

WEBINAR

Prime Minister's 10 Point Agenda No. 1, 5 & 8

URBAN FLOODING: CHALLENGES TO SOLUTIONS

 **09**
October 2020

 **TIME:**
11:00 AM - 01:00 PM

Special Address



Smt Debashree Mukherjee
Addl. Sec, Dept. of Water Resources,
RD & GR, Ministry of Jal Shakti, GoI

Patron



Maj Gen Manoj K Bindal
Executive Director,
NIDM

Opening Remarks



Dr Veena Khanduri
Executive Secretary,
IWP

Convenor



Prof Santosh Kumar
Head, GiDRR & CCDRR
NIDM

SPEAKERS



Prof Mahua Mukherjee
IIT, Roorkee



Prof Kapil Gupta
IIT, Bombay



Shri Kumar Ravi, IAS
District Magistrate, Patna



Er Avinash C Tyagi
Vice President, IWP

Moderator



Ms Mohana Manna
Young Professional, NIDM

 **Register now:** <https://forms.gle/N22H3U9P2rAt9Uzh8>

Organized by :

National Institute of Disaster Management (NIDM)
Ministry of Home Affairs, Government of India
in collaboration with
India Water Partnership (IWP)



Programme Team

Patron

Major General Manoj Kumar Bindal, VSM, Executive Director, NIDM

Convenors

Prof. Santosh Kumar, Head, G&IDRR, NIDM

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Co-convenor and Moderator

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Webinar Report

The flooding of Indian cities have become a regular phenomenon owing to the rapid urbanisation and population growth. The issues have particularly increased over the last two decades as the natural land cover of the earth's surface and vegetation are being replaced by built-up structures, roads and other impervious surfaces leading to increased runoff. Most of the flood prone cities in India like that of Kolkata, Chennai, Surat, Bangalore and Hyderabad faces the issue of water scarcity in dry seasons clearly representing a major paradox in the present mechanism of urban water management in the country. The traditional engineering approaches of urban management system are developed to rid of stormwater at the earliest resulting in increased imperviousness. The urban dwellers thus face the dual issues of waterlogging and depleting groundwater tables. Real estate-driven developments and poor city planning further compound the problem by encroaching and blocking the natural drainage channels, filling up of natural water bodies and exploitation of reservoirs. Without strict adherence to landuse planning and construction guidelines, most of the cities are also unable to facilitate adequate drainage infrastructure to tackle heavy rainfall over a short span of time. To address the concern, the approach of slow, spread, sink and store runoff needs to be integrated in the urban drainage system. Coordinated water and land-use planning can mitigate the risks of flooding in urban areas. Concepts like Water Sensitive Urban Designs (WSUD) and Low-impact development (LID) needs to be adopted by citizens to increase the stormwater infiltration facilitating the storage of excess floodwaters in dry seasons and reducing waterlogging in monsoons. These approaches needs to be mainstreamed and integrated in the landuse and drainage planning of urban area.

National Institute of Disaster Management (NIDM), Ministry of Home Affairs (MHA), Govt. of India in collaboration with **India Water Partnership (IWP)** organized a webinar on “**Urban Flooding: Challenges to Solutions**” on **9th October 2020** during **11:00 am to 1:00 pm** to highlight the prevalent issues of existing drainage infrastructure and water management system in the Indian cities. The webinar was initiated by **Prof. Santosh Kumar**, *Head, G&IDRR Division, NIDM* with programme overview and remarks. **Smt. Debashree Mukherjee**, *Additional Secretary, Dept. of Water Resources, Rural Development & Ganga Rejuvenation, Ministry of Jal Shakti, Govt. of India* graced the webinar with her Special Address. Sessions were conducted by **Shri Kumar Ravi**, *District Magistrate, Patna*; **Prof. Mahua Mukherjee**, *Head, Centre of*

Excellence in Disaster Mitigation and Management (CoEDMM), Indian Institute of Technology Roorkee; Prof. Kapil Gupta, Department of Civil Engineering, Indian Institute of Technology, Bombay and Er. Avinash C Tyagi, Vice-President, IWP. The webinar was concluded with remarks by **Dr. Veena Khanduri**, Executive Secretary, IWP. **Ms. Mohana Manna**, *Young Professional, NIDM* coordinated the webinar. Around 169 participants joined the webinar while more than 114 participants have actively participated the webinar throughout. The webinar was accessed through YouTube Live by 160 viewers.

Prof. Santosh Kumar during his opening remarks highlighted how the Indian cities are now grappling with dual issues of water scarcity and flooding at the same time. He further stressed that these issues are further getting aggravated with the impacts of climate change. He then shared his filed-visit experience of the Patna Floods of 2019. He emphasized the need of stormwater management and drainage issues in the urban areas and how the vulnerability to flooding has increased even in small and medium towns like Jamshedpur, Patna, etc. He also pointed out the several practices like encroachment of water bodies, unplanned disposal of solid waste, unregulated landuse planning, etc. that accumulates the risk of urban flooding.

Shri Kumar Ravi shared his ground level experiences of management of Patna Floods in 2019. He cited that the major cause behind urban flooding was the incessant rains and the high level of adjacent rivers around the city. He added there was a lot of gap in stormwater management of the urban areas. He further discuss how the needs of the victims in the urban areas during the flooding is entirely different from that of rural areas and needs pre-emptive planning for management. He also shared the difficulty of rescue and relief distribution through boats in urban areas instead of roads. He recommended that special maps needs to be made for relief distribution in water-inundated areas. He further shared the challenges of network and communication and the psychological stress faced by the urban residents during flooding. Several risks of epidemic and water-related infectious diseases were also emerging in the aftermath of the floods. Cases of theft and robbery were also reported and police personnel were deputed to monitor the situation.

Smt. Debashree Mukherjee during her special address stated that the major challenges between urban flooding are extreme weather-related events and the unregulated pattern of urbanisation. She stressed that the pattern of urbanisation at the present scenario are encroaching the urban water bodies and rivers. She emphasized that the water bodies needs to be an integral part of spatial

planning and needs to be protected by involving communities. She further stressed on the need of balance of maintenance of green cover and the use of permeable materials for built-up areas for facilitating ground water recharging.

Prof. Mahua Mukherjee during her session focused on how the challenges of urban flooding can be developed into opportunities through blue-green infrastructure and ecosystem-based planning. She emphasized the approaches of integrated water management in the traditional and indigenous approaches of development. She further address the complexities and the risks in urban areas that are leading to multi-hazards proneness in the Indian cities. She listed several solutions for urban flooding and ground water recharging like bio swales, retention ponds, reuse of wastewater among several others. She also stressed on the need of collaboration of multi-stakeholders and the linkages of developmental practices with the urban livelihood schemes.

Prof. Kapil Gupta focused on the mitigation measures of urban flooding in his session. He highlighted the changing characteristics of rainfall where the intensity rainfall is increasing due to climate change. He emphasized on the need of water sensitive urban designing instead of traditional retrofitting of urban drainage systems. He covered various structural and non-structural controls like porous pavement, rooftop rainwater tanks, detention ponds, underground storage, etc. for urban flood risk management.

Er. Avinash C Tyagi stressed on the need of involvement of public in flood risk management of urban areas. He also stressed that the deigning of urban drainage needs to consider the varying intensity of rainfall. He highlighted the need for continuous trilogue between the government processes, scientific process and the society processes for mainstreaming communities in urban flood risk management. He further summarised that water is the central element of all the developmental activities and hence, needs to be considered in the planning and development of all sectors.

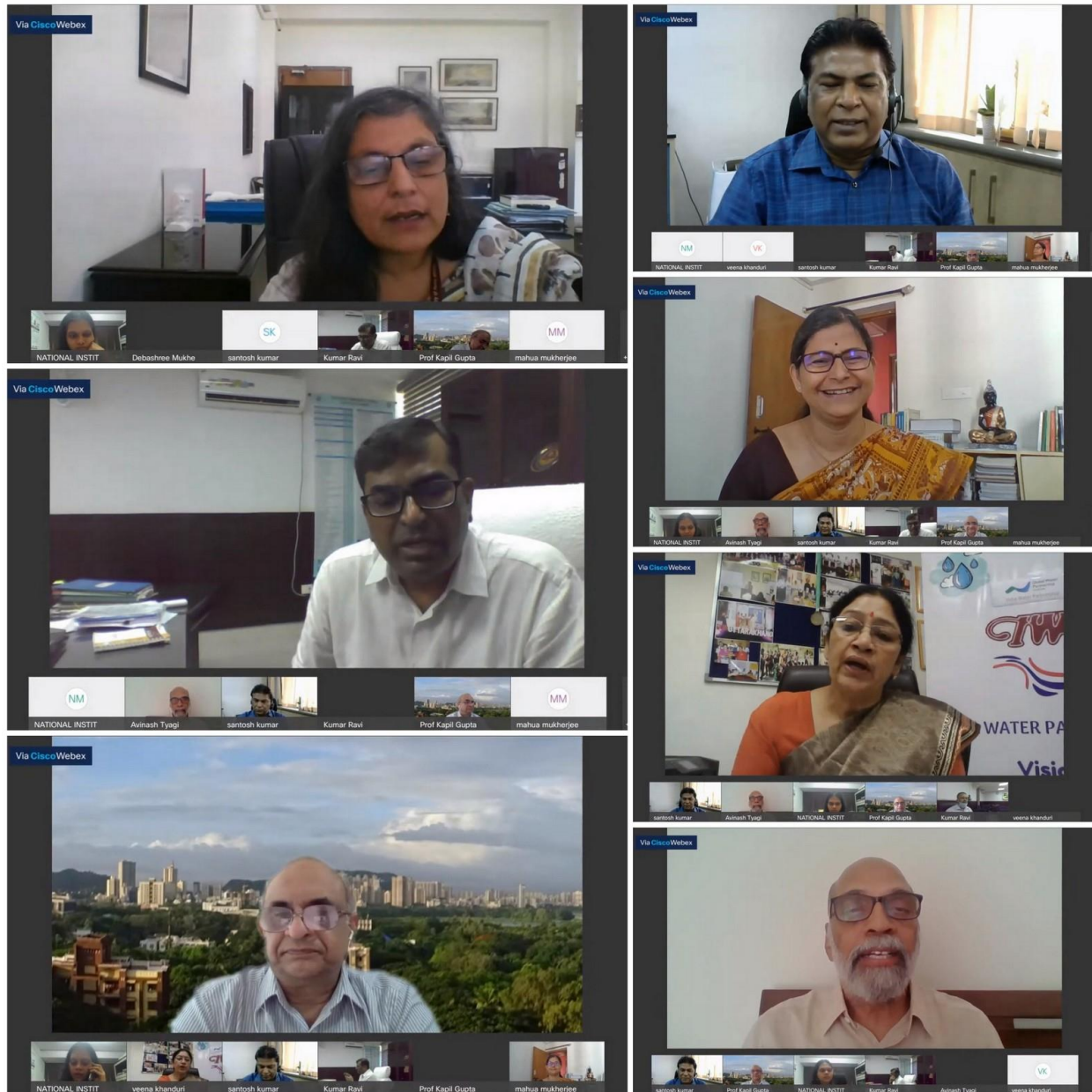
The sessions were followed by an open-house discussion addressing the queries of the participant by the experts. **Dr. Veena Khanduri** concluded the webinar with her closing remarks by stating that water needs to be core of all development sector. She stressed the need of excess utilisation of excess floodwater runoff by incorporating several water-sensitive design measures and reclamation of wetlands and water bodies.

Key Takeaways

The webinar advocate and mainstream the concept of utilizing excess floodwater in urban landuse and drainage planning and pave the way forward for technical solutions. Some of the key recommendations of this webinar are as follows:

- Water should be the central theme of urban development and planning.
- The developmental practices and approached need to incorporate flood plain zoning.
- Geotagging of water bodies and reservoirs needs to be implemented for protection and reclamation of these entities.
- The idea of reusing wastewater and storing rainwater needs to be mainstreamed and integrated in developmental policies and practices.
- Measures for maintaining the balance between biodiversity and water bodies needs to be focused upon.
- Measure for enhancing groundwater recharge should be emphasized.
- The planning and management of water in urban areas needs to have a multi-stakeholder approach instead of segregated approach.
- The local challenges needs to be incorporated in the management of urban flood risks.
- The communities need to be engaged for management of urban storm water and flood risks.

Photographs



List of Participants

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Webinar on
Urban Flooding: Challenges to Solutions
Prime Ministers Agenda 1, 5 & 8

Organised by

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9th October 2020

11.00 – 13.00 hrs

Background

The flooding of Indian cities have become a regular phenomenon owing to the rapid urbanisation and population growth. The issues has particularly increased over the last two decades as the natural land cover of the earth's surface and vegetation are being replaced by built-up structures, roads and other impervious surfaces leading to increased runoff. Most of the major cities and towns in India like that of Kolkata, Chennai, Surat, Bangalore and Hyderabad have witnessed repeated instances of flooding over the previous decades. The risks of urban flooding in these cities are projected to further worsen with the ongoing global climate change and increasing urbanisation in the country.

Most of the flood prone cities in India faces the issue of water scarcity in dry seasons clearly representing a major paradox in the present mechanism of urban water management in the country. The traditional engineering approaches of urban management system are developed to rid of

stormwater at the earliest resulting in increased imperviousness. The urban dwellers thus face the dual issues of waterlogging and depleting groundwater tables. Real estate-driven developments and poor city planning further compound the problem by encroaching and blocking the natural drainage channels, filling up of natural water bodies and exploitation of reservoirs. For instance, the increasing encroachment in the city of Bengaluru and Chennai has blocked their drainage system of inter-locked water bodies and reservoirs turning them into flooding hotspots in every monsoon. The increasing development has created a similar scenario in the city of Hyderabad resulting in extinction of 375 lakes. Without strict adherence to landuse planning and construction guidelines, most of the cities are unable to facilitate adequate drainage infrastructure to tackle heavy rainfall over a short span of time. The development of the city of Gurugram is an evidence to that which has been developed in a low-lying area without adequate drainage infrastructure.

To address the concern, the approach of slow, spread, sink and store runoff needs to be integrated in the urban drainage system. Coordinated water and land-use planning can mitigate the risks of flooding in urban areas. Concepts like Water Sensitive Urban Designs (WSUD) and Low-impact development (LID) needs to be adopted by citizens to increase the stormwater infiltration facilitating the storage of excess floodwaters in dry seasons and reducing waterlogging in monsoons. These approaches needs to be mainstreamed and integrated in the landuse and drainage planning of urban area.

About the Webinar

To advocate and mainstream the concept of utilizing excess floodwater in urban landuse and drainage planning, the National Institute of Disaster Management (NIDM) and the India Water Partnership (IWP) has collaborated for a research study outlined with Prime Minister's Agenda of 1, 5 and 8. The research would focus on how excess flood runoff water can be utilized as an asset for mitigating the risks of both floods and water-scarcity in an urban scenario. The study will also encompasses the existing risks of urban floods and highlight several challenges in urban landuse and drainage planning with the help of cases studies of Patna, Bihar and Gurugram, Haryana.

In this context, a Webinar on **“Urban Flooding: Challenges to Solutions”** is being jointly organized by NIDM and IWP on **9th October 2020** during **11.00 – 13.00 hours** to highlight the

prevalent issues of existing drainage infrastructure and water management system in the Indian cities. This webinar would pave the way forward for the aforementioned collaborative research.

The webinar intends to target officers and representatives from Ministry of Housing and Urban Affairs, (MoHUA); Ministry of Jal Shakti, Ministry of Science and Technology (MoST), National Building Construction Corporation Limited (NBCC), State Urban Development Departments, Urban Local Bodies (ULBs), State Public Health Departments, State Town and Country Planning Organisations, State Disaster Management Authorities (SDMAs) and District Disaster Management Authorities (DDMAs).

Objectives of the Webinar

- To advocate the utilization of excess floodwater as an asset for risk mitigation of flooding water scarcity in urban areas.
- To mainstream and integrate water sensitive urban designs and low impact development in urban drainage and landuse planning.
- To sensitize all the stakeholders and designers about the utilization of excess flood runoff.
- To analyse the exiting urban flooding challenges and deliberate on solutions to address these challenges as a way forward.
- To integrate real-time flood modelling with Decision Support System (DSS) for improving local mile connectivity.

Programme Team

Patron

Major General Manoj K Bindal, VSM, Executive Director, NIDM

Convenors

Prof. Santosh Kumar, Head, GIDRR & CCDRR, NIDM

Dr. Veena Khanduri, Executive Secretary, India Water Partnership (IWP)

Co-convenor & Moderator

Ms Mohana Manna, Young Professional, NIDM

IT Support

NIDM IT Team

Webinar and Registration Details

Interested candidates may register at <https://forms.gle/N22H3U9P2rAt9Uzh8>. The webinar would be conducted on Webex Platform and the link would be sent individually.

Session Plan

Date: 9th October 2020

Time	Topic/Session	Faculty
11.00 – 11.40 hrs	Inaugural Session • Welcome • Programme Overview • Opening Remarks • Keynote Address • Special Address	Ms. Mohana Manna, YP, NIDM Prof. Santosh Kumar, Head, G&IDRR, NIDM Dr. Veena Khanduri, Executive Secretary, IWP Maj. Gen. Manoj K Bindal, VSM, ED, NIDM Smt. Debashree Mukherjee, Addl. Secretary, Dept. of Water Resources, RD & GR, Ministry of Jal Shakti
11.40 – 11.55 hrs	Urban Floods: Overview of Challenges to Solutions	Prof. Mahua Mukherjee, Centre of Excellence in Disaster Mitigation and Management (CoEDMM), IIT Roorkee
11.55 – 12.10 hrs	Preventive Measures & Interventions to Urban Flooding	Prof. Kapil Gupta, Dept. of Civil Engineering, IIT Bombay
12.10 – 12.25 hrs	Issues of Urban Drainage: Case Study of Patna, Bihar	Shri Kumar Ravi, IAS, District Magistrate, Patna
12.25 – 12.35 hrs	Utilisation of Flood runoff for mitigation of urban flooding & water-scarcity: Proposal for Study	Er. Avinash C. Tyagi, Vice President, India Water Partnership
12.35 – 12.50 hrs	Q&A	
12.50 – 13.00 hrs	Closing and Conclusion	