सत्यमेव जयते

National Conference on Coastal Disaster Risk Reduction and Resilience
(CDRR&R)-2020



Tuesday 25th Feb, 2020

Venue:
Banquet Hall, 3rd Floor, The Ashok Hotel, 50-B,
Diplomatic Enclave, Chanakyapuri, New Delhi, India-110021

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Resilient India : Disaster free India

National Institute of Disaster Management
Ministry of Home Affairs, Government of India

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National Conference on Coastal Disaster Risk Reduction and Resilience (CDRR&R)-2020

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Inaugural Session
Ms. Aradhna Moktan and Mr. Arun Verma

Plenary Session: Initiatives on Coastal DRR&R
Ms. Mohana Manna and Ms. Shilky

Parallel Session I: Frameworks and Strategies on CDRR&R
Mr. Tanmay Uttam Gound, Ms. Aradhna Moktan and Mr. Arun Verma

Parallel session-II: Challenges and Opportunities for CDRR&R
Ms. Shilky, Ms. Mohana Manna and Mr. Tanmay Uttam Gound

Valedictory Session
Ms. Aradhna Moktan and Ms. Shilky

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Background

The coasts are one of the highly dynamic parts of the earth surface. About half of the world's population (~3 billion people) lives within 200 kilometers of a coastline. Coastal areas have been attractive human settlements as these areas provide abundant marine resources, fertile agricultural land and possibilities for trade and transport. Coastal areas contain world's most sensitive ecosystem like mangroves, wetlands, coral reefs, dunes and beaches. The various natural hazards pertaining to coastal zones are hydro-meteorological disasters (cyclone, wind damage, storm surge, heat and cold waves, heavy rainfall, lightning, droughts, floods), geological disaster (earthquake, tsunami, landslides), biological disasters like epidemics and anthropogenic disasters like stampedes, oil spills and fires besides the potential technological, industrial, chemical and radiological disasters. Adverse climate change impacts and rapid unscientific developments with rise in population are likely to aggravate and magnify the incidences and impacts of these disasters. Hence, it is very important to understand the nature, dynamics, trends and scales of these disasters well for minimizing the risks and enhancing the resilience amongst the affected communities. The conference has been planned with this background in mind.

Indian Context

The 7516 km long coastline of India is threatened by many natural hazards resulting in the loss of life and property. About 40% of the total population of India lives within 100 km of coastline. Data for the period 1980-2000 shows that on an average, annually 370 million people are exposed to cyclones in India. Furthermore, India's coastline has already been affected by the sea level rise (SLR) that has been recorded at a rate of 2.5 mm per year since the 1950s. The east coast of India is more affected by the seasonal tropical cyclones in South West monsoon as well as in the return North East monsoon as compared to west coast. There are 13 coastal states/UTs encompassing 84 coastal districts which are affected by cyclones. Amongst them Andhra Pradesh, Odisha, Tamil Nadu and West Bengal and Puducherry (UT) on the East Coast and Gujarat state on the West Coast are more vulnerable to cyclone disasters as compared to other coastal states and UTs. The major multi hazards that threaten the eastern coast are; tropical cyclones, sea level rise, floods, coastal erosion, and storm surge. Some of the dreadful events that had catastrophic effects include the super cyclone of Orissa in the year 1999 devastated the coastal area of Paradip with storm surges penetrating up to 100 along the river Mahanadi causing extensive damage to human life and property, Indian Ocean Tsunami of 2004 caused loss of human life and damage on property to the coast of Tamilnadu. Similarly, recent cyclones such as Fani, Gaja and Hudhud as well as severe floods have caused massive devastation to its coastal states (Odisha, Andhra Pradesh, Tamil Nadu and Kerala). The August 2018 floods in Kerala, for example, number of completely and partially damaged houses were 2,632 and 11,223, damage to permanent crops was 881 (INR crore), and overall 435 km of roads (179 km of SH & 256 km of MDR) are fully damaged. The total recovery needs of the State were estimated at INR 31,000 crore (USD 4.4 billion),

according to the Post Disaster Needs Assessment (PDNA) jointly conducted by the Kerala Government, UN Agencies, World Bank and European Commission. Similarly, the April 2019 cyclone Fani damaged 3.62 lakh houses (2.96 lakh in rural and 66,040 in urban areas), and 100,880 lakh hectare of agricultural land. The assessment estimated the total damage to be worth INR 16,465 crore (USD 2,352 million and total loss to be worth INR 7,712 crore (USD 1,102 million). The estimated recovery needs are INR 29,315 crore (USD 4,188 million). Studies and the damage assessment report indicate that it will take the coastal states about 5 to 10 years to rebuild and recover. Consequently, there has been a dramatic decrease in the casualty count: over 9,887 in 1999 (IMD, 2000); 64 in 2014 due to cyclone Hudhud (Parliamentary Standing Report-195); and 64 in 2019 due to cyclone Fani (UNICEF, 2019). However, coastal states are facing significant challenges in rebuilding the critical infrastructure lost and damaged, and in recovering from the consequent disruptions caused by disasters

In order to reduce the impact of coastal disasters, Government of India has taken up major projects including National Cyclone Risk Mitigation Project by National Disaster Management Authority (for 13 cyclone prone States and Union Territories (UTs)) and Multi-hazard Vulnerability Mapping by Ministry of Earth Sciences. The projects have the objective to make infrastructure disaster resilient, in harmony with conservation of coastal ecosystems. In India, about 129 institutions are currently working on the ocean and marine related issues.

Global Context

The total length of the world's coastlines is about 504,000 km, usually densely populated and places of intensive economic development. More than 70% of the world's megacities (greater than 8 million inhabitants) are located in coastal areas. Half of the world's cities with more than one million people are sited in and around estuaries. Population growth and economic pressure in the coastal zone will continue to increase in the near future. Especially in the light of projected global climate change, it is of paramount importance to comprehend the long-term (decades to centuries) and large-scale (10–102 km^2) evolution of the coastal zone for sustainable coastal management and related coastal impact assessments. In present scenarios, China, India, Bangladesh, Vietnam, Thailand, Myanmar, USA, Egypt, Nigeria, Japan, Indonesia population are exposed to coastal flooding; storm surge events is highest in Asia (Organisation for Economic Co-operation and Development, 2007)

According to Organization for Economic Co-operation and Development (OECD) reports, the cities with the highest value of property and infrastructure assets exposed to coastal flooding are primarily in developed countries. Miami is the most exposed city and will remain so, with exposed assets rising from approximately US$400 billion to over US$3.5 trillion. Guangzhou is the second most exposed city in terms of assets, followed by New York, Kolkata, Shanghai, Mumbai, Tianjin, Tokyo, Hong Kong, and Bangkok, respectively.

Inaugural Session

Inaugural session was presided over by **Shri G. V. V. Sarma,** *Member Secretary of National Disaster Management Authority (NDMA);* **Dr. Mrutyunjay Mohapatra,** *DGM, IMD;* **Dr. R. K. Bhandari,** *Distinguished Professor (IITR) and Member, Advisory Committee, NDM* along with **Major General Manoj Kumar Bindal,** *VSM, Executive Director, NIDM;* and **Prof. Surya Parkash,** *Head GMR Division, NIDM.*

The inaugural ceremony commenced with a warm welcome to the dignitaries and participants by the conference coordinator, **Dr. Surya Parkash,** *Professor & Head GMR Division, NIDM.* He shared the conference agenda with the dignitaries as well as delegates and informed them regarding the potential hazards and risks faced in the coastal zones. He elaborated on Prime Minister's 10 Point agenda and Sendai Framework on Disaster Risk Reduction (2015 – 2030). He stated that the conference would deliberate upon the need to understand disaster risk reduction and resilience efforts with a view to reduce the damages and losses in the coastal region.





In his inaugural address, **Major General Manoj Kumar Bindal,** *VSM, Executive Director, NIDM* gave brief view regarding the coastline of India and associated hazards like hydro-meteorological disaster, geological disaster and anthropogenic disaster etc. He narrated the impact of coastal hazards on life, livestock and economy of the country. He stressed on the necessity of having a CDRR Management system, having formal jurisdiction and integrating it in policy making as well as plans. Finally, he concluded by saying that the recommendations and suggestions that will emerge from the parallel sessions I & II, will be the prime focus of the conference. This will also be discussed in detail and documented in report.



Dr. R.K Bhandari, *Distinguished Professor (IITR) and Member, Advisory Committee, NDMA* started his speech by saying that India as a country, with all the chaos going on, we should focus more on our strengths and abilities rather than weaknesses. He said that our strengths are: NDMA, NIDM, IMD, all Govt. institute and all the nodal organizations. He highlighted the guidelines on management of cyclone and need of multi hazard approach to the coastal areas. He elaborated on PM10 point agenda. Dr. Bhandari openly discussed about the problems in policies, absences of appropriate reviews in the journals and plagiarism issues. While concluding, he acknowledged and applauded the NIDM team for organizing the conference on this sensitive and pertinent topic i.e. Coastal DRR&R.



Dr. Mrutyunjay Mohapatra, *DGM, IMD* began by giving an overview about cyclone Bhola in 1970 that is recorded as one of the deadliest natural disasters. He stated that coastal areas are vulnerable to major disasters namely cyclone, tsunami, storm surge and thunderstorm and hence IMD is collaborative with various Government agency for generation of Early Warning System (EWS) for relevant disasters. IMD forecast at regional, global, mesoscale and nowcasting level has improved quite a lot. He highlighted that due to climate change, the frequency of occurrence of the disasters in coastal areas has increased. He stated that IMD is working closely with INCOIS to provide Met services to the oceanic region and integrating with ocean state forecast of INCOIS. He also discussed the future plans of IMD for enhancement of its forecasting capabilities.



Shri G.V.V. Sarma, *Member Secretary of National Disaster Management Authority (NDMA),* Chief Guest, of the programme, during his inaugural address appreciated the initiative of NIDM for organizing national conference on CDRR&R which is the part of National Platform for Disaster Risk Reduction (NPDRR). He briefed about NPDRR platform where Government of India recognizes the need to evolve a participatory process of decision making in disaster management with active involvement of central and state governments as well as all stakeholders including people representing different interests in the field of disaster management. He also stressed for development of robust technologies, multipurpose cyclone shelters, strengthening of Early Warning System (EWS), improvement of role of SDMA's in capacity development etc. He urged to identify the specific risk in coastal communities. He said that India is gradually able to reduce the impact of cyclones after learning lesson from Super cyclone 1999 and Indian ocean tsunami, 2004. He mentioned about the NDMA's project for coastal states namely (i) National Cyclone Risk Mitigation Project (NCRMP) to minimize vulnerability to cyclones and make people and infrastructure disaster resilient (ii) National Earthquake Risk Mitigation Project. NCRMP Project has covered various aspects like improved early warning dissemination systems, enhanced capacity of local communities to respond to disasters, improved access to emergency shelter, evacuation, and protection against wind storms, flooding and storm surge in high areas, strengthening DRM capacity at central, state and local levels in order to enable. The NCRMP Project has identified 13 cyclone prone States and Union Territories (UTs), with varying levels of vulnerability. He said that there is need for post disaster need assessment (PDNA) to restoring damaged infrastructure, houses, livelihoods, services, governance and building resilience.



Inaugural session concluded with the vote of thanks by **Dr. Harjeet Kaur,** *Young Professional, NIDM* by expressing gratitude to Chief Guest **Shri G.V.V. Sarma,** *Member Secretary of National Disaster Management Authority (NDMA),* Guest of Honour **Dr. M. Mohapatra** *(DGM, IMD),* **Dr. R.K. Bhandari,** *Distinguished Professor (IITR)* and *Member, Advisory Committee, NDMA* and other dignitaries at the conference, Knowledge partners, delegates and participants of the conference across the country. Further, she extended her thanks to **Dr. Surya Parkash,** *Head, Geo-Meteorological Risks Management Division and Faculty Incharge, Specialized Centre on Coastal Disaster Risk Reduction & Resilience* and **Lt. Col. D.C. Vashista,** *Joint Director, NIDM*, **Shri Vikram Gurjar,** *DC (Trg.) NIDM,* logistic support team, YPs and other staff of the NIDM.



Left to Right: **Dr. Surya Parkash** *(Professor & Head of GMR Division, NIDM),* **Major General Manoj Kumar Bindal,** *VSM (Executive Director, NIDM),* **Shri G.V.V. Sarma,** *Member Secretary of National Disaster Management Authority (NDMA),* **Dr. Mrutyunjay Mohapatra** *(DGM, IMD),* **Dr. R.K. Bhandari** *(Distinguished Professor (IITR) and Member, Advisory Committee, NDMA)*

Plenary Session: Initiatives on Coastal DRR&R

Time: 11:20 to 12:10 hrs

Chairs: **Shri Rajendra Singh** *(Member NDMA)* and **Dr. Mrutyunjay Mohapatra** *(DGM, IMD)*

Speakers: **Shri Samir Kumar** *(Dy. Project Director NCRMP, NDMA);* **Shri Anup Karanth** *(Senior Disaster Risk Management Specialist, World Bank);* **Dr. E. Pattabhi Rama Rao** *(Scientist- F, INCOIS);* **Ms. Neetha K Gopal** *(Scientist-E, IMD)*



Left to Right: **Dr. E. Pattabhi Rama Rao** *(Scientist- F, INCOIS),* **Dr. Surya Parkash** *(Professor & Head of GMR Division, NIDM),* **Major General Manoj Kumar Bindal,** *VSM (Executive Director, NIDM),* **Dr. Mrutyunjay Mohapatra** *(DGM, IMD),* **Shri Rajendra Singh** *(Member NDMA),* **Shri Samir Kumar** *(Dy. Project Director NCRMP, NDMA),* **Shri Anup Karanth** *(Senior Disaster Risk Management Specialist, World Bank),* **Ms. Neetha K Gopal** *(Scientist-E, IMD)*

Key Points

- Role of NDMA in NCRMP and NSRMP projects.
- DRR&R initiatives and action by World Bank.
- Role of IMD in reducing the coastal hazards in India.
- Role of INCOIS in Tsunami Risk Reduction and Resilience.
- Early Warnings and Communication on meteorological hazards in coastal and island areas.

Opening Remarks by Chairs

Shri Rajendra Singh, *Member NDMA,* talked about the uniqueness of Indian geography and various hazards faced by coastal states. He raised concern on the increase frequency of occurrence of disasters recently. He emphasised on response based management to preparedness based management strategies. He highlighted on Sendai framework & its 7 targets. He suggested for collaborative work with NDMA in synergy to ensure better disaster risk management.





Dr. Mrutyunjay Mohapatra *(DGM, IMD)* shared his vivid experiences about the cyclones and their impact on coastal life. He pointed out the holistic approaches towards Coastal DRR&R viz. integrated approach to reduce the hazard risk, multi hazard Early Warning System (EWS), potential fishing zone map, numerical modelling and development of science and technology.



Shri Samir Kumar, *Dy. Project Director NCRMP, NDMA,* gave presentation on **"National Cyclone Risk Mitigation Project (NCRMP) and National Seismic Risk Mitigation Project (NSRMP)".** He discussed about the previous cyclones and their impact on coastal states like Cyclone Phailin in Andhra Pradesh in Oct 2013, Cyclone Hudhud in Andhra Pradesh and Odisha in Oct 2014, Cyclone Vardah in Tamil Nadu in 2016, Cyclone Titli in Odisha in Aug 2018,Cyclone Gaja in Andhra Pradesh and Tamil Nadu in Nov 2018, Cyclone Fani in Odisha in May 2019, Cyclone Bulbul in West Bengal in Nov 2019. He highlighted the NCRMP project's objectives, phase and its components. NCRMP project is being implemented by NDMA in 8 cyclone prone coastal states with overall budget of Rs. 5232 Crore. This project has two phases where phase I of the project has been completed and phase II is still going in 6 states. Phase I consisted of three components i.e. (i) Component A: Early Warning Dissemination System (EWDS); (ii) Component B:Cyclone Risk Mitigation Infrastructure (CRMI) which includes: MPCS (Multi-Purpose Cyclone Shelters), Road/Bridge, Saline Embankment, UGC (Underground Electric Cabling), Additional Mitigation Measures (Lightning Arresters/Coastal Belt Plantation); (iii) Component C: Technical Assistance for Multi-Hazard Risk Management & Capacity Building/ Training. Phase II of NCRMP project comprises various approaches theses are: Hazard Risk Vulnerability Assessment (HRVA); Hydro-meteorological Resilience Action Plan (HmRAP); Designing of Comprehensive Multi-hazard Risk Financing Strategies; Capacity Building of Government Officials; Shelter Level Training. He cited one of the example of success story of NCRMP assets which were used during Cyclone 'FANI' in Odisha. He also highlighted about the NSRMP project implemented by NDMA in 9 states/UTs. He stressed on the components of the project namely: Component A1: Earthquake Early Warning Dissemination System; Component A2: Enhancing Emergency Response Capacity; Component B: Multi-Hazard Risk Mitigation of Critical Facilities / Infrastructure; Component C: Technical Assistance to Improve Disaster Risk Management; Component D: Project Management, Monitoring and Implementation Support System.



Shri Anup Karanth, *Senior Disaster Risk Management Specialist, World Bank,* shared his views on **"Disaster Risk Reduction and Resilience (DRR&R) initiatives and actions supported by World Bank".** He mentioned the evolution of Disaster risk management (DRM) in India. He emphasized on five components of DRM i.e. Risk Identification, Risk Reduction, Preparedness, Financial Protection and Resilient Recovery. He cited some examples related to said components viz., Uttarakhand Disaster Recovery Project (UDRP); NCRMP-I India Cyclone Hazard & Risk Atlas & Development of Web-DCRA and DSS Tool for Cyclone and associated impacts including Storm Surge and Inland Flooding (NCRMP Phase II); and TNSMART. He discussed the role of World Bank to achieve SFDRR goals from Indian prospective which are:

Resilient Housing Reconstruction & Community Infrastructure:

- Hazard resistant design / Livelihood specific design
- Owner driven construction of houses and contractor built
- Rental allowance and relocation expenses
- Basic amenities and habitat development – Community infrastructure
- Multi-hazard insurance
- Dovetailing with other schemes (Indira Awas Yojana, Total Sanitation Campaign)
- Multi level support and monitoring mechanism

Urban Resilience: Increase Resilience of Public Infrastructure, Flood Risk Management

- Master plan for storm water drainage system
- Strengthening trunk water supply infrastructure
- Improved design and integration of services
- Change in design approach e.g infrastructure designed to address higher threshold of hydro meteorological events, service integration (underground cabling, connection of primary drains to outfall drains, improved sanitation, improve service delivery & living conditions)
- Upgrading of slums
- Street improvement

- Access to improved water and sanitation
- Drainage
- Septic management
- Street lighting

Besides above these, World Bank is also involved in Resilient Electrical Network, CBDRM / DRR in Education, Restoration of Environment Services and Livelihood Support, Strengthening Emergency Response Capability, Sustainable fisheries and Integrated Coastal Zone Management Project.



Dr. E. Pattabhi Rama Rao, *Scientist – F and Head ODG, INCOIS,* started his presentation on **"Role of INCOIS in Tsunami Risk Reduction and Resilience"** by discussing the vulnerability of Indian coastal states to Tsunami and mentioned about two major subduction zones that may cause Tsunami for India: (i) Andaman Sumatra Subduction Zone and (ii) Makran Subduction Zone. He talked about the initiative taken by the Govt. of India to disseminate Early Warning System for Tsunami. He enlightened the participants about the four modules of the Tsunami Early Warning System developed by INCOIS:

- Observation Module;
- Communication Module;
- Modeling Module;
- Research & Development (R&D) and Capacity building Module.

INCOIS has conducted various programmes and drills conducted for various stakeholders namely Capacity building programmes for DRR professional; Capacity building programmes coastal communities; and Regional and National Mock drills. He highlighted the major initiatives taken by ICNOIS is Indian Ocean Tsunami Ready Programme (soon to be known as IOC_UNESCO Tsunami Ready Programme) for enhancing the coping capacity of coastal communities to tackle Tsunami. This programme has been successfully completed in two villages of Odisha.



Ms. Neetha K. Gopal, *Scientist-E, IMD* shared **"Initiatives and projects taken by the Organization for early warning dissemination for meteorological hazards in coastal areas".** She discussed about all the meteorological hazards that affects coastal areas like storm surges, thunderstorms, heavy rains, strong winds and associated high waves. She mentioned that IMD combines the early warning for all the different meteorological hazards and provide a single bulletin. In this line, the major points discussed by her are:

- International Responsibility of IMD in issuing warnings
- Issuance of Warnings for Tropical Cyclones
- Cyclone hazard analysis for vulnerable districts of all the states of the country

She also discussed the initiatives undertaken by IMD for issuing warning to fisherman.

Open House and Interventions from audience

- There is the gap of communication link between the community radio centers with IMD
- Future Connectivity for Disaster and Emergency Point of Care
- Frequency of issuing warnings during tsunami
- Synergy between the coast guard and IMD
- Lack of awareness of community towards risks of various disasters





Closing Remarks

- Strategies for mainstreaming Coastal DRR&R include policies that clearly lay down the road map to integrate Coastal DRR&R.
- There should be an establishment of a direct link with community radio centers with IMD.
- Ocean and Atmospheric Technology plays a dominant role for an end-to-end integrated Meteorological Services for DRR.
- IMD and MoES are continuously strengthening and upgrading their Early Warning System (EWS) aiming at DRR based on state of art technology.
- Essential management strategies to save invaluable life and valuable assets.

Pre-lunch Roundtable Meetings and Discussions

Time: 12:10 to 12:55 hrs

Theme 1: **Governance and administration for Coastal Disaster Risk Reduction and Resilience**

Chairs: **Dr. Santosh Kumar** *(Professor, NIDM);* **Shri P. P. Srivastav** *(Member, Advisory Committee, NDMA)*; **Dr. P.K. Singh** *(Associate Professor, LBSNAA).*



Left to Right: **Dr. Santosh Kumar** *(Professor, NIDM),* **Shri P. P. Srivastav** *(Member, Advisory Committee, NDMA),* **Dr. P. K. Singh** *(Associate Professor, LBSNAA)*

The roundtable discussion on the theme has been led by Shri P.P. Srivastava, a veteran Bureaucrat and initiated by Professor Santosh Kumar, NIDM and supported by Dr. P. K. Singh from LBSNAA, Mussoorie. After a background note and discussion by the chairs, the following key points emerged from the discussions with the participants:

- Efficacy of Post Disaster Need Assessment (PDNA).

- Equal importance to human lives and livestock.
- Both government and private sectors can invest to reduce losses and risk.
- Utilization of fund for demand driven programme in DRR.
- Approaches to finance CDRR&R from national budgets.

Theme 2: **Science and Technology for Coastal Disaster Risk Reduction and Resilience**

Chairs: **Dr. Ramanathan Baskar** *(Professor, Guru Jambheshwar University of Science and Technology, Hissar);* **Dr. Basanta Kumar Jena** *(Scientist-G, National Institute of Ocean Technology);* **Dr. G Suresh** *(Scientist-F, National Center for Seismology)*



Left to Right : **Dr. Ramanathan Baskar** *(Professor,Guru Jambheshwar University of Science and Technology, Hissar),* **Dr. Basanta Kumar Jena** *(Scientist-G, NIOT),* **Dr. G. Suresh** *(Scientist F, NCS)*

Opening of the meeting discussions, the chairs shared their experiences of cyclone Fani, Hudhud and Indian Ocean tsunami and requested discussant to share their respective experiences on the theme of roundtable meeting. Some of the key points that emerged from the roundtable discussions are listed below:

- Science & technology support the implementation of SFDRR (2015-2030) and PM 10 point Agenda.
- DRR associated with climate change.
- Extreme climate whether events.
- Functions of INCOIS and IMD in EWS.
- Projects run by CSIR and other institute to reduce the risk of coastal disaster.
- Role of youth in the application of science for DRR.

Theme 3: **National, State and Local Level Frameworks for Coastal DRR&R**

Chairs: **Prof. Surya Parkash** *(Head GMR Division, NIDM)* and **Shri Samir Kumar** (*Dy. Project Director NCRMP, NDMA*)



Left to Right: **Shri Samir Kumar** *(Dy. Project Director NCRMP, NDMA) ;* and **Prof. Surya Parkash** *(Head GMR Division, NIDM)*

Professor Surya Parkash, NIDM initiated the discussion by informing that the country has a legal institutional framework at national, state, district and local levels for activities related to disaster risk reduction and

resilience. Because of geographical affinity and commonality of disasters in coastal area, there is a need for coordination and collaboration at all levels. Shri Samir Kumar from NDMA, informed about the national cyclone risk mitigation project and initiatives made in the coastal states. He pointed out the field challenges in multi-hazard risk assessment and management. The major outcomes of the discussion in this thematic session are:

- Flood management in coastal areas need to be sensitized for effective CDRR&R.
- Improve data quality and accessibility of economic and social impacts of disaster in coastal area.
- Reduce overlap in national and regional DRR competencies.
- Need for clarity in governance structures and procedures as well as the importance of citizen engagement.
- Support more multi-disciplinary collaborations.









Post-lunch Roundtable Meetings and Discussions

Time: **13:40 to 14:25 hrs**

Theme 4: **Socio-economic, Environment and Emerging Issues**

Chairs: **Dr. S. K. Das** *(Scientist F, National Centre for Coastal Research) and* **Shri Anil Kathait** *(Young Professional, NIDM)*



Left to Right: **Shri Anil Kathait** *(Young Professional, NIDM)* and **Dr. S. K. Das** *(Scientist, NCCR, Ministry of Earth Sciences)*

Dr. S. K. Das and Shri Anil Kathait, chairs of the roundtable discussions provided a brief background on the socio-economic, environment and emerging issues related to disaster risk reduction and resilience in coastal area. They urged discussants to express their issues, critical situations and challenges that they are facing during the disaster. The important issues discussed in the session are:

- Need to address gender inequalities of Disaster Risk.
- Develops a regional scale coastal risk assessment framework to assess future risk.

- Complex systems of emergencies response and management at national level were highlighted.
- Plan sufficient funding for adaptation to climate change related risk in particular rising sea level and extreme weather events.

Theme 5: **Public Private Partnerships (PPP) and Corporate Social Responsibility (CSR) for Coastal Disaster Risk Reduction and Resilience**

Chairs: **Prof. Surya Parkash** *(Head GMR Division, NIDM)* and **Dr. Harjeet Kaur** *(Young Professional, NIDM)*



Left to Right: **Prof. Surya Parkash** *(Head GMR Division, NIDM)* and **Dr. Harjeet Kaur** *(Young Professional, NIDM)*

Professor Surya Parkash from NIDM initiated the discussions highlighting the Government of India initiatives for involving Public, Private and Corporate Sectors in the process of Disaster Risk Reduction and Resilience. The key points discussed by the participants are:

- Promote combinations of measures including ecosystem based solutions to reduce the impact of coastal disasters.

- Need to develop stronger stakeholder involvement in CDRR&R.
- Various types of hazard induced by industries in coastal areas.
- Inclusion of disaster management in Coastal Zone Regulation (CRZ).
- Need to review the management strategies for Chemical, biological, radiological and nuclear (CBRN) disasters in coastal areas.

Theme 6: **Community based Coastal Disaster Risk Reduction and Resilience**

Chairs: **Ms. Shreya P. Singh,** *IAS (Collector (Revenue)/ Additional District Magistrate, Villuppuruam District, TN)* and **Ms. Anu Puri** *(UNICEF)*



Left to Right: **Ms. Shreya P. Singh,** *IAS (Collector (Revenue)/ Additional District Magistrate, Villuppuruam District, TN)* and **Ms. Anu Puri** *(UNICEF)*

Ms. Shreya P. Singh, IAS initiated the discussion in the roundtable meeting on theme with the remark that the community is the ultimate stakeholders as first sufferer and also the first responder at the local levels. Ms. Anu Puri from UNICEF shared her experience working in the field of coastal disaster and

discussed about the projects carried out by UNICEF to achieve SFDRR goals. The co-chair discussed about the vulnerability of coastal states and opened the session for contribution from the discussants.
The major points discussed are highlighted below:

- At local level, build capacity, particularly by improving general CDRR&R competence and by focusing on prevention measures and activities
- Fostering collaboration and cooperation amongst and between key stakeholders
- Enhancing awareness, knowledge and understanding of CDRR&R at community level
- Promote participatory approaches in CDRR&R









Parallel Session-I: Frameworks and Strategies on Coastal DRR&R

Time: **14:40 to 15:20 hrs**

Chair: **Dr. Pradeep Kumar,** *IAS, Spl. Secretary and PD, NCRMP*

Speakers: **Prof. Santosh Kumar** *(Head G & IDRR Division, NIDM);* **Dr. Basanta Kumar Jena** *(Scientist-G, National Institute of Ocean Technology);* **Shri Surajit Bordoli** *(Social Management Specialist, NCRMP)*



Left to Right: **Prof. Surya Parkash** *(Head GMR Division, NIDM),* **Prof. Santosh Kumar** *(Head G&IDRR Division, NIDM),* **Maj. Gen. Manoj Kumar Bindal** *(Executive Director, NIDM),* **Dr. Pradeep Kumar,** *IAS (Spl. Secretary and PD NCRMP),* **Dr. Basanta Kumar Jena** *(Scientist-G, NIOT),* **Shri Surajit Bordoli** *(Social Management Specialist, NCRMP)*

Opening Remarks by Chair

Dr. Pradeep Kumar, *IAS, Spl. Secretary and PD NCRMP, NDMA* gave his formal introduction by talking about his research experience in coastal pollution, ecosystem and capacity building working with the community. He also gave brief information about the coastal area and how community is dependent on

coastal area for livelihood. He suggested considering coast as sensitive approach. He told that when a disaster occurs in coastal area the entire livelihood gets affected, thus he said that the objectives of the session should be:

- How to reduce the economic loss?
- What are the emerging issues? and
- How disaster impact on environment?



Prof. Santosh Kumar, *(Head G & IDRR Division, NIDM)* presented the outcomes of roundtable meeting entitled **"Governance and Administration on Coastal DRR&R".** He briefed about the governance and administrative action taken by central and state government and highlighted the various issues that are being faced while working at local level. He stated that east coast is more vulnerable to west coast. In this regard he stressed on identifying the specific hazard & vulnerability with respect to geographical area. He discussed about the forecasting, hydraulic and hydrodynamic models for floods, storm surge in Chennai and integrated these models to developed TNSMART app which is a web GIS based Decision Support system to strengthen preparedness, response, and recovery and mitigation measures during multi hazards of flood, cyclone and tsunami. Similar system now has been replicated for other coastal states of India. TNSMART of Tamil Nadu state is an excellent example of utilization of science and technology for building a disaster resilient India.

The key suggestions from round table discussions are:

- Governance framework should be focused on 3 composition of DRR i.e. life, livestock and livelihood.
- He emphasized to relook the DRR plans at district, state and national level.
- State government should develop village level volunteers those are actively participating during disaster.
- The project proposals for the coastal areas need to look into differential need and differential geographical areas. He suggested a comprehensive scenario-based robust approach embedded in Coastal DRR.
- He urged all the agencies/institutes/departments to work in collaboration together and break silos.
- Scientist from MOEFCC urged the Coastal authority to work together DM authorities for coastal

areas problem. Coastal zone regulation (CRZ) and Disaster Management (DM) Act should get together.

- Need to strengthen the training and capacity building in the area of disaster management.
- He also pointed out to strengthen the governance for financing in DRR.



Dr. Basanta Kumar Jena *(Scientist-G, National Institute of Ocean Technology)* conferred the outcomes of roundtable meeting on **"Science & Technology for Coastal DRR&R".** He suggested for developing evidence based guidance on future investment for the coastal projects to further enhance the coastal resilience and reduce risk by evaluating past, ongoing interventions in a highly participatory process with the local stake holders. He also highlighted to consider the climate change into account for all coastal hazards like, storm surge, coastal erosion, and ecosystem disturbance to water quality. He also mentioned the responsibility of MoES-NCS for monitoring earthquake and microzonation studies for seismicity. NCS disseminates the earthquake (EQ) information to all decision making authorities in the least possible time through SMS, Email, Fax etc. The EQ information with value added products published through Mobile-App RISEQ and website seismo.gov.in.

The key suggestions from round table discussions are:

- He suggested to classify the projects basis on the severity of the coast like Seawalls for Puducherry coast; Beach restoration for Puducherry; Multipurpose cyclone warning system; Shore protection for Pentha coast using geosynthetic tubes; Beach nourishment for Visakhapatnam coast; Mangrove plantation in Sunderbans; Cyclone Warning System; Coastal Regulatory Zone.
- He stressed on the selection and exploration of future interventions, carried out by means of stakeholder consultations.
- He suggested for analysis of cost benefit of a selected number of proposed interventions.
- Developing a strategic investment plan and identify funding sources for execution of the project.
- Cyclone shelters – routine maintenance assessment of its engineering deficiencies and upkeep for next future disaster.
- Monitoring of coastal infrastructure and enforcing norms prepared by BIS and other coastal

agencies. Information and other valuable products should be made available to the public through a single web portal.



The outcomes of roundtable meeting on the topic **"National, State, District and Local level Frameworks for Coastal DRR&R"** were presented by **Shri Surajit Bordoli** *(Social Management Specialist, NCRMP).* He emphasized the need for multi-hazard integrated risk management strategies. He also highlighted the role of haphazard development activities in increasing the number of disaster events particularly in coastal areas. The key suggestions from round table discussions are:

- He urged simpler, community based ideas which are important such as first aids, search and rescue, capacity buildings, considering vulnerable group as an integral part of vulnerability assessment and need to involve community radio as partners in disaster management.
- He also stressed that senior citizen, children; disabled should be looked upon differently while formulating coastal disaster risk management.
- Community involvement through Ham Radio etc. for disseminating the information, and need to be trained about the level of impact of disaster to sensitize the Public.
- Media people to understand the bulletins for different hazards issued by Operational agencies. They need to be trained. Further, Teachers/Staff of local Schools/Colleges/Local Institutes are also to be involved.

The session concluded with the suggestion that budget can be allocated to stimulate training programmes which can help the adverse situation faced by vulnerable groups during disaster Phases.

Parallel Session-II: Challenges and Opportunities for DRR&R

Time: **15:20 to 16:00 hrs**

Chairs: **Shri P. P. Shrivastav** *(Member, Advisory Committee, NDMA)* and **Dr. Surya Parkash** *(Prof. & Head GMR Division, NIDM)*
Speakers: **Dr. S. K. Das** *(Scientist F, National Centre for Coastal Research),* **Dr. Harjeet Kaur** *(Young Professional, NIDM),* **Ms. Shreya P. Singh,** *IAS (Collector (Revenue)/ Additional District Magistrate, Villuppuruam District, TN)*



Left to Right: **Shreya P. Singh,** *IAS (Collector (Revenue)/ Additional District Magistrate, Villuppuruam District, TN),* **Maj. Gen. Manoj Kumar Bindal** *(Executive Director, NIDM),* **Shri P. P. Srivastav** *(Member, Advisory Committee, NDMA),* **Dr. Harjeet Kaur** *(Young Professional, NIDM)*: **Dr. S. K. Das** *(Scientist, NCCR, Ministry of Earth Sciences)*

Opening Remarks by Chairs

Shri P. P. Shrivastav, Session Chair stated that the roles of civil societies are vital and we could learn from each state so as to include Build Back Better approach. He urged speakers from the states to express how they are going ahead in terms of the execution.





Dr. Surya Parkash as a co-chair briefed about the improvement in dissemination of public information about any extreme events like lightning, tsunami, cyclone, storm surges, and flood needs to be taken care of. He also stressed on focusing on lightening and heat wave and robust technologies have been used for early warning.

Dr. S. K. Das *(Scientist-F, National Centre for Coastal Research)* shared **"Socio-economic, Environmental and Emerging Issues".** He addressed the complexity of risk in two-way system between environment and human societies. He also recognized that ecosystem services, environmental management offer opportunities to reduce the disaster risk.



The following are the major points discussed during the session:

- Population growth and increased rural/urban migration contribute to changing patterns in increasing people's exposure to hazards.
- Climate change and rising sea levels, are affecting the patterns and intensity of hydro-meteorological hazards.
- Need to identify the vulnerability of the geographical area and develop management strategies for vulnerable group namely old age, children, women and disabled persons etc.
- He stressed to recognize the need for policy to tackle the complexity of Socio-economic, Environmental and Emerging challenges in Coastal areas.



Dr. Harjeet Kaur *(Young Professional, NIDM)* presented the outcomes of roundtable meeting on **"Public Private Partnerships (PPP) and Corporate Social Responsibility (CSR) for Coastal Disaster Risk Reduction and Resilience".** She discussed hazards associated with Port industry developed in coastal states.

The key points discussed are as follows:

- Need for development of early warnings and personnel in the field that are limiting the effects of CBRN (Chemical, Biological, radiological) threats.
- Enhance capacity building and community based approach for coastal areas.
- Ecosystem based approach should be involved in CDRR&R.
- Enhance the capacity of health centers in rural part of the coastal area and suggested boat ambulance in coastal communities.
- She suggested mangrove plantation along the coast to avoid the coastal erosion.
- One of the participants suggested for cloud based platform in DRR&R
- She also mentioned role of institute those are particular dealing with industrial disaster & management like Federation of Indian Chambers of Commerce & Industry (FICCI).
- She mentioned that there is need for development of business continuity plan for coastal industries with the sake of DRR&R.

Ms. Shreya P. Singh, *IAS (Collector (Revenue)/ Additional District Magistrate, Villuppuruam District, TN)* highlighted the need of "Community based Coastal Disaster Risk Reduction and Resilience" by sharing her experiences from the field.



The major points discussed are:

- She urged to widely disseminate best practices related to disaster management regionally through community radio and broadcasting.
- She discussed to enhance capacity of communities to respond, by adapting the effects of climate change and environmental degradation.
- She stressed on implementation of village based disaster management plan.
- She highlighted the role of community radio in CDRR&R.
- She also pointed the problem of insufficient funds for NGOs and community radio.
- She recommended the user-friendly early warning system for the communities.

The session concluded with the suggestions that

- Cloud based platform in CDRR&R is urgently required.
- Implementation of village based disaster management plan.
- Development of training module for CDRR&R.
- Harnessing multi-stakeholder and multi-level platforms.

Valedictory Session

Valedictory session was graced with presence of Chief Guest **Shri Nityanand Rai,** *MoS Home Affairs,* Guest of Honour: **Shri Kamal Kishore,** *Member NDMA;* **Maj. Gen. Manoj Kumar Bindal,** *ED NIDM;* **Dr. Surya Parkash,** *Professor & Head GMRD, NIDM* and **Lt. Col. Dinesh Chander Vashista,** *JD NIDM.* **Maj. Gen. Manoj Kumar Bindal** *(Executive Director, NIDM)* addressing the valedictory session of the conference



Left to Right: **Dr. Surya Parkash** *(Prof. & Head GMRD, NIDM),* **Maj. Gen. Manoj Kumar Bindal,** *VSM (Executive Director, NIDM),* **Shri Nityanand Rai** *(Minister of State, Home Affairs),* **Shri Kamal Kishore** *(Member NDMA),* **Lt. Col. Dinesh Chander Vashista** *(Joint Director, NIDM)*



Dr. Surya Parkash, *Professor & Head GMRD, NIDM* welcomed the dignitaries on the dais and summarized the outcomes of sessions of the conference in his valediction address. He highlighted the initiatives and action taken by IMD for integrated holistic approach and its outreach to various stakeholders for early warning and communication and also suggested the last mile outreach through community radio. He mentioned the contribution of NDMA and Govt. of India towards disaster management and highlighted the National Disaster Risk Management Fund, National Disaster Response Fund, National Disaster Mitigation Fund, State level Disaster Risk Management Fund and various other schemes which have come up after Fifteen Finance Commission Report. He briefed the role of World Bank towards CDRR&R and World Bank initiatives and collaboration with Department of Fisheries, Ministries of forest and Climate change, Ministry of Home Affairs etc in planning and implementing projects related to CDRR&R. He also highlighted the Initiatives on Tsunami Risk Reduction and Resilience by INCOIS (to name a few tsunami early warning systems, preparation of vulnerability maps etc). INCOIS is a national organisation and nodal institute for tsunami Warning in India which was formed after the tsunami disaster of 2004. He also discussed how IMD is involved with Early warning and Communication Geo-meteorological hazards such as cyclone, lightening, hailstorms etc in coastal and island areas.



In his valedictory remarks **Maj Gen. Manoj Kumar Bindal,** *ED NIDM* welcomed the chief guest Shri Nityanand Rai, MoS, MHA and briefed him about the conference. He stated that coastal areas are more vulnerable to disaster; partly due to denser urbanization and human populations and related economic activities in these locations. In coastal areas, to bring up a Coastal Disaster Risk Reduction and Resilience a coordinated, collaborated and holistic approach involving multi-stakeholders such as Ministries/government departments, various NGO, Community radio, HAM radio, Self-help groups etc should be promoted. He also pointed out that NIDM will document the outcome of the conference and will continuously stride towards making coastal areas of the country disaster resilient through research and training on gaps identified during different sessions of the conference.



Shri Kamal Kishore, *Member NDMA,* the Guest of Honour highlighted the importance and need of the national conference on Coastal DRR&R. He highlighted that even though coastal areas are vulnerable yet they have very high economic growth. So an effort should be made to minimize the hazard risk and maximize the economic growth. He further added development of coastal areas without compromising natural resources such as mangroves, wetlands, sand dunes and marine ecosystem. He stressed on need of development of multilingual DM guidelines & policy for the country. He concluded valediction address with a slogan "Aapda Prabandhan Mahavicchar, Pura Bharat Bhagidar".



Hon'ble Minister **Shri Nityanand Rai,** *Minister of State, Home Affairs,* Chief Guest, presided over the valedictory session of the national conference. He congratulated NIDM team for bringing up the subject of Coastal DRR&R. In his address, Sh. Nityanand Rai highlighted the major interventions carried out by Ministry of Home Affairs for CDRR&R including PM10-point agenda on DRR, Paris Agreement and SFDRR (2015-2030). He talked about the major projects carried out by Ministry of Home Affairs to reduce the risk of hazards namely (i) National Cyclone Risk Mitigation Project (NCRMP) to minimize vulnerability to cyclones and make people and infrastructure disaster resilient (ii) National Earthquake Risk Mitigation Project (iii) Decision Support System for offsite Nuclear Emergencies (iv) National Disaster Management Services Pilot Scheme and many more. He also emphasized the role of communities and volunteers in disaster situations. In the context with coastal disaster, he mentioned significance importance of mangrove ecosystem.



Lt. Col. Dinesh Chander Vashista, *Joint Director, NIDM,* concluded the national conference with vote of thanks. He conveyed his heartiest thanks to Hon'ble Minister of State *(Home Affairs)* **Shri Nityanand Rai,** *Member, NDMA,* **Shri Kamal Kishore** and all esteem guests, dignitaries, speakers, discussants, DM Division MHA, NDMA, knowledge partners, media and staff of NIDM for making the conference a successful.

Way Forward

The key takeaways from the national conference are summarized below:

- To encourage the implementations of recommendations made by national authorities for coastal disaster risk reduction and resilience.
- To promote the integration of the Governance of DRR & climate change.
- To strengthen governance and administration strategies for Coastal DRR&R.
- To strengthen the guidelines, plans and action framework at all levels with keeping in the view of the community and their vulnerability.
- More research to link climate change with coastal hazards.
- To promote Post Disaster Need Assessment (PDNA) aftermath of disaster.
- To promote community participation through CBDRM.
- To establish common dimensions, indicators and sub-indicators for assessing resilience.
- Development and implementation of coastal community resilience assessment frameworks.
- To adopt nature based strategies and solution for coastal disaster management.
- To adopt user-friendly early warning system for the communities.
- To promote ecosystem based approach for CDRR&R.
- To develop robust practical networking, linkage, coordination and collaboration among different stockholders including institutions and individual experts to share exchange and disseminate the information and knowledge.
- To strengthen local accountability and participation in CDRR&R.
- To bridge the gaps between national, local and community levels in order to build resilience.
- To develop a road map for future plans and actions.

Abstract Volume - **National Conference on Coastal Disaster Risk Reduction and Resilience – 2020**

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

The Abstract Volume is the product of contributions from International and National scientists and researchers working in the field of coastal disaster risk reduction and resilience. Around 21 delegates share their original work through this abstract volume.

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