

5th

WORLD CONGRESS
ON
DISASTER MANAGEMENT

24-27 November, 2021 • New Delhi • India

WCDM

**Technology, Finance, Capacity
for Building Resilience to Disasters**

With Special Focus on Pandemics

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NARENDRA MODI
PRIME MINISTER OF INDIA



MESSAGE

It is heartening to learn that Disaster Management Initiatives and Convergence Society is organising the 5th World Congress on Disaster Management (WCDM) at IIT Delhi. The hosting of the World Congress in association with organisations such as NDMA and NIDM is a commendable initiative.

Disasters, natural or man-made, require quick and effective remedial measures. They invariably affect the poor the most. Frequent disasters induced by the menace of global warming and climate change pose foremost challenges before the world today.

Efforts towards disaster management and the fight against climate change must be holistic and in integrated manner, as the challenges need regional as also wider co-operation for effective advancement in this direction.

In India, sustainable practices have always been an integral part of our way of life. Even though India's role in furthering global warming has always been low, we are playing an active role to mitigate this menace with a sense of responsibility. From taking lead in harnessing renewable resources to protecting the environment, our commitment for a better and safer planet for our future generations is unwavering.

We don't see development and the environment as mutually exclusive entities, and our efforts towards building consensus on disaster management reflects this spirit. *Jan-bhagidari* is central to our efforts that is constantly strengthening various activities towards disaster management and environment conservation.

We need to further our endeavour towards disaster resilience with effective strategies as per varied geographical conditions of different parts of the country. It is crucial to adopt and take leverage of the best sustainable practices and technological advancements. In such a scenario, the initiatives such as WCDM assume a great significance as key partners for shaping future-ready disaster management capacities.

I am sure that the deliberations of environmental and technical experts, policy makers and other stakeholders at this robust platform will enable a practical roadmap towards reducing the risk of disasters.

May the discussions help strengthen our capabilities towards protecting our citizens and bio-diversity.

Best wishes for all success of the 5th World Congress on Disaster Management.

(Narendra Modi)

New Delhi
अग्रहायण 16, शक संवत् 1942
December 07, 2020



AMIT SHAH
HOME MINISTER OF INDIA



MESSAGE

I am pleased to note that Fifth World Congress on Disaster Management (WCDM-2021) is being held at Indian Institute of Technology, Delhi, on November 24-27, 2021 in collaboration with Disaster Management Initiatives and Convergence Society (DMICS) Hyderabad, NDMA, NIDM along with other scientific, technical and academic institutions.

I am glad to observe that deliberations shall focus on technology, finance and capacity, which would identify the challenges, brain-storm every issue and recommend measures for the successful implementation of global agendas of building resilience across sectors.

I convey my good wishes and success to all the stakeholders organising the WCDM-2021.



(Amit Shah)

**MAMI MIZUTORI**

*Special Representative of the
UN Secretary-General for Disaster Risk Reduction*



MESSAGE

I extend my congratulations to the Government of the National Capital Territory of Delhi, the Indian Institute of Technology (IIT) Delhi and the Disaster Management Initiatives and Convergence Society (DMICS) on organizing the Fifth World Congress on Disaster Management (WCDM), in collaboration with our partners in India's National Disaster Management Authority (NDMA) and the National Institute of Disaster Management (NIDM).

The three priority topics of the WCDM, namely technology, finance, and capacity, are all critical to building disaster resilience and to achieving the targets and priorities of the Sendai Framework for Disaster Risk Reduction 2015-2030. I am particularly pleased to learn that the WCDM will examine these topics in the context of the impact and lessons of the COVID-19 pandemic.

While the pandemic has presented unprecedented challenges for governments and the international community, it has also provided countries with an opportunity to re-think their approaches to managing risk and their efforts to build resilient systems towards more proactive and prevention-centric approaches. The need to integrate biological hazards into disaster risk reduction strategies is one clear lesson from the pandemic. However, ambitions should be raised to improve disaster risk governance systems that not only mitigate the occurrence of another pandemic, but can guard against all types of hazards, including human-induced hazards. This requires the adoption of risk reduction approaches that are multi-sectoral, multi-hazard, gender-responsive and inclusive.

Moreover, as the theme for this year's International Day for Disaster Risk Reduction is focused on Target (f) of the Sendai Framework, which calls for increased international cooperation, it is important that countries leverage opportunities, such as the WCDM, to strengthen cooperation including south-south and triangular cooperation in disaster risk reduction. This includes the sharing of data and exchanging lessons learned, good practices and expertise, both at the regional and global levels.

I look forward to learning about the outcomes of the WCDM and wish you a successful event.

Mami Mizutori

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**ANIL BAIJAL**

LIEUTENANT GOVERNOR DELHI

MESSAGE

I am pleased to learn that the “Fifth World Congress on Disaster Management” is being organised in New Delhi between 24th – 27th November, 2021 by ‘Disaster Management Initiatives and Convergence Society’, Hyderabad in collaboration with Indian Institute of Technology Delhi, National Disaster Management Authority, National Institute of Disaster Management and other scientific and technical organizations as knowledge partners.

I am certain the Conference will provide a useful platform to researchers, practitioners and policy makers and experts from across academic disciplines and development sectors around the world, for detailed deliberations on issues pertaining to logistics, human resources, technology, finance etc. for building resilience to various kinds of disasters.

The outbreak of the COVID 19 virus globally has not only posed unprecedented challenges but has also provided opportunities for reviewing the existing systems, frameworks, laws, regulations and practices. The lessons learnt by the National, State and Local governments, social and medical communities and other stakeholders in dealing with and containing the pandemic have been invaluable and are still evolving.

I am sure the Conference will come forward with meaningful solutions and effective strategies towards mitigating disasters, enhancing preparedness and building resilience through collaborative efforts of the State and the civil society.

I extend my good wishes for the success of the 5th World Congress on Disaster Management.


(Anil Baijal)

ARVIND KEJRIWAL
CHIEF MINISTER
DELHI



MESSAGE

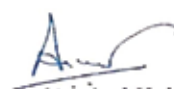
I am glad to know that **Indian Institute of Technology, Delhi**, would be hosting the prestigious 'Fifth World Congress on Disaster Management' in New Delhi during 9-12 December 2020 in collaboration with DMICS Hyderabad, and several other organizations. Government of National Capital Territory of Delhi would also extend necessary support for the smooth organization of this mega event in the national capital.

The theme chosen for WCDM- 2020- *Technology, Finance and Capacity for Building Resilience to Disasters*- is central to the successful implementation of ambitious 2030 global development agenda that include the Sendai Framework for Disaster Risk Reduction, Sustainable Development Goals and Paris Agreement on Climate Change.

I am sure WCDM -2020 would discuss the related issues and come out with specific recommendations for follow up action by all stakeholders.

I urge scientists, researchers, practitioners and policy makers from around the world to attend WCDM- 2020 and participate actively in its deliberations to make it a grand success.

My best wishes for success of Entire Endeavour.


(Arvind Kejriwal)

NITYANAND RAI

MINISTER OF STATE
MINISTRY OF HOME AFFAIRS
GOVERNMENT OF INDIA



MESSAGE

I am delighted to know that Disaster Management Initiatives and Convergence Society (DMICS) in collaboration with Indian Institute of Technology Delhi, National Institute of Disaster Management (NIDM) and several other knowledge based institutions would be organizing the Fifth Edition of the World Congress on Disaster Management in Delhi during December, 2020.

I am informed that more than 1500 researchers, practitioners and policy makers from around the world are expected to attend the event to deliberate on various issues related to the core theme of Building Resilience to Disasters on three critical planks of Technology, Finance and Capacity which are crucial for implementation of Sendai Framework for Disaster Risk Reduction and 2030 Agenda for Sustainable Development.

I convey my very best wishes to both the organizations and the participants, and hope that the deliberation will promote resilience to disasters and lead to reducing the impact of disasters.



(Nityanand Rai)

G.KISHAN REDDY

MINISTER OF STATE
MINISTRY OF HOME AFFAIRS
GOVERNMENT OF INDIA

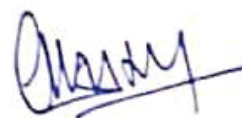


MESSAGE

I am happy to know that Disaster Management Initiatives and Convergence Society (DMICS) Hyderabad would be organising the fifth World Congress on Disaster Management (WCDM-2020) in New Delhi during 9-12 December, 2020 in collaboration with Indian Institute of Technology Delhi, National Disaster Management Authority, National Institute of Disaster Management and several other institutions.

Scientists, engineers, researchers, policy makers and practitioners from around the world would attend this event to discuss some of the critical issues of building resilience to disasters. This would provide excellent opportunities to all stakeholders to meet and interact with global thought leaders for finding solutions to some of these challenging issues of our time.

I wish this event a great success.

A handwritten signature in blue ink, appearing to read 'G. Kishan Reddy'.

(G. Kishan Reddy)

PROF. V. RAMGOPAL RAO

*PhD, Fellow IEEE, FNAE, FASc,
FNASc, FNA*
DIRECTOR



IIT Delhi



Indian Institute Technology Delhi is delighted to host in its campus the Fifth World Congress on Disaster Management (WCDM-2020) on 9-12 December 2020. This mega event is expected to draw more than 1500 scientists, researchers, policy makers and practitioners across multiple disciplines from around the world to discuss some of the most critical issues of sustainable development of the world.

These issues are clustered around the overarching theme of WCDM-2020: *Technology, Finance and Capacity for Building Resilience to Disasters*. These issues figure prominently in every framework of 2030 global development agendas – Sendai Framework for Disaster Risk Reduction, Paris Agreement on Climate Change, UN Sustainable Development Goals, and New Urban Agenda.

Innovative, affordable and cutting edge technologies in every sector of development ranging from constructions to communications, infrastructure to social protection, agriculture to health can be the game changer in the challenging tasks of building resilience to disasters. Technology development, transmission and application require investment and capacity development, which are lagging behind critically in most of the developing regions. Yet there are significant initiatives and experiments across sectors and regions, which need to be further encouraged, promoted and replicated for addressing the gaps and meeting the challenges of building resilience to disasters.

The four-day WCDM-2020 would be packed up with thought provoking keynote addresses, panel discussions, technical sessions, special feature events, exhibitions etc that would present excellent opportunities to contribute, learn, enrich and take away.

I call upon researchers, policy makers and practitioners to join WCDM-2020 to make it a grand success.

A handwritten signature in black ink, appearing to read 'Ramgopal Rao'.

(V. Ramgopal Rao)

Dr P G Dhar Chakrabarti**Chairman**

*Scientific and Technical Committee
WCDM-2021*



WCDM-2021 succeeds four earlier editions of World Congress on Disaster Management held under the auspices of DMICS to discuss some of the challenging issues of reducing risks and building resilience to disasters in communities, countries and regions.

Each edition brought together scientists, researchers, policy makers and practitioners from around the world in a common platform for free exchange of ideas and experiences on successes, shortcomings, challenges and opportunities on disaster management.

The third edition of WCDM in Visakhapatnam discussed seven pillars of resilience on health, education, agriculture, livelihood, social protection, infrastructure and sustainable cities. The fourth edition in Mumbai deliberated on the challenges of bridging gaps between promises and action on each of these pillars. WCDM-2021 has been structured to discuss the issues of Technology, Finance and Capacity (TFC) for building resilience across all sectors.

The trinity of the TFC holds the keys to the success of global frameworks of disaster resilience. Cutting edge technologies have always been the game changers and these would more likely to be so in the years ahead. Global resources are more than adequate to finance implementation of the ambitious agendas of resilience. Countries and communities have inherent capacities to adjust, adapt and absorb changes. Yet these apparently simple tasks are so formidable to accomplish.

WCDM-2021 would deliberate on the challenges and opportunities of harnessing technologies, mobilising resources and developing capacities for building resilience to disasters. Each day morning in plenary sessions, global thought leaders and opinion makers would deliver keynote addresses and engage in panel discussions on various aspects on technology, finance and capacity. Post-lunch in parallel technical sessions, researchers and practitioners would present their recent scientific, academic and action research on different aspects resilience building. There would be separate sessions on recent disasters, special session on forensic ge-technical engineering and special feature events involving parliamentarians, mayors, media, youths and innovators.

In all, WCDM-2021 promises to be the largest and most diverse conference on disaster management in the developing world. I urge researchers, practitioners and policy makers across all relevant disciplines and sectors to attend, interact and contribute to make it a success.

GLIMPSES OF PREVIOUS WCDM



TECHNOLOGY, FINANCE AND CAPACITY

For Building Resilience to Disasters

CONTEXT

Spiralling risks of disasters and persistent adverse impacts of disasters on the lives, livelihoods, economy and environment have posed serious threats to sustainable development. Rapid onset catastrophic disasters like earthquake, tsunami, volcanoes, cyclone and flash flood erode in a matter of few minutes and hours hard-earned gains of development of years and decades. Slow onset creeping disasters like drought engulf large areas of developing countries threatening food security, livelihood, nutrition and health of the vulnerable communities including women and children. The recurring disasters of flood, landslides, cloud bursts, hailstorms, heat and cold waves, forest fires, pest attacks, epidemics, pandemic and technological disasters of mining, industrial and transport-related accidents cause innumerable losses of lives, assets, wealth and economy. Climate change is compounding the risks through its impact on increasing frequency and intensity of disasters. Now the deadly pandemics of COVID-19, affecting communities and countries across regions, killing people, and disrupting society and economy have added another dimension to the complex risks of disasters.

As per the global database of disasters, during the past two decades there were as many as 12732 disasters in which 1.47 million people lost their lives, 3.9 billion people were affected adversely, and economic losses of USD 2.47 trillion was suffered around the world.¹ These could very well be conservative estimates as the global database does not include disasters in which either less than 10 lives were lost and/or less than 100 persons were affected. Further, estimation of economic losses does not include either opportunity costs of disasters such as productions that did not take place or tourists who could not travel due to disasters or damages that are difficult to quantify such as psycho-social damages

or damages to natural and cultural heritage or environment and eco-system services.

Considering the severe threats that disasters pose for sustainable development, the global communities have flagged 'building resilience to disasters' as one of the overarching goals of global development agendas. The Sendai Framework for Disaster Risk Reduction seeks to achieve 'substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.'² UN Sustainable Development Goals are 'determined to take the bold and

¹ EM-DAT, The International Disaster Database, Centre for Research on Epidemiology of Disasters, Leuven, Belgium <https://emdat.be/>

² The Sendai Framework for Disaster Risk Reduction 2015-2030, March 2015

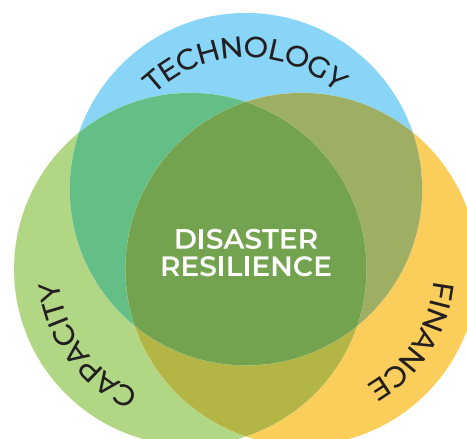
transformative steps which are urgently needed to shift the world on to a sustainable and resilient path.³ The Paris Agreement on Climate Change professes to 'foster climate resilience' for 'sustainable development and eradication of poverty'.⁴ Similar commitments for building resilience to disasters have been made in the New Urban Agenda⁵ and the Agenda for Humanity.⁶

Scanning these global development agendas, the Third World Congress on Disaster Management held in

Vishakhapatnam on November 2017 identified seven pillars for building resilience to disasters. These are resilient agriculture and livelihood, resilient schools and hospitals, resilient infrastructure, resilient cities and human settlements, resilient communities, resilient businesses, and the resilience of the vulnerable communities. The Fourth World Congress held in Mumbai in January 2019 deliberated on the challenges and opportunities for bridging the gaps between promises and action across all these pillars of resilience.

THEME

In this backdrop the Fifth World Congress on Disaster Management (WCDM) is being organised in New Delhi from 24-27 November, 2021 to deliberate on three critical issues that pose the most serious challenges as well as hold the best possible promises of building resilience to disasters. These are Technology, Finance, and Capacity (TFC).



TECHNOLOGY

Science and technology have made significant achievements across different fields and would surely be making further breakthroughs in many crucial areas of development like health, agriculture, energy, communication etc. These can accelerate the process of implementation of the ambitious and transformative global agendas of resilient and sustainable development, if the power of technology is harnessed and applied in innovative ways to address the critical gaps in key areas.

There has been some progress in hazard, vulnerability and risk assessments at global, regional and national levels, but down scaling such assessments at local levels and

³ Transforming Our World: the 2030 Agenda for Sustainable Development, September 2015

⁴ Article 1, Paris Agreement on Climate Change, December 2015

⁵ New Urban Agenda, Habitat III, October 2016

⁶ Agenda for Humanity, May 2016

communicating the risks to the last mile have remained problematic in most of the developing countries. Recent advances in geo-spatial and information and communication technologies have opened new possibilities for risk assessment and risk communication in a very cost effective manner.

Similarly, there have been significant progress in early warning of hydro-meteorological hazards like hurricanes, tropical cyclones, tornadoes, floods, heat and cold wave, avalanche, forest fires etc., but similar progress are yet to be seen for early warning of landslides, cloudbursts, etc. Flood warning in most of the developing world has not progressed beyond forecasts of rainfall and river discharge. Breakthrough in seismological research is yet to take place for early warning of earthquakes, but advance sensor-based warnings for a few seconds are possible to pre-empt damages to critical installations and loss of lives.

Tremendous progress has been made in developing disaster resilient technologies for construction of houses and various types of infrastructure, which can significantly reduce damage and losses, yet there are formidable challenges in complying with standards and specifications of such technologies for new constructions and retrofitting of existing stock of houses and infrastructure.

New technologies have been developed for enhancing energy and water efficiency in irrigation and for promoting resilience of agriculture during drought, flood and other extreme climatic events, but such adaptive technologies and practices are yet to be adopted on a wide scale in most of the countries. New frontiers of research have also been opened for dealing with epidemics and pandemics and for emergency health management which can significantly reduce disaster mortalities and disabilities but here again there are huge gaps between the possibilities and the realities.

Technology can certainly be a game changer in building resilience. This would require transfer and dissemination of proven technologies from the lab to land, and from the developed to the developing countries. This would also require enhanced investments on fundamental and applied research for development of new technologies for dealing with the existing and emerging risks of disasters. Various global frameworks have created mechanisms for addressing these issues. Sendai Framework has proposed creation of 'global technology pools and global systems to share know-how, innovation and research and ensure access to technology and information on disaster risk reduction'.⁷ UN Sustainable Development Goals have called for enhancing 'North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through a global technology facilitation mechanism'.⁸ Paris

⁷Sendai Framework for Disaster Risk Reduction, 2015, para 47(c)

Agreement on Climate Change established a Technology Mechanism for 'strengthening cooperation for technology development and transfer at different stages of the technology cycle, with a view to improve resilience to climate change through mitigation and adaptation'.⁹

During the past five years several initiatives have been taken for technology development and transfer for building resilience to disasters, but the impacts of the initiatives are yet to be seen in large parts of the globe.

FINANCE

Finance is the second most critical issue for building resilience to disasters as without adequate allocation of funds the programmes, activities and projects on disaster prevention, mitigation and preparedness cannot be undertaken in any meaningful manner. National governments in developing countries have not invested more than 1 percent of their budget on disaster risk management and most of these resources have been used for disaster response and relief.¹⁰ International development assistance has also focused primarily on humanitarian assistance post disasters.¹¹

The tools of risk pooling, risk transfer, risk insurance, and catastrophic bonds have been advanced in developed countries and introduced in some of the emerging economies with a mixed bag of success, but these are yet to be accepted in most of the developing economies. Many countries like India have launched ambitious crop insurance programmes, with varying degrees of success. Countries like Bangladesh have experimented with micro-insurance with some success which offers scope for replication and further scaling up in many developing countries.

The need for significant mobilization of resources from a variety of sources and the effective use of financing for build resilience to disasters have been highlighted very prominently in the global development agendas. 'Investing in disaster risk reduction for resilience' is one of four priorities of action of the Sendai Framework for Disaster Risk Reduction. The Framework prescribed a series of action to be taken at national and local as well as global and regional levels to enhance investments for disaster risk reduction. These include direct allocation of resources by governments at all levels, mainstreaming of disaster risk reduction across all sectors of development, developing social safety nets to protect poor and vulnerable sections of society, promoting mechanisms for disaster risk transfer and insurance, developing and enforcing standards and benchmarks for disaster risk reduction and resilience, encouraging business continuity practices, and public-private partnerships for disaster risk reduction. UN Sustainable Development

⁸2030 Agenda for Sustainable Development, September 2015, para 17(c)

⁹Paris Agreement on Climate Change, December 2015, article 10

¹⁰Global Assessment Report on Disaster Risk Reduction 2015 - Making Development Sustainable: The Future of Disaster Risk Management, p-123

¹¹GFDRR (Global Facility for Disaster Reduction and Recovery), Managing Disaster Risks for a Resilient Future: A Strategy for the Global Facility for Disaster Reduction and Recovery, 2012

Goals called for enhanced investments for building resilience on agriculture, health, education, infrastructure, urban development, business and poor and other vulnerable groups. Article 9 of the Paris Agreement stipulated that developed countries shall provide financial assistance to the developing countries and further take the lead in mobilizing global climate finance, which as per the declaration of the COP-20, would be a minimum of USD 100 billion per year, to be spent for climate change mitigation and adaptation.

Sustainable Development Solution Network had estimated that the incremental spending needs for achieving SDGs in low and lower-middle-income countries would be least US\$ 1.4 trillion per year (\$343-360 billion for low-income countries and \$900-944 billion for lower-middle-income countries), which corresponds to 11.5% of GDP of these countries.¹² Even if half of these investments are mobilized through domestic sources in public and private sector, which is highly unlikely, there would still be huge gaps that must be met through international public finance, including Official Development Assistance.

There are no indications that these gaps would ever be addressed. As of now the much hyped Green Climate Fund of USD 100 billion per annum is far from being a reality.

The Addis Ababa Action Agenda had outlined four principle mechanisms for financing development. These are (a) domestic public resources; (b) domestic and international private business and finance; (c) international development cooperation; and (d) international trade. It is time to review how these principles have been effective in mobilizing finance for building resilience to disasters.

CAPACITY

Even if there is transfer of technology and flow of funds there is no certainty that these would be utilised optimally for the desired results unless capacities are developed across all sectors and at all levels for leveraging technology and finance for building resilience. Therefore capacity building has been rightly highlighted as one of the most essential prerequisites of resilience building. Every country and community has inherent capacities through years of experiences and wisdom in dealing with disasters. Some of these traditional capacity are still relevant but the changing pattern of risks and emergence of new risks of disasters make it imperative that indigenous knowledge on disaster are validated, upgraded and supplemented with scientific knowledge of hazards, vulnerabilities and risks and the means for preventing and mitigating such risks and for getting prepared with residual risks.

¹² *Investment Needs to Achieve the Sustainable Development Goals: Understanding the Billions and Trillions, Sustainable development Solutions Network, 2015*

Any comprehensive framework for capacity building must necessarily be multi-hazard which include geological, hydrological, meteorological, climatic, biological, environmental and technological hazards; multi-sectoral which include all sectors of development including social, infrastructural, economic and environmental sectors; and multi-level which include national, provincial, local and community levels.¹³

Capacity can be developed through a mix of approaches which include education, research training, sensitisation and awareness generation. Education on disaster resilience would include basic education and safety drills for school students; more mature understanding and exposure to college and university students about hazards, vulnerabilities and risks of disasters and the mechanisms for risk prevention and mitigation and disaster preparedness, response and relief; and advanced education and research on resilience across various disciplines like earth sciences, social sciences, engineering, technology, agriculture, medicine, management etc.

Trainings are mainly oriented for skill development for cutting edge functionaries in government, private and non-government sectors for dealing with various general and specialised aspects of disaster risk management cycles including pre-disaster prevention, mitigation and preparedness

and post-disaster response, relief and rehabilitation. Sensitization programmes are meant for policy makers, parliamentarians and community and other opinion leaders to sensitize them about the various issues of disaster risk management, while awareness generation is meant for common people in urban and rural areas to make them aware about the hazards, early warning of hazards and various do's and don'ts for saving lives and protecting properties before, during and after disasters.

Capacity building is not limited to individuals only, it extends to capacity development of organisations and institutions entrusted with the responsibilities of various phases and aspects of risk management cycle. This involves setting up institutional goals, objectives, strategies and plans of action with strong mechanisms for monitoring and evaluation.

¹³ *Strategic Approach to Capacity Development for Implementation of the Sendai Framework for Disaster Risk Reduction, 2019*

STRUCTURE

WCDM would be structured in a number of Plenary Sessions, Thematic Sessions, Special Technical Sessions, Concurrent Session, Special Feature Events and Pre-conference events. Besides poster presentations, exhibitions and start ups on disaster management would also be organised.

PLENARY SESSIONS

Eminent thought leaders and experts will deliver keynote addresses and participate in panel discussions in the following Plenary Sessions

PLENARY	THEME
1.	COVID-19: New Challenges and Opportunities of Building Resilience to Disasters
2.	Emerging Technologies and Innovations for Reducing Risks of Disasters
3.	COVID-19: Lessons for Early Warning, Prevention, Preparedness and Response
4.	Enhancing Investments for Building Resilience: Global and National Perspectives
5.	COVID-19: Overcoming Economic Slowdown and Financial Stress for Building Resilience
6.	Capacity Development Strategies for Building Resilience to Disasters
7.	Social and Psycho-social Issues for Long Term Recovery from Pandemics

TECHNICAL SESSIONS

The Technical Sessions would be aligned with three key themes of the Congress - Technology, Finance and Capacity. Researchers, policy makers and practitioners would present their papers in these sessions on a wide range of issues related to each of these key themes; however the Congress would be open to accept original research papers and presentations on any other issue related to the themes. Depending on the responses received the Technical Sessions may be restructured at a later stage.

KEY THEMES	SESSIONS	TECHNICAL SESSIONS
HARNESSING TECHNOLOGY FOR DISASTER RISK MANAGEMENT	1	New Innovations in Earthquake Resistant Housing and Infrastructure
	2	Roads, Railways and Bridges: Risk Assessment and Mitigation
	3	Making Power and Telecommunication Infrastructure Resilient
	4	Resilient Aviation in a Changing Climate
	5	Challenges and Opportunities of Green Infrastructure
	6	Early Warning of Hydro-Meteorological Disasters: Tasks Ahead
	7	Early Warning of Earthquakes: How Far, How Near
	8	Operationalising Early Warning of Landslides
	9	Remote Sensing, GIS and Drones for Disaster Risk Management
	10	Application of Artificial Intelligence for Managing Risks of Disasters
	11	Emerging Technologies for Climate & Disaster Resistant Agriculture
	12	Technology and Practices for Fighting Epidemics and Pandemics
	13	Emergency Health Management: New Concepts and Practices
	14	Managing Post Traumatic Stress Disorders in Disasters
	15	Technology Innovations for Disaster Response
	16	Small and Big Data: Challenges of Collection, Compilation, Innovation
	17	Technology Transfer and Technology Facilitation Mechanism
ENHANCING INVESTMENTS FOR REDUCING RISKS OF DISASTERS	18	Patterns and Trends in Public Expenditure for Disaster Management
	19	Making Private Investments Resilient to Climate and Disasters
	20	Corporate Social Responsibility for Disaster Risk Management
	21	International Development Assistance for Disaster Resilience
	22	Green Climate Fund: Problems and Prospects
	23	Risk Finance for Resilient Agriculture
	24	Risk Transfer, Risk Pool and Catastrophic Risk Insurance
	25	Micro-Credit and Micro-Insurance for Disaster Risk Reduction
	26	Cost-Benefit Analysis of Disaster and Climate Resilience Projects
	27	Mainstreaming DRR and CCA in Development Projects
STRENGTHENING CAPACITY FOR BUILDING RESILIENCE	28	Indigenous Capacity for Disaster Resilience: Strengths & Limitations
	29	Basic Education on Disaster Management for Protecting Lives
	30	Disaster Management in Higher Education: Ways Ahead
	31	Disaster and Climate Resilience in Engineering Studies and Research
	32	Disaster Management in Medical Education and Research
	33	Communicating Research on Disaster Resilience to Policy Makers
	34	Pedagogy of Training on Disaster Management
	35	Mass Awareness Strategies for Disaster Management
	36	Networking and Knowledge Management for Capacity Building
	37	North-South, South-South, Triangular Cooperation for Capacity Building
MAJOR DISASTERS SINCE 2015	38	Nepal Earthquake 2015
	39	Kerala Floods 2018
	40	Indonesia Earthquake 2018
	41	Indian Cyclones of 2019 and 2020
	42	Mozambique Floods 2019
	43	Australian Bushfire 2020
	44	Pattern and Trend of Disasters post-2015
	45	Any Other Disaster
CORONAVIRUS PANDEMIC	46	COVID-19: Relook in National DM Policies, Plans and Guidelines?
	47	Lessons Learnt from Success: Kerala, Korea and Vietnam
	48	Origin, Transmission and Spread of COVID-19: Lessons for Future
	49	Managing COVID-19: Experience of Mega Cities
	50	Costs and Benefits of Lockdown for Managing Risks of Pandemics

SPECIAL TECHNICAL SESSIONS

WCDM shall provide a platform to interested scientific, technical, research and academic institutions to organise Special Technical Sessions of 2 to 4 hour duration each on specific issue related to the theme of the conference. These sessions would run parallel to other Technical Sessions. The organising institutions shall have the liberty to decide the structure and format of the session invite speakers /panellists and conduct the sessions.

SPECIAL FEATURED EVENTS

Following Special Feature Events with public representatives, youths, scientists, innovators and media would be organised.

Parliamentarians on Disaster Management	Members of Parliament, Legislative Assemblies and Councils will present their experiences and views on management of coronavirus
Mayors on Disaster Management	City Mayors and administrators will share their experiences and good practices in managing the risks of coronavirus
Children and Youths on Disaster Management	Children, Youth leaders and volunteers will narrate their experiences of working with communities for managing risks and building resilience
Media and Disaster Management	Leaders from the media will discuss their challenges and experiences in reporting disasters including corona virus
Innovators and Start-ups on Disaster Management	The innovators and start-up teams aiming to address disaster risk management would share their ideas and initiatives

CONCURRENT SESSION

A Concurrent Session on “Forensic Geotechnical Engineering and Geo-disaster Documentation” is also being organized by IIT Delhi on the occasion. The session is supported by SPARC (Scheme for Promotion of Academic and Research Collaboration) of MHRD, Government of India as part of the project on “Advanced Technologies for Post-Disasters Reconnaissance, Forensic and Environmental Impact Studies - Geotechnical”. Collaborating institutions involved in the project are Indian Institute of Technology Delhi, Indian Institute of Science Bengaluru, Georgia Institute of Technology Atlanta, University of California Davis, and University of Cambridge London.

PRE-CONFERENCE EVENTS

Starting from July-August a series of pre-conference conferences and workshops shall be organized on various themes, leading up to the main event. These would be notified separately in the conference website.

EXHIBITIONS

WCDM would provide space and facilities to national, state and local government organizations and agencies, UN agencies, regional organizations, financial institutions, public sector undertakings, academic and research organizations, scientific institutions, non-government organizations, humanitarian agencies, private companies, publishing houses, media and other organizations to display their products, services, activities on various aspects of disaster management, climate change and sustainable development.

VENUE

WCDM shall be held on the premises of the Indian Institute of Technology (IITD), Haus Khas, Delhi.

CALL FOR PAPERS

WCDM invites researchers, policy makers and practitioners to contribute papers for oral and presentations in different Technical Sessions of the Congress. Accepted full-length papers would be considered for publication in Scopus-Indexed Conference Publications.

GUIDELINES

- Abstract not exceeding 500 words be submitted online at the WCDM website **www.wcdm.co.in**
- Cite Abstract title, Author(s) name, Affiliation and Contact details (email, mobile)

TIMELINE

EVENT	DATE
Last date for submission of abstracts	31 May 2021
Last date for intimation of acceptance of abstracts	15 June 2021
Last date for submission of full-length draft papers	31 August 2021
Acceptance of full-length papers for publication	15 October 2021

AWARDS FOR EXCELLENCE

Awards would be given to recognize outstanding contributions to the WCDM in the following categories:

- Three best paper awards
- Three best young researcher awards
- Three best exhibitor awards
- Three most innovative startup awards
- All registered paper presenters, exhibitors, start-ups and participants would receive Certificate of Participation

REGISTRATION

Registration for the participants, authors, exhibitors and sponsors shall be notified in Congress website www.wcdm.co.in

ORGANISERS

WCDM shall be organised jointly by the Government of National Capital Territory (GNCT), Indian Institute of Technology (IIT) Delhi and Disaster Management Initiatives and Convergence Society (DMICS) Hyderabad. Besides several academic and research institutions would join as knowledge partners.

Building on the experiences gained in the preceding Congresses, WCDM would involve national, provincial and local governments, scientific and technical organisations, academia, professional bodies, industry, civil society, practitioners and media from around the world, besides the UN bodies and multi-lateral and regional organisations.

WCDM would provide a platform for sharing critical understanding, research, innovation, and good practices on disaster risk reduction and promoting interaction among scientists, policy makers and practitioners, besides forging new partnerships and networks for building resilience to disasters.

WCDM has been designed to be the largest assembly on disaster management outside the UN system.

GNCT



Government of the National
Capital Territory of Delhi

The city of Delhi, officially known as the National Capital Territory (NCT), covers an area of 1,484 square kilometres with an estimated population of 16.8 million, the second most populated city of India after Mumbai. Delhi's urban area extends much beyond the NCT boundaries and includes the neighbouring satellite cities of Ghaziabad, Faridabad, Gurgaon, and NOIDA, which together is called Central National Capital Region (CNCR) with an estimated population of over 26 million people, making it the world's second-largest urban area after Tokyo Japan.

Delhi has a chequered history dating back to 6th century BC. Through most of its history, Delhi has served as a capital of various kingdoms and empires. The city has been captured, ransacked and rebuilt several times, particularly during the medieval period, and modern Delhi is a cluster of at least seven cities spread across the metropolitan region.

Delhi has over a dozen universities besides several deemed to be universities and engineering and other colleges and Institutes of Eminence, including the Indian Institute of Technology, which attract students from all over India.

GNCT has a unique constitutional status of Union Territory with a Legislative Assembly. The Government of NCT is headed by a Lt. Governor appointed by the Government of India. He runs the affairs of the Union Territory with the aid and advice of an elected Chief Minister enjoying the confidence of the Legislative Assembly.



Disaster Management Initiatives and Convergence Society (DMICS) was established in 2005, in the aftermath of India Ocean Tsunami, to enhance understanding and awareness among the people about the risks of various types and dimensions of disasters, and the measures to be taken for reducing the risks, and for better preparedness, response and recovery through multi-disciplinary research and publications, and multi-stake holder's consultations.

DMICS is engaged in conducting series of workshops, seminars and conferences on a wide range of issues of disaster risk management and networks with communities, governments, NGOs, academic and research institutions, media, public and private sectors. DMICS had been privileged to organize four World Congresses on Disaster Management, each attended by more than 1000 delegates from around the world.

IIT DELHI



Indian Institute of Technology (IIT) Delhi is recognised worldwide as a leading institute of technology. Established in 1961, the Institute provides state-of-art infrastructure and environment for teaching, research and innovation across a wide range of disciplines and inter-disciplinary subjects. The academic and research activities of IIT Delhi are structured in 5 Schools, 15 Departments, 10 Interdisciplinary Centres, and 18 Centres of Excellence.

With a student body of over 5,000 students including doctoral students, IIT Delhi is one of the most sought-after academic institutions in India. In 2018, the Government of India has accorded IIT Delhi with the highly prestigious status of an *Institute of Eminence*.

NDMA



National Disaster Management Authority (NDMA) is the apex Body of Government of India, established through the Disaster Management Act 2005 and responsible for framing policies, laying down guidelines, and coordinating with the State Disaster Management Authorities (SDMAs) for holistic and distributed approach to disaster management in India. NDMA is headed by the Prime Minister of India and can have up to nine other members. NDMA has a vision to "build a safer and disaster resilient India by a holistic, pro-active, technology driven and sustainable development strategy that involves all stakeholders and fosters a culture of prevention, preparedness and mitigation."

NDMA has developed the National Policy, framed a series of National Guidelines, and issued National Plan on Disaster Management. NDMA has also spearheaded the process of setting up a global Coalition of Disaster Resilient Infrastructure (CDRI) in New Delhi.



National Institute of Disaster Management (NIDM), constituted under the Disaster Management Act 2005, has the responsibility of planning and promoting training and capacity building services including strategic learning on disaster management; undertaking research, documentation and development of national level information base on disasters; providing assistance for national level policies, strategies and frameworks on disaster management; promoting awareness and enhancing knowledge and skills of all stakeholders; and networking and facilitating exchange of information, experience and expertise on disaster management in the country and the region.

Over the past one and half decade NIDM has excelled in the discharge of all these responsibilities and emerged as one of the premier institutes on disaster management in the region. It is steadily marching towards the mission of making a disaster resilient India by developing and promoting a culture of prevention and preparedness at all levels.

WCDM



5th

WORLD CONGRESS ON DISASTER MANAGEMENT

24-27 November, 2021 • New Delhi • India



KNOWLEDGE PARTNERS



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