

Five Days National Training Programme on  
**“Flood Risk Management”**  
11-15 June, 2018, NIDM



## About the Course

### Logistics:

**Accommodation of Confirmed Outstation Participants:** YMCA Tourist Hostel - New Delhi YMCA.1 Jai Singh Road, New Delhi-110 001.

<http://www.newdelhiymca.in/ndymcath/contact.php>

**Target Group:** Senior and middle level officers/trainers from state government departments of Urban development, Irrigation & Flood Control, Agriculture, Animal Husbandry, Revenue, Health, PHED, PWD, Road & Bridges, Food & Civil Supplies, Environment & Forests, Police, Civil Defence, Municipal Corporations, Panchayati Raj, Rural Development and Fire & Emergency Services, etc.

**Course Fee:** The Registration/nomination is free for the participants nominated by establishments/Departments/Institutes under the State/ Central Government of India.

**Logistics:** Participants nominated by the Central/State Government or their establishments would be provided free modest accommodation, besides course documents, tea and lunch, etc. whereas the travel cost of participants from their headquarters to New Delhi would be borne by their own sponsoring / nominating organization/Department.

## **Academic:**

**Objectives:** The key objectives are as follows:

- ◆ To provide the participants about the concepts of disaster management and an overview on flood scenario of India
- ◆ To enhance understanding concerning the nature, extent of the threats and the value of counter measures to combat the adverse impact of floods
- ◆ To give an overview on use of various structural and non-structural measures for preparedness and mitigation during floods
- ◆ To provide an overview on the role of Remote Sensing ,GIS, GPS and communication technology in flood management
- ◆ To develop administrative capabilities to plan and implement disaster of a safe national sustainable development

**Course Contents:** The contents of the course would cover the following aspects, to achieve the objectives:

- Basic Concepts of Disaster Management and Disaster Risk Reduction in Flood Risk Management in changing scenario of climate and w.r.t. Environment & Disaster Management in India
- Flood Forecasting and Early Warning System & Role of Strategic preparedness tools in flood management / National Guidelines on Floods
- Health aspects in floods & Geo-informatics Applications in flood Disaster risk reduction
- Flood mitigation measures in India - Structural and Non- structural (flood zoning)
- Search & Rescue operation in flood management & Incident Response System for Floods
- Rain Water Harvesting & Resilient structures for Flood Mitigation
- Urban floods: Experience, Lessons learnt & Challenges ahead
- Experience sharing & Challenges ahead based on initiatives taken by the stakeholders & lessons learnt on floods in changing scenario of climate – Panel Discussion

**Methodology:** Power point presentations, discussions, exercises, with question/ answer

**Duration & Venue:** The five days training programme will be commenced from Monday, 11<sup>th</sup> June, 2018 and would be concluded on Friday, 15<sup>th</sup> June, 2018 at YMCA Tourist Hostel, 1 Jai Singh Road, New Delhi-110 001.

**Attendance & Certificate:** Marking attendance Forenoon and Afternoon is compulsory for certification. A certificate will be awarded to each participant on the successful completion of the programme.

**Boarding & Lodging Arrangements:** Standard Double Rooms on twin sharing basis for five (05) days have been booked at Delhi YMCA Tourist Hostel for the course participants from outside Delhi. As per booking, YMCA will facilitate Breakfast, Buffet Veg Lunch and Buffet mix (Veg & Non Veg) Dinner along with two times tea and cookies to resident participants.

The confirmed participants should reach New Delhi YMCA Tourist Hostel, 1 Jai Singh Road, New Delhi 110001. The contact details are Tel No. 01143644000, 43644090, Reservations 011 43644047, 23746031, Fax 011 23746032, email: reservation@newdelhiymca.org, Website [www.newdelhiymca.org](http://www.newdelhiymca.org).

# “Flood Risk Management”

## *Basic Reading Materials*

### **Environment and Disasters**

Disasters are environmental imperatives of this living world. Disaster risk is increasing with growing exposure of people and assets to natural hazards, which is known to be aggravated due to environmental changes, viz. climate change, land use changes, and natural resource degradation. Analysis shows that the substantial growth of population and assets in at-risk areas has been a biggest driver of disaster risk in recent years. Uncertainties associated with climate change impacts, as extreme events, coupled with limitations of climate projection downscaling, multi-hazard, multi-sector exposure of land, environment and resources and dependent property and people, particularly life and health called for a holistic understanding of disaster risk management. Migration to coastal areas and the expansion of cities in flood plains, coupled with inappropriate building construction, are among important reasons for increased disaster risk and vulnerability. Geo-climatic, environmental and socio-economic conditions in the regions of India make it severely prone to various natural disasters including flood and cyclone.

Disaster, as defined in the DM Act 2005, means *“a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area”*.

According to the estimate, nearly 59% of India’s land area is prone to earthquakes of moderate to high intensity, 68% land area is susceptible to droughts, nearly 12% is flood prone, 50% forest area is prone towards forest fire, about 8% is cyclone prone, 2% is landslide prone and a long coastline is exposed to tsunamis and storm surges. Of the 35 States and Union territories, as many as 27 are disaster prone. However, these vary significantly as the situation changes every year and every season. Besides, this doesn’t account for urban floods, flash floods and cyclonic effects in non-coastal states or areas. And if the perceived threats due to other disasters such as chemical and terrorist attacks are added, every square inch of India is vulnerable, calling for immediate attention and sustained efforts.

### **Legal and Institutional Framework**

The parliament of India enacted the National Disaster Management Act in 2005, which brings about a paradigm shift in India’s approach to disaster management. The centre of gravity stands visibly shifted to preparedness, prevention and planning from earlier response and relief centric approach. The proposed legislation is in the concurrent list of constitution thus having the advantage that it will permit the States also to enact their own legislation on disaster

management. According to this Act, National Disaster Management Authority (NDMA) of which the Prime Minister of India is the Chairperson has the responsibility of laying down the policies, plans and guidelines for disaster management. Similarly, State Disaster Management Authorities (SDMAs), under the Chief Minister of the State and District Disaster Management Authority (DDMAs) co-chaired by District Collector and President of the elected body of the district are being developed to take the responsibility of down the policies, plans and guidelines for disaster management at State and District levels, respectively.

The crucial role of National Institute of Disaster Management (NIDM) is to plan and promote training and research in disaster management, documentation and development of national level information base relating to disaster management policies, prevention mechanism and mitigation measures. As per provisions of the DM Act, 2005, the Govt. of India has constituted National Disaster Response Force (NDRF) for the purpose of specialized response to disasters such as search, rescue, relief operations and rehabilitation. (<http://disastermanagement.ap.gov.in/website/download/DM%20ACT-2005.pdf>). There are disaster management funds available to the Union, State and District Authorities to meet the immediate needs of providing rescue and relief to the victims of Disasters. National Policy on Disaster Management, 2009, has also emphasized on the institutional arrangements for disaster risk management (Section 12.2.1 of DM Policy). The entire Disaster Management architecture needs to be supported by a solid foundation of frontline research and development efforts, offering sound and state-of-the-art science and technology options in a user friendly manner. (<http://www.ndma.gov.in/images/guidelines/national-dm-policy2009.pdf>).

### **Understanding Hydro-meteorological disasters and DRR**

Climate change is known to aggravate hydro-meteorological disasters, as these comprise almost 70-80% of disasters globally in occurrence. India is one of the most flood and cyclone prone countries in the world. Every year, Indian sub-continent witnesses floods in different States/UTs and cyclones in coastal areas, causing widespread miseries to the people and other forms of life including vegetation and animals. Floods & Cyclones are the phenomena of nature which have caused great havoc of disastrous dimensions in India particularly in coastal areas. Among the natural hazards that affect the Indian coastal line, these hazards are known to be the most destructive to property, crops and infrastructure, and worst for causing death and injury. Environmental damage and ecological losses caused by these, and loss of assets and resources, cause risk recycling, i.e. aggravating future hazards and creating new and incremental layers to factors of disaster vulnerability.

**Floods** are any high stream over flow, which overlap natural or artificial banks of a river or a stream and are markedly higher than the usual as well as inundation of low land. Sometimes copious monsoon rains combine with massive flows from the rivers, then the floods indeed become calamitous. In India, 22 States and one Union territory (Andaman & Nicobar) are



vulnerable to floods. However, the most vulnerable States of India are Uttar Pradesh, Bihar, Assam, West Bengal, Gujarat, Orissa, Andhra Pradesh, Madhya Pradesh, Maharashtra, Punjab and Jammu & Kashmir. On an average, an area of about 7 million hectares (17.50 mha maximum in 1978) was flooded, of which, on average crop area affected was of the order of 3.302 million hectares (10.15 m ha in 1988). The floods claimed on an average 1464 human life and 86288 heads of cattle dead every year. The National Commission on Floods (Rashtriya Barh Ayog) Government of India (1980) laid a great stress on proper flood management for the specific problems of the Ganga and the Brahmaputra by adopting a suitable blend of structural and non-structural measures based on long term strategy with time and cost effectiveness, was evolved to mitigate the flood fury. Flood Plain Zoning aims to regulate the indiscriminate and unplanned development in flood plains. It is relevant both for unprotected as well as protected areas. Hydrological and hydro meteorological data from 175 flood forecasting stations located in different river basins of the country are collected, analyzed and then forecasts issued by Central Water Commission (CWC) for the benefit of State Governments and general public.

The impact of climate on water resources realizes that efficient management of water resources is only the key to economic growth and poverty alleviation. “This is so because about 70 per cent of India’s population is dependent on agriculture and about 83 per cent of the water is utilized for irrigation.” The National Water Policy (NWP), 2002 guided the formulation of policies and programmes for water resources development and its management. Thereafter, new challenges emerged in the water resources sector, which necessitated review of the National Water Policy. Accordingly, there should be a Master Plan for flood control and management for each flood prone basin. In flood control and management, the strategy should be to reduce the intensity of floods. Indiscriminate occupation of, and economic activity in coastal areas and flood plain zones should be regulated.

The country is one of the most flood prone countries in the world. In every monsoon season, India witnesses floods in different States/UTs, causing widespread miseries to the people. Flood is one of the phenomena of nature which has caused great havoc of disastrous dimensions in India. Among the natural hazards that affect the Indian sub continent, flood is known to be the most destructive to property, crops and infrastructure, and one of the worst for causing death and injury. The need to combat the perennial problem of floods and the resultant destruction has been at the forefront of concern.

Around 75% of the total rainfall in India is concentrated over 4 months of monsoon (June – September). Around 12% of the country’s land area is prone to floods which means around 40 million hectares are prone to flood and annually on an average 8 million is affected by floods. The most flood prone areas are the Brahmaputra, Ganga and the Meghna basins; the states are Uttar Pradesh, Bihar, West Bengal, Assam and Orissa. In the recent times, floods have also become a serious affair in the states of Tamil Nadu, Andhra Pradesh, Karnataka and Gujarat. India accounts for one- fifth of the global death count due to floods. Over 30 million people are

displaced annually. Although it is impossible to prevent floods completely, but losses due to floods can be minimized by better preparedness, mitigation, planning and timely response.

### **Suggested Readings**

- Rashtriya Barh Ayog Report 1980: Government of India Publication  
<https://www.cabdirect.org/cabdirect/abstract/19826741927>
- Shah, M. P., Virdi, N. S. & Bhartarya, K. S. (1996), Slope Failure and damaging of river channels: some examples from Sutlej Valley, Himachal Pradesh, Himalayan Geology, 17, 183-191. <http://wihg.res.in/scientists/mpsah.htm>
- National Water Policy (2002), Ministry of Water Resources, Govt. of India  
<http://www.dowrorissa.gov.in/ActsnPolicies/NWP/2002/NationalWaterPolicy2002.pdf>
- Government of India, National Disaster Management Authority (2008): National Disaster Management Guidelines, Management of Floods
- National Policy on Disaster Management 2009  
<http://www.ndma.gov.in/images/guidelines/national-dm-policy2009.pdf>
- National Water Policy (2012), Ministry of Water Resources, Govt. of India  
<http://wrmin.nic.in/writereaddata/NationalWaterPolicy/NWP2012Eng6495132651.pdf>
- Kaushik, Ashutosh Dev (2012). Flood Risk Mitigation and Management: ToT Module. National Institute of Disaster Management, New Delhi-110002, pages 179.  
<http://nidm.gov.in/PDF/modules/flood.pdf>
- Gupta, A.K., Nair, S.S., Wajih, S.A., & Dey, S. (2013). Flood Disaster Risk Management: Gorakhpur Case Study. <http://www.preventionweb.net/educational/view/31503> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Germany, 116 p.  
<http://nidm.gov.in/PDF/modules/flood2.pdf>
- Vogelbacher, A. (2013). Flood Disaster Risk Management - Hydrological Forecasts: Requirements and Best Practices (Training Module). National Institute of Disaster Management, New Delhi and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Germany, 88 p. <http://www.preventionweb.net/educational/view/31586>
- Flood Risk Mitigation and Management – Guidelines and Strategies  
[https://www.researchgate.net/publication/309558673\\_Flood\\_Risk\\_Mitigation\\_and\\_Management\\_-\\_Guidelines\\_and\\_Strategies](https://www.researchgate.net/publication/309558673_Flood_Risk_Mitigation_and_Management_-_Guidelines_and_Strategies)

### **Other Important Readings on the Theme/Subject are following:**

- Strengthening climate resilience through disaster risk reduction.  
<http://www.preventionweb.net/publications/view/37390>
- Applying environmental impact assessments and strategic environmental assessments in disaster management. [https://www.researchgate.net/publication/309464899\\_applying\\_environmental\\_impact\\_assessments\\_and\\_strategic\\_environmental\\_assessments\\_in\\_disaster\\_management](https://www.researchgate.net/publication/309464899_applying_environmental_impact_assessments_and_strategic_environmental_assessments_in_disaster_management)
- Flood disaster risk management: Gorakhpur case study.  
<http://www.preventionweb.net/educational/view/31503>
- Uttarakhand Disaster 2013 <http://nidm.gov.in/pdf/pubs/ukd-p1.pdf>
- Ecosystem <http://www.preventionweb.net/go/26498>

- Urban floods in Bangalore and Chennai – risk management challenges and lessons for sustainable urban ecology. [http://www.indiawaterportal.org/sites/indiawaterportal.org/files/urban\\_floods\\_in\\_bangalore\\_and\\_chennairisk\\_management\\_challenges\\_and\\_lessons\\_for\\_sustainable\\_urban\\_ecology\\_current\\_science\\_2011.pdf](http://www.indiawaterportal.org/sites/indiawaterportal.org/files/urban_floods_in_bangalore_and_chennairisk_management_challenges_and_lessons_for_sustainable_urban_ecology_current_science_2011.pdf)

## **NIDM COURSE TEAM**

### **Executive Director:**

Shri B. H. Anil Kumar, IAS  
ED, NIDM

### **Course Director:**

Dr. A.D. Kaushik  
Sr. Faculty,  
Tel: +91 11 2343 8274,  
Email: [adkaushik@gmail.com](mailto:adkaushik@gmail.com)

### **Course Logistics Support:**

- Shri Anil Shekhawat – Assistant Commandant (training)
- Shri J N Jha – Junior Engineer

### **Course Assistant:**

Mr. Sumit Sharma, DEO

### **Contacts Address:**

National Institute of Disaster Management (NIDM)  
(Ministry of Home Affairs, Government of India)  
A-wing, 4th floor, NDCC-II Building,  
Jai Singh Road, New Delhi – 110001  
Website: [www.nidm.gov.in](http://www.nidm.gov.in)



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

**Nomination Form**

Name of Programme: Training Programme on “Flood Risk Management”

Date & Venue: **11 June – 15 June 2018 at YMCA Tourist Hostel - New Delhi YMCA.1 Jai Singh Road, New Delhi-110 001.**

Name of Nominee: \_\_\_\_\_

Designation: \_\_\_\_\_ Age \_\_\_\_\_

Name & Address of the Organization \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Address for Correspondence: \_\_\_\_\_

\_\_\_\_\_

Tel: STD Code: \_\_\_\_\_ Office: \_\_\_\_\_ Residence: \_\_\_\_\_

Mobile: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

Accommodation requirement during training (Required/Not required): \_\_\_\_\_

Expectations from the Course: \_\_\_\_\_

\_\_\_\_\_

In what way do you think that this training will be useful for you? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Name, Designation and Signature of the Nominating Authority**

**Date:**

\_\_\_\_\_

Address: A-Wing, 4<sup>th</sup> Floor, NDCC-II Building, Jai Singh Road, New Delhi-110001.  
Phone: 011-23438296 Fax: 011-23438290/8287/8285/8288/86 Mob: 8279846376  
Email: [nidmtrgcell@gmail.com](mailto:nidmtrgcell@gmail.com) Website: [www.nidm.net](http://www.nidm.net), [www.nidm.gov.in](http://www.nidm.gov.in)