	350	-	240-24000
3115	BARH, NEAR UMANATH TEMPLE	13000	1300	3500	790	2400	33	920	-	33-13000
10130	U/S OF M/S NTPC BARH	1300	5400	790	17	1300	33	140	-	17-5400
10131	D/S OF M/S NTPC BINDTOLA, BARH	2200	2400	3400	1300	1700	130	79	-	79-3400
1817	U/S MOKAMA	1300	330	2200	33	2400	79	170	-	33-2400
1815	MOKAMA D/S	1300	5400	1300	2400	3500	540	170	-	170-5400
3123	BARAHIA	1300	1300	2400	490	790	240	540	-	240-2400
3116	U/S MUNGER	3500	5400	3500	3500	330	13	79	-	13-5400
1818	MUNGER D/S	13000	790	1700	1700	790	540	490	-	490-13000
3117	U/S SULTANGANJ	2400	2200	3500	1700	230	33	350	-	33-3500
2554	SULTANGANJ (BHAGALPUR)	1700	3300	1300	490	790	350	79	-	79-3300
4398	WATER INTAKE POINT, BHAGALPUR	32000	3500	2400	790	330	540	130	-	130-32000
10138	CHAMPANAGAR	790	3500	2400	33	330	240	49	-	33-3500
1819	BHAGALPUR	330	3500	790	230	1100	540	79	-	79-3500
3118	D/S BHAGALPUR	2200	2400	1700	2400	490	540	490	-	490-2400
1816	KAHALGAON	2400	2200	1300	49	490	920	79	-	49-2400
10143	KAHALGAON D/S	2400	1300	1300	1700	790	240	130	-	130-2400