

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
(PRINCIPAL BENCH)**

IN THE MATTER OF:

OA NO 515 of 2024

GANGA POLLUTION VS STATE OF U.P & OTHERS.

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Place: New Delhi

Through

Dated: 11.09.2024

GIGI . C. GEORGE, ADVOCATE
STANDING COUNSEL (UOI)
CH. NO. 457, LAWYER BLOCK-1
DELHI HIGH COURT, NEW DELHI
Gigigeorge.adv42@yahoo.in
M- 9810625315
(NMCG & CWC)

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH

IN THE MATTER OF:

OA NO. 515/2024

GANGA POLLUTION VS STATE OF UP & OTHERS

Response on behalf of the National Mission for Clean Ganga (NMCG) and Central Water Commission in the matter of OA no 515/2023- Ganga Pollution Vs State of U.P & Others.

MOST RESPECTFULLY, IT IS SUBMITTED:

1. That in the aforesaid matter the Hon'ble NGT, amongst other, is considering the issue of demarcation of floodplain zone of river Ganga and its tributaries in the State of Uttar Pradesh (UP) and action to be taken by the concerned authorities to protect the floodplain zone.
2. That this Hon'ble Tribunal, while considering the matter, has invited attention to the provisions of the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016, especially Clause 3(l) defining floodplain, 3(c) buffer area, Clause 4(ix) restriction relating to construction in floodplain that responsibility to determine the floodplain zone primarily lies at the first instance with the authorities and thereafter action to be taken for protection of the floodplain zone.
3. That the State Government of UP had informed this Hon'ble Tribunal that the State of UP has adopted the criteria of interval of five years, twenty-five years and hundred years for the three zones while dividing the flood plains in three parts as under: -

2

25

- Prohibited Zone: recurrence interval of 5 years.
 - Regulatory Zone: 25-year return period flood.
 - Warning Zone: 100-year return period flood.
4. That the Hon'ble Tribunal vide order dated 27.05.2024 has implead the following as respondents in the matter: -
- (i) Central Water Commission (CWC) through its Chairman;
 - (ii) National Mission for Clean Ganga (NMCG) through its Chairman.
5. NMCG sought opinion of CWC and Flood Management Wing of the DoWR, RD & GR in the matter to frame consolidated reply.
6. Hon'ble NGT vide its judgement dated 13th July, 2017 in the matter of M.C. Mehta vs Union of India, 200/2014 has, inter-alia, directed as follows:
- Being an integral part of the river, floodplain of the river requires protection. Floodplains play significant role in maintaining the bio-diversity and aquatic life of the river. It's significance cannot be overlooked, in terms of environment and ecology. There are numerous dimensions involved while identifying the floodplains.
 - It is required to categorize it into different zones, namely, No Development Zone, Regulated Zone and a Free Zone for development. The principle of Sustainable Development itself justifies the classification of floodplains into such zones for protecting the river. This Tribunal in the case of Manoj Misra (supra) had the occasion to deal with the concept of floodplain, its zoning and management. The Tribunal held as under:
 - a) Development and regulation of floodplain of Rivers falls within the purview of the State.

- b) It is not possible to provide uniformity in the extent of floodplains with respect to different Rivers as well as its various reaches.
 - c) Floodplain zoning has been accepted as an important non-structural strategy for flood management. The basic concept of floodplain zoning is to regulate land use of floodplains to restrict damage caused due to floods.
 - d) The floodplain zoning, therefore, aims at determination of locations so that flood damages are reduced to minimum. A very restrictive activity can be allowed in that area. It is not only to protect the areas from damage resulting from floods and failure of water protective measures, but is also useful in reducing the damage caused due to drainage congestion, particularly in urban areas.
7. That in pursuance of the Hon'ble NGT order dated 13th July 2017 in respect of Phase-I, Segment 'B' of River Ganga from Haridwar to Unnao in the matter of OA No200/2014 (M.C. Mehta vs (UOI and Ors), the identification and demarcation of the flood plains was completed by a Special Committee constituted vide OM No.T-12/2017-18/268/NMCG dated 01.08.2017 (**Annexure-1**), for the purpose by the then Ministry of Water Resources, River Development and Ganga Rejuvenation under Chairmanship of Member (WP&P), CWC. The scope of work of the Special Committee was as follows:
- i. To identify and demarcate the flood plains of river Ganga in segment B of phase I on one in Twenty-Five Years cycle or appropriately; &
 - ii. Identify no development/construction zone and regulatory zone and the activities that can/cannot be carried out in the regulatory zone of the floodplain.

That the Committee finalized its report and submitted to DoWR, RD&GR with identification of "No development zone and the regulatory zone" based on the flood recurrence interval of 5-year return period and 25-year return period floods respectively. (**Annexure-2**)

1


8. That as far as flood management is concerned, flood plain zoning is considered as one of the major non-structural measures meant to regulate use of floodplains and thereby minimizing the flood risk and losses. Flood plain zoning regulates land-use or zoning policies which in turn regulates construction in these areas. Regulation of land-use in flood plains in turn also lead to reduction in pollution sources on river banks and maintain natural ground water recharge functions of the plains, Ministry of Jal Shakti has continuously impressed upon the States the need to adopt flood plain zoning approach.
9. That a model draft bill for flood-plain zoning legislation was also circulated by Central Water Commission (CWC) in 1975 to all the States. The bill envisages establishing flood plain zones and delineates the areas which are subject to flooding including classification of land with reference to relative risk of flood plain use intended to safeguard the health, safety and property of the general public. For this purpose, it provides for surveys of flood plains of the rivers to determine the nature and the extent of flood plains. To-date, the States of Manipur, Rajasthan, Uttarakhand, and erstwhile State of Jammu & Kashmir had enacted the legislation. Following the enactment of the Disaster Management Act, 2005, the Government of India (GOI) constituted the National Disaster Management Authority (NDMA) as the apex body for Disaster Management (DM) in India with the mandate, inter alia, for laying down policies and guidelines on disaster management. National Disaster Management Guidelines for Management of Floods, January'2008 also advocates adoption of Flood Plain Zoning as an important measure to manage the flood and its risks.
10. In order to enable States to undertake scientific assessment of flood plains and its zoning, need of technical guidelines on the subject has been felt. Accordingly, DoWR, RD&GR, Ministry of Jal Shakti constituted a committee, vide O.M. Z-5/03/2106-FM-MoWR/2569-79 dated 28.11.2022, under Member (RM), CWC for formulation of 'Technical Guidelines on Flood Plain Zone.' (**Annexure-3**). The Committee took into consideration practices which are being followed in other countries wherever regulation of flood plain has been enacted

and enforced. The Committee has submitted its report to the DoWR, RD&GR which is under consideration of Government.

11. That as per the report, a river's floodplain is the low-lying land adjacent to a river and is prone to flooding and generally conforms to a flood of frequency of one in a hundred years. To minimize the damages due to floods and to protect the pristine nature of the river, there is a need to regulate the activities in the flood plain of the river. The report proposes flood-plain zoning conforming to flood of frequency of one in a hundred years. However, considering areas conforming to one in hundred year flood will be huge, especially in plain and flat areas, the Committee proposed that the entire flood plain area further needs to be divided in different zones depending upon its proximity to the river banks, type of developmental activities that can be permitted and the nature of settlement in the area i.e. rural, or urban.
12. That the Committee has proposed division of flood plain into 3-zones for urban settlement and into 2-zones for rural settlement:
 - Prohibited Zone: with limits conforming to 5-year return period flood
 - Regulatory Zone: with extent up to 25-year return period flood beyond extent of prohibited zone.
 - Warning Zone: with extent up to 100-year return period flood beyond extent of Regulatory Zone (for urban areas only).
13. That the DoWR, RD & GR, Ministry of Jal Shakti has sought comments/observations from State Govts on the report, as cited at Para12 above. Thus, it is submitted that the matter is under deliberations of the Ministry. (*Annexure-4*);
14. That the NMCG, from time to time, has been advising all the states governments in Ganga basin for demarcation, delineation and notification of river flood plains and removal of encroachment from the riverbed/floodplain of



the river Ganga and its tributaries in accordance to the provisions of the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016. In this context, a letter written to Ganga basin states on 06.08.2024 is placed at **Annexure-5.**



11.09.2024

Anup Kumar Srivastava
Executive Director (Tech)

अनूप कुमार श्रीवास्तव/Anup Kumar Srivastava
कार्यकारी निदेशक (तकनीकी)/Executive Director (Technical)
राष्ट्रीय स्वच्छ गंगा मिशन/National Mission for Clean Ganga
सफाई संसाधन, नदी विकास और गंगा संरक्षण विभाग
Dept of Water Resources, River Development and Ganga Rejuvenation
जल शक्ति मंत्रालय /Ministry of Jal Shakti
सर्वकार, नई दिल्ली /Govt. of India, New Delhi

T-12/2017-18/268/NMCG
National Mission for Clean Ganga
Ministry of Water Resources, River Development &
Ganga Rejuvenation

1st Floor,
Major Dhyan Chand National Stadium
India Gate, New Delhi-110002
Dated: 1st August, 2017

OFFICE MEMORANDUM

Subject: Constitution of Special Committee in the matter of O.A. No. 200 of 2014 – M.C. Mehta Vs Union of India & Ors before the Hon'ble NGT, New Delhi.

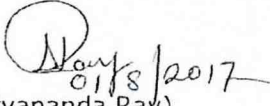
In pursuance to the directions contained in the judgment passed by Hon'ble NGT on 13th July 2017 in respect of Phase-I, Segment 'B' of River Ganga (Haridwar to Unnao), a Special Committee is hereby constituted as below:

- | | |
|---|------------------|
| (i) Sh. S Masood Husain, Member (WP&P), Central Water Commission | Chairman |
| (ii) Commissioner (FM), Ministry of Water Resources, River Development & Ganga Rejuvenation | Member |
| (iii) Chairman, Ganga Flood Control Commission | Member |
| (iv) Additional Chief Secretary, Revenue Department, Uttar Pradesh | Member |
| (v) Principal Secretary, Irrigation & Water Resources Department, Government of Uttar Pradesh | Member |
| (vi) Executive Director (Technical), National Mission for Clean Ganga | Member |
| (vii) Director, National Institute of Hydrology | Member |
| (viii) Sr. Joint Commissioner (PP), Ministry of Water Resources, River Development & Ganga Rejuvenation | Member Secretary |

The scope of the Special Committee shall be as follows:

- a. Identify and demarcate the flood plains of river Ganga in Segment B of Phase I on one in twenty five years cycle or appropriately.
- b. Identify no development/construction zone, regulatory zone and the activities that can be/cannot be carried on in the regulatory zone of the floodplain.

This issues with the approval of Competent Authority.


(Nityananda Ray)
Deputy Secretary

To:

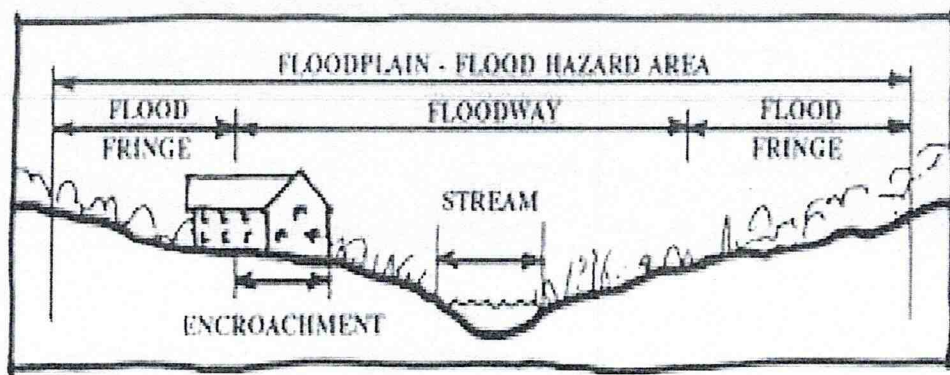
1. Sh. S Masood Husain, M (WP&P), Central Water Commission, Sewa Bhawan (S), R.K. Puram, New Delhi- 110066
2. Commissioner (FM), Ministry of Water Resources, River Development & Ganga Rejuvenation, Shram Shakti Bhavan, Rafi Marg, Sansad Marg Area, New Delhi- 110001
3. Chairman, Ganga Flood Control Commission, Ministry of Water Resources, Govt. of India. 3rd Floor, Sinchai Bhawan, Patna, Bihar - 800 015
4. Additional Chief Secretary, Revenue Department, Lucknow, Uttar Pradesh-226001
5. Principal Secretary, Irrigation & Water Resources Department, Government of Uttar Pradesh, Cantt Road, Udaiganj, Lucknow, Uttar Pradesh - 226001
6. Executive Director (Technical), National Mission for Clean Ganga, 1st Floor, Major Dhyan Chand National Stadium, India Gate, New Delhi- 110002
7. Director, National Institute of Hydrology, Roorkee- 247667, Uttarakhand, India.
8. Sr. Joint Commissioner (PP), Ministry of Water Resources, River Development & Ganga Rejuvenation, Shram Shakti Bhavan, Rafi Marg, Sansad Marg Area, New Delhi- 110001

Copy for kind information to:

1. PPS to Secretary, Ministry of Water Resources, River Development & Ganga Rejuvenation, Shram Shakti Bhavan, Rafi Marg, Sansad Marg Area, New Delhi -110001
2. PS to Joint Secretary (PP), Ministry of Water Resources, River Development & Ganga Rejuvenation, Shram Shakti Bhavan, Rafi Marg, Sansad Marg Area, New Delhi -110001
3. PS to Director General, NMCG
4. PS to Deputy Director General, NMCG
5. PS to ED (Project/Finance/Admin), NMCG



**STUDY TO IDENTIFY AND DEMARCATÉ
THE FLOOD PLAINS OF RIVER GANGA
IN SEGMENT B OF PHASE I
(HARIDWAR TO UNNAO)**



**Ministry of Jal Shakti
Department of Water resources, River development & Ganga Rejuvenation**

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Report on identification and demarcation of the flood plains of river Ganga in segment B of Phase- I (Haridwar to Unnao)

1. INTRODUCTION

Floods constitute one of the major national calamities faced by India almost every year resulting in substantial loss of life, large scale damage to property, disruption of community lifelines besides entailing untold misery to the millions. Concerted efforts have been made over the years to reduce the damage due to floods and mitigate the sufferings of the people. Various structural flood control measures were taken up in the past including construction of reservoirs, embankments, drainage channels, etc. It is, however, now realised that absolute and permanent protection to all flood prone areas and for all magnitudes of floods by structural measures alone is not only impossible but also not economically viable. The emphasis has therefore been rightly shifted to non-structural measures like Flood Plain Zoning and Regulation, Flood Forecasting, etc., to effectively supplement the structural measures for providing sustainable protection to flood affected areas.

The broad concept in flood plain zoning is to regulate the land use in order to mitigate the damage potential. The role of flood plains and need for flood plain zoning was recognised by the Central Water Commission (CWC) as early as 1975. CWC had prepared a Model Floodplain Zoning Bill for adaptation by states but it did not receive due attention of states.

1.1 BACKGROUND

In pursuance to the directions contained in the judgment passed by Hon'ble NGT on 13th July 2017, in respect of Phase-I, Segment 'B' of River Ganga (Haridwar to Unnao), Ministry of Water resources, River development & Ganga Rejuvenation constituted a special committee vide OM T-12/2017-18/268/NMCG dated 01.07.2017 (copy enclosed as Annexure-1) with following scope:

- a) Identify and demarcate the flood plains of river Ganga in segment B of Phase- I on one in twenty five year's cycle or appropriately.
- b) Identify no development /construction zone, regulatory zone and the activities that can be /cannot be carried on in the regulatory zone of the floodplain.

The first meeting of the committee was held under the chairmanship of Member (WP&P), CWC on 05.12.2017 (Annexure-2), wherein it was decided to constitute a core group to carry out following task:

- Data collection and compilation of available information

- Identification of flood event dates corresponding to 2, 5, 10, 25, 50, 100 return period and supplying the same to NRSC for further analysis
- Processing of collected information

Using the available datasets and latest modelling techniques, a presentation on flood plain demarcation for the reach from Haridwar to Unnao was made to the committee during the second meeting held at CWC HQ on 30th January 2018 (Annexure-3). The committee decided to prepare an interim report based on the analysis done so far mentioning the assumption made and/or limitations of the study.

Further on the basis of the discussion held during the third meeting held on 23rd April, 2018 (Annexure-4), it was decided to re-examine the flood frequency analysis and validate the study by incorporating details of embankments, cross-section of river at every 5 Km interval upto 1 m above HFL, to be provided by Irrigation department, Govt. of U.P.

During the 4th meeting held on 22nd April, 2019 (Annexure-5), the core group presented 3 types of flood demarcation analysis viz. Fully based on Satellite, Fully based on Model with DEM reconditioning and Hybrid approach. It was decided to carry out the ground truth verification by Irrigation department, Govt. of U.P. in consultation with core group/ officers in field offices of CWC/ GFCC

In compliance to the decision taken in the 4th meeting, the ground truth verification was done in 3 phases i.e. (from 07.05.2019 to 08.05.2019, 15.05.2019 to 17.05.2019, 11.06.2019). The report of the same is enclosed as Annexure-6.

Subsequent to completion of exercise of ground truth verification, the report was revised on the basis of the recommendations of the joint team constituted for ground truth verification. The report, including the activities that can be/cannot be carried out in the No development / Regulatory zones of the floodplain, was presented during the 5th meeting of the Special Committee held on 29th August 2019.

Taking into consideration the findings of ground truth report, embankment data provided by U.P. Govt., other datasets/information and comments of the participants received during the 5th meeting, the report on demarcation of floodplains along with the activities to be carried out in such demarcation zones has been finalized.

2. DATA USED

Following data/information was used:

- 90m Digital elevation model (DEM) from Shuttle Radar Topography Mission (SRTM) of United States.
- Analyzed Satellite datasets of Joint Research Commission- European Commission for the period from (1984-2015)

- Cartosat 30 m DEM from Indian Space Research Organization (ISRO)
- Historical Annual Peak discharge data of CWC sites.
- Satellite images of flood events from National Remote Sensing Centre.
- Embankment data provided by Irrigation Department, Govt. of U.P.

3. SOFTWARE USED

3.1 MIKE FLOOD

It includes a wide selection of specialized 1D and 2D flood simulation engines, enabling to model any flood problem - whether it involves rivers, floodplains, flooding in streets, drainage networks, coastal areas, dams, levee and dike breaches, or any combination of these. MIKE FLOOD is capable to generate dynamic flood depth maps and velocity distribution (spatially) maps of flood water propagation.

There are several advantages of applying models like MIKE FLOOD. It provides more reliable and accurate flood maps and flood hazard maps, than simpler methods like superimposing static water level maps on topographic maps. It simulates water levels accurately taking into account backwater effects from e.g. obstructions on the flood plain, and simulates correctly pathways, which may not necessarily be the shortest and direct distance between e.g. the river and the point of concern.

This technique requires a fine resolution land terrain model. The land terrain model, HD model are dynamically linked in MIKE FLOOD, and generate flood depth map and flood velocity map in every time step of its computation process.

3.2 ARCGIS

It is a geographic information system (GIS) for working with maps and geographic information. It is used for creating and using maps, compiling geographic data, analyzing mapped information, sharing and discovering geographic information, using maps and geographic information in a range of applications, and managing geographic information in a database.

4. METHODOLOGY

All the relevant information were collected from various agencies and then analyzed in the following manner:

4.1 FLOOD FREQUENCY ANALYSIS

The flood frequency analysis was carried out by Hydrology North, CWC. Various distribution viz. 2-Parameter log Normal, 3-Parameter log Normal, 2-Parameters Gamma, Log Pearson Type-III and Gumble have been used to derive return period flood and details of which are mentioned in Annexure-9. The average historical data availability was around 40 years. The results are shown in Table 1.

Table 1: Flood Frequency Analysis

S.No	Station	Distribution	Magnitudes (m ³ /s) for different return period flood					
			2 yr	3 yr	10 yr	25 yr	50 yr	100 yr
1	Rishikesh	Gumbel	5240	6286	8914	10763	12135	13497
2	Garhmukteshwar	2-Parameter log Normal	4631	5535	7870	9555	10832	12125
3	Kachla Bridge	Gumbel	6140	7168	9751	11569	12917	14255
4	Fatehgarh	Gumbel	4594	5737	8608	10628	12126	13614
5	Ankinghat	Log Pearson III	7117	8597	11687	13377	14426	15326
6	Kanpur	2-Parameter Gamma	7984	9506	13057	15348	16962	18507

4.2 SATELLITE DATA SELECTION

1. Based on the CWC records, dates for some high flood events in the recent past were identified for collecting satellite imagery data from NRSC.

NRSC provided satellite images for two flood events dated on 18-19 June 2013 and 23rd & 25th September 2010 through their web messaging service (WMS). Using GIS software, outer envelope of flood extent was digitized manually.

2. Joint Research Centre- European Commission have analyzed Landsat multispectral Satellite images of past 31 years (1984-2015) for deriving frequency with which water returns from year to year i.e. recurrence interval. The same has been used in the study through Google Earth Engine platform.

4.3 DIGITAL ELEVATION MODEL SELECTION

SRTM 90 m and Cartosat 30 m DEM available in public domain were considered for the study area. The Cartosat data downloaded from the NRSC website was vertically referenced to some other vertical datum which was further corrected to the desired projection as informed by NRSC in the third meeting. It was noticed that SRTM 90 m DEM was relatively better representing elevation value and was therefore selected for use in the model. Given the hardware and software available with the core group and size of the study area, the 90m resolution was found to be more optimal for simulation. The comparison of elevation values of few selected stations in the study area is shown in Table 2:

FTable 2: Spot Height Analysis

Station	Spot Heights(m)		
	SRTM	Cartosat	Difference
Ankinghat	127	121.6	5.4
Garhmuketshwar	201	199	2
Fatehgarh	138	135.8	2.2
Kachhalabridge	161	164.5	-3.5
Kanpur	115	111.5	3.5
Haridwar	294	293.7	0.3

Further, core group also referred few research papers and it was found that SRTM is widely used in the scientific community as its spot height accuracy seems to be good for all kind of terrains as mentioned in the paper (Annexure-10).

4.4 DEM REFINEMENT:

SRTM DEM 90 m was further processed to improve the river profile below the water surface, since SRTM does not capture the same. To achieve this, lean season satellite imageries for last 30 years, representing the river portion only was adjusted according to the average mean depth based on the cross section data of CWC at six gauging locations.

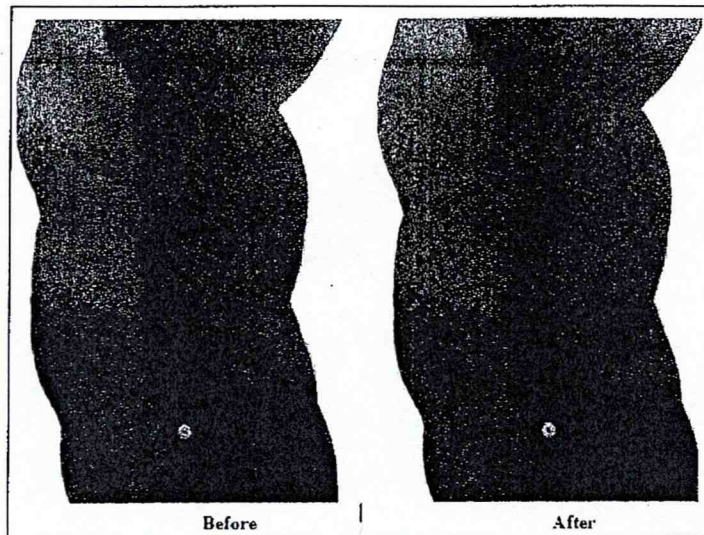


Figure 1: DEM refinement –River Bathymetry

4.5 MODELLING METHODOLOGY

Using the SRTM 90m DEM and the outputs of flood frequency analysis, a coupled hydrodynamic model - one dimensional (1D) and two dimensional (2D) was setup (Figure 1).

The details of setup are as under :

- Upstream branch to provide constant flood magnitude equal to the given return period at rishikesh using a 1D model.
- Downstream branch for draining the flow from dalmu using a 1D model.
- Flood plain bathymetry for routing the flows between rishikesh and dalmu using a 2D Hydrodynamic modeling.
- Five flow locations (Garhmukteshwar, Kachla Bridge, Fatehgarh, Ankinghat and Kanpur) in 2D model for maintating constant river flows equal to the given return period flood magnitude.
- 2D domain was represented by finite difference rectangular grid (MIKE 21 "classic")

Steady state analysis was performed to workout the extent of floodplain for various return period flood.

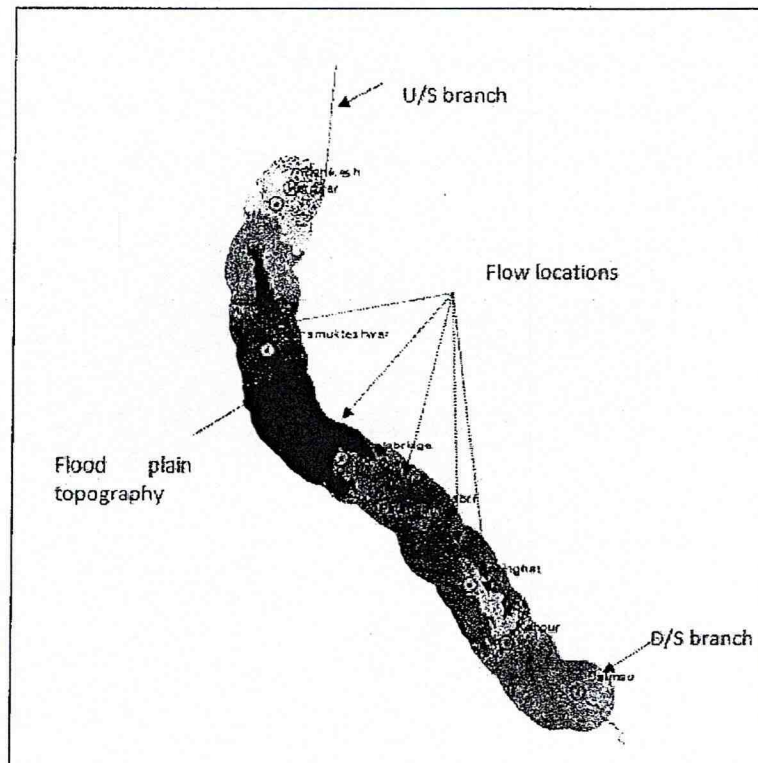


Figure 2: Model Setup

5. Approaches analyzed for flood plain demarcation

5.1 Flood Plain Demarcation based on Satellite Data/Images

5.1.1 No Development Zone

Satellite data of past 31 years (1984-2015) of JRC (Joint Research Centre-European Commission) was taken for study to demarcate flood boundary based on recurrence interval. It was found that the flood extent corresponding to recurrence interval of 2, 3 & 5 years were most frequent with little difference in spatial extent. This was mainly due to presence of embankment and braided nature of the river. It was thus considered most appropriate for No-Development Zone which is also in-line with the NDMA guidelines for *Management of floods, 2008*.

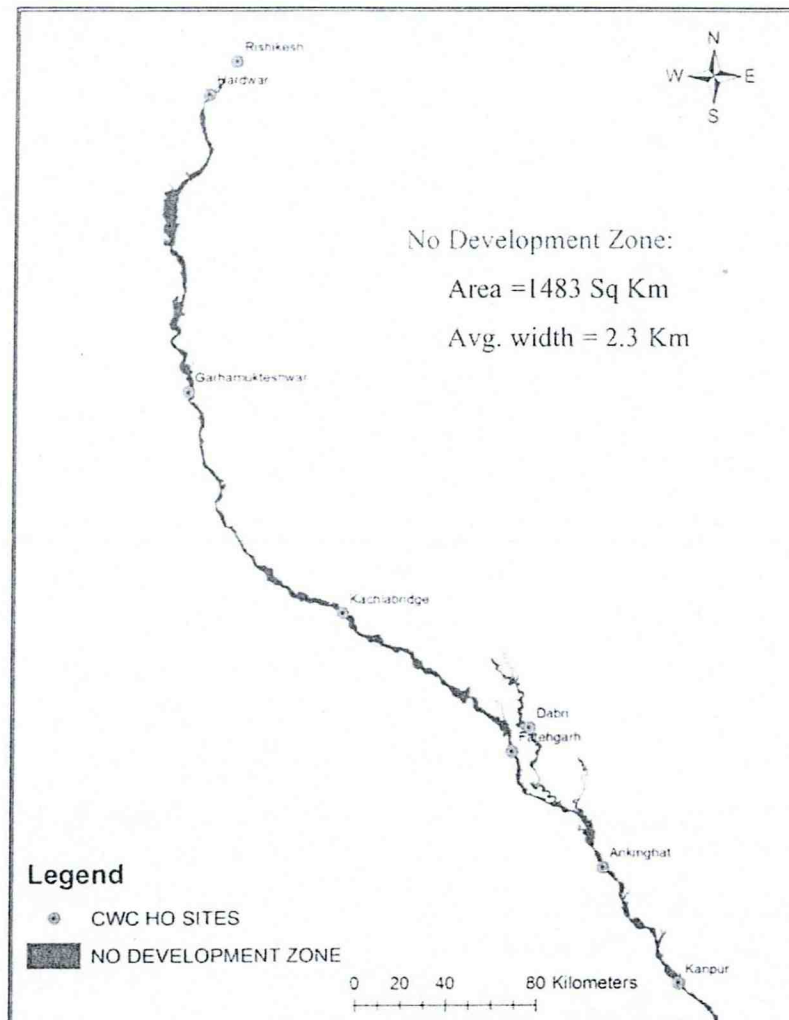


Figure 3: No Development zone based on Satellite datasets

5.1.2 Regulatory Zone

Outer envelope of flood extent on the satellite images provided by NRSC was digitized manually. The outer extent of Satellite images for two flood events dated on 18-19 June 2013 and 23rd & 25th September 2010 which was found to be near to 25 year return flows has been considered for as **Regulatory Zone demarcation**. This accounts for both protected i.e. embanked as well as unprotected flood plain area in the study reach.

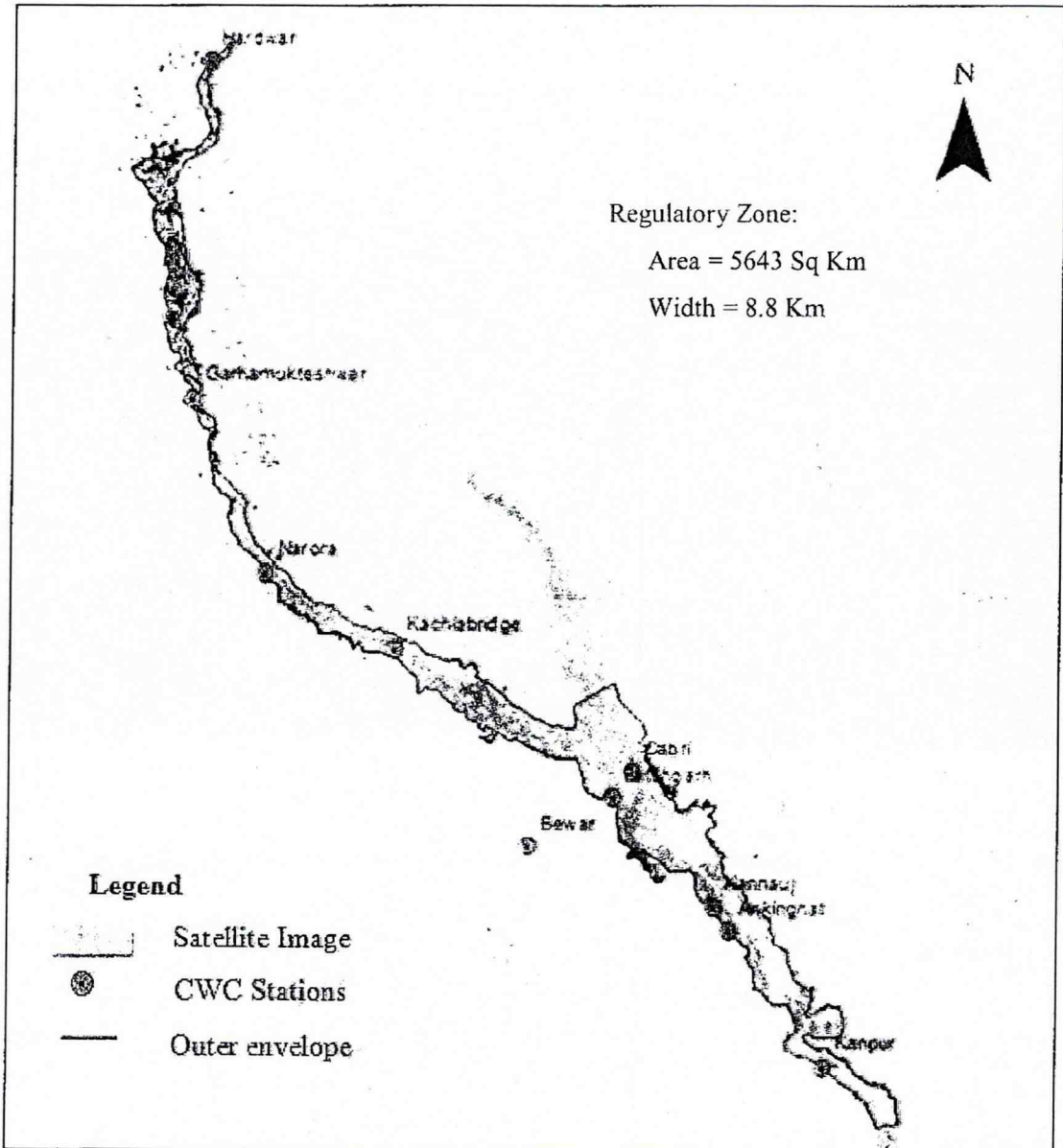


Figure 4: Satellite derived Floodplain- Outer extent of Regulatory Zone

5.2 Model based Flood Plain Demarcation

The SRTM 90m DEM used for modeling was further processed to cater for the sub-surface river bathymetry which was not accounted in the original DEM. The final model results show many small islands within the flood extent causing inundation gaps. These gaps have been filled to get final inundation area.

No Development Zone - Based on 2-Year Return Period Flood (without Embankment)

Regulatory Zone – Based on 25 Year Return Period Flood (without Embankment)

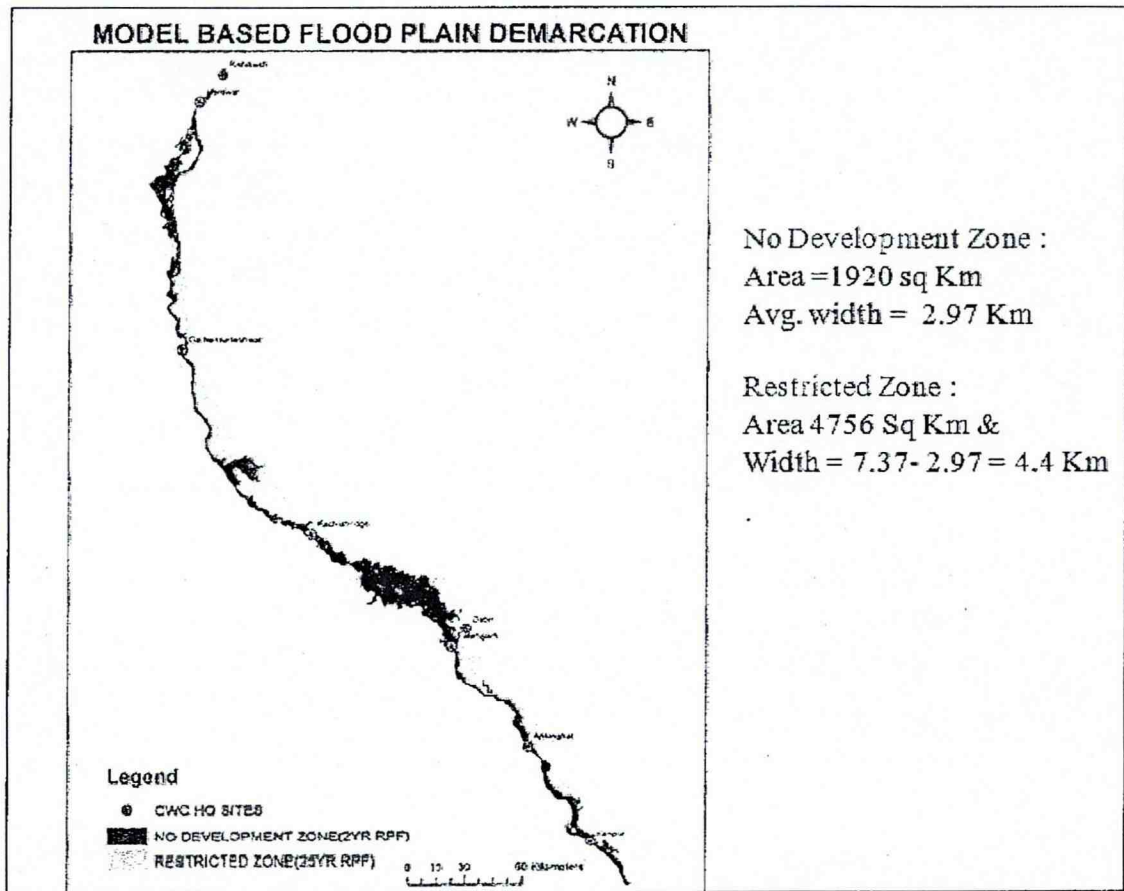


Figure 5: Floodplain Demarcation based on Model Result

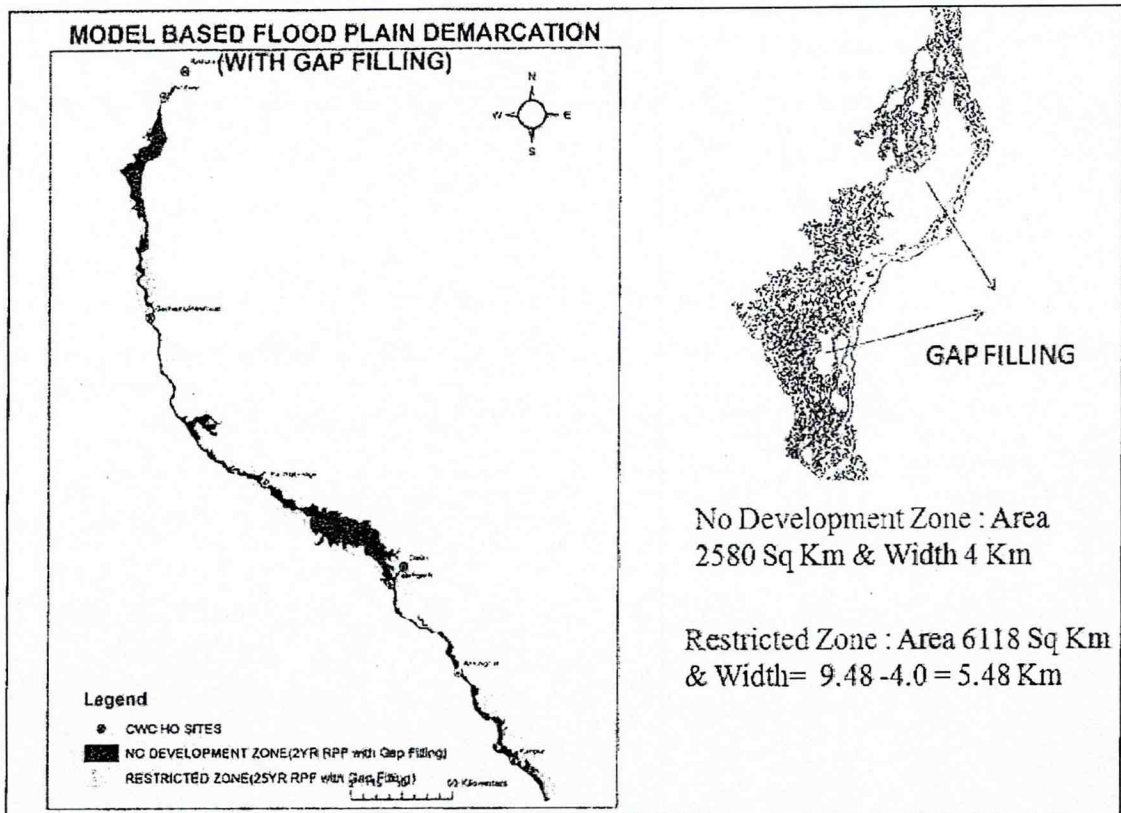


Figure 6: Model Based Flood Plain Demarcation with Gap filling

5.3 Hybrid Approach for Flood Plain Demarcation:

The results of satellite analysis and modelling have their own limitation. Satellite may not cover the full flood event and model results are subjected to DEM quality. Therefore hybrid approach has been adopted by combining both the results by taking union of the areas obtained from both the results.

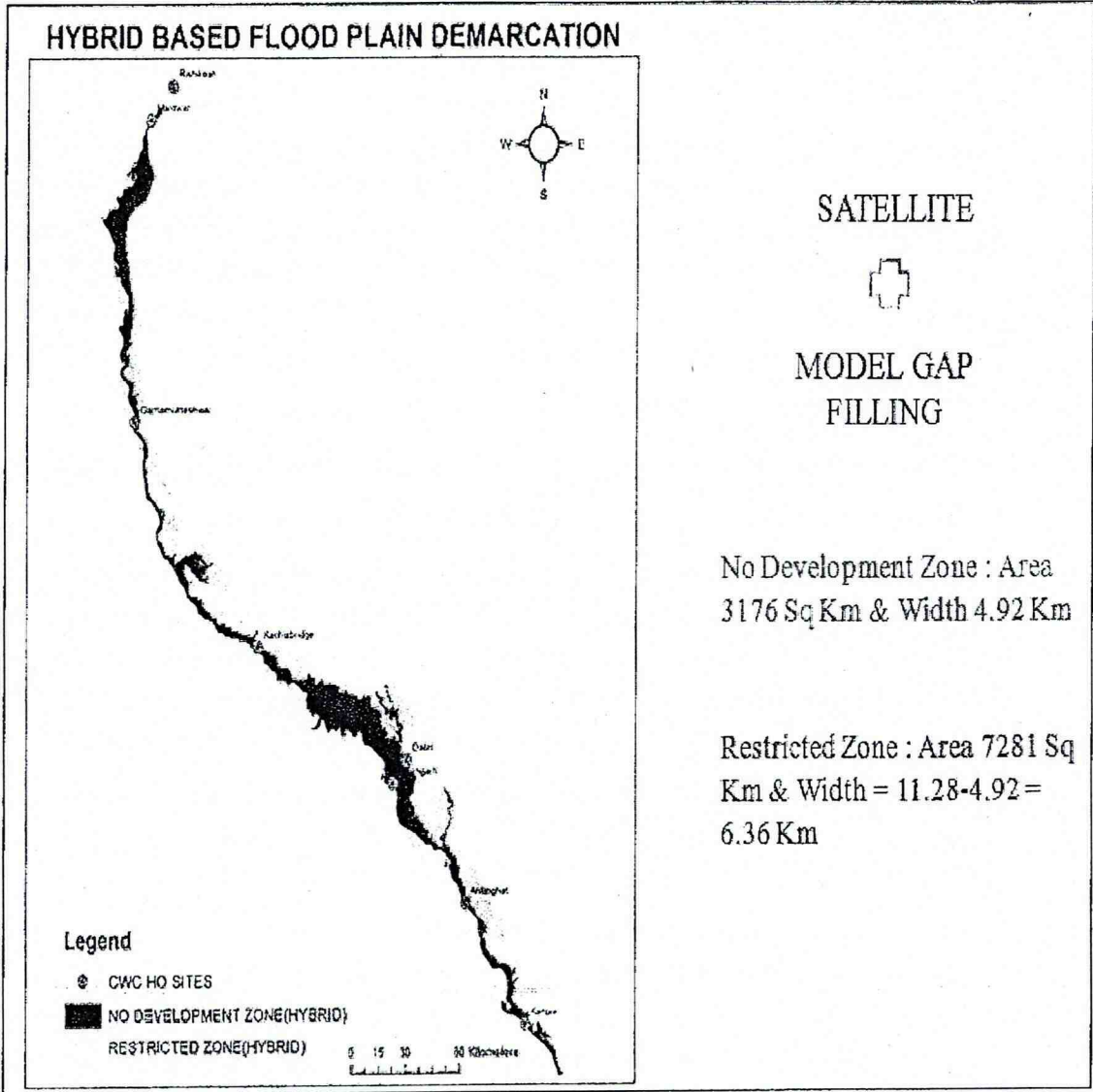


Figure 7: Flood plain Demarcation based on Hybrid Approach

6. FINAL FLOOD PLAIN DEMARCATION

As decided during the 4th meeting, the Hybrid based Flood Plain Demarcation combining results of satellite imageries and model with gap filling were shared with I&WRD, Govt. of UP, regional offices of CWC/GFCC for ground truth verification jointly near all important cities/municipalities/major habitations. Subsequently, ground truth verification was carried out by the team consisting of officials from Central Water Commission, Ganga Flood Control Commission, National Institute of Hydrology and State Government of Uttar Pradesh and Uttarakhand in following three segments:

Segment-I from 07.05.2019 to 08.05.2019 in reach Haridwar to Bijnore.

Segment-II from 15.05.2019 to 16.05.2019 in reach Kannauj to Kanpur/ Unnao.

Segment-III from 11.06.2019 in reach Brajghat/Garhmukteshwar to Narora.

During the ground truth verification exercise, the committee members used the Google Earth mobile application platform for overlaying all the results i.e. Satellite, Model and Hybrid in KML format so that they could compare the result location on mobile application with the actual ground location and marks the difference. Besides this, during the visits, the information available from local residents was also gathered to verify the results.

No development zone demarcated using satellite data was found to be more or less confirming to the ground reality. The same has been selected and finalized further by incorporating the details of embankments, bunds collected from U.P. Govt.

The final average satellite based No Development Zone width i.e. 3.15 Km has been arrived through refining the previous No Development zone by incorporating the findings of ground truth verification report such as gap-filling, correcting the bank lines, smoothening the outer edges, and extending the No Development zones upto the embankment line where ever applicable. This resulted in increase of area of No Development Zone from 1483 Sq.Km. to 2032 Sq. Km., consequently, increasing the average width from 2.3 Km to 3.15 Km.

Similarly, the satellite based average Regulatory Zone width i.e. 10.12 Km has been arrived through refining the previous Restricted Zone by taking the union of satellite area provided by NRSC and the newly defined No Development Zone and smoothening the outer edges. This has again resulted in increase of area from 5643 Sq.Km. to 6530 Sq.Km., consequently, increasing the average width from 8.8 Km to 10.12 Km.

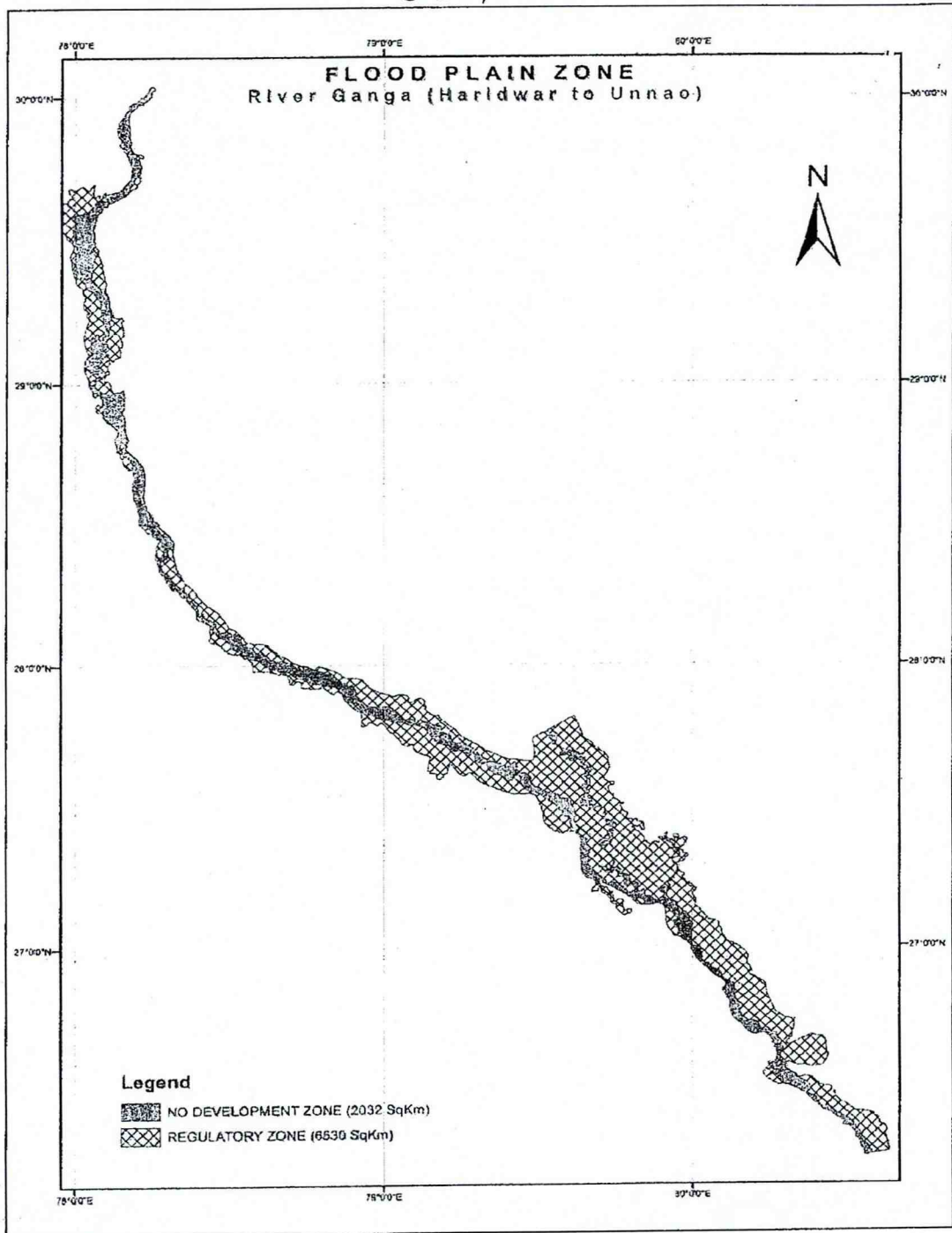


Figure 8: Final Flood Plain based on Ground Truth Verification

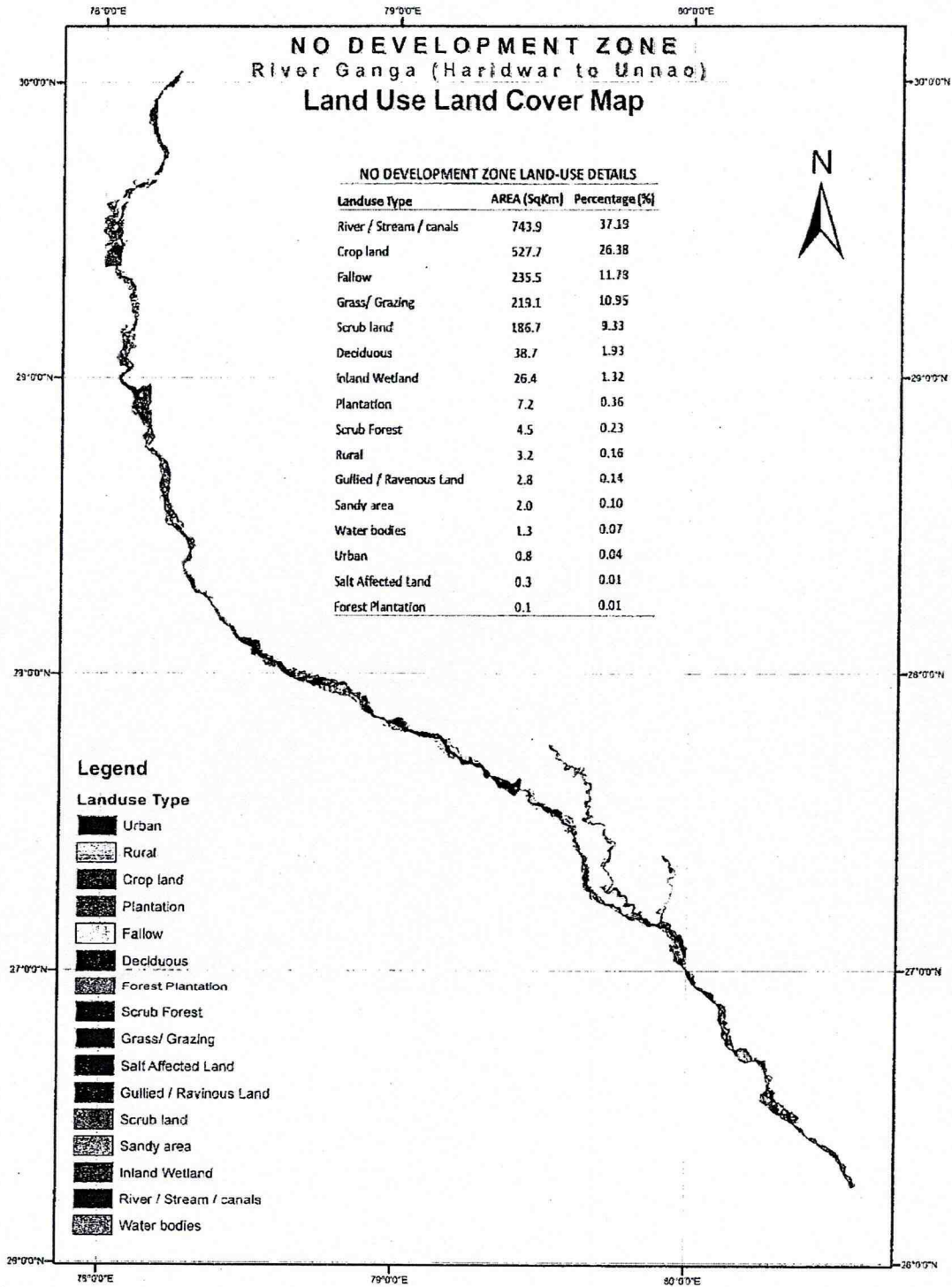


Figure 9: Land Use Land Cover Map for No Development Zone

26-

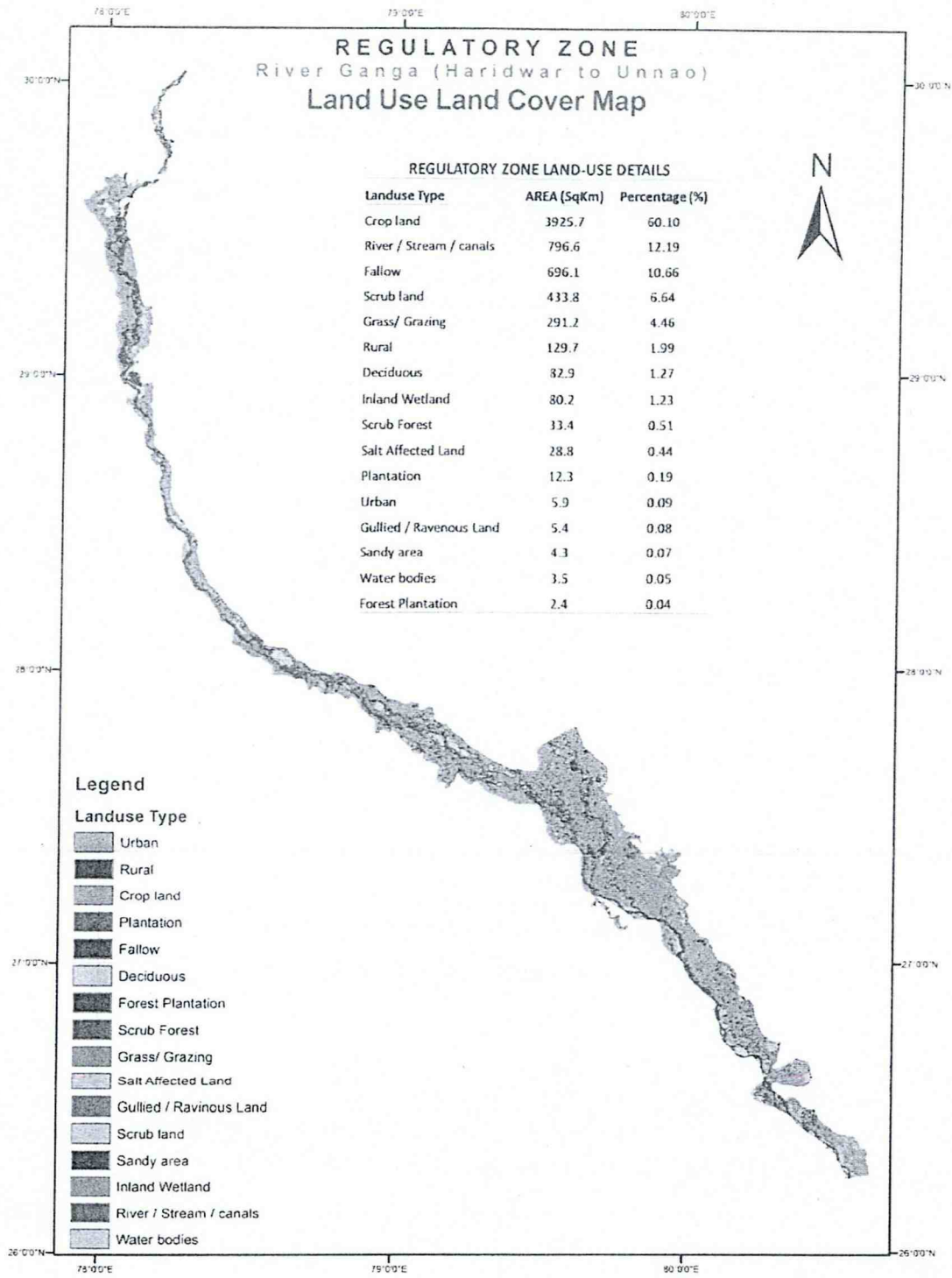


Figure 10: Land Use Land Cover Map for Regulatory Map

7. ASSUMPTIONS AND LIMITATIONS

For Satellite

- Flood extent covered by satellite depends upon revisit period, cloud cover, river turbidity, river seasonality etc. & classification algorithms used by space agency.
- image processing algorithms, etc.
- Embankment breach scenarios are not accounted
- Cannot segregate riverine flooding from other types of flooding.

For Model

- Mannings value of 0.04 was adopted uniform throughout the flood plains as well as river channel.
- Limitations of topography i.e. 90m SRTM DEM
- River bathymetry accounted using available cross sections only.
- Effects of flood embankments ,roads, buildings ,hydraulic structures,bridge etc were not considered.
- Scenarios like Dambreak and GLOF are not considered
- Morphological changes not considered
- Flooding due to drainage congestion, water clogging etc not accounted.
- Study area is confined to Maximum 30 km buffer on either side of river centerline
- Evaporation ,infiltration and diversion losses neglected

For Ground Truth Verification

- Restricted zone could not be verified
- Subject to the accuracy of geo-location services available on mobile
- Only accessible and habituated areas were surveyed

8. ACTIVITIES IN FLOOD PLAIN ZONE

The following literatures were considered for defining activities that can be/cannot be carried out in the No development / Restricted zones of the floodplain.

1. Concept paper on river Conservation Zone prepared by the expert group of Ministry of Environment and Forest & Climate Change
2. National Disaster Management Authority guidelines for flood management
3. Flood Plain Zoning notification of Uttarakhand Irrigation Department.
4. NMCG guidelines for Ganga Basin

The above literatures were discussed by the committee during the 5th meeting of the Committee held on 29th August 2019 in firming up the activities that can be/cannot be carried out in the No development / Regulatory zones of the floodplain. Finally following activities were identified and recommended by the committee.

8.1 NO DEVELOPMENT ZONE

Prohibited activities in No Development Zone:

All activities except mentioned under the regulated activities in no-development zone.

Regulated Activities in No Development Zone:

- i. Temporary constructions, if absolutely necessary, in exceptional circumstances like natural calamities or religious events at traditional locations, with prior permission of the National Mission for Clean Ganga acting through the State Ganga Committee and the District Ganga Committee.
- ii. Regulated Sand/ Stone/ sediment/ river borne material mining may be allowed as per MoEF&CC guidelines
- iii. Repair/renovation of protected monuments, temples, boating jetties, parks, ghats and crematorium
- iv. Existing structure, whether permanent or temporary for residential or commercial or industrial or any other purposes in the River Ganga, Bank of River Ganga or in active flood plain area of River Ganga or its tributaries provided that such construction has already been completed, shall be reviewed by the 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 as per provisions under para [6(3)] of Ministry of Water Resources, River Development and Ganga Rejuvenation notification no. S.O. 3187(E), dated the 7th October 2016 (as amended from time to time) (copy enclosed) regarding constitution of an authority, namely, the National Mission for Clean Ganga for Rejuvenation, Protection and Management of River Ganga.
- v. Organic farming by owners/lease holders
- vi. Plantation of native trees / shrubs (for commercial use)
- vii. Measures for control of erosion and floods, maintenance or de-silting of river ways, waterways and channels
- viii. Repair of breaches in embankments
- ix. Laying of unpaved paths for access to the river for cultural, religious or any other purposes

- x. Various activities such as engineered diversion and storage of water in River Ganga, construction of bridges and associated roads and embankments over the River Ganga or at its River Bank or its flood plain area, construction of Ghats or extension of any existing Ghat, construction of jetties, construction of permanent hydraulic structures for storage or diversion or control of waters or channelization of River Ganga, etc., shall be governed as mentioned under para (42) of Ministry of Water Resources, River Development and Ganga Rejuvenation notification no. S.O. 3187(E), dated the 7th October 2016 (as amended from time to time) regarding constitution of an authority, namely, the National Mission for Clean Ganga for Rejuvenation, Protection and Management of River Ganga
- xi. Navigation, Water Sports, Water Transport related activities.

8.2 REGULATORY ZONE

Prohibited Activities in Regulatory Zone:

Red category of industries as mentioned in CPCB guidelines (as amended from time to time)

Regulated Activities in Regulatory Zone:

- i. Construction of residential/ Institutional/ commercial buildings, school, dispensaries, recreational facilities with certain stipulations as mentioned in NDMA guidelines (as amended from time to time) such as prohibition of basement in buildings, construction on stilts (columns), plinth level above the flood lines, provision of stairway in single storey building, roof level of single storey or first floor level above 100 years flood level/HFL, preferably utilizing ground floor for non-residential purposes.
- ii. Various activities such as engineered diversion and storage of water in River Ganga, construction of bridges and associated roads and embankments over the River Ganga or at its River Bank or its flood plain area, construction of Ghats or extension of any existing Ghat, construction of jetties, construction of permanent hydraulic structures for storage or diversion or control of waters or channelization of River Ganga, etc., shall be governed as mentioned under para (42) of Ministry of Water Resources, River Development and Ganga Rejuvenation notification no. S.O. 3187(E), dated the 7th October 2016 (as amended from time to time) regarding constitution of an authority, namely, the National Mission for Clean Ganga for Rejuvenation, Protection and Management of River Ganga
- iii. Setting up of non-polluting cottage industries.
- iv. Construction / expansion/ modernization of bridges, roads and similar facilities that may affect ND Zone
- v. Creation of navigational facilities involving dredging, mechanised ferries, jetties etc.
- vi. Green and Orange category of industries as mentioned in CPCB guidelines (as amended from time to time)
- vii. Water Sports, Water Transport related activities
- viii. Stone crushing plants etc.

9. Concluding Remarks

1. As per the recommendations of the report of ground truth verification (Annexure-6), Satellite based No Development Zone was found to be more or less confirming to the ground reality which was found to be most frequent with respect to recurrence interval of 5 years. The same has been selected and finalized further by incorporating the details of embankments, bunds collected from U.P. Govt.
2. The outer extent of Satellite images for two flood events dated on 18-19 June 2013 and 23rd & 25th September 2010 provided by NRSC has been considered as Regulatory / Restricted Zone which was confirming to the 25 years return period flood.
3. The lat/long of demarcating pillars for both left and right side of No Development zone at interval of 200 m is provided in Annexure-7.
4. The lat/long of demarcating pillars for both left and right side of restricted zone at interval of 200 m is provided in Annexure-8.
5. Total flood plain area for No Development Zone is 2032 sq. KM corresponding to the average width of 3.15 KM.
6. Total flood plain area for Restricted/ Regulatory Zone is 6530 sq. KM corresponding to the average width of 10.12 KM.
7. For monitoring of flood line area a monitoring committee comprising members of GFCC, NIH, UP Govt and Field units of CWC is recommended.

Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development
and Ganga Rejuvenation
(Flood Management Wing)

31-
ANNEXURE-3

11th Block, 8th Floor, CGO Complex,
Lodhi Road, New Delhi-110003

Dated 28th November 2022

OFFICE MEMORANDUM

Subject: Constitution of Committee for formulation of "Technical Guidelines on Flood Plain Zoning" - reg.

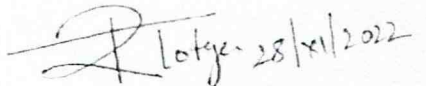
The undersigned is directed to convey that with the approval of Secretary, DoWR, RD & GR, a Committee under the Chairmanship of Member (RM), Central Water Commission is hereby constituted for formulation of "Technical Guidelines on Flood Plain Zoning". The constitution of the Committee and its Terms of Reference are as under-

The composition of the Committee is -

- 1 Member (River Management), Central Water Commission --- Chairman
- 2 Representative from NDMA
- 3 Representative from MoEF & CC
- 4 Chairman, Ganga Flood Control Commission, Patna
- 5 Executive Director (Technical), NMCG
- 6 Project Director, NRCD
- 7 Commissioner (Flood Management), DoWR, RD & GR
- 8 Chief Engineer, Flood Monitoring Organisation, CWC
- 9 Chief Engineer, Planning and Design, CWC --- Member Secretary

The Terms of Reference of the Committee are-

- 1 To formulate "Technical Guidelines on Flood Plain Zoning"
- 2 The Committee may co-opt any other Member, if required
- 3 The Committee to finalise the "Technical Guidelines on Flood Plain Zoning" in a period of three months after its constitution



(Rakesh Toteja)

Senior Joint Commissioner (FM)

Tel 24360611

E mail sjcer2-mowr@nic.in

To

- 1 Chairman, Central Water Commission, New Delhi
- 2 Member Secretary, NDMA, New Delhi- with a request to nominate an officer of NDMA for this Committee
- 3 Director General, NMCG, New Delhi
- 4 Member (RM), Central Water Commission, New Delhi
- 5 Secretary, MoEF & CC, New Delhi- with a request to nominate an officer of MoEF&CC for this Committee
- 6 Joint Secretary (PP & RD), DoWR, RD & GR.
- 7 Members of the Committee

Copy for information to-

- 1 Senior PPS to Secretary, DoWR, RD & GR, Shram Shakti Bhawan, New Delhi
- 2 PPS to Special Secretary, DoWR, RD & GR, Shram Shakti Bhawan, New Delhi

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ANNEXURE 4769

Z. 24011/43/2023 FM Section-MOWR
भारत सरकार/Government of India
जल शक्ति मंत्रालय/Ministry of Jal Shakti
जल संसाधन, न.वि. एवं गं.सं. विभाग/Department of Water Resources, RD & GR
(बाढ़ प्रबंधन स्कंध /Flood Management Wing)

8वां तल, ब्लॉक-11, सीजीओ कॉम्प्लेक्स/ 8th Floor, Block-11, CGO Complex,
लोधी रोड, नई दिल्ली/ Lodhi Road, New Delhi - 110003

24th July, 2024

To,

Chief Secretary of all States/UTs (as per List-I)

Subject: Draft Technical Guidelines on Flood Plain Zoning (FPZ) - reg.

Sir,

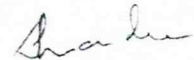
I am directed to forward herewith a copy of the Technical Guidelines on Flood Plain Zoning prepared by this Department for facilitating States/UT Governments in implementation of flood plain zoning

There is need of implementing "Flood Plain Zoning (FPZ)" which is considered an effective non-structural measure for flood management. The basic concept of flood plain zoning is to regulate the land use in the flood plains of a river so as to restrict the damage caused by floods which are bound to occur from time to time. Demarcation of appropriate zones for various uses of flood plains not only helps in mitigation of flood damage, but it also aids in ground water recharge, maintenance of water quality and conservation of riverine biodiversity.

It is requested that the Draft Guidelines may be got examined and comments/observations on the same may be conveyed latest by 31.08.2024 to this office at email id sjcer2 mowr@nic.in.

Encl.: As above

Yours faithfully,



(Sharad Chandra)
Commissioner (FM)
Tel: 011-24368238

Copy to,

1. Engineer-in-Chief, Water Resources/Irrigation Department - (As per List-II)

Copy for information to:

PPS to Secretary (DoWR, RD & GR), Shram Shakti Bhawan, Rafi Marg, New Delhi

TE-16015/7/2023-O/o ED(TECH) NMCG

Dated: 6th August, 2024

Subject: *Status of Flood plain identification & demarcation and identification and removal of encroachments - reg.*

Ref: *NMCG letter no. 25011(11)/2/2021/NMCG/900 dated 09.03.2023 (copy enclosed)*

Sir,

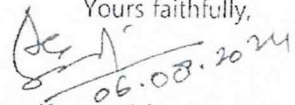
Kind attention is drawn towards above referred letter regarding demarcation of Flood Plain Zones (FPZ) and identification of constructions falling in these zones. In this context, it is further submitted that-

2. The Hon'ble NGT has passed orders/directions in the matter of O. A. No. 200/2014 - *M. C. Mehta Vs. Union of India & Ors.* directing the State Government(s) for identification and demarcation of flood plains. It further emphasizes that 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 also, has been reiterating the compliance of direction by the State Governments in this regard:
3. Provisions of the River Ganga (Rejuvenation, Protection and Management) Authorities Order dated 07.10.2016 too advocates no construction activities in flood plains in the Ganga Basin.
4. Further, DoWR, RD & GR has circulated a draft Technical Guidelines on Flood Plain Zones on 24.07.2024 to all States seeking their comments/observations by 31.08.2024 (copy enclosed).
5. Needless to say, early compliance of Court Orders/Provisions embedded in the Authorities Notification for delineation, demarcation, and notification of river flood plains is required to be ensured along with removal of encroachment from river bed/floodplain of the river Ganga and its tributaries for rejuvenating and maintaining river health.

Considering above, it is requested that the concerned officials in the State may be directed to expedite and complete the FPZ works at the earliest. They may also be asked to submit updated reports on the FPZ related activities/its implementation status to NMCG at the earliest.

This issues with approval of the competent authority.

Encl.: As above

Yours faithfully,

 06.08.2024
 (Anup Kumar Srivastava)
 Executive Director - Technical, NMCG

-38-

To,

1. The Chief Secretary, Government of Uttarakhand, Uttarakhand Secretariat, 4 Subhash Road, Dehradun - 248 001, email: chiefsecyuk@gmail.com
2. The Chief Secretary, Government of Uttar Pradesh, Secretariat, Lucknow - 226 001 email: csup@nic.in
3. The Chief Secretary, Government of Jharkhand, Secretariat, Ranchi - 834 004 email: cs-jharkhand@nic.in
4. The Chief Secretary, Government of West Bengal, Nabana (13th Floor), 325 Sarat Chatterjee Road, Shibpur, Howrah - 711102 email: cs-westbengal@nic.in
5. The Chief Secretary, Government of Himachal Pradesh, Government Secretariat, Shimla-171 002 email: cs-hp@nic.in
6. The Chief Secretary, Government of Rajasthan, Secretariat, Jaipur - 302 005 email: csraj@rajasthan.gov.in
7. The Chief Secretary, Government of Madhya Pradesh, MP Mantralaya, Vallabh Bhawan, Bhopal - 462 004 email: cs@mp.nic.in
8. The Chief Secretary, Government of Haryana, 4th Floor, Haryana Civil Secretariat, Sector-1, Chandigarh - 160019, email: cs@haryana.nic.in
9. The Chief Secretary, Delhi, Government of National Capital Territory of Delhi, 3rd level, Delhi Secretariat, I.P. Estate, New Delhi-110002, email: csdelhi@nic.in
10. The Chief Secretary, Government of Chhattisgarh, Mahanadi Bhawan, Mantralaya, Naya Raipur - 492 002 email: csoffice.cg@gov.in
11. The Chief Secretary, Government of Bihar, Government of Bihar, Main Secretariat, Patna-800015 email: cs-bihar@nic.in

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

1. Project Director, SPMG - Uttarakhand, 117 Indira Nagar, Dehradun - 248 001
2. Project Director, SMCG- UP, Plot No. 18, Sec - 7, Gomti Nagar Extn., Lucknow - 226 010
3. Project Director, SPMG - Jharkhand, Room No. 403, 4th Floor, Project Bhawan, Dhurwa, Ranchi - 834 004
4. Project Director, SPMG - West Bengal, Unnayan Bhawan (3rd floor), DJ-11, Sector II, Block-A, KMDA, Kolkata - 700 091
5. Project Director, SPMG, Bihar, Patna

4772

35

Copy for kind information to:

1. PS to Secretary, DoWS, RD&GR, Ministry of Jal Shakti, Govt. of India
2. PS to DG, NMCG
3. Ms Ruby, Sr Project Engineer, NMCG

No. L-25011(11)/2/2021/NMCG/900

Date: 9th March, 2023

Subject: In the matter of Civil Appeal No. 3367/2020 - Ashok Kumar Sinha Vs. Union of India & Ors., before the Hon'ble Supreme Court – reg.

Dear Sir,

This is in reference to the matter in C. A. No. 3367/2020 - *Ashok Kumar Sinha Vs. Union of India & Ors.* that is seized before the Hon'ble Supreme Court and is inter alia related to the extent of flood plain area of River Ganga and unauthorized/illegal construction and encroachments on the banks and floodplains of river Ganga in Patna, Bihar. The Hon'ble Supreme Court in order dated 17.02.2023 (copy enclosed) directed the State Government of Bihar to demarcate the flood plain of River Ganga in Patna and identify constructions falling within zone of floodplains of Ganga in Patna taking into reference survey maps obtained from the NMCG.

2. The Hon'ble NGT has also passed orders/directions in the matter of O. A. No. 200/2014 – *M. C. Mehta Vs. Union of India & Ors.*, directing the State Government(s) for identification and demarcation of flood plain in river Ganga, based on one in twenty-five 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/protection of flood plain of rivers by removal of unauthorized/illegal construction and encroachments on the banks and river floodplains.

3. It is evident that besides Bihar, the aforesaid orders/directions along with provisions of the River Ganga (Rejuvenation, Protection and Management) Authorities Order dated 07.10.2016 (in terms of which the river floodplain area is to be maintained as 'construction free zone'), are categorically applicable also for other States falling in the Ganga Basin region namely, Uttarakhand, Uttar Pradesh, Jharkhand, West Bengal, Himachal Pradesh, Rajasthan, Madhya Pradesh, Haryana, Chhattisgarh and Delhi.

4. Therefore, it is requested that the concerned officers/agencies in the State may be asked to disclose following information:

- a) the extent of flood plain the river Ganga and its tributaries, as described in the revenue records available with Revenue Authorities of the State
- b) the ground level situation as regards particulars of existing constructions on the floodplains of the river Ganga and its tributaries
- c) inventory of constructions falling within the zone of floodplains of the river Ganga and its tributaries.

Contd. Pg-2

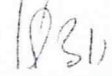
एन.एम.सी.जी., (जल शक्ति मंत्रालय, जल संसाधन, नदी विकास और गंगा संरक्षण विभाग, भारत सरकार)
प्रथम तल, मेजर ध्यान चन्द नेशनल स्टेडियम, इन्डिया गेट, नई दिल्ली-110002

NMCG, (Ministry of Jal Shakti, Department of Water Resources, River Development & Ganga Rejuvenation, Government of India)
First Floor, Major Dhyan Chand National Stadium, India Gate, New Delhi-110002

PH : 011-22270000, 22270001

5. Further, it is also requested that the concerned officials in State may provide a report on the requisite information as mentioned in preceding para 3, to NMCG within 3 months of receipt of this letter.
6. This issues with approval of the competent authority.

Yours faithfully



(D. P. Mathuria)

Executive Director - Technical, NMCG

Encl.: As above

To,

1. The Chief Secretary, Government of Uttarakhand, Uttarakhand Secretariat, 4 Subhash Road, Dehradun - 248 001
2. The Chief Secretary, Government of Uttar Pradesh, Secretariat, Lucknow - 226 001
3. The Chief Secretary, Government of Jharkhand, Secretariat, Ranchi - 834 004
4. The Chief Secretary, Government of West Bengal, Nabana (13th Floor), 325 Sarat Chatterjee Road, Shibpur, Howrah - 711102
5. The Chief Secretary, Government of Himachal Pradesh, Government Secretariat, Shimla - 171 002
6. The Chief Secretary, Government of Rajasthan, Secretariat, Jaipur - 302 005
7. The Chief Secretary, Government of Madhya Pradesh, MP Mantralaya, Vallabh Bhawan, Bhopal - 462 004
8. The Chief Secretary, Government of Haryana, 4th Floor, Haryana Civil Secretariat, Sector-1, Chandigarh - 160 019
9. The Chief Secretary, Government of Chhattisgarh, Mahanadi Bhawan, Mantralaya, Naya Raipur - 492 002
10. The Chief Secretary, Government of NCT of Delhi, Delhi Secretariat, I.P. Estate, New Delhi - 110 002

Copy (with request for co-ordination and necessary action in the matter) to:

1. Chairman, Central Water Commission, 3rd Floor, room No. 313 (South), Sewa Bhawan, R. K. Puram, Sector - I, New Delhi - 110 066
2. Chairman, Central Pollution Control Board, Pariwesh Bhawan, East Arjun Nagar, Delhi - 110 032
3. Project Director, SMCG - Uttarakhand, 117 Indira Nagar, Dehradun - 248 001

4. Project Director, SMCG-UP, Plot No. 18, Sec - 7, Gomti Nagar Extn., Lucknow - 226 010
5. Project Director, SPMG Group - Jharkhand, Room No. 403, 4th Floor, Project Bhawan, Dhurwa, Ranchi - 834 004
6. Project Director, SPMG Group - West Bengal, Unnayan Bhawan (3rd floor), DJ-11, Sector II, Block-A, KMDA, Kolkata - 700 091

Copy for kind information to:

1. PS to Secretary, DoWS, RD&GR, Ministry of Jal Shakti, Govt. of India
2. PS to Secretary, MoEF&CC, Indira Paryavaran Bhawan, Jorbagh Road, New Delhi - 110 003
3. PS to DG, NMCG

08.3.223

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ITEM NO.43

COURT NO.11

SECTION XVII

S U P R E M E C O U R T O F I N D I A
R E C O R D O F P R O C E E D I N G S

Civil Appeal No(s). 3367/2020

ASHOK KUMAR SINHA

Appellant(s)

VERSUS

UNION OF INDIA & ORS.

Respondent(s)

(IA No. 100859/2020 - STAY APPLICATION)

Date : 17-02-2023 This matter was called on for hearing today.

CORAM :

HON'BLE MR. JUSTICE ANIRUDDHA BOSE
HON'BLE MR. JUSTICE SUDHANSHU DHULIA

For Appellant(s) Mr. Aakash Vashisht, Adv.
Ms. Nidhi Agarwal, Adv.
Ms. Tanya Saraswat, Adv.
Mr. Neeraj Kumar Sharma, AOR

For Respondent(s) Mrs. Aishwarya Bhati, ASG
Mrs. Swarupama Chaturvedi, Adv.
Mrs. Ruchi Kohli, Adv.
Mr. Navanjay Mahapatra, Adv.
Mr. Santosh Kumar, Adv.
Mr. Arvind Kumar Sharma, AOR

Ms. Aishwarya Bhati, ASG
Mr. Gurmeet Singh Makker, AOR
Ms. Swarupama Chaturvedi, Adv.
Ms. Ruchi Kohli, Adv.
Mr. Navanjay Mahapatra, Adv.


Mr. Manish Kumar, AOR

Mr. Azmat H Amanullah, AOR
Mr. Hardik Choudhary, Adv.

UPON hearing the counsel the Court made the following
O R D E R

Valigity unknown
Digitally signed by
Ms. Aishwarya Bhati
Date: 2023.02.17
16:29:16 +05:30
Reason:

Ms. Aishwarya Bhati, learned additional solicitor general appearing for the Union of India, Ministry of Jal Shakti, submits that a survey map has already been made available to the State of



Bihar.

Let an assessment on the survey map giving the ground level situation as regards particulars of existing constructions on the floodplains of the river Ganga in Patna. A report shall be filed disclosing therein how the floodplains have been described in the revenue records and if there is any construction within the zone of floodplains of the Ganga.

List after four weeks.

(NIRMALA NEGI)
COURT MASTER (SH)

(VIDYA NEGI)
ASSISTANT REGISTRAR