



Webinar Report

Urban Flooding in Tripura: Experiences and Initiatives

July 12, 2021




Jointly Organized by:

National Institute of Disaster Management
(Ministry of Home Affairs, Govt. of India)


&

SDMA Tripura, Govt of Tripura


POSTER



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Resilient India - Disaster Free India




Webinar on


Urban Flooding in Tripura: Experiences and Initiatives

📅 12th July 2021 ⌚ 03:00 PM – 04:30 PM

PATRONS




Maj Gen M K Bindal, VSM
Executive Director,
NIDM




Smt Tanusree Deb Barma, IAS
Secretary Revenue Dept,
Govt. of Tripura

CONVENORS




Dr Amir Ali Khan
Faculty, NIDM




Dr Sarat Kumar Das
SPO-DM, Govt of Tripura


KEY SPEAKERS



Shri Debapriya Bardhan, IAS
DM & Collector
West Tripura




Dr Siddharth Shiv Jaiswal, IAS
MD NHM
Tripura



Shri R Srinivas
Head Metropolitan & Union
Territories Division, TCPO

COORDINATOR



Ms Yogita Garbyal
Young Professional,
NIDM


Organized by

National Institute of Disaster Management
Ministry of Home Affairs, Govt. of India
in collaboration with
Tripura SDMA, Government of Tripura

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Link: <https://qrqo.page.link/psjaa>


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Website: www.nidm.gov.in


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Wear your Mask Properly




Follow Proper Hand Hygiene



Maintain Social Distancing



Get Vaccinated



Resilient India : Disaster free India

Programme Team

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Assistant Professor, NIDM, MHA, GoI

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Dr. Sarat Kumar Das

SPO-DM, Tripura

Course Coordinator

Ms. Yogita Garbyal, Moderator

Young Professional, NIDM, MHA, GoI

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Webinar Programme Schedule

Urban Flooding in Tripura: Experiences and Initiatives

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SDMA Tripura, Govt of Tripura

Hrs	Topic	Speaker
1500-1505	Introduction and Welcome address	Dr. Amir Ali Khan, NIDM
1505-1510	Urban Flooding in Tripura: an introduction	Dr. Sarat Kumar Das, SPO-DM, Tripura
1510-1520	Urban Flooding in Tripura: Experiences and Challenges	Smt. Tanusree Deb Barma, Secretary Revenue Dept. Govt of Tripura
1520-1530	Opening Remarks	Maj. Gen. Manoj Kumar Bindal, Executive Director, NIDM
1530-1545	National Guidelines on Urban Flooding	Dr. R Srinivas, TCPO, New Delhi
1545-1605	Urban Flooding in Agartala and its Management	Dr. Siddarth Shiv Jaiswal, MD, NHM, Tripura
1605-1620	Recent Initiatives for Urban Flooding Mitigation at State Level	Mr. Enjula Uchoi, Manager ICCC, Agartala Smart City Ltd.
1620-1630	Discussion & Closing Session	Dr. Amir Ali Khan & Ms. Yogita Garbyal, YP, NIDM

Introduction

Webinar on *Urban Flooding in Tripura: Experiences and Initiatives* was organized by National Institute of Disaster Management (NIDM), Ministry of Home Affairs, Govt. of India in collaboration with SDMA Tripura, Govt of Tripura on 12 July 2021. The programme was held online for duration of one and half hours from 1500hrs to 1630 hrs. The webinar topic was also in compliance with PM 10-point agenda no. 5, 8 and 9 of DRR which highlighted the importance of using technology for DRR, learning from past lessons and building our local capacities.

Objective

1. Share experiences of frequent flooding in the Tripura state in the past and the lessons learnt.
2. Involving community and leaders to work together with Govt. to mitigate the pertinent issue of urban flooding.
3. Elaborating on initiatives taken by State Govt through various projects and schemes to mitigate the urban flooding issue.
4. To inspect the challenges and solutions in the current scenario.
5. To discuss the urban flooding mitigation measures for Indian cities.
6. To bring awareness in our participants for building resilience.

Overview

With monsoon hitting the Northeast region of India, the Tripura government has prepared an action plan for management of any flood-like situation in the state. This year, the challenges will be bigger amid the second wave of COVID-19 pandemic. Through the eminent delegates of the webinar we tried to share their experiences and efforts.

The webinar held many important discussions regarding the issues and mitigation methods regarding urban flooding scenario in Tripura state and issues at national level as well. The action plans, SoPs, national schemes like Jal Jeevan Mission, Swachh Bharat Mission, AMRUT, Smart City Missions and other guidelines were discussed. Drainage network system maintenance to curb the issues of urban flooding were highlighted. The recent initiatives for urban flooding mitigation at state level on ground were shown and importance of dissemination

of early warnings for urban flooding through text message and control rooms was pointed out. Flood monitoring system established at ICCC was talked.

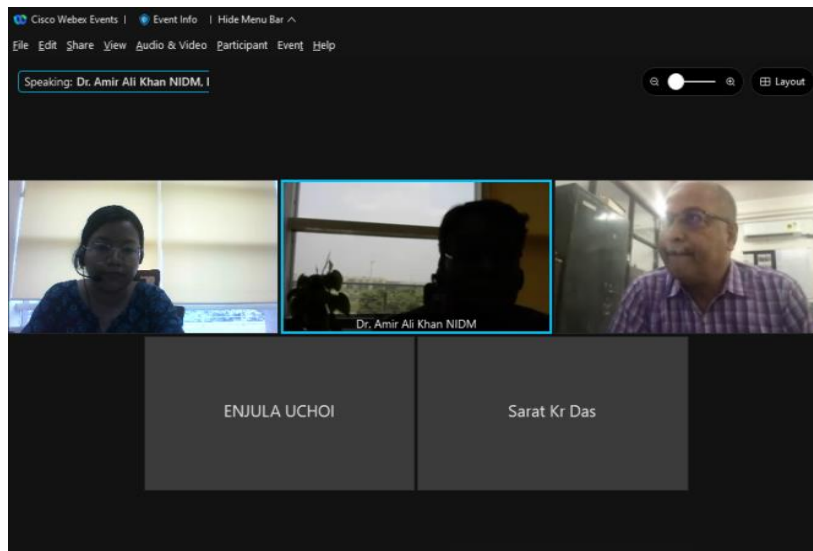
SUMMARY OF THE PROGRAMME

Inaugural Session

Introduction: Ms. **Yogita Garbyal**, Young Professional, NIDM and coordinator of the webinar welcomed each and every one. She gave introduction of the programme and shared the objectives of the webinar.

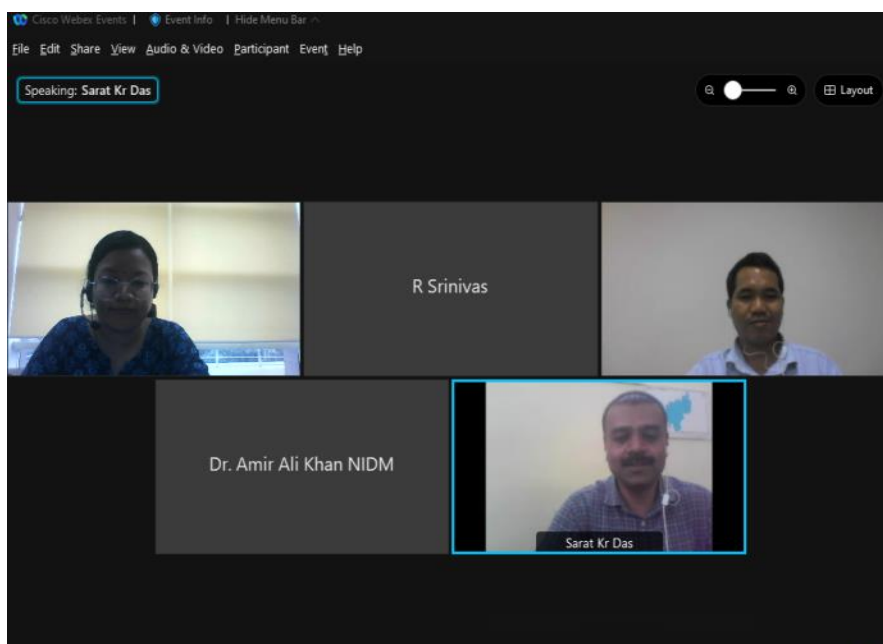
Opening address by Dr. Amir Ali Khan, NIDM, Convener

Dr Khan said that the issue of flooding is seen in every monsoon, faced majorly by all developing countries. He described what actually urban flooding means and told that it is mainly a drainage issue and issues and challenges are way complex than rivurine flooding. He told the maintenance and upgradation of drainage system is required at most part of urban areas which faces the urban flooding challenges. He recalled some of the major cases of flooding in Indian cities like Hyderabad, Ahmedabad, Delhi, Chennai Mumbai, Surat, Kolkata etc. Dr Khan pointed towards the unauthorised construction and slums near Yamuna river banks surrounding the urban Delhi which has major role in blocking the free flow of drainages of Delhi. He also highlighted that these urban flooding situations also challenges the critical infrastructures like airport, hospitals and schools by getting submerged and impacting their usability. Meteorological factors, increase of impervious layers, non-maintenance of drainage system, destroying the water bodies and other factors combined pose bigger threat to the urban areas. Dr Khan concluded by saying technology should be applied in a way to provide additional water supply during dry spells and during overflow it can be taken out from local inundated areas from one catchment to another.



Introductory Remarks on Urban Flooding in Tripura by Dr. Sarat Kumar Das, SPO-DM, Tripura, Convener

Dr Das thanked NIDM for this initiative and told about the various inputs taken up by Govt of Tripura regarding the issue of urban flooding. He recalled, Agartala being flooded last year due to heavy rain which impacted the state in many ways. He also told that in Tripura one ULB is present and 2 urban areas is at international borders which share another set of challenges. He also said the outlet of all the river flows to Bangladesh from Tripura, these outflow is becoming narrow due to geopolitical issues. Dr Das highlighted upon improper waste management and low maintenance of infrastructures.

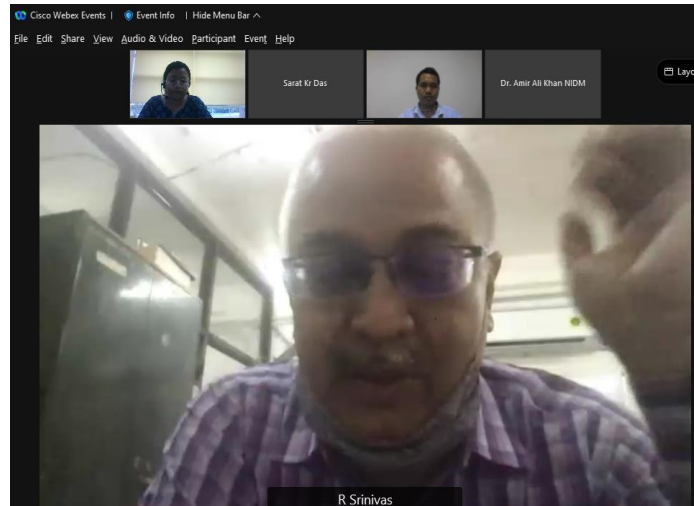


Technical Sessions

Lecture 1: National Guidelines on Urban Flooding

Speaker: Dr. R Srinivas, TCPO, New Delhi

Dr Srinivas in his lecture talked about the disaster management plan in specific reference to urban flooding. He specified the five phases of the plan namely: preparedness, early warning, response, relief and restoration out of which four phases is covered by SoP issued by MoHUA. He told about URDPFI guideline, 2014 by MoHUA which has its focus



on management of urban floods as a part of disaster management. The vision for the DMP is to be set in a way to mitigate urban flooding by ensuring robust storm water drainage in cities and towns to make them inundation free.

Dr Srinivas further stated that ministry is actively working towards the goals of NDPD and shall advise State Govt. to adhere to timelines for implementing flood mitigation measures in their areas. He told the priority should be to understand urban flood risk, strengthening of urban flooding risk governance, investing in flood mitigation for resilience and enhancing the disaster preparedness and to build back better in post disaster stages. He also briefly talked about how to carry HRVCA for urban flooding and the structural measures needed to be taken care off. He concluded by sharing a preparedness and action plan for response mechanism with suggestion for its way forward.

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Sarat Ki Das Dr. Amir Ali Khan NIDM ENJULA UCHOI

Viewing R Srinivas's screen

DISASTER MANAGEMENT PLAN-URBAN FLOODING

TOWN AND COUNTRY PLANNING ORGANIZATION
MINISTRY OF HOUSING AND URBAN AFFAIRS
GOVERNMENT OF INDIA

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Sarat Ki Das Dr. Amir Ali Khan NIDM ENJULA UCHOI

R Srinivas

Viewing R Srinivas's screen

URBAN FLOODING AS A PART OF NATIONAL DISASTER MANAGEMENT PLAN

* Management of urban flooding is an emerging subject, and as such it has to be treated holistically in a multi-disciplinary manner.

* Standard Operating Procedures (SOP) issued by Ministry of Housing and Urban Affairs covers the following three phases of disaster management for effective and efficient response to urban flooding:

- Preparedness
- Early Warning
- Relief
- Restoration

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Sarat Ki Das Dr. Amir Ali Khan NIDM ENJULA UCHOI

R Srinivas

Viewing R Srinivas's screen

HAZARD, RISK, VULNERABILITY AND RESILIENCE ANALYSIS (HRVCA) Urban Flooding

While preparing the Master Plan of a city / town, it has to be ensured that

- Areas vulnerable to flooding are delineated/demarcated .
- Flood zoning can be made and appropriate development control may be done on the basis of degree of risk associated with the same.
- An inventory of drainage and sewerage system for the entire city should be made and the status of the same should also be mapped.
- This will enable the city authorities to identify which area suffers from water logging and improvement/augmentation by replacing the old sewer lines and drains.

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Sarat Ki Das Dr. Amir Ali Khan NIDM ENJULA UCHOI

R Srinivas

Viewing R Srinivas's screen

VISION of DMP for URBAN FLOODING

To mitigate Urban Flooding by ensuring robust storm water drainage in cities and towns in order to make them inundation free.

Time Frames

- Short, Medium and Long-Term - As per NDMP most activities, irrespective of time frames, will run concurrently; only some take longer to complete. Depending upon the physiography and nature of physical development of the cities, time frames have been indicated for :

- ✓ Coastal cities
- ✓ Inland cities
- ✓ Hill towns
- ✓ Cities along rivers
- ✓ Cities/Towns near dams and reservoirs

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Sarat Ki Das Dr. Amir Ali Khan NIDM ENJULA UCHOI

R Srinivas

Viewing R Srinivas's screen

Mainstreaming Disaster Management in Urban Flooding

Structural measures need to be taken like:

- Removal of encroachments in the flood plains and subsequent construction of a flood wall with detention pond.
- Provision of additional box culverts under the arterial roads .
- Widening of some of the channels of rivers reduces the flooding adjacent to the channels of the river.
- Detention/holding ponds are an effective way of reducing flooding in coastal cities like Mumbai, although the availability of land for the design capacity is always a challenge.
- Rain gardens need to be constructed, with a depth varying from 400 to 500 mm to absorb the rainwater.
- Strengthening the existing storm water drainage network.
- New construction in floodplains should be strictly regulated.
- Hazard resistant construction, strengthening and retrofitting of all lifeline structures and critical infrastructure.

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Sarat Ki Das Dr. Amir Ali Khan NIDM ENJULA UCHOI

R Srinivas

Viewing R Srinivas's screen

ACTION PLAN FOR URBAN FLOODING

Task	Agency/Person Responsible
Raise alert	Emergency Operating Centre
Assess and Notify	ULB/UDA
Activate Control Room	ULB/UDA
Establish command	Emergency Operating Centre
Prioritise actions	Emergency Operating Centre
Mobilise and deploy resources	ULB/UDA
SAR/Evacuation	ULB/UDA and other agencies
Establish Relief operations	ULB/UDA and other agencies/NGOs and CBOs
Assess situation dynamics to readjust action plan	Emergency Operating Centre

Speaker: Dr. Siddarth Shiv Jaiswal, MD, NHM, Tripura

Lecture: Urban Flooding in Agartala and its Management.

In his lecture Dr Jaiswal summarised the flood management of Agartala. He started by sharing the basic information of Tripura and the impact recorded from past incidents of floods at Agartala city such as in 2017 62000 persons were shifted to relief camps due to flooding etc. He then focused on the robust flood mitigation measures such as desilting of drains, capacity building of manpower and necessary repairs and maintenance that were taken up in the past to curb the issue. He also spoke about their response strategy in such situation like following the early warning IMD alert, deployment of rain teams, opening pump house, monitoring through ICCC city surveillance cameras and field visits. Dr Jaiswal concluded by saying coordination is important with other departments as well for efficient response and showed the outcomes of their current efforts which has reduced peak water level to half compared to 5 years earlier.



14 Outcomes

1. In previous data analytics it has been observe that it takes 6 to 7 hours to get the water logging in its stable in most of the areas Now it takes only 2/3 hours maximum.
2. The peak water level is reduced to half compared to peak 5 years back
3. Previous almost all the locations occurs huge water logging now only few locations like Orient Chowmuhani, Jackson gate, Ganaraj Chowmuhani and Paradise chowmuhani occurs water logging .

Climate - Data Agartala

11 Outline pumps pictures

Motorstand outline pump Orient chowmuhani outline pump

3 Response

- Early warning system by IMD
- Deployment of rain teams
- Opening of pump house by operators & helpers
- Timely start of diesel/ electric pumps
- Monitoring through field visits
- Monitoring through ICCC

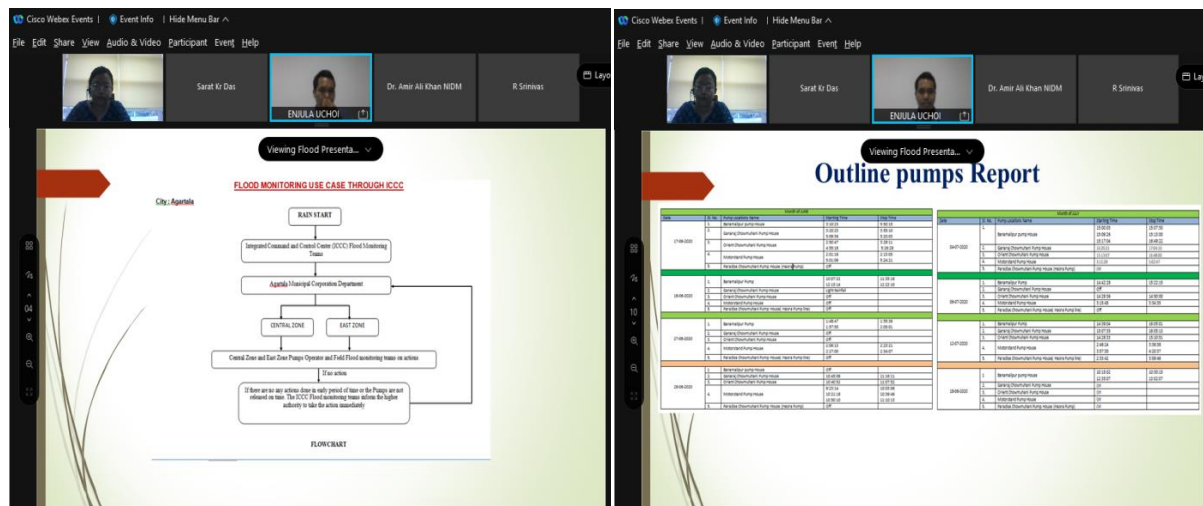
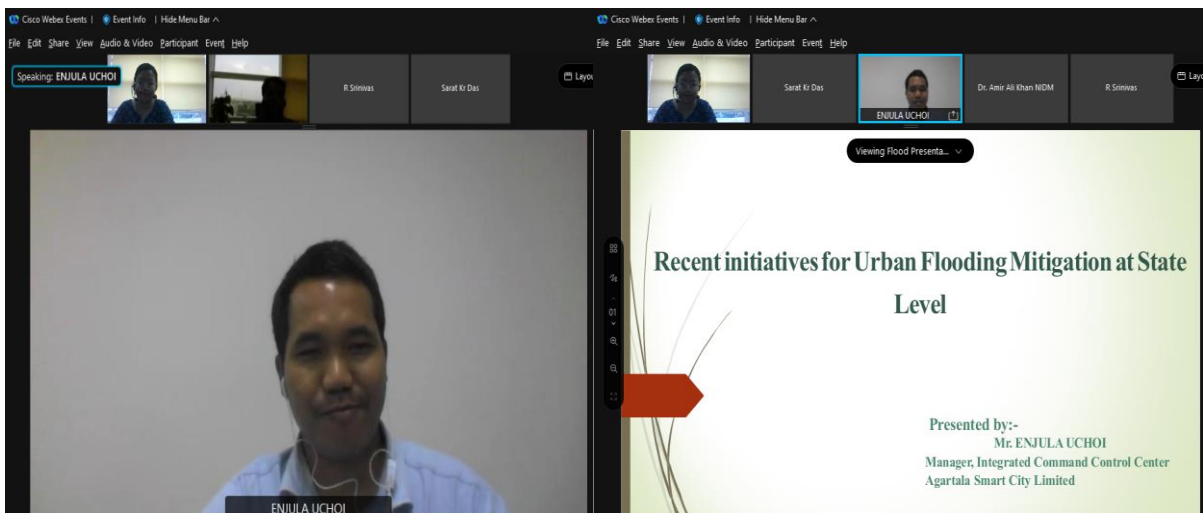
3 Previous Incident Pictures

Sukantala Road Water Logging RMS way to Post office Chowmuhani

Speaker: Mr. Enjula Uchoi, Manager ICCC, Agartala Smart City Ltd.

Lecture: Recent Initiatives for Urban Flooding Mitigation at State Level

Mr Enjula Uchoi showed how ICCC operate for flood monitoring in the Agartala. He briefly described the areas in Tripura which is frequently inundated during heavy rains and highlighted the issues of those areas such as Ganaraj Chowmuhani and Paradise Chowmuhani in Agartala. He also showed how using the surveillance cameras they monitor the inundation of city area and deploying of pump team in such areas.



Discussion and Closing Session

All panellists gave their last concluding remarks, all agreeing on the fact to go for adoption of holistic approach to inculcate these learning as our practices on ground. Dr. Amir Ali Khan, convener of the webinar in closing remark said there is a need to have involvement of different departments for the operation of good plans and sensitized citizen that should help retain the water bodies and built good communication for early warning.

Ms. Yogita Garbyal, YP, NIDM moderated the session, took panel discussions and participants queries in the end of the session.. She thanked all the participants, eminent experts joining the platform and the patron of the programme during vote of thanks.

Key takeaway points

1. Action plans, SoPs, National schemes like Jal Jeevan Mission, Swachh Bharat, AMRUT and Smart City Mission and other guidelines need to be adopted nationally to build resilient smart cities.
2. Strengthening of the existing storm water drainage network and the complete drainage system of urban cities is must to curb the issues of urban flooding.
3. Management of urban flooding is an emerging subject and has to be treated holistically & in multi disciplinary manner.
4. Implementation of DM Plan for urban flooding shall vest with the Urban Local Bodies and Urban Development Authorities.
5. Some recent initiatives for urban flooding mitigation at Tripura were: procurement of electric and mobile diesel pumps and monitoring through surveillance cameras in flood prone areas and in the pump house.
6. Early warning through text message and control rooms and flood monitoring at ICCC are also required.
7. Issues like encroachment in flood prone areas in megacities may happen in urban areas of Tripura as well and need to be monitored.
8. Rain gardens need to be constructed with a depth varying from 4000 to 500 mm to absorb the rainwater.

9. involvement of different departments for the operation of good plans with sensitization of community should help retain the water bodies and built good communication for early warning.
10. Focus should be on hazard resistant constructions, strengthening and retrofitting of all lifeline structures and critical infrastructures.
11. Need coherence of Disaster management across resilient development and climate change action.
12. MoHUA through AMRUT and SCM will focus on strengthening the urban drainage networking through new techniques.

Target group

This webinar was primarily designed for people who may in some capacity be involved in construction activities at different levels specific to urban areas. The target group will also include senior and middle level functionaries from Govt sector, other SDMAs and DDMA, PSUs, Municipal Corporations involved in planning, design, construction and maintenance of infrastructure and representing various departments including Town Planning, CPWD, PWD, Urban Development, Municipalities, Faculties/ Researchers at Universities/IITs/NITs and Industries/R&D facilities dealing in upcoming innovation in sustainable constructions for urban areas.

Participants

Overall 96 participants attended the webinar session through webex platform. The webinar was also went YouTube live at NIDM YouTube stream link ["Urban Flooding in Tripura: Experiences and Initiatives". | DISASTER IN INDIA | MHA | NIDM | COVID-19 - YouTube](#).

As per the NIDM rules of 80% attendance and registration at NIDM training portal was kept mandatory for getting e-certificates of the webinar.

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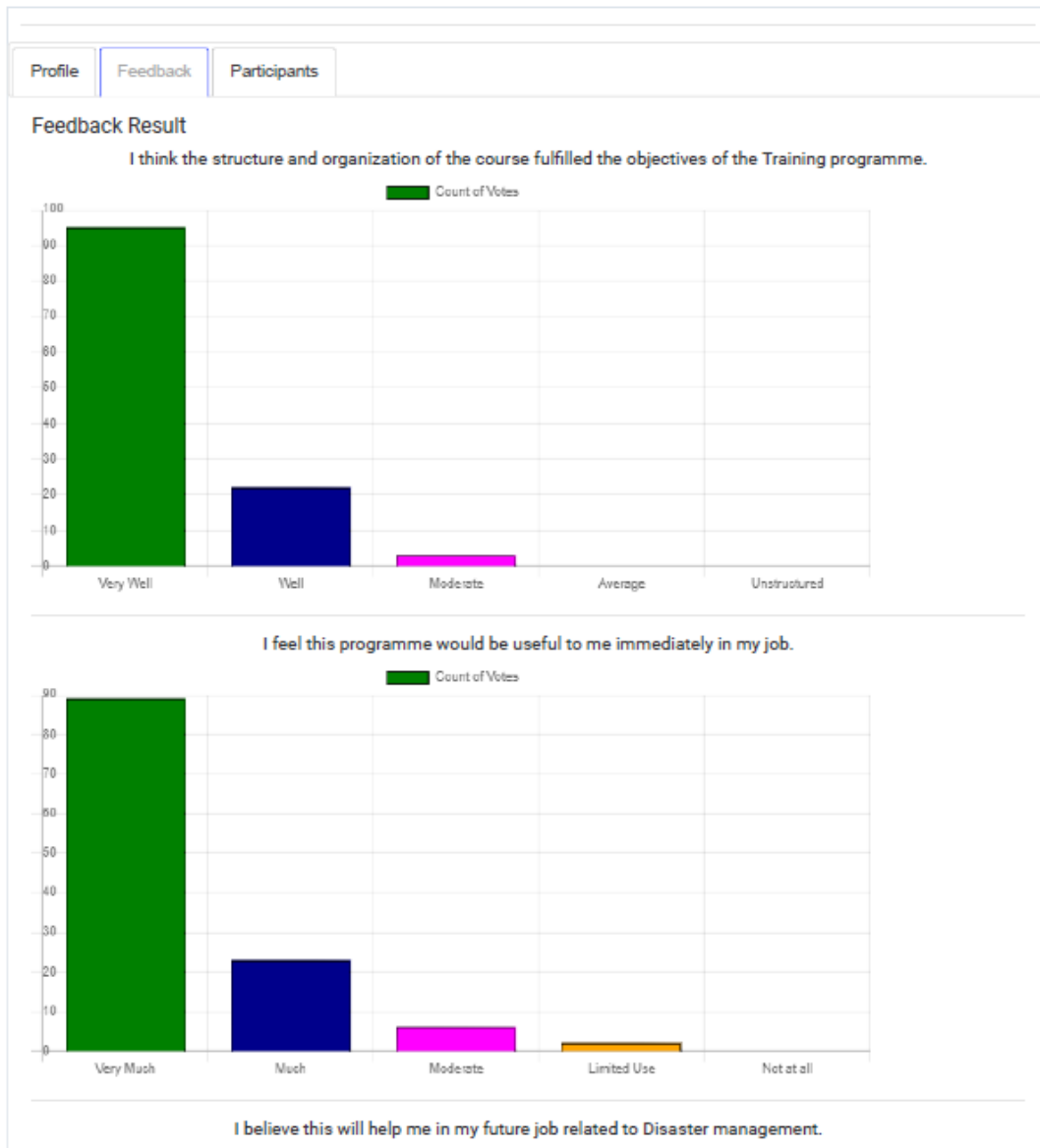
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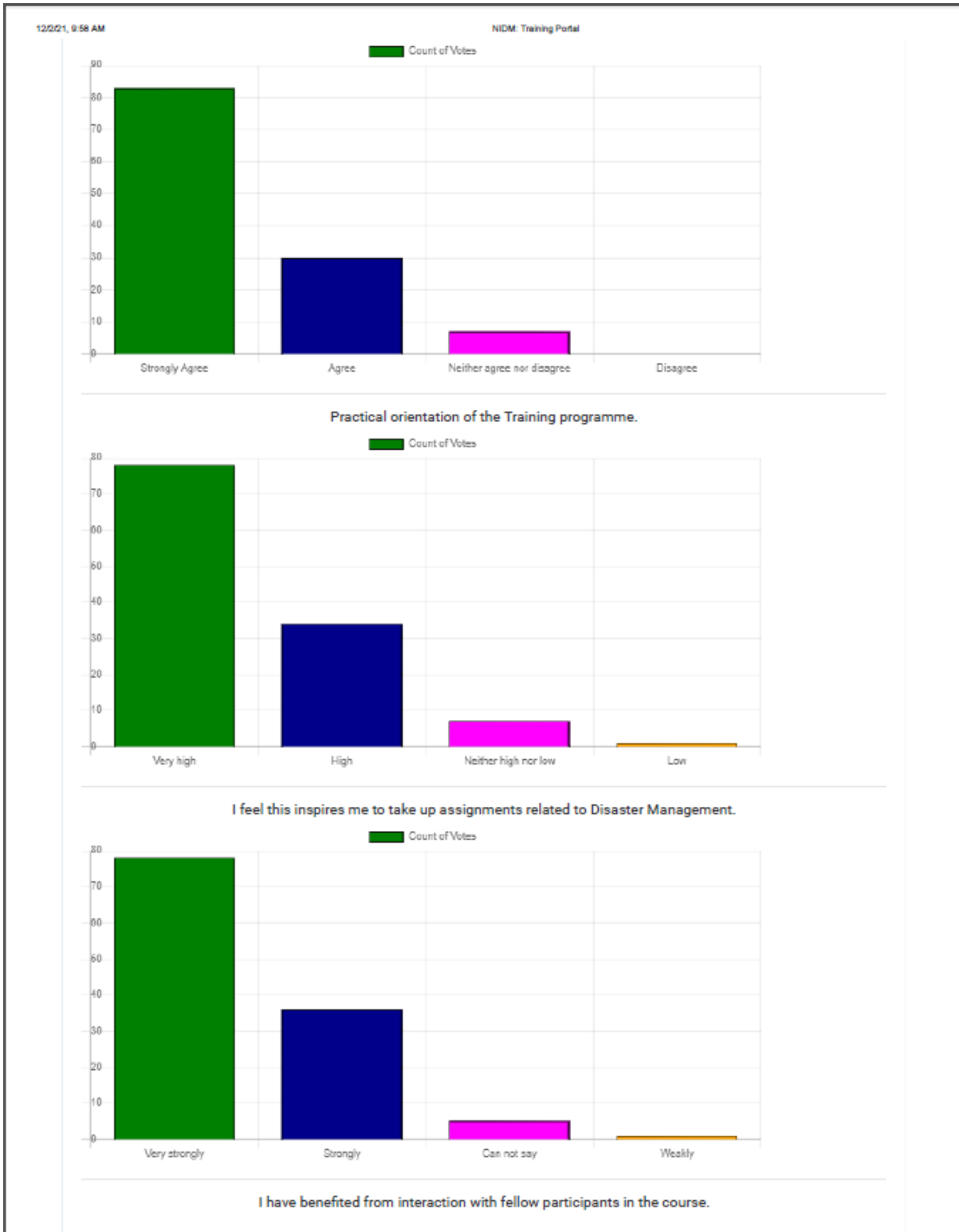
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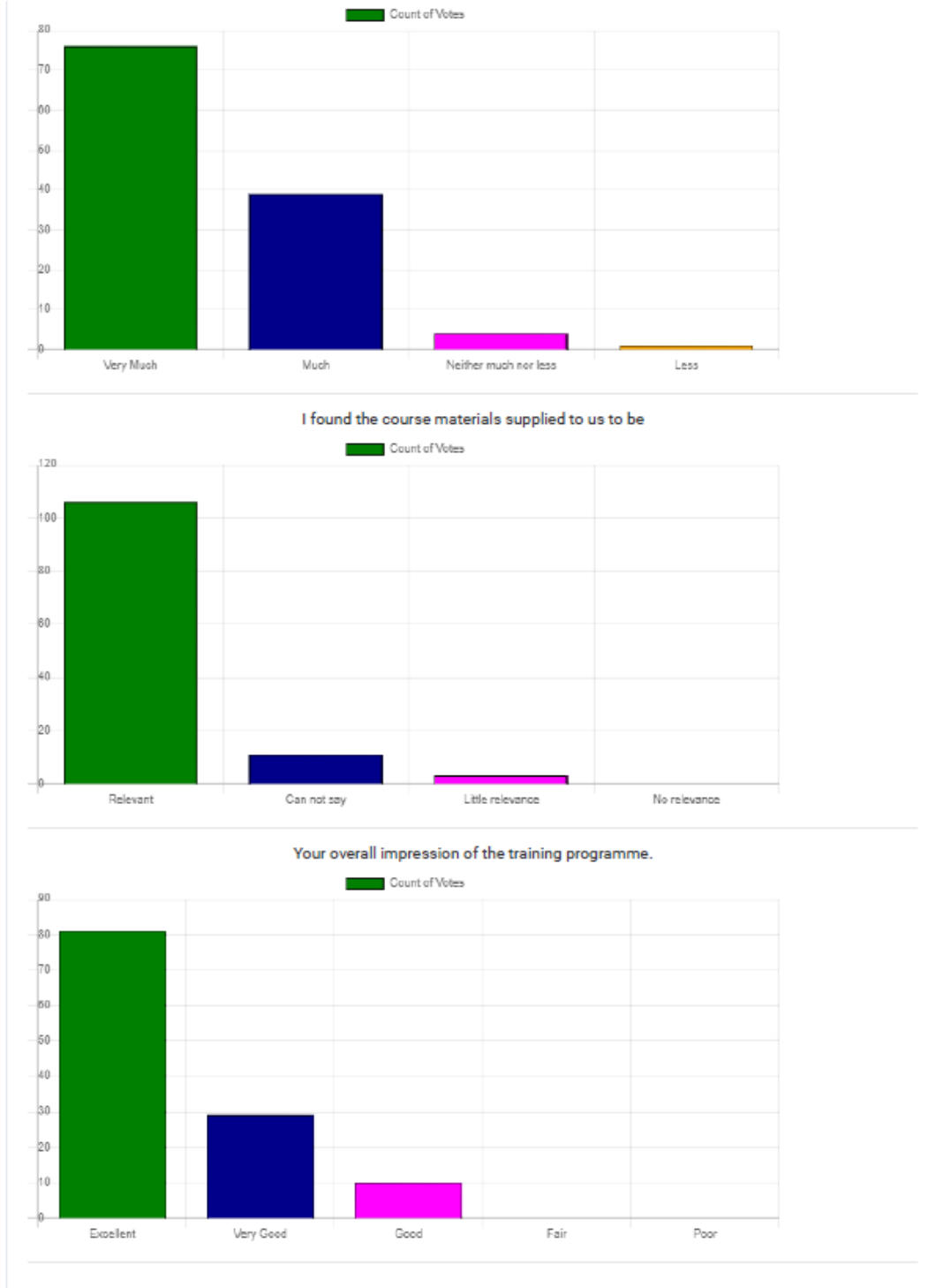
Enrolled Participants





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