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SAARC Disaster Management Centre

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SAARC Disaster Management Centre (IU)

SAARC Annual Report - 2019-2020



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1. Background

The SAARC region, by virtue of its unique geographical setting, climate and socioeconomic vulnerabilities, is amongst the world's multi-hazard hotspots. The region bears the brunt of large-scale catastrophic disasters. Major population centers such as Kathmandu, Karachi, Kabul, New Delhi, Dhaka lie on key seismic fault lines or along coastal areas constantly buffeted by cyclones, floods, and storm surges. The latter extreme weather events increase in number and intensity due to the effects of climate change. Unplanned human settlements, unsafe building practices, and high population densities have further compounded the exposure and vulnerability of people and economies. As a result, earthquakes, cyclones, floods, tsunamis, droughts, and other hazards of every type and magnitude continue to consume lives, property, and livelihoods across the region. SAARC Disaster Management Centre (SDMC-IU) has been set up at Gujarat Institute of Disaster Management (GIDM) Campus, Gandhinagar, Gujarat, India in November 2016, with a vision to be a Centre of Excellence to provide policy advice, technical support on system development, capacity building services and training for holistic management of disaster risk in the SAARC region. The centre facilitates exchange of information and expertise for effective and efficient management of disaster risk. Eight Member States, i.e. Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka are served by the SDMC (IU).

2. Scope of Work

SDMC(IU) is working to give a fillip to regional cooperation for holistic management of disaster risk in the SAARC region. It serves the Member States by providing policy advice, technical support on system development, capacity building services and training. The Centre facilitates exchange of information and expertise for effective and efficient management of disaster risk. As needed, the Centre undertakes projects and programmes to serve the needs of the Member States. It seeks to expand from a 'knowledge sharing' organisation to an 'action-response' organisation and develop Standard Operating Procedures, tools, guidelines and methodologies for different types and phases of disasters.

It is vital for SDMC (IU) to frame cooperation as technical responsibility for regional Disaster Management and Disaster Risk Reduction (DRR) making material contribution to the lives of vulnerable population and those exposed by the natural disasters. The centre is entrusted with the responsibility to support Member States in their DRR initiatives through application of Science & Technology, knowledge from multiple disciplines, exchange of good practices, capacity development, collaborative research and networking in line with the global priorities and goals and other relevant frameworks adopted by Member States.

In addition, the SDMC (IU) has been re-established with an expanded role by merging four erstwhile SAARC Centres namely (1) SAARC Disaster Management Centre (SDMC – New Delhi, India); (2) SAARC Meteorological Research Centre (SMRC - Dhaka, Bangladesh); (3) SAARC Forestry Centre (SFC - Thimphu, Bhutan); (4) SAARC Coastal Zone Management Centre (SCZMC - Male, Maldives). Disaster Risk Reduction relevant functions of these centres are also a part of the scope of work.

3. Vision

To be a Centre of Excellence for regional cooperation and specialised service delivery to Member States for Disaster Risk Reduction (DRR), Response, Recovery and Sustainable Development.

4. Mission

To support Member States in their DRR initiatives through application of Science & Technology, knowledge from multiple disciplines, exchange of good practices, capacity development, collaborative research and networking in line with the global priorities and goals and other relevant frameworks adopted by Member States.

5. Functions of SDMC

1. Provide assistance in formulation of Policies, Strategies and Sustainable Development Frameworks in relation to disaster Management and Disaster Risk Reduction
2. Undertake/ promote research for better understanding of the various meteorological phenomena of particular interest to the SAARC Region, with a view to enhance the capability of National Meteorological Services (NMSs) of the Member States, particularly

in the field of early warning to provide support for preparedness and management of natural hazards involving relevant knowledge and operational institutions in India.

3. Collect, compile, document and disseminate data, information, case studies, indigenous knowledge and good practices relating to disaster risk reduction, and sustainable development.
4. Compile and collate information for the region required for weather forecasting and monitoring special weather phenomena.
5. Strengthen regional response mechanisms to reduce loss of lives, injuries and to provide timely humanitarian assistance to people affected by disasters.
6. To identify organisations in the region dealing with relevant key focus areas, facilitate interaction, promote coordination and cooperation amongst institutions (ministries, authorities, inter-governmental organisations, international organisations, non-governmental organisations, funding agencies, etc.) and other stakeholders involved through networking for the exchange of experiences, information, data, expertise, knowledge and technology transfer in the key focus areas of SDMC.
7. Organise training workshops, conferences, seminars, lectures for various stakeholders on key priority/focus areas of the Member States and on various aspects of disaster management.
8. Develop educational materials and conduct academic and professional courses on key priority/focus areas.
9. Develop training modules on various aspects of key priority/focus areas and conduct programmes for Training of Trainers including simulation exercises.
10. Coordinate SAADMEx with the Member States.
11. Analyse information, undertake research and disseminate research findings on key priority/focus areas among the Member States.
12. Undertake preparation of databases, publication of journals, research papers and books, and establish and maintain online resource centre in furtherance of the aforesaid objectives.
13. Collaborate with other global, regional and national centres of excellence to achieve synergies in programmes and activities.
14. Conduct studies on assessment and management of disaster risks posing a threat to inclusive and sustainable development in South Asia.

15. Undertake research, projects, programmes contributing towards mitigating the impact of trans-boundary disasters.
16. Facilitate from within and outside the region supply of emergency needs in times of disaster, in line with SAARC disaster response mechanisms.
17. Facilitate exchange of experiences and technical support among Member States on National Action Plans for Disaster Risk Reduction.

6. Activities in the Financial Year 2019-2020

6.1 Preparation of Activity Plan

SDMC (IU) had prepared its annual Activity Plan for FY 2019-2020 based on the discussion in third Inter-Ministerial Meeting and shared with MEA, GoI which has been approved by MEA on May 1, 2019.

6.2 Capacity Building Programs organized

Sr. No.	Name of Program	No of Participants	Presence of the Member States	Date	Program Details
1.	Towards Coherent Disaster Risk Reduction Strategy Development, Implementation and Monitoring among SAARC Member States	24	All	09 – 11 July, 2019	Annexure 1
2.	Post Disaster Needs Assessment	26	All Member States except Bhutan	27 – 30 Aug, 2019	Annexure 2
3.	Regional Severe Weather and Flash Flood Hazard Early Warning Mechanisms	23	All	15 – 17 Oct, 2019	Annexure 3
4.	Role of Earth Observation in Multi- Hazard Disaster Risk Assessment and Monitoring Targets of the Sendai Framework	21	All Member States except Sri Lanka	04 – 07 Dec, 2019	Annexure 4

5.	Rapid Structural & Non-Structural Risk Assessment of School Building	23	All Member States except Pakistan	21 – 24 Jan, 2020	Annexure 5
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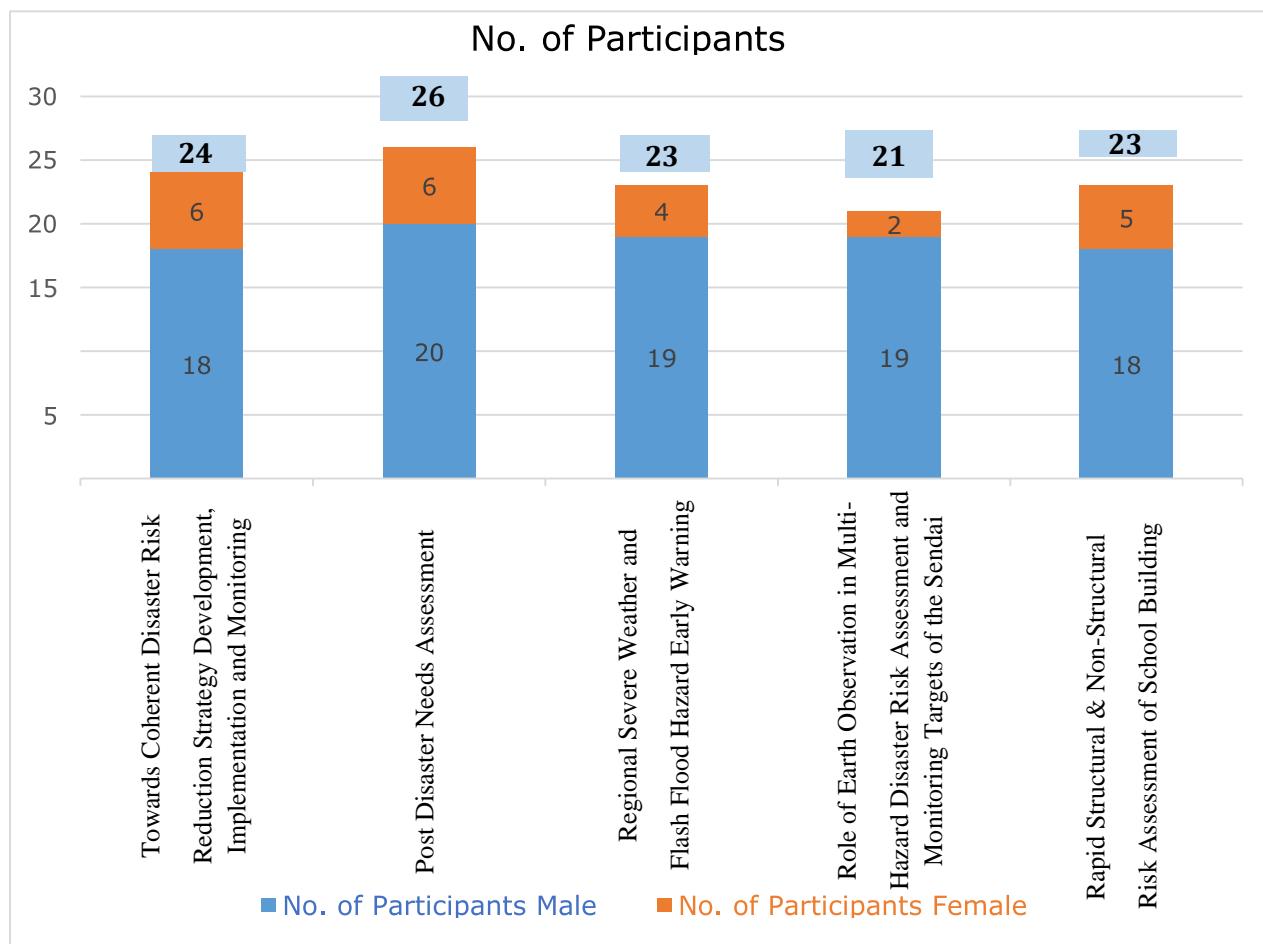
Participants

- **117 Participants** have been trained in five Capacity Building Programs

Experts

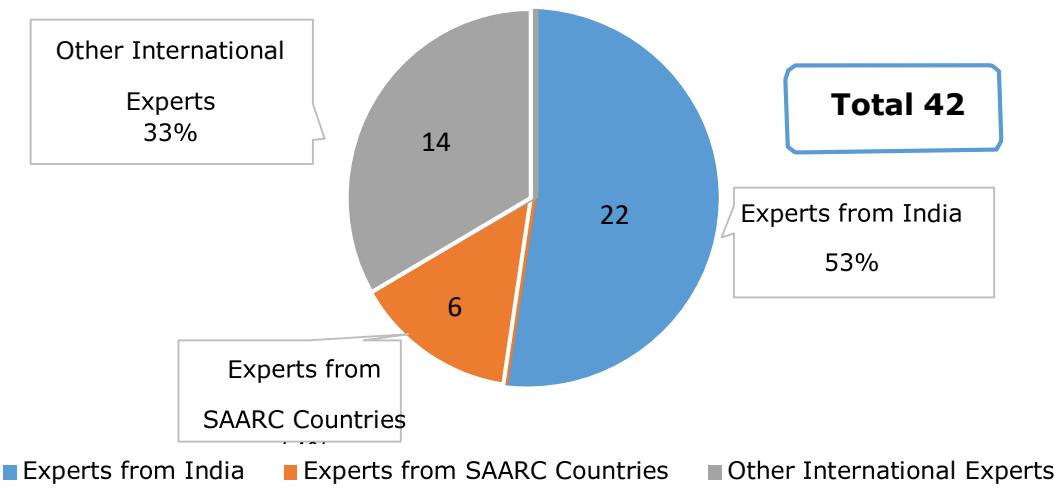
- **42 Experts** (22 from India, 6 from SAARC Member States and 14 others) have shared their experiences during the capacity development programs

Training Program-wise Number of Participants



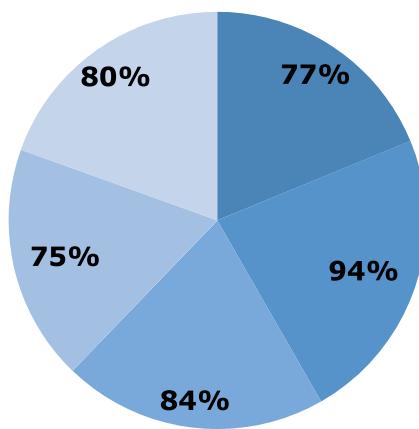
Resource Persons/ Experts Invited to deliver the talk

No. of Experts/ Speakers



Feedback from the Participants about the Capacity Building Programs

Quality of Input



- Towards Coherent Disaster Risk Reduction Strategy Development, Implementation and Monitoring among SAARC Member States (77%)
- Post Disaster Needs Assessment (94%)
- Regional Severe Weather and Flash Flood Hazard Early Warning Mechanisms (84%)
- Role of Earth Observation in Multi- Hazard Disaster Risk Assessment and Monitoring Targets of the Sendai Framework (75%)
- Rapid Structural & Non-Structural Risk Assessment of School Building (80%)

6.3 Other Programs

Sr. No.	Activity	Action Taken
1	Implementation of STORM Project	<ul style="list-style-type: none"> ○ Series of teleconferences/ meetings (on 25/3/ 2019, 11/06/2019 and 10/02/2020) were held to discuss and ascertain the current status of the STORM Project and deliberate towards necessary completion / conclusion of the project, wherein officials from SAARC Secretariat, Bangladesh, Bhutan, Nepal, IMD and ISRO were participated. ○ The MoMs are attached as Annexure 6 for kind reference/ record.
2	Programme on Development of Regional Response Mechanism (RRM) in the SAARC Region	<ul style="list-style-type: none"> ○ The Task Force for Development of Draft Regional Response Mechanism in SAARC Region was constituted. ○ Existing Regional Response Mechanism across the world and Response Mechanism in each of the SAARC Member States are being studied. ○ The Task Force Meeting was held on 7th June, 2019. The MoM of the meeting is attached as Annexure 7 for kind reference/ record. ○ Further, SAARC Secretariat in collaboration with IFRC has organized a “South Asia Forum on Preparedness for Regional Disaster Response on the Implementation of SAARC Agreement on Rapid Response to Natural Disasters (SARRND)” at Kathmandu, Nepal from 4th to 6th November, 2019. The outcome of the forum is given as Annexure 8 for information.
3	Celebration of SAARC Charter Day	<ul style="list-style-type: none"> ○ SDMC (IU) celebrated the 35th SAARC Charter Day on 8th December 2019 by organizing a half-day workshop on “Use of Space Technologies in Disaster Risk Reduction (DRR)” in collaboration with UNSPIDER and IWMI, wherein 21 participants from all the Member States (except Sri Lanka) were participated.

4	Publications	<ul style="list-style-type: none"> ○ SDMC (IU) in collaboration with IWMI has published a Policy Brief on “Insurance as an agricultural disaster risk management tool: Evidence and lessons learned from South Asia” in December 2019. ○ SDMC (IU) has collaborate with UNESCAP in developing Asia-Pacific Disaster Report 2019 which covered a comprehensive picture of the complexity of disaster risk landscape in the Asia- Pacific region. ○ One volume of the Newsletter has been published and available on SDMC (IU) web portal. <p>Annual Report of SDMC (IU) developed.</p>
5	Web Portal	<ul style="list-style-type: none"> ○ SDMC (IU) updates its portal with all the necessary information/ data on regular basis. ○ Country Page for each country has been developed. User Manual for the same has been prepared and shared for updation of the country page.

6.4 Activities of SDMC (IU) on COVID-19

A pneumonia of unknown cause was detected in Wuhan, China and was first reported to the WHO Country Office in China on 31 December 2019. Soon the cause of this pneumonia was detected to be the Novel Coronavirus. The novel coronavirus disease, COVID-19, was declared a Public Health Emergency of International Concern on 30 January 2020. The infectious disease started spreading globally and the outbreak was announced as a pandemic by World Health Organization on 11 March 2020.

On 13 March 2020, the Prime Minister of India proposed leadership of SAARC nations to chalk out a strategy to combat Coronavirus. On 15 March, Prime Minister Shri

Narendra Modi interacted with the leaders of the SAARC countries through video conference. Some important points discussed were:

- Prime Minister Modi proposed creation of a COVID-19 Emergency Fund based on voluntary contributions from all the countries, with India making an initial offer of US \$10

million for the fund. The fund can be used by any of the partner countries to meet the cost of immediate actions. He informed that India is assembling a Rapid Response Team of doctors and specialists, along with testing kits and other equipment, which will be on stand-by, to be placed at the disposal of the countries, if required.

- Prime Minister also offered arranging for online training capsules for the emergency response teams of the neighboring countries and sharing of software behind India's Integrated Disease Surveillance Portal to help trace possible virus carriers and the people they contacted. **He suggested that existing mechanisms like SAARC Disaster Management Centre can be used to pool in best practises.**

Post this video conferencing, following development was made by SAARC Disaster Management Centre (SDMC-IU).

SDMC (IU) set up a dedicated web-portal (<http://www.covid19-sdmc.org>) on COVID-19 for shared use of SAARC countries. The website aims to provide a platform, wherein through active participation, all member countries can disseminate reliable information and updates on the evolving situation relating to COVID-19 in the region, and best practices being followed in member countries.



A snapshot of the portal ([covid19-sdmc.org](http://www.covid19-sdmc.org))

Situation report of the region is updated twice a day on the portal using data from authentic sources like government/Ministry websites of member countries and WHO. Along with the regional situation report, individual country situation reports are also linked. The portal also compiles guidelines and best practices, made available by the member countries. The portal keeps a track of social media updates on COVID-19, relevant to the region. The portal provides useful and knowledgeable video links providing awareness on the subject. The portal puts in place all the important links for the region which can be accessed for in-depth information. The portal also has a tab for COVID-19 Emergency Fund, which provide updates on contributions by member countries and will also show the utilization of the funds, in due course of time.

7. Financial Status (Amount in INR)

Total Funds Approved in FY 2019-20	Fund released in FY 2019-20 (Including net Interest)	Expenditure incurred in FY 2019-20
2,97,18,500	1,81,75,670.76	1,12,18,554.62

ANNEXURE

Annexure - 1

Towards Coherent Disaster Risk Reduction Strategy Development, Implementation and Monitoring Among SAARC Member States

Training Report : 9th to 11th July 2019



SAARC Disaster Management Centre, Gandhinagar

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With funding support from



Programme Note

Towards Coherent Disaster Risk Reduction Strategy Development, Implementation and Monitoring among SAARC Member States

... “the priority for the international community must be prevention ... prevention of natural disasters and a certain number of other forms and other threats that undermine the well-being of the population of our planet.”

- UN Secretary-General Antonio Guterres

Background and Introduction

The Sendai Framework for Disaster Risk Reduction is the global blueprint for disaster risk reduction (DRR). Adopted at the Third UN World Conference for Disaster Risk Reduction (WCDRR) in March 2015, it was the first major agreement of the post-2015 development agenda, with seven global targets and four priorities for actions. The Sendai Framework reinforces the shift from managing disasters to managing risk, and also establishes resilience-building as a shared vision of the 2030 Agenda.

Specifically, the Sendai Framework calls for strong political leadership, commitment, and involvement of all stakeholders at all levels from local to national and international to pursue a goal to:

“prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience”.

UN Secretary-General Antonio Guterres' remarks at the World Economic Forum, Davos, Switzerland, 19 January 2016
Words Into Action Guidelines: "Developing a National DRR Strategy and Planning for Implementation", Final Draft, Public Consultation Version to be released

Pursuit of such a comprehensive goal, requires a strategic approach and a well-defined plan to ensure efforts are coordinated, while still being inclusive of whole-of-society, and to ensure resources are efficiently used across all sectors and by all stakeholders. Reflecting this foundational requirement, Target E of the Sendai Framework calls to “substantially increase the number of countries with national and local disaster risk reduction strategies by 2020”. This precise target is shared with indicators of SDG 1 that calls for an end to poverty, SDG 11 on sustainable cities and communities, and SDG 13 on climate action.³

Within the guidance and spirit of the Sendai Framework, the UN member states have requested UNDRR to continue its mandate of facilitating the implementation, review and monitoring of the Framework. Accordingly, the UNDRR provides training on disaster risk reduction with affiliated organizations to countries and relevant stakeholders to improve understanding of the Sendai Framework, including planning for its implementation and use of relevant monitoring tools.

SAARC Background

The South Asian Association for Regional Cooperation (SAARC) was established with the signing of the SAARC Charter in Dhaka on 8 December 1985. SAARC comprises of eight Member States: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

Among SAARC areas of cooperation is a focus on Environment, Climate Change and ‘Natural Disasters’. The Heads of State or Government of the Member States of SAARC, at successive Summits since 1987, have reiterated the need to strengthen and intensify regional cooperation to preserve, protect and manage the diverse and fragile eco-systems of the region including the need to address the challenges posed by climate change and ‘natural disasters’. The Leaders noted that the development process and prospects of the Member States were being severely undermined by these challenges.

The preservation and protection of the environment including disaster risk reduction and management remains a high priority on the agenda of cooperation being pursued by the Member States of SAARC. The numerous directives issued by successive SAARC Summits and meetings of the SAARC Environment Ministers provide continued impetus for strengthening and intensifying regional cooperation in these areas.

Among the Regional Centres established which address diverse aspects of environment, climate change and disasters, the SAARC Disaster Management Centre (SDMC) provides policy advice and facilitates capacity building including strategic learning, research, training, system development, expertise promotion and exchange of information for effective disaster risk reduction and management – the mandate of the Centre was expanded to include the development of a Natural Disaster Rapid Response Mechanism (2008).

Workshop Purpose

The overall purpose of this workshop is to strengthen capacities for coherent disaster risk reduction strategy development, implementation and monitoring at national and local level (Sendai Framework Target E) among SAARC Member States through shared lessons learned and introduction to latest guidance and tools.

Organizers

- SAARC Disaster Management Centre (SDMC)
- UN Office for Disaster Risk Reduction (UNDRR) Global Education and Training Institute (GETI) and Regional Office for Asia and the Pacific (ROAP)

Target Audience

SAARC Member State Sendai Framework focal ministries, Ministry of Finance, planning authorities or others from national government responsible for developing and implementing disaster risk reduction, development, climate change and sectoral plans and strategies for resilient development.

Workshop Objectives and Expected Outcomes

Objectives

Overall, the training workshop will provide an opportunity for participants to:

- Refresh understanding of concepts and trends in disaster risk reduction (DRR), risk-informed development, climate change adaptation and sustainable development.

SDG Indicators: Official list of SDG indicators. See Sendai Framework target (e) as shared, repeated SDG indicators 1.5.3/11.b.2/13.1.1
<https://unstats.un.org/sdgs/indicators/indicators-list/>
See more including related documents at: http://saarc-sec.org/areas_of_cooperation/area_detail/environment-natural-disasters-and-biotechnology/click-for-details_6

- Share their country's lessons and recommended approaches for developing and implementing national DRR strategies in coherence with development, climate change and sectoral plans and strategies.
- Identify gaps and opportunities to 'review and re-align' current DRR strategies and implementation action plans.
- Learn from global disaster risk reduction case studies, including governance, finance and planning.
- Strengthen understanding of the institutional arrangements and partnerships needed for Sendai Framework implementation at national and/or regional, local and sectoral level.
- Plan the way forward at regional and national level to scale up collaboration to reduce the risks and impacts of disasters.

Expected Outcomes

After completing this workshop, the participants will be able to:

- 'Make the case for risk-informed development and Disaster risk Reduction': share deepened understanding of the Sendai Framework for Disaster Risk Reduction (goal, outcome, targets, priorities, principles) as an imperative for addressing climate change and sustainable development.
- Understand recommended approaches and requirements for developing, implementing and monitoring national and local DRR strategies in line with Sendai Framework Target E related to SDGs 1, 11 and 13.
- Use or adapt the workshop tools and approach to 'review and re-align' ongoing strategic planning, implementation and monitoring processes at various levels.
- Consider DRR case studies to highlight and inspire implementation mechanisms.
- Understand mechanisms and approaches for implementation (financing, M&E, capacity development, legal and regulatory frameworks, partnerships and institutional arrangements) of DRR strategies, is enhanced among Member states.
- Identify ways forward to update and align the SAARC regional DRM framework to the Sendai Framework and the region contexts and needs.

See inter-sectoral recommended list of participants in UNDRR GETI Standard Operating Procedures

Agenda

Day One	9 th July 2019
9:00 - 9:30	<u>Arrival and registration</u>
9:30 – 10:00	<u>Opening Session</u> <u>Welcome and Keynote Speech:</u> <i>SAARC DMC or SAARC Secretariat</i> <u>Introductory Remarks:</u> <i>United Nations Office for Disaster Risk Reduction</i>
10:00 - 10:15	Tea/coffee break and group photo
10:15 – 10:45	Session 1: Understanding Disaster Risk and Disaster Risk Management: Concepts and Trends Presentation: Concepts, Global and Regional Trends in Disaster Risk Reduction – UNDRR ROAP Q&A
10:45 – 11:45	Session 2: Global and Regional Frameworks in Coherence: Reducing Risk for Sustainable Development Presentation: Building Coherence between the Sendai Framework for Disaster Risk Reduction 2015-2030 the 2030 Agenda and the Paris Agreement – UNDRR GETI <i>Meaning and implications of Sendai alignment will be discussed (Unpacking the 10 key elements of Sendai Alignment)</i> Presentation: Overview and Status of SAARC Comprehensive Framework on Disaster Management – SAARC DMC Q&A
11:45 – 13:00	Session 3: Disaster Risk Reduction, Climate Change Adaptation and Sustainable Development Implementation in the SAARC region Presentation: Overview of Regional and National Strategies in Asia Pacific – UNDRR ROAP Facilitated Round Table Discussion: Experience sharing on developing and implementing DRR Strategies in Alignment with the Sendai Framework, in coherence with Climate Change Adaptation & Sustainable Development – national and local levels (All SAARC Member States: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka) <i>Country experience and challenges shared may include:</i> coordination, coherence, integration of DRR into development planning, legal and regulatory frameworks, monitoring, financing, sectoral implementation, partnership, local engagement.
13:00 – 14:00	Lunch

	Session 4: Getting to know/Refresher and using the tools for DRM self-assessment, planning and monitoring: Sendai Framework Monitor and Custom Indicators
14:00 – 14:30	<u>Presentations:</u> -Overview of the methodology, approach and tools for developing a National DRR Strategy and Action Plan -Sendai Framework monitor and custom indicators– UNDRR GETI
14:30 – 15:30	<u>Working Group Discussion:</u> Identifying DRR/DRM implementation gaps in current DRR strategies or related sectoral/regional strategies and plans
15: 30	Working tea/coffee served
15:30 – 17:30	<u>Working Group Discussion (continued):</u> Identifying DRR/DRM implementation gaps in current DRR strategies or related sectoral/regional strategies and plans
17:30	<u>Closing the day: What to expect tomorrow</u>
Day Two	10th July 2019
9:00 - 9:30	<u>Day 1 Recap and Day 2 Overview</u> – UNDRR <u>Plenary Discussion:</u> <i>Presenting Day 1 group work outputs</i>
9:30 – 10:30	Session 5: Case studies for DRR Planning and Implementation Priority 1: Understanding Disaster Risk; Priority 2: Strengthening Disaster Risk Governance to Manage Disaster Risk with links to SDGs <u>Presentation:</u> Mainstreaming DRR and CCA into Sectoral Programmes for Social Economic Development with Case Studies – UNDRR GETI (e.g. Risk Information, Governance, Climate Change Adaptation) <u>Plenary: Q&A and country experience sharing:</u> (All SAARC Member States: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka) <ul style="list-style-type: none"> • TBC Case studies from SAARC MS on Priority 1: Disaster Loss Databases (Sri Lanka); Risk assessment and decision support tools (Pakistan) • TBC Case studies from SAARC MS on Priority 2: Disaster risk governance (Nepal on their new legislation; Afghanistan on new DRR strategy); ADPC on media engagement; India (private sector engagement – ARISE)
10:30 – 10:45	Tea/Coffee break
10:45 – 11:45	Session 5 continued: Case studies for DRR Planning and Implementation Priority 3: Investing in Disaster Risk Reduction for Resilience, Priority 4: Enhancing Disaster Preparedness for Effective Response, and to “Build

	<p>“Back Better” in Recovery, Rehabilitation and Reconstruction with links to SDGs</p> <p>Presentation: Mainstreaming DRR and CCA into Sectoral Programmes for Social Economic Development with Case Studies – UNDRR GETI (e.g. Finance, Environment, Critical Infrastructure, Housing and Land Use Planning, Livelihood Protection, Health)</p> <p>Plenary: Q&A and country experience sharing: (All SAARC Member States: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka)</p> <ul style="list-style-type: none"> • TBC Case studies from SAARC MS on Priority 3: Disaster resilience infrastructure (India); Comprehensive School Safety (Save the Children or Plan International India); DRR in WASH (UNICEF India); mainstreaming DRR into development planning (Maldives) <p>TBC Case studies from SAARC MS on Priority 4: Preparedness: Early Warning Systems (India – Odisha); Bhutan (Floods – Early Warning Systems)</p>
11:45 - 13: 00	<p>Focus Session: Recovery and build back better on</p> <p>Presentation: Post- disaster housing reconstruction in Asia Pacific paper - <i>Presenter: ADPC; Discussant: Nepal Reconstruction Authority.</i></p> <p>Plenary discussion: Post-disaster recovery issues in SAARC countries: Key challenges and opportunities to BBB in regard to housing and infrastructures sectors.</p>
13:00 – 14:00	Lunch
14:00 – 15:30	<p>Focus Session: Financing DRR Strategies</p> <p>Presentation: Implementing DRR strategies: financing the implementation of DRR strategies, regional mechanisms – UNDRR GETI and ROAP</p> <p>Presentation: Assessing financial risk from disasters and strategies for financial protection and applying layered approach to disaster risk management. (GFDRR Asia)</p> <p>Presentation: Disaster risk financing: catastrophic insurance mechanisms experiences and lessons learned in Asia Pacific (ADB)</p> <p>Plenary and experiences sharing by SAARC MS:</p> <ul style="list-style-type: none"> • Climate and DRR blended finance in Bangladesh (TBC) • Sri Lanka disaster risk financial protection options (TBC) • Nepal financing disaster recovery (TBC) • India: financing DRR (TBC) • Others: addressing key questions on DRM budget allocation systems; DRR funding mechanisms; private sector financing

	for DRR; climate and disaster risk insurance schemas. Q&A
15:30	Working tea/coffee served
15:30 – 17:30	Session 6: Reviewing and Re-Aligning Regional/Sectoral Strategy and Plans for Resilient Development <u>Working Group Exercise: Reviewing/Re-aligning the Regional and/or National Strategy and Sectoral Plans, Revising the Action Plan (All Sendai Priorities)</u>
17:30	Closing the day: What to expect tomorrow
Day Three	11th July 2019
9:30 – 9:45	<u>Day 2 Recap and Day 3 Overview – UNDRR</u>
9:45 – 10:45	<u>Plenary Discussion: Presenting Day 2 group work outputs (All Priorities)</u> Q&A
10:45 – 11:00	<u>Tea/coffee break</u>
11:00 – 12:00	Session 7: Implementation of the DRR strategy: Roles, Responsibilities and Partnerships <u>Presentation: Multi-sectoral engagement in DRR: UN partners approach</u> (WHO, WFP, UNICEF and FAO – Regional or India-based offices) (TBC) <u>Plenary Discussion:</u> countries to share experiences on partnership strategies on DRR (i.e. public-private sector collaboration; academia, sciences and technology collaboration; regional and transboundary collaboration; civil society engagement in DRR).
12:00 – 13:00	Session 8: Strategy and Action Plan Monitoring, Evaluation and Follow-Up <u>Presentation: Setting Indicators for Monitoring and Evaluating Strategies and action plans.</u> UNDRR <u>Q&A and country presentation/experience sharing (All SAARC Member States invited to share examples of their DRR Strategy results and outcome indicators and monitoring systems)</u>
13:00 – 14:00	Lunch
14:00 – 15:30	Session 9: Developing SMART Indicators, Completing the Action Plan towards Sectoral/Regional Alignment <u>Working Group Exercise: Developing/Refining Indicators for the Action Plan (All Sendai Priorities)</u> <u>Plenary Discussion: Presenting group work outputs</u>
15:30	Working tea/coffee served

15:30 – 16:30	<p><u>Session 10: Promoting Alignment and Linkages Between National and sub-national DRR Strategies: Development and Implementation</u></p> <p><u>Presentations: Making Cities Resilient: Tools for Local DRR Planning and Implementation – UNDRR</u></p> <p><i>Making Cities Resilient, Words into Action Implementation Guide for Local Disaster Risk Reduction and Resilience Strategies and the Disaster Resilience Scorecard for Cities</i></p> <p><u>Presentation: Bangladesh Making Cities Resilient – Bangladesh national DRR focal point (TBC)</u></p> <p><u>Presentation: GIDM and Ahmedabad Municipal corporation – sub-national perspectives (TBC)</u></p> <p>Q&A and other country experience sharing</p>
16:30 – 17:00	<p><u>Session 12: Planning the Way Forward: Aligning your Current Plans and Strategies on DRR at regional/national and sub-national level and scaling up Sendai Framework implementation and</u></p> <p><u>Presentation: The Strategic Approach to Capacity Development Strategy to Support Implementation of the Sendai Framework for Disaster Risk Reduction – UNDRR</u></p> <p><u>Presentation and Facilitated Plenary Discussion – SAARC Secretariat and SAARC DMC</u></p>
17:00-17:30	<p><u>Closing Session</u></p> <p>Workshop evaluation, closing Remarks and presentation of certificates – SAARC and UNDRR</p>

Day 1: 9th July 2019

Address by Director, SDMC(IU)

Mr. P.K. Taneja, Director, SDMC (IU) welcomed all the participants and resource persons. He expressed his views regarding data management technology, sharing of best practices, and emphasized on finding the gaps and issues in implementation of Sendai Framework for DRR. He further added to invest in early warning and planning. To prepare a template and identify and focus on gaps to be filled up.



Session 1: Understanding Disaster Risk and Disaster Risk Management: Concepts and Trends By Dr. Animesh Kumar, UNDRR

Dr. Animesh explained the concept that hazards can be natural but disaster cannot be natural. He presented the statistics of last 30 years reflecting the magnitude of losses, especially in the South Asian region, with flood and storm being the

most prominent causative factors. He shed light on the drivers of risk, i.e., changing environment, human induced climate change, multi-dimensional vulnerability (the complexity and dynamism therein) and the most important aspect that risk is systemic in nature and requires a systemic approach- systematic disaster risk governance i.e., coherence and synergy between the relevant departments. He discussed that financing in DRR maybe a good way forward but questions like dedicated DRR funding, budgetary allocation at the national or the local level still remains.

Session 2: Global and Regional Frameworks in Coherence: Reducing Risk for Sustainable Development

Building Coherence between the Sendai Framework for Disaster Risk Reduction 2015-2030 the 2030 Agenda and the Paris Agreement – UNDRR GETI

She explained that amidst all the discussions on climate change adaptation and disaster risk management happening separately, a lot of things are being done and much more needs to be done. Tools are being developed to address the commitments of the regional framework; there are numerous stakeholders working at different levels, starting from the regional level right down to the local level. Tools of accounting for the losses that have been or could be averted by risk informed development planning are present. Governance mechanism need to take heed of these practical necessities.



She discussed on the ASEAN (Association of Southeast Asian Nations) experience on enabling collaboration for Disaster Risk Reduction. ASEAN Agreement on Disaster Management and Emergency Response was signed in July 2005, and has an objective of reducing disaster losses and jointly respond to emergencies where AHA (ASEAN Coordinating Centre for Humanitarian Assistance) works as the coordination centre.

Overview and Status of SAARC Comprehensive Framework on Disaster Management – SAARC DMC



Director SDMC(IU) explained about the SAARC Comprehensive Framework for Disaster Management which was articulated in 2006. Its objectives address many avenues; starting from sharing of best practices to creating a regional response mechanism. The framework has outlined six priorities of actions for the period of 2006 – 2015. It includes priorities way ahead of their times; inclusion and use of ICT in DM which is now a hot cake, has been a priority for SAARC DMC since 2006.

He expressed that there is a need to align the present regional framework and update it to include the global frameworks and guiding principles.

He also discussed about the challenges; SDMC is an interim unit with many centres merged with the SDMC, thus, the volume of work is huge. Apart from this the usual hindrances of lack of financial and technical support remains. The process is also tedious; one needs to get inputs on the draft, approval from the member countries, i.e., the changes need to go through the SAARC process.

Session 3: Disaster Risk Reduction, Climate Change Adaptation and Sustainable Development Implementation in the SAARC region

A discussion with all the member states was held in which each country gave following information:

Afghanistan: Discussed the four-year action plan adhering to the elements of SFDRR. Mentioned challenges like lack of financial support; however, the training and capacity building dimension is something that needs to be commended. A National Platform is being formulated which would align the national government to the needs of DRR.

Bangladesh: Schemes and projects are being implemented and are being piloted by various government ministries. There exists a mechanism of fund transfer from the central government to the local government; the projects and schemes are being implemented at the local level by the local government which includes officials as well as elected representatives. The achievements can be seen in the way they acted in Fani. There lurks numerous gaps and challenges and maybe there is a need to not dwell on them but move forward resolving them.

Bhutan: DM Act of Bhutan, 2013, is perhaps one of the achievements that needs to be mentioned. This Act puts in place the governmental mechanism of disaster management. All the districts have a well-established mechanism. The roadmap to risk reduction 2018-2023 of Bhutan is a recent development in this regard. Focus is being put on issues like carbon neutrality, climate smart and disaster resilient development etc. Efforts are also being put to mainstream DRR by ways of legislations.

India: Acts, policies and plans are all in place. Role and responsibility matrix at the central and the state level has been worked out, which has been put down in the national plan.

A long process of stakeholder consultation has taken place; coherence with international agendas and agreements, financing to mainstream DRR and social inclusion are the new things that are being brought in the new updated plan. Target A and B are well achieved; Target D and Target E are being worked upon vehemently. Other mentionable activities are:

- a. Seismic micro-zonation for all cities in Zone 4 & 5.
- b. SGM sensors in the Himalayan region.
- c. EWS for lightning with lead time of 48 hours. State interventions in this regard are also commendable.
- d. Doppler Weather Radars 35 now, more to be installed.

Maldives: Disaster Management Centre (semi-autonomous) established in December, 2018, as per the Act. DRR to be incorporated in every sector; however, there is a lack of DRR strategy. Vision 2020 is an effort towards bringing about coherence amongst all the agendas and agreements.

The capacity building through the CBDRM programs is really effective. The challenges are the lack of existence of a planning ministry to provide coordination at the helm; however, the new government has taken a step towards this. A national development plan is being formulated where DRR and CCA are being taken into consideration. Holistic, integrated risk management is the approach with coordination of all agencies. Special plans for different regions / zones in the nation are also being prepared to ensure planned, inclusive development.

Nepal: Acts, guidelines, action plans, strategies are in place. Just like the three-tiered structure of governance starting from the PM to the mayor at the local level, there is a provision of three different funds at three levels which is sourced from the budgetary allocations as well as donations. EOCs are operational at national, regional, and district level. 2009 – 2024 plan talks about disaster resilient Nepal. Sendai+ approach is something that needs to be mentioned, which is SFDRR plus the local needs are being taken care of.

Pakistan: Programs on afforestation, climate change adaptations are in full swing. Government is working towards creating resilience; starting from problems of groundwater to climate smart

agricultural practices. DRR inclusive education system, poverty alleviation programs, alignment of DRR policies with SFDRR, SDGs, 5 Year annual plan, Vision documents are some of the things being done.

Sri Lanka: Policies, laws, acts are in place. Three national policies in place; coordinating committees are at all levels. A lot of efforts are being put in aggregating data; data about losses and damages which shows there has been a reduction by 50% in terms of Target A to D. Target E & F increased by 80% while Target F is at its full potential. Sendai Secretariat setup to ensure Sendai monitoring through different ministries. 15 Technical Working Committees, 15 Clusters and different agencies have been setup to ensure the data is correct and appropriate. Sri Lanka is positive about attainment of Sendai targets.

Session 4: Getting to know/Refresher and using the tools for DRM self-assessment, planning and monitoring: Sendai Framework Monitor and Custom Indicators

In this session aligning national and local DRR strategies with the 10 key elements of Words into Action were discussed.

The session focused on the fact that self-assessment of Target E is extremely necessary as it helps a country to understand the true character of its national strategies and then local strategies can emulate the national strategy. Light was shed on the global and regional platforms and the way UNDRR functions at the global and regional level.

Group Exercise



Asia Regional Plan: Action Plan 2018-2020 which came out of AMCDRR 2018 formed the basis of the group exercise. The Action Plan has ‘actions needed’ and the ‘progress made’. Issues for countries to consider when seeking alignment among DRR and other policy arenas, derived from lessons learned and

case studies, found in GAR 2019, was discussed. The interlinkages between SFDRR and SDG was also highlighted.

In this exercise key implementation challenges in country were discussed and noted and how the SAARC Regional Framework can support, with the help of SFDRR at global and local level, implementation strategies and the Asia Regional Plan.

Day 2: 10th July 2019

Session 5: Case studies for DRR Planning and Implementation



All the four priorities of action set in the Sendai Framework were discussed in detail. Points were discussed on the challenges faced in achieving the priorities at local, national and regional level and also the areas that can be strengthened to achieve the priorities.

Each group was assigned different priorities. Also, each group discussed a little about all the priorities which manifests the systemic nature of risks and risk management.

Mr. Taneja, who observed the discussion outputs, emphasized that use of technology, data management and sharing are cross-cutting issues that is a challenge in all the priorities. Mainstreaming DRR principles in development is a truly risk governance issue. Investment can be in different forms; investment in capacity building, investment in resilient infrastructure, investment in early warning etc. He suggested that it will possibly be better to have a planning template to help come up with the regional / national level plan.

Case studies from SAARC member states were presented on Priority 2: Disaster risk governance (Nepal presented on their new legislation; Afghanistan presented on new DRR strategy);

Role of Media by Aslam Pervaiz

Mr. Aslam talked about the Jakarta Declaration that has identified media as a stakeholder in DRM. He discussed that there is a need to translate, interpret and contextualise the agendas, the science behind disasters etc. and programmes to build capacity of journalists to motivate reports on disaster risks, i.e., Reporting on Disaster Risk and Making People Aware (RedMap). He also discussed the challenges like trust deficit between stakeholders, the culture of reporting disasters as an event, lack of skills to find newsworthy stories during peace times, lack of capacity to read data and turn into stories. The role of media is immense; misinterpretation of information, getting lost in translation may add to the worries rather than helping in calming down the situation. The way forward is to establish faith, trust among the journalists and the officials on the other side; establishes a transparency.

Case Studies from countries



Presentation from Pakistan

The National Disaster Management Plan has 10 priority areas and execution guidelines have been laid down for the conduct of Multi-Hazard Vulnerability Risk Assessment (MHVRA) so that all relevant stakeholders can take part in it.

Based upon the MHVRA, a decision support system has been devised. The outcome is in the form of a visualization which facilitates easy decision making.

Presentation from Sri Lanka

The practice of maintaining disaster loss database is in place since 1972 that covers houses damaged and lost, the extent of damage; agricultural losses; infrastructure damage. Based on this recovery and rehabilitation grants are given, which may come from insurance schemes or the government.

Presentation from India

Disaster Resilient Infrastructure (DRI)- A report from ADB states that 26 billion USD is required in Asia for implementation and upkeep of attainment of SDGs from 2016 to 2030.

AMCDRR 2016, in Delhi, initiated the concept of DRI which was followed by a wider scope of discussion with all stakeholders like ADB, AIIB and even academia. This primarily caters to Target D but affects all the preceding Targets. A subsequent discussion was held in AMCDRR in 2018. Many issues like risk transfer, micro-insurance were discussed along with policies of reconstruction and rehabilitation policies. In March, 2019, the 2nd conference was conducted in New Delhi and it focussed on sharing of best practices, collaborative research in DRI, building upon new technologies and common learnings and lastly a platform to share. The outcome document mentions setting up of interim secretariat of DRI and it will work on issues like finance mechanisms, research innovation and would be run for 3 years by UNDRR and Government of India.

The political influence is immense; the level of involvement and commitment is something to look forward.

Presentation from AHA Centre

One of the core business of AHA is coordination at three levels; strategic (ministerial level), operational (at the capital country of the affected nation) and field coordination.

The AHA Centre provides a platform for information sharing among ASEAN member states and partners as well as data intelligence and analysis services. There exists a web-EOC which facilitates real-time exchange of data and information like flash updates, situation updates. AHA Centre is also into Resource Management; manages the database of standby resources of ASEAN member states; ASEAN-ERAT is an official resource of ASEAN managed by the AHA Centre; it arrives in the affected country within 24 hours.

There exists an ASEAN Joint Disaster Response Plan (AJDRP) with three disaster scenarios. There is DELSA which manages a stockpile of relief items and it is located in Subang, Malaysia.

ASEAN Agreement of Disaster Response is a legally binding document which is not only adopted by the 10 nations but it also needs to be ratified by the individual nations as per their legislative mandate. Perhaps, the SAARC framework might need such a revolutionary change to practically implement the concept of Regional Response Mechanism.

Presentation from Kerala

The story of Kerala Floods of 2018 is a story of the triumph of human spirit. All the 14 districts were affected and the disaggregated data is also available. The concept of volunteerism became an epitome; army of fishermen set a huge example. A damage assessment of 3,30,000 damaged houses were conducted; the approach was crowd-sourced damage assessment, owner driven reconstruction and damage magnitude linked cash grant. A vulnerability linked housing relocation scheme was also launched. Crowd-sourced inundation depth mapping and marking was also carried out; 13,000 flood water level points have been geo-tagged. In terms of building back better, Kerala has started- Nava Keralam: Green and Resilient Kerala, Rebuild based on the recommendation of PDNA and new standards of disaster relief has been set, Training of civil forces and community based DRM programs are also being carried out to prepare village level DM Plans, Participatory decentralized planning is at the core of all that has been done since the disaster.

Presentation from Nepal

Nepal Reconstruction Authority (NRA) setup after the Gorkha Earthquake, 2015, only for reconstruction, rehabilitation and uplifting of livelihood of the victims. There is an elaborate institutional setup; Consultation Council (Chaired by PM), Directive Committee (Chaired by PM), Executive Committee (CEO NRA) and local bodies. There are Central Disaster Management Fund, Provincial Disaster Management Fund, Local Disaster Management Fund. However, the challenges are also immense like GIS open source technology, adequate search and rescue equipment, DRR mainstreaming, etc. The way forwards have also been laid down and is being worked upon.

Presentation from Maldives

The National Development Plan was perhaps the missing link in mainstreaming DRR in development planning. The emergence of this plan will help in bridging the gaps and develop a coherence amongst all the frameworks.

The challenges are primarily inter-sectoral coordination, lack of prioritisation of DRR at policy level, limited capacity & resources, data management etc. However, there exists opportunities too. DRR and CCA has been mainstreamed in the national development plan and strategies.

The importance of decentralization in DRM expresses itself in the way of having island disaster management plans (57 islands already have such plans).

Presentation by Paul Rosenberg

Mr. Paul discussed about International Recovery Platform (IRP) that is composed of 17 organisations, agencies etc. It focusses on recovering with greater resilience, improving standards, improving urban planning and land use, and progressing in the dimensions of development (post disaster building back is also taken as an opportunity to foster peace, establish gender equality). He explained Build Back Better; housing forms 80% of the built environment thus, half of the recovery cost flows into construction of shelters, housing repairs etc. The psychological effects are also significant. In fact, the longer people are exposed to shelters which are temporary and not their home, longer is the entire recovery process.

Presentation by Aslam Perwaiz

A brief description of the document on reconstruction and rehabilitation prepared by ADPC was carried out. Key lessons learnt were discussed like integration of housing with community infrastructure, support for livelihoods and the local economy, sustained engagement, multi-stakeholder engagement, role of built environment professionals, owner driven approach, success in difficult contexts like high poverty or remoteness of location.

Some issues were also highlighted like the importance of linking physical products with social and institutional processes, not to give the owners a new process but a choice of means and support etc.

The focus should be on building back stronger, building back faster and building back more inclusively.

Panel Discussion



In this session various learnings were discussed- Learning from the experience of ADB in Pakistan, owner driven approach has indeed benefits that needs to be realised.

The experience of Fiji, owner driven approach, adds to the learnings; it is pragmatic and perhaps addresses issues which are larger than the scope it was meant to address. There are existing issues too; training of masons, policy formulation, land owning issues etc. but there are no such issues which can't be addressed.

From the experiences at Kandla, it was realised that injuries are mostly due to the failing structures. There is a need to incorporate socio-technical processes in owner driven approach of reconstruction and only then such approach can be faster and more efficient. A mid-way approach is to have transition shelters, i.e., an addition of permanency to temporary shelters.

The Government of India is coming up with a guideline on the same.

Experiences from Nepal were shared by representatives from JICA in Kathmandu; eligibility conditions, mechanisms, legal framework, institutions, human resources, training of masons, engineers and inspectors etc. At the 2nd anniversary it was realised that only 20% started reconstruction. It was found that cash disbursed was inefficient, lack of knowledge and the materials. This led to the start of community mobilisation program to build on the trust and fraternity found in the communities of Nepal. Indigenous masons were identified to foster the trust and ownership of the villagers. The 3rd year (2017-2018) saw a huge increase in the reconstructions. On the 4th anniversary it was found that many people still could not start construction; these were the people who were the most vulnerable. Setting up mechanisms, legal frameworks are never enough; intangible dimensions also needs to be considered. Social dimensions like solidarity needs to be harnessed and leveraged.

Experiences from Kutch: 600 houses across numerous villages (120) were built. The fund came from UNDP, the technology from IITR and masons were brought in from Latur. These model houses were built while giving hands-on training to the local people and later the completed houses were given to the most vulnerable groups, destitute etc. Decision making and disbursement of relief funds were streamlined by cutting short the decision-making process.

Presentation by Steve Goldfinch

Mr. Steve talked about ADB Strategy 2030 and its coherence amongst all the agendas and frameworks; most importantly, disaster resilience has been included as one of the seven operational priorities. A layered approach is very important in this regard depending on the severity and frequency of the events; from DRR to risk retention to risk transfer to international assistance which spanned across high frequency to low frequency on the X-axis and low to high severity on the Y-axis. ADB loan modalities and sources of financing for disaster risk management were highlighted. There exists a proposition of contingent disaster financing (CDF). Funds would be disbursed in the event of a pre-agreed trigger event. The features include policy matrix based on reforms to strengthen disaster resilience, post program partnerships framework detailing future reform targets and planned ADB assistance and IMF Assessment Letter (macroeconomic framework).



The Country Diagnostic Assessment Reviews the current disaster risk financing landscape and enabling environment. The focus is on risk transfer instruments. There are examples like that of Philippine City Disaster Insurance Pool which provides for early recovery.

Pakistan National Disaster Risk Management Fund is a multi-donor fund and it comes from ADB and Governments of Pakistan, Australia and Switzerland. The investments are aligned with NDMP, National Flood Protection Plan – IV.

The countries are divided into Groups A, B, C depending on their economic status and based on these groups they can access regular grants or a combination of regular grants and DRR related funds.

Session 6: Reviewing and Re-Aligning Regional/Sectoral Strategy and Plans for Resilient Development

In this session, India's provisions of National/ State Disaster Response Fund (NDRF/ SDRF) and Prime Minister's Relief Fund which goes above and beyond the previously mentioned funds, was discussed. India has projects like NCRMP which is worth 4800 Crores. A new

concept of Flexi Funds has also come in. Other schemes which have been dove-tailed with DRR strategies are- PMAY (Houses built are hazard resilient), PM Irrigation Program, PMFBY (Agri Insurance), and PM Livestock Insurance Scheme.

Case of Sri Lanka

Insurance and fast disbursal form the core of resilient recovery.

Agriculture insurance- The moderator highlighted that insurance is also a way of prevention; assuming that EWS triggers a Contingency Fund which triggers the scaling up of existing safety-net programs. So, if the contingency fund mechanism is composed of these three components and works in the illustrated way, insurance may become a measure of prevention:

1. Mainstreaming DRR into development planning: Separate funding mechanism of DRR and development planning may not work out. Funds to develop needs to ensure risk screening and individual funds of disaster prevention may work out for existing developments.
2. Role of social safety net programs
3. Risk assessment: Incredibly important to understand what risks to accept and what risks to be ready for.

Day 3: 11th July 2019

Outputs of group exercise

Priority 1:

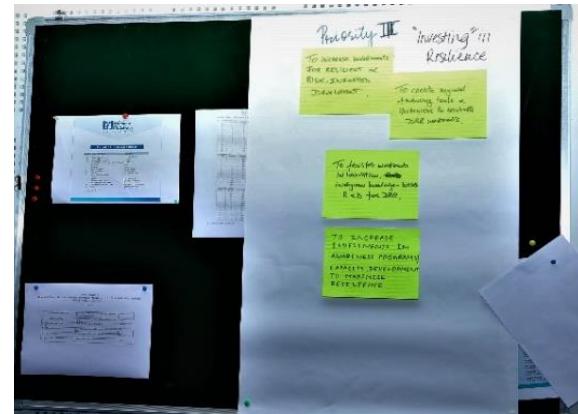
For the priority 1, the outputs were as follows:

1. Lack of proper knowledge sharing; there is a need to have a platform to share knowledge and an institutional mechanism of risk assessment.
2. Lack of data which can be taken care of by endorsement of cross-border MoUs & regional



platforms can be leveraged to share knowledge, data, information and even experiences.

Use of satellites by neighbouring countries to monitor events like cyclones, droughts etc. can be facilitated through MoUs. MoUs are primarily part of governance but they are also important in working towards Priority 1.



Priority 2:

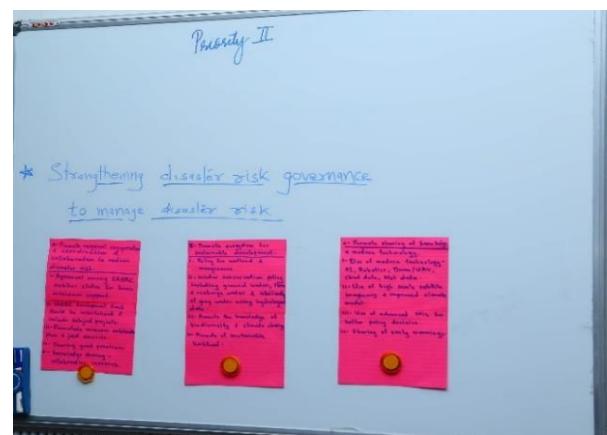
It was discussed to have an agreement amongst the SAARC countries for basic minimum support and policy designing: example, it may be learnt from how EU Flood Directive works so as to understand the true essence of risk governance.

1. SAARC development fund should be revitalized.
2. Resource mobilisation and joint exercises should be carried out.
3. Sharing good practices, collaborative researches must be undertaken.
4. Policies on water conservation, biodiversity, sustainable livelihood practices should be worked out surpassing the geographical boundaries.
5. Promote the use of advanced technologies, processes etc. for detection, monitoring and better early warning, which would enhance decision making required for effective risk governance.
6. Regional governance is particularly important in cross-boundary events.
7. The role of civil society and corporate sector also needs to be emphasised upon.

Priority 3:

The outputs for priority 3 were,

1. To have a regional financing mechanism
2. Innovations to foster indigenous knowledge
3. Providing people options based on advanced technologies

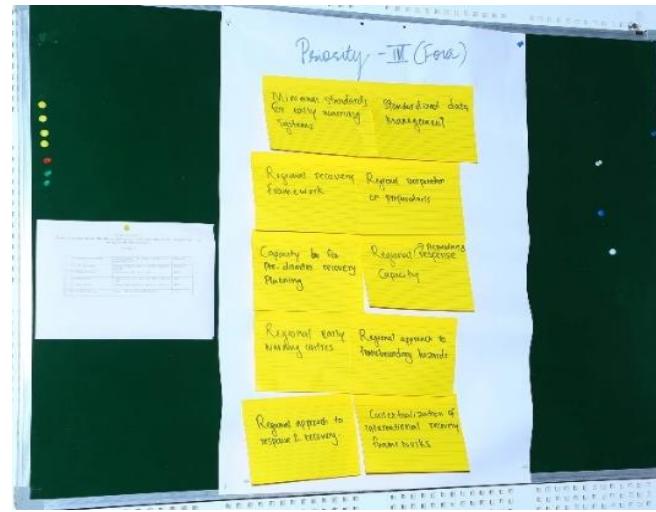


4. Finance for education and awareness to maximize resilience
5. Investing in disaster resilience as per the SFDRR is more than finance; it's social investment too.

Priority 4:

The outputs for priority 3 were,

1. Standardize data management; Nepal has launched a disaster risk reduction portal which promotes data sharing and free dissemination.
2. Regional recovery framework and pre-disaster preparedness and recovery plan.
3. Capacity for regional preparedness and response
4. Regional early warning system Centres
5. Contextualization of international recovery frameworks
6. Good examples of recovery and rehabilitation were seen in Latur and Kutch earthquake but there is a stark lack of documentation of the same.



Presentation by WFP: Food security and DRR

Understanding impacts of disasters and climate change on food security is key to resilience. Translation and contextualization of complex DRR concepts is very important to generate actionable plans and investments. There are numerous tools like PRISM (Platform for Real Time Information and Situation Monitoring) that is used to provide timely and appropriate assistance to decision makers. The basis of the tool is simple; economic vulnerability coupled with drought exposure shows the impacts.

Forecast based financing: The forecasts are tailored to predict the potential impact on food insecure people and their livelihoods, according to the cropping seasons. However, all of this depends on the capacity to forecast, existing SoPs and coordination with key stakeholders based on the agreed upon trigger level.

The need of the hours is more agile, responsive/dynamic and grounded EWS, better preparedness and responses.

Panel Discussion: Civil Society Organisation Partnerships

In the panel discussion, importance of CSOs was discussed. Over the years CSOs have moved from confrontational to constructional mode. The SFDRR mentions the whole-of-society approach which sets the tone for a discussion on the role of CSOs.



Local CSOs can play a powerful role in helping CBOs to map their vulnerabilities and risks. A system of providing information from Government to the public and vice versa needs to be thought of; SETU is one of the good examples. Village Knowledge Centres by M. S. Swami Nathan Foundation shares information on tides, fishing zones etc. Local leaders are very influential and there is a need to cultivate them as well.

Partnership with private sector: A different perspective: In this discussion it was highlighted that losses of the private sector are much higher than the public sector; this shows that when the private sector is itself not prepared; how can they probably help the government in building resilience? More than 60% of the SMEs vanish within 4 days of a disaster, 30% never come back. Corporate sector as a donor is equally vulnerable.

However, on the other side, industries/ manufacturing sectors are also responsible for the degradation of ecosystems and enhancing disaster risks. It is important to look at the private sector engagement in DRR.

Session: Strategy and action plan monitoring, evaluation and follow-up

Monitoring is the periodic information of the progress on achieving targets while evaluation is the observed change that comes after the process has been implemented either completely or in phases. Indicators need to be SMART (Specific, Measurable, Attributable, Relevant / Realistic, Time-bound).

It can be achieved by breaking down the strategy into objectives, actions and indicators. Also, targets can also be broken down into indicators and sub-indicators. However, baseline data is always required for effective M&E.

Presentation by UNICEF

UNICEF presented the case of Bihar, which has a roadmap for DRR at State level which outlines the policies and practices that needs to be adopted, clear directions for DRR actions and agenda for 15 years; in fact, the government reinforced its commitment through dedicated allocation of resources. Depending on the Roadmap, Action Plan has been prepared for 16 departments through state level workshop, VDMP template has also been prepared. A lot of learnings come from the process of development of the Roadmap but this brought about high ownership amongst key stakeholders and it also helped in identifying critical gaps in policy and institution arrangements.

The Central Government also played an important role in the process of development of the Roadmap.

Presentation by IIPHG

Over the years, the number of deaths due to heat wave only increased. In 2010, Ahmedabad experienced an unprecedented heatwave incident. More than 800 people died in just a week (20 – 27th May, 2010). This was the first time when it was shown that in a tropical / sub-tropical country heat-waves can be a major hazard. Pakistan heat-wave of 2016 was also an event to be mentioned. ‘Bat drop’ incidents also became frequent. Heat-



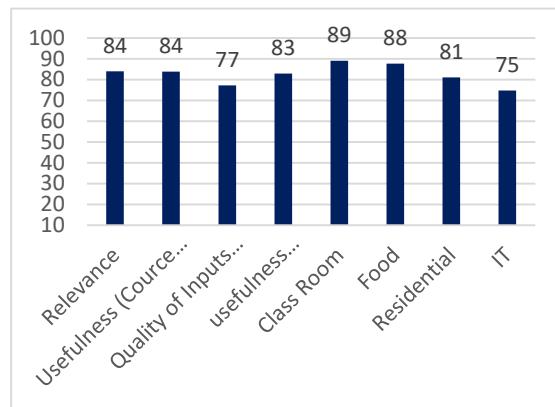
wave combined with shortage of water spells a greater disaster. Thus, came the Heat Action Plans, awareness, building capacity of medical communities, reducing heat exposure and promoting adaptive measures. Other measures like changing housing and area planning were also taken into account. The assessment of the impact is based on the comparative analysis of mortality, cases reported in 5 municipal hospitals. The key lessons are involvement of local leadership, local data and improvement of the plan throughout the years.

It was also realised that issues like Urban Heat Island also needs to be considered while coming up with Action Plans as without any permanent interventions, which are primarily limited to Band-Aid approach, the solutions proposed would be futile.

Valedictory Session



Feedback from Participants



Group Photograph



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21	Pakistan	Name : Ms. Nigar Anjum Organization : M/o Planning Development & Reforms, Islamabad
		Email : thanrim@yahoo.com nigar.rah@gmail.com

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22	Sri Lanka	Name : Dr. S.Amalanathan Ministry of Public Organization : Administration and Disaster Management Email : samal25spm@yahoo.com Contact No : 94 777547778 Whatsapp No. :
23	Sri Lanka	Name : Mr. N.A.V.Dissanayake Organization : Disaster Management Centre Email : nra.viraj74@gmail.com Contact No : 94 773957887 Whatsapp No. :
24	Sri Lanka	Name : Ms. M A Kavitha Ministry of Finance, Organization : Department of External Resources Email : kavitha@erd.gov.lk Contact No : 94 776404236 Whatsapp No. :
25	Sri Lanka	Name : Ms. Henry Glorieux Organization : UN RC Office Bangladesh Email : henry.glorieux@one.un.org Contact No : Whatsapp No. :

Annexure - 2

Post Disaster Needs Assessment

Training Report : 27th to 30th August 2019



SAARC Disaster Management Centre, Gandhinagar

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Programme Note

Post Disaster Needs Assessment & Disaster Recovery Frameworks for SAARC Member States

Background

- The United Nations Development Group (UNDG), the European Union (EU) and the World Bank (WB) signed a joint declaration¹ in 2008 on Post-Crisis Assessments and Recovery Planning committing their Organizations to collaborate and harmonize post-crisis frameworks to support post-disaster needs assessments and recovery planning.
- Since the signature of the agreement, the three partners have jointly prepared the Post-Disaster Needs Assessment (PDNA) procedural and technical guidelines and the Disaster Recovery Framework (DRF) guide. Both the PDNA Guidelines and the Recovery Framework Guide were presented last September 2014 at the Second World Reconstruction Conference and officially launched at the Sendai Third World Conference on DRR on 14 March 2015.
- The development of the PDNA and DRF guides represents a unique outcome towards a harmonized and standardized approach in Government-led efforts to estimate the needs for recovery after a disastrous event and to plan and implement recovery strategies to help rebuild the physical, social and human capital of disaster affected communities.
- The guidelines now need to be widely disseminated and capacities strengthened among Governments, staff members of the three partner organizations as well as among practitioners, for needs assessment and recovery planning. UNDP anchors the capacity building efforts for PDNA and DRFs in partnership with the EU and World Bank.
- These efforts envisage a systematic approach to develop PDNA and DRF capacities covering different regions around the world. To this end, Intergovernmental Organizations, such as South Asian Association for Regional Cooperation (SAARC) are principal stakeholders to encourage member countries to prepare and undertake recovery processes in a more effective and efficient manner.
- The regional workshop on Post Disaster Needs Assessment and Recovery Frameworks, targets Member States of SAARC, in particular officials from the ministry of disaster

management or ministry of planning and finance. The training will be help in collaboration with SAARC Disaster Management Center and UNDP.

- This concept note provides the necessary information to participants to understand the objective, selection criteria and other operational procedures that will be followed in the organization of this event.

Objective

The main purpose of the training on PDNA and DRF is to inform Government officials from the SAARC Member States about the advantages of applying a standardized approach and methodology to conduct post disaster needs assessments, formulate a recovery strategy and plan for its successful implementation.

In addition, a pool of 35 to 40 delegates from member countries will be trained on the use and application of the PDNA and DRF methodology and approach. One of the expected results is to establish a roster of professionals from the member countries to undertake needs assessment and formulate recovery frameworks in the Asian Region.

Regional experts are expected to support in-country trainings and capacity-building within SAARC member countries.

Methodology

The 4-day training methodology includes: a series of interactive lectures, power point presentations, directives for small and large group discussions, practical exercises, role-plays and a standardized case-study analysis. Handouts, flash drives with relevant essential documents for the workshop, and instructions for facilitators and trainees will be shared during the workshop; prior to the workshop, participants are encouraged to: read and familiarize themselves with the PDNA methodology, Vol. A, review the suit of sector chapters Vol. B as well as the Disaster Recovery Framework (DRF).

¹ EU, UNDG and World Bank- Joint Declaration on Post-Crisis Assessment and Recovery Planning, 25th September 2008. The UNDP Administrator signed the Declaration on behalf of the UNDG.

<http://www.undp.org/content/undp/en/home/librarypage/crisis-prevention-and-recovery/pdna.html#>
<https://gfdrr.org/sites/gfdrr/files/publication/DRF-Guide.pdf>

About the Trainers

Experienced professionals in the field of post disaster needs assessments who have been engaged in the development of the PDNA methodology and the formulation of recovery frameworks, with enough practical experience on the ground, have been invited to conduct this workshop.

The core team of trainers is complemented by selected sector experts who will provide their specialized perspective in key areas such as infrastructure, production, socio-economic aspects and will reflect on the cross-cutting issues of PDNA and recovery formulation such as governance, disaster risk reduction, environment, gender, employment and livelihoods.

About the Trainees

The main targets of the training are delegates from the SAARC Member States, in their capacity to support policy and technical issues related to post disaster assessment and recovery planning. Trainees are expected to support future PDNAs and the formulation of DRFs in the aftermath of a disaster. They will be also part of a regional network that expects to contribute to the strengthening of national and regional capacities for recovery. Delegates from the countries are expected to have a strong technical background on development, disaster risk reduction or recovery. Emergency management is not the focus of this training.

Workshop details

The four-day workshop includes a series of interactive lectures, power point presentations, directives for small and large group discussions, practical exercises, role-plays and a standardized case-study analysis. Participants are encouraged to familiarize themselves with the PDNA methodology (Vol. A) and the Sectorial Approach (Vol. B) through links provided on the Methodology Section.

Eligibility Criteria

Participants are invited based on their capacity to influence politically and technically the use and application of the PDNA and DRF. Trained staff will be expected to lead and contribute to post disaster needs assessment activities on the ground, regionally and within their own

countries. All the proposed participants are required to fill out the application form attached to this concept note.

SAARC Disaster Management Centre (SDMC-IU), Gujarat

South Asia Association of Regional Cooperation (SAARC) Disaster Management Centre (SDMC-IU) has been set up at Gujarat Institute of Disaster Management (GIDM) Campus, Gandhinagar, Gujarat, India in November 2016, with a vision to be a Centre of Excellence for regional cooperation and specialised service delivery to Member States for Disaster Risk Reduction (DRR), Response and Recovery for Sustainable Development. Eight Member States, i.e. Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka are expected to be served by the SDMC (IU).

Agenda

Day 1: Tuesday 27 August 2019			
Time	Session and Objectives	Facilitators/ Presenters	Methodology
09.00 – 09:30	Arrival and Registration	SDMC (IU)	30 min
09:30 – 10.00	Opening Session Welcome and Participants Introduction Introductory Remarks Address by Member NDMA Inaugural Speech and Key Note Address Group Photo	Mr Krishna Vatsa (UNDP) Mr Kamal Kishore Director SDMC (IU)	30 min 10 min. 5 min. 5 min. 8 min. 2 min.
10.00 – 10.20	<i>Coffee Break</i>		
10:20 – 11:30	Session 2: PDNA Overview - Evolution of Recovery Approaches	Trainers: Mr Kamal Kishore, Member, NDMA	70 min. 20 min.

	<ul style="list-style-type: none"> - To explain the rationale working principles, purpose, value add and limitations of the PDNA process and methodology. - To understand the institutional protocols of the PDNA, procedures, roles and responsibilities for activating and conducting a PDNA. 	Dr Krishna Vatsa (UNDP) Ms Rita Missal (UNDP)	10 min 20min. 20 min. Q&A
11:30 – 12:30	Session 3: Experience Sharing <ul style="list-style-type: none"> - Panel Discussion: Officials and practitioners share their experience of participating in a PDNA/ assessments. 	Facilitated by: Director, SDMC (IU) Country representatives : Nepal; Sri Lanka;	60 min. 20 min. for each ppt & 20 min. Q & A
12:30 - 13:30	Lunch		
13:30 – 14:10	Session 4: <ul style="list-style-type: none"> - Pre-Disaster Baseline and Data Collection: To understand the pre-disaster 	Mr Ricardo Zapata (Partcip EU)	40 min. 20 Mins
	context and how to identify sources of baseline data. <ul style="list-style-type: none"> - Use of Data and Imagery: To understand what systems and mechanisms exist and how they can be used to strengthen data collection. 	Dr Rama Mohan Rao National Remote Sensing Centre (NRSC), Hyderabad	20 Mins
14:10 -14:30	Session 5: Introduction to Case Study To provide an overview of the case study on which the group exercises for the PDNA will be based and announce the groups.	Rita Missal (UNDP)	20 mins
14:30 – 15:00	Session 5: Group Exercise Developing baseline data and pre disaster context analysis	Facilitation by trainers Subgroups: Group 1: Housing Group 2: Agriculture Group 3: DRR & Environment	30 min. Group Exercise

15:00 – 15:15	Coffee Break		
15:15 - 16:00	Session 6 : Post Disaster Effects and four dimensions of disaster effects	Mr Ricardo Zapata	45 min.
16:00 – 16:45	Session 7: Group Exercise Analysing the four dimensions of the disaster effects	Trainers:	45 min.
16:45 – 17:00	Wrap-up and closing of the day		
Day 2: Wednesday, 28 August 2019			
Time	Name of Session / Objectives	Responsible / Facilitator	Methodology
09:00 - 09:15	Recap of the previous day and introduction to second day		
09:15 – 09:45	Session 8: Estimating Damage and Loss <ul style="list-style-type: none"> - To understand the general principles of estimating damage and loss - To understand sector-wise estimation of damage and loss 	Trainer: Dr Krishna Vatsa (UNDP)	30 min. 15 min. (ppt) 15 min. Q&A
09:45 – 10:00	Exercise: Damage and Loss	Facilitated by: Rita Missal	15 min.
10:00 – 10:30	Session 9: Group work Estimating Damage and Loss	Trainers:	30 min.
10:30-10:45	Coffee Break		
10:45 – 11:30	Session 10: Group Presentations on Context analysis, Post Disaster Effects, Damage and Loss Estimates	Trainers	45 min.
11:30 – 12:00	Session 11 : Estimating Recovery Needs and Developing a Recovery strategy	Trainer Ms Rita Missal	30 min.
12:00 -12:30	Session 12: Group work on developing recovery needs and strategy	Trainers	30 mins

12:30 – 13:00	Session 13: Sharing of experiences Developing Institutional & Technical capacities in PDNA	Mr Bishnupada Sethi NIDM	30 mins
12:45-13:45	Lunch		
13:45 – 14:30	Group Presentations		45 min
14:30 – 14:50	Session 14: Analysing the Macro-economic Impact of a disaster To be able to identify the consequences of the disaster at the macro and micro-economic level.	Trainer Mr Ricardo Zapata	20 min.
14:50 -15:10	Session 15: Analysing the Human Development Impact of a disaster To be able to identify the consequences of the disaster on the quality of human life in the medium and long-term.	Dr Krishna Vatsa	20 min
15:10 –15:25	Coffee Break		
15:25 – 15:45	Session 16: Exercise : Affects and Impacts	Facilitated by: Rita Missal	20 min.
15:45 – 16.00	Wrap-up and closing of the day		
16:00 – 19:00	Visit to Dandi Kutir, Gandhinagar		

Day 3: Thursday, 28 August 2019

Time	Name of Session / Objectives	Responsible / Facilitator	Methodology
06:15-12.00	Heritage Walk – World Heritage City of Ahmedabad		
12:00 -13:00	Lunch		
13:00-13:15	Recap of the previous day and introduction to third day		

13.15 – 14:15	Session 17: Developing a Recovery Framework; Elements of a Recovery Framework - Recovery Policy - Institutional arrangements for Recovery	Trainer: Ricardo Zapata	60 min. 45 min. presentation 15 min. Q&A
14:15 –15:00	Session 18: Group Discussion and presentation on : - Recovery policy and Institutional arrangements for recovery in two selected countries in SAARC (Gujarat, Bangladesh, Nepal)		45 Min. 30 min. presentation 15 min. Q&A
15:00 –15:15	<i>Coffee Break</i>		
15.15 – 16:00	Session 19: Disaster Recovery Framework - Financing Options for Recovery - Implementation arrangements including monitoring recovery	Dr Krishna Vatsa (UNDP)	45 Min.
16:00 -17:00	Session 20: Group Discussions and presentation on financing options and implementation /monitoring options for recovery	Trainers	60 Min.
17:00 – 17.15	Wrap-up and closing of the day		
Day 4: Friday, 30 August 2019			
Time	Name of Session / Objectives	Responsible / Facilitator	Methodology / Comments
09:00-09:15	Recap of the previous day and introduction to fourth day		
09:15 – 10:30	Session 20: Writing the PDNA Report and DRF report - To understand how the sector and full PDNA report and a DRF sector report is prepared	Trainer Ricardo Zapata	75 min 60 min Presentation 30 min. Q&A
10:30 – 10:45	<i>Coffee Break</i>		

10:45 – 11:30	Session 21: Reflections Discussion on lessons learnt and improvement in Recovery practices	Presentation by: Krishna Vatsa	45 min. 15 min. presentation 30 min. Q&A
11:30 – 12:30	Session 22: Introducing Recovery Preparedness Best practices from countries in Asia and ASEAN	Ms Rita Missal	60 min.
12:30 – 13:30	<i>Lunch Break</i>		
13:30 – 14:00	Session 23: New Initiatives - South -South Cooperation efforts - Coalition for Disaster Resilient Infrastructure	Facilitated by: Dr Krishna Vatsa (UNDP)	30 min. 20 min. presentation 10 min. Q & A
14:00 – 14:45	Session 24: Next Steps and Wrap Up Participant recommendations to national and regional agencies to strengthen PDNA and Recovery Planning	Facilitated by: Mr Ricardo Zapata (EU)	45 min. Group Discussion to prepare Action Plan matrix
14:45 – 15:00	<i>Coffee Break</i>		
15:00 – 15:30	Closing remarks Training Evaluation and Participation Certificates	SDMC (IU)	
16:00 – 20:00	<i>Visit to Ahmedabad (Shopping)</i>		

Post Disaster Needs Assessment

August 27 – 30, 2019

Day 1: Tuesday, 27 August '19

Opening Session

On behalf of SAARC Disaster Management Center Mr. Sumedh Patil welcomed all the dignitaries on the dais and participants from respective SAARC Member States and resource person for the capacity building program on Post Disaster Needs Assessment organized with technical support of UNDP, World bank and European Union and gave introduction of dignitaries



(L to R: Ms. Rita Misal (UNDP), Mr. Kamal Kishor (NDMA), Mr. P.K. Taneja (Director SDMC-IU), Mr. Krishan Vatsa (UNDP), Mr. Ricardo Zapata (EU))

After introduction of all the participants the session was inaugurated by lightning of lamp in the presence of Mr. P.K. Taneja, Director SDMC (IU), facilitators from UNDP, EU, and participant from each of SAARC Member states.



(Mr. Ricardo Zapata lightning the lamp)

Key Note Address by Mr. P.K. Taneja (Director, SDMC-IU)



Mr. P.K. Taneja, Director, SDMC(IU) welcomed all the facilitators and delegates from SAARC Member States, experts from all the sectors and specially thanked UNDP and EU for providing technical support and organizing the capacity building program with SDMC(IU).

Further he emphasised that the need of an era is to manage risks instead of managing disaster.

In that case, PDNA provides an opportunity to document fast and real time lessons learned and experience on DRR and recovery planning, and further provides the space to advocate for putting the lessons learned into the recovery plan.

He explained that the main objective of the capacity building workshop was to share practical knowledge and experience on various methodologies to design and implement recovery initiative so as to strengthen the government in the early, medium, and long term recovery stages to build back better.

Group Photo



Introductory Remarks: Mr. Krishna Vatsa (UNDP)

Mr. Krishna highlighted the need of partnership for development of process for PDNA in South Asian region. South Asian countries are exposed to different hazards and recovery is becoming an important aspect after any disaster. Rather than providing mere humanitarian assistance there is a need for Strengthening Governance for comprehensive recovery.



He expressed his happiness about conducting this program at GIDM and SDMC venue as these both are an outgrowth of recovery program. He also mentioned that it is good opportunity for learning and to have presence from NDMA, NIDM, SDMC and UNDP on a same platform as NIDM is working on PDNA for a long time. He also acknowledged the presence of Mr. Ricardo from EU in this training.

Key note address by Member of NDMA: Mr Kamal Kishore



Mr. Kamal Kishore expressed that the practice of recovery is getting much more systematic over the last two decades. Every recovery needs a good assessment and theoretical exercise involving all stakeholders to build back better in post disaster needs assessment. He acknowledged Mr. Krishna Vatsa statement that this training itself is a symbolic one, as it is happening in GIDM venue which has been developed post Bhuj Earthquake as recovery program.

In his presentation Mr. Kamal Kishore talked about two major points, 1. Whole notion of comprehensive PDNA reconstruction, recovery and rehabilitation program 2. Institution mechanism for reconstruction and managing recovery.

And he explained about 5 key trends going on in PDNA:

1. Integrated comprehensive approach of PDNA going around Reconstruction and Recovery,
2. Greater emphasis on outcome along with the input,
3. Build Back Better in true sense by taking in account of livelihood of people, green recovery, proper debris removal, and building resilient ecosystem services,
4. Focused on strong coordination mechanism including multi stakeholders in loop of PDNA.

Taking accountability of end users in Build Back Better mechanism.

Session 2: PDNA Overview

In this session Ms. Rita Misal, Mr. Krishan Vatsa and Mr. Ricardo briefed on the PDNA, its Conceptual Framework and Protocols for undertaking a PDNA, and PDNA process and methodology. Further they explained in detail about joint assessment and recovery planning, analyses of damage and loss, its impacts and effect on Macro economy.



They also explained the importance of conducting such workshop on regional level that can help national government to form a recovery framework, considering DRR and BBB.

Session 3: Experience Sharing

Ms. Rita Misal encouraged representatives from SAARC Member States to share their respective experience about PDNA.

Nepal experience presentation:

Mr. Anup KC presented about 2015 Nepal earthquake's PDNA. He shared that it took approximately 45 days to prepare first PDNA report.

He also presented the outcomes of PDNA towards institutional strengthening like:



(Country representatives: Mr. Anup KC, Nepal)

- Reconstruction Act Formation of NRA (Dec2015)
- Reconstruction and Rehabilitation Policy (Feb2016)
- Post Disaster Recovery Framework (May- 2016). The challenges faced and lesson learned was also talked about.

Sri Lanka experience presentation:

Mr. Samarakoon presented experiences on Sri Lanka's Floods and Landslides May 2016 and associated PDNA practice. He talked about the location and background of PDNA, International parties participated in preparing the PDNA and methodology used, sectors and geographical area affected and covered under PDNA, the chart of Damage and Losses in monetary value.



Country representatives: Mr.Samarakoon Sri Lanka)

After the presentation, Ms. Rita informed that Sri Lanka is one of the countries which has insurance coverage for housing against disaster damage and loss. The government provides subsidy for the insurance.

Session 4: Dr Rama Mohan Rao from National Remote Sensing Centre (NRSC), Hyderabad

Dr. Rama Mohan Rao presented on the use of Data and Imagery techniques to understand existing system and mechanisms, their application to strengthen data collection to be used in PDNA. He talked about major three data sets,

1. Raster,
2. Vector,
3. Non spatial/Attribute.



(Mr. Rama Mohan Rao taking session on Use of Data imagery

Further he explained use of RS & GIS in Disaster Relief, Damage Assessment, and given details of Release of NDEM Version 3.0, and Product and Services of NRSC working on the Disaster data.

Ms. Rita Misal and Mr. P.K. Taneja talked about the usability of GIS data in PDNA possible only if we get the Pre and Post Disaster data with good enough visibility. Mr. Ricardo talked about how Haiti used spatial GIS data in PDNA for recovery of various ecosystem.

Pre-Disaster Baseline and Data Collection: Mr. Ricardo Zapata (EU)

Mr. Ricardo presented on Pre-Disaster Baseline and data collection and explained the importance of having baseline data from census and other sources of data collection by the government.

Further he explained to understand Gap Analysis from Pre Disaster and Post Disaster Data. He also explained the form of datasets.

Session 5: Introduction to Case Study

The session provided an overview of the case study on which the group exercises for the PDNA was based. The Group Exercise for developing baseline data and pre disaster context analysis was announced by Ms. Rita Missal (UNDP).

In the Group Exercise Participants were divided into three different subgroups mentioned as below:

Group 1: Housing

Group 2: Agriculture

Group 3: DRR & Environment



(Mr. Ricardo taking session on Pre Disaster baseline and collection)



Each group was given one case study. Participants were asked to go through the case study. As part of the exercise they were asked to calculate Damage & Loss in their respective sectors, make a presentation and share with other groups.

Note: Remaining Session of Day 1 were continued on Day 2

Day 2: Wednesday, 28 August'19

In the beginning of the day 2, Ms. Ekta Thaman from GSDMA briefed on the previous day and Ms. Rita Misal gave the introduction on day 2.

And the day was started by continuing with the previous day exercise.



(Ms.Ekta Thaman-GSDMA)

Session 5: Group Exercise

Developing baseline data and pre disaster context analysis



In this exercise participants were divided into three different sub group mentioned as below.

Group 1: Housing

Group 2: Agriculture

Group 3: DRR & Environment

Each group was given a case study for analysis of damage and loss in different sectors. As per the instructions given by PDNA Team, there was one leader and one reporter in each group.

Mr. Krishana Vatsa guided the Housing Group, Mr. Ricardo Guided the Agriculture Group and



Ms. Rita Mishal guided the DRR & environment sector.

After Group exercise one participant from each group presented the outcome of their group discussion and explained about the calculation of damage and loss in their respective sector.

Session 6: Post Disaster Effects and four dimensions of disaster effects

Mr. Ricardo explained that post disaster effect is a quantitative and qualitative term by sectors, geographic division and gender- age. This should be evaluated for each disaster affected area and for each sector aggregation of total, follows a bottom up approach.

He also explained about four dimensions of the disaster effect:

- Damage of infrastructure and physical assets,
- Disruption to access to goods and services,
- Disruption to governance and decision-making process,
- Increase risk and vulnerability.

And also discussed about sources of information for effects, primary sources and secondary sources.

Session 7: Group Exercise

Analysing the four dimensions of the disaster effects

Participants were divided in three groups and were given the case study to understand four dimensions of the disaster effects on their respective sector, Housing, Agriculture and DRR & Environment.

Session 8: Estimating Damage and Loss: Dr Krishna Vatsa (UNDP)

Mr. Krishna Vatsa explained general principles of estimating damage and loss and sector-wise estimation of damage and loss. He explained in detail about the aggregation of the disaster effect and how summarisation take place in a typical PDNA report. He gave detailed understanding of PDNA terminology like Damage and Loss, Estimating Damage in PDNA Report and Estimating Loss in PDNA Report. He also explained the importance of costing the loss.



He has taken example of fruit juice vendor, to make participants understand the calculation of damage and loss.

Exercise: Damage and Loss Facilitated by Rita Missal



Ms. Rita Missal took this session and made participant understand the factors to be considered in assessing the damage and loss post disaster. She also explained the use of baseline data in calculating Damage and Loss post disaster.

Session 9: Group work

Estimating Damage and Loss:



(Group Discussion)

Session 10: Group Presentations on Context analysis, Post Disaster Effects, Damage and Loss Estimates

Housing sector: Estimating Damage and Loss

On behalf of the Housing sector Group Mr. Gulam Sanghro presented about pre Disaster base line data and estimated damage and loss in Housing sector on the basis of case study given to them. They have very well worked on pre disaster baseline data, challenges for housing sector, existing capacity and capacity gap.



Agriculture sector: Estimating Damage and Loss

Mr. Mohd. Aminul Islam presented on pre disaster baseline data and estimating damage and loss for Agriculture sector. They have calculated most of the Damage of assets and losses due to damage of infrastructure and property loss.



DRR and Environment sector: Estimating Damage and Loss



Mr. Repaul Kanji and Mr. Amshad Ahmed presented on pre disaster baseline data and estimating damage and loss for DRR and Environment Sector. They have done detailed analysis of damage and loss data base on both the sector that is DRR and Environment sector for the case study given to them. They have considered policy which are already in place in DRR and environment sector.

Session 11: Estimating Recovery Needs and Developing a Recovery strategy by Ms Rita Missal

Ms. Rita Missal took the session on the fourth pillar of PDNA process that is Recovery needs. In her presentation she explained about four dimension of recovery needs, reconstruction of infrastructure and physical assets, resumption of the production of goods and services, access to goods and services, restoration of Governance and Decision-Making Processes, Risk Reduction and Building Back Better-BBB



Note: Remaining Session of Day 2 were continued on Day 3

Day 3: Thursday, 29 August' 19

On Day 3 early morning Heritage walk was planned by SDMC for the participant at **World Heritage City of Ahmedabad**. All the participant joined for the walk actively and enjoyed the walk.



Session: Sharing of experiences

Developing Institutional & Technical capacities in PDNA Mr Bishnupada Sethi NIDM

Mr. Bishnupada Sethi from NIDM has taken this session online. He presented about developing institutional & technical capacities in PDNA used in recent Odisha Flood. He talked about the affected area, restoration taken place in Puri and other area, Damage and Restoration in Energy Department, Restoration of roads, communication system, Losses to private sector.

Session 12: Group work on developing recovery needs and strategy



Mr. Ahmed Sujeeth presented on Sector report for Calculation of Damage and Loss account for Post Disaster Needs Assessments for housing Sector.

Mr. Binoy Acharya from Unnati

He talked about the post disaster scenario of 2001 earthquake in Gujarat and the recovery process. He also talked about the Damage and Loss Assessment methodology adopted post disaster in 2001 Bhuj earthquake. He further added how the recovery approach in Gujarat was inclusive in nature, wherein special packages were declared for orphans, old age people, women, widows, handicapped everyone. He also mentioned about the urban reconstruction strategy after the earthquake and grievance redressal mechanism.



Session 13: Analysing the Macro-economic Impact of a disaster

This session was combined taken by Mr. Ricardo and Ms. Rita, they explained on appreciating the differences and complementarities between the economic and human impact assessments, identify key macroeconomic variables for the economic impact assessment, and how to analyse examples of past economic impact assessments.



They also explained about identifying the consequences of the disaster at the macro and micro-economic level, the GAP analysis undertaken at the national and regional levels for all sectors and all social groups, analysis between economy impact and human impact.

Session 14: Analysing the Human Development Impact of a disaster

This session was taken by Mr. Krishna, in his presentation he briefed about the consequences of the disaster on the quality of human life in the medium and long-term. He explained on how to get the direct inputs from the people on their recovery priorities to mitigate the worsening of the human impact.

Further he explained that Human Development Impacts relies on the five key indicators:

- Living condition,
- Livelihood,
- Food Security,
- Gender equality and
- Social inclusion.

He has given example of Health Impact Assessment from the Drought Impact and



Needs Assessment (DINA) Somalia-2017, the difference between pre disaster baseline scenario and post disaster human impact.

Day 4: Friday, 30 August'19

Session 15: Exercise on Affects and Impacts Facilitated by Ms. Rita Missal

On the beginning of the day participants from each group presented on the Affects and Impacts and Damage and loss Accounts in their respective sectors namely Agriculture, Housing, DRR and Environment.

Session 16: Developing the Recovery Strategy

The session was taken by Ms. Rita Missal. She explained about the links between the PDNA Assessment and the Recovery Strategy, and the links between the Disaster Recovery Strategy and the Disaster Recovery Framework.

She also briefed about the objective of the recovery strategy mentioned as below:

- Identify priorities based on assessment results
- Establish milestones for recovery
- Promote an equity based, participatory and inclusive recovery process
- Provide an indicative cost of recovery
- Provide the basis for DRF
- Serve as a tool for resource mobilization with donors



She further explained how Disaster recovery strategy leads to making Disaster recovery frame work.

Session 17: Developing a Recovery Framework; Elements of a Recovery Framework by Ricardo Zapata

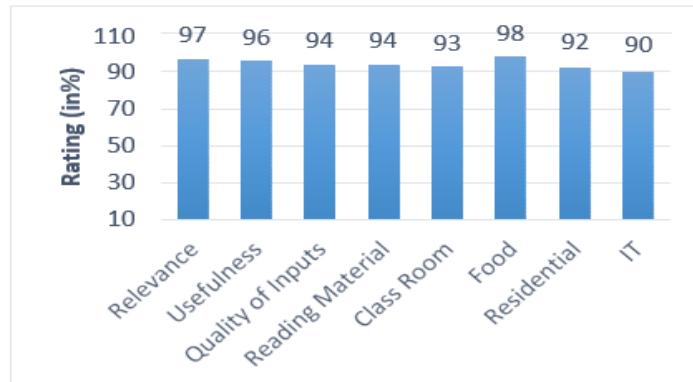


Mr. Ricardo took the session on Developing a Recovery Framework, Elements of Recovery framework, Financing Options for recovery and Implementation arrangements including monitoring recovery. He has presented the summary of Disaster Recovery Framework modules and explained about developing, Policy and Strategy Setting, Institutional Framework, Financing for Recovery, Implementation. He also talked about the importance of considering need of the stakeholders and taking them into the loop in development of DRF- policy for short-term medium term and long-term recovery process.

He explained in detail, the linkages between PDNA and DRF, and the use of PDNA report in developing DRF-plan.

Feedback from the Participants

On the closing of Day 4 activities, feedback from the participants was taken on various criteria. The rating given by the participants is shown in the graph below:



Closing remarks

The training program had presentations, discussions and certain amount of reflections also. After attending this program, the participants can contribute to recovery preparedness and recovery planning in their respective countries and also support different kind of assessments for any disaster. Post this program, participants are aware of the PDNA methodology and can promote the same in various discussions, practice it, advocate, and put to good use.



List of Participants

Sr. No.	Country	Particulars	Photograph
1	Afghanistan	Name : Mr. Ebadullah Arifi Organization : Manager of Customs Exemption, Ministry of Finance, Afghanistan Email : ebadiarifi@mof.gov.af Contact No : +93 790454747 WhatsApp No. :	
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3	Afghanistan	Name : Mr. Mohammad Ajmal Karimi General Manager of International Organization : Trips & Programs, ANDMA, Afghanistan Email : karimi27@gmail.com Contact No : +93 700237511 WhatsApp No. :	
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Training Workshop on Regional Severe Weather and Flash Flood Hazard Early Warning Mechanism

Training Report : 15th to 17th October 2019



SAARC Disaster Management Centre, Gandhinagar

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Programme Note

Regional Severe Weather and Flash Flood Hazard Early Warning Mechanism

Background

South Asia is home to about one fourth of the world's population and occupies only 3% of the global land area, making it both the most populous and the most densely populated geographical region in the world. SAARC region is among the most vulnerable regions of the world to hydro-meteorological hazards including floods, cyclones, droughts and extreme temperatures.

Climate, weather and hydrological hazards do not recognize national boundaries. Transboundary/regional programs and cooperation are essential for reduction of the loss of lives and damage to livelihoods when facing these hazards. The development and implementation of systems to provide early warnings for severe weather events such as cyclones and flash floods requires data and information sharing in real time, and coordination among the government agencies at all levels. Within a country, this includes local, municipal, provincial-to-national levels as well as regional and international entities involved in hydro-meteorological services and Disaster Risk Reduction (DRR). The National Meteorological and Hydrologic Services (NMHSs) is generally the authority solely responsible for issuing warnings for these hazards. However, in many countries, the linkages and interfaces between the NMHS and other agencies need to be strengthened. Therefore, there is a critical need to assess, strengthen, and formalize collaborations when addressing the concept of reducing risk and impacts from severe weather and floods.

The Sendai Framework for Disaster Risk Reduction: 2015–2030 (SFDRR) that was adopted by 187 nations (including all the SAARC Member States) aimed at the 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. As outlined in the principles and priorities under SFDRR, a critical component of Disaster Risk Reduction (DRR) is to enable early action. One way to achieve this is through a well-functioning early warning system that delivers accurate, reliable and easy to understand warnings, in a timely manner, to authorized disaster managers and populations at risk to take necessary actions. Effective

early warning systems involve four operational components viz. (1) Monitoring and Warning Service; (2) Risk Knowledge; (3) Dissemination and Communication; and (4) Response Capability; which requires close cooperation and coordination among all the agencies involved.

State-of-the-art technology and a perfect forecast will not save lives if the populations at risk are not informed in a timely manner or do not have plans and policies in place in advance to reduce impacts. Well-prepared communities remain vulnerable to these hazards if they do not have access to and understand information that provides the lead time needed to take necessary actions. Communications and warning/information dissemination are important attributes of a successful warning system as well as investment into building the capacity of forecasters and knowledge user. In addition, close coordination must occur between all sectors and between national and local governments for systems to function properly with clear lines of roles and responsibilities to avoid confusion and chaos during disasters. Important parts of this process are the systems that enable user feedback to periodically improve to address the needs of decision makers.

Considering the same, SDMC (IU) is organizing a training workshop with the aim to strengthen coordination and collaboration mechanisms from national to local levels for Severe Weather and Flash Flood Hazard Early Warning Systems. During the program various tools and facilities to enhance currently operational severe weather and flash flood early warning systems in various countries in support of delivery and communication of warnings for the DRR entities at the regional, national and local levels in order to reduce the loss of life and property will be demonstrated.

Objectives

Overall, the capacity building program will provide an opportunity to:

- Provide an updated overview on different approaches used for severe weather prediction/forecasting of rainfall in the region;
- Understand the role of agencies involved in severe weather early warning and their mechanisms in the SAARC region.
- Discuss the issues and challenges of hazard assessment and ways of risk communication amongst the stakeholders.

- Understand opportunity to develop simple prediction mechanism using Climate Prediction Tool (CPT) for the region;

Targeted Audience

About 25 participants from the SAARC Member States working with National Meteorological and Hydrology Services, disaster management agencies and relevant departments are expected to be participate in the training workshop.

Course Delivery

The course will be delivered using modern learning techniques with an emphasis on interactive lectures, group exercises, field visits and group brainstorming. The course will be enriched by guest speakers who will host debates and discussions using their wealth of practical experience in the field to provide cutting-edge insights on Severe Weather and Flash Flood Hazard Early Warning Systems. Participants will also be encouraged to share their experiences of end-to-end Early warning systems and dissemination techniques from their respective countries.

SAARC Disaster Management Centre (SDMC-IU)

SDMC (IU) has been set up at Gujarat Institute of Disaster Management (GIDM) Campus, Gandhinagar, Gujarat, India in November 2016, with a vision to be a Centre of Excellence for regional cooperation and specialized service delivery to Member States for Disaster Risk Reduction (DRR), Response and Recovery for Sustainable Development. Eight Member States, i.e. Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka are being served by the SDMC (IU).

Agenda

Day 1: 15th October 2019 – Tuesday

Time	Session and Objectives	Facilitators/ Presenters	Methodology
09.15 – 09:45	Arrival and Registration	SDMC (IU)	30 min
09:45 – 10.15	Opening Session Welcome and Participants Introduction Introductory remarks and Keynote Speech Group Photo	SDMC (IU) Director, SDMC (IU)	30 min 10 min. 15 min. 5 min.
10.15 –10.45	Coffee Break		
10.45 – 12.00	Regional Severe Weather Forecasting Status on Plan	Dr Naresh Kumar, Scientist IMD	75 min. 60 min. ppt. & 15 min. Q&A
12.00 –13.00	Lunch Break		
13.00-14.00	Early Warning Mechanism in South Asia	Dr Naresh Kumar, Scientist IMD	60 min. 50 min. ppt. & 10 min. Q&A.
14.00-15.00	<u>Country Presentations:</u> Status and Future Plans of Severe Weather and Flash Flood Hazard Early Warning Mechanism - <i>Afghanistan</i> - <i>Bangladesh</i> - <i>Bhutan</i>		60 min. 15 min for each presentation 15 min Q & A
15.00 – 15.15	Coffee Break		
15.15 – 16.45	<u>Country Presentations:</u> Status and Future Plans of Severe Weather and Flash Flood Hazard Early Warning Mechanism - <i>India</i> - <i>Maldives</i> - <i>Nepal</i> - <i>Pakistan</i> - <i>Sri Lanka</i>		75 min. 15 min for each presentation 15 min Q & A

17:30 – 18:30 Meditation – Fitness Centre

Day 2: 16th October 2019 – Wednesday

07.30 – 08.30 Meditation – Fitness Centre

Time	Session and Objectives	Facilitators/ Presenters	Methodology
10.00 – 10.45	Case Study – Kerala Floods, 2018	Dr. Sekhar L. Kuriakose Member Secretary SDMA - Kerala	45 min. 35 min ppt 10 min Q & A
10.45 – 11.15	Activities of Regional Integrated Multi-Hazard Early Warning System in SAARC region: Discussion on Establishing and Maintaining end-to-end Early Warning System – Issues and Challenges (Skype call)	Dr. S. Jothiganesw Team Leader - Climate Applications RIMES, Thailand	30 min. 25 min ppt 5 min Q & A
11.15 –11.30	Coffee Break		

11.30 – 12.15	South Asian Climate Outlook Forum (SASCOF) - A Mechanism for preparing consensus climate forecast outlook for South Asia	Dr O P Sreejith Scientist IMD	45 min. 35 min ppt 10 min Q & A
13.00 –14.00	Lunch Break		
14.00 – 14.45	Community based Floods Early-Warning Dissemination and Communication	Dr Karna Nepal	45 min. 35 min ppt 10 min Q & A
14.45 –15.00	Coffee Break		
15.00 –17.00	Visit to India Meteorological Department, Ahmedabad	Dr Jayant Sarkar Director IMD, Ahmedabad	60 min. Discussion 20 min Q & A

17:00 – 19:00 Shopping - Ahmedabad

Day 3: 17th October 2019 – Thursday

07.30 – 08.30 Meditation – Fitness Centre

Time	Session and Objectives	Facilitators/ Presenters	Methodology
10.00 – 11.00	Regional framework for Lightning EWS for South Asia	Col. Sanjay Srivastava Chairman, CROP	60 min. 45 min ppt 15 min Q & A
11.00 –11.30	Coffee Break		
11.30 – 12.15	Climate Change and its Impact on Extreme Weather over South Asia	Dr D R Pattanaik Head,(Numerical Weather Prediction) Division, IMD	45 min. 35 min ppt 10 min Q & A
12.15 – 13.00	Integration of Space Technology in Severe Weather Warning and Flash Floods Monitoring	Dr Abhinav Kumar NRSC, Hyderabad	45 min. 35 min ppt 10 min Q & A
13.00 –14.00	Lunch Break		
14.00 – 15.00	Perspectives of Severe Weather Predictions in SAARC Region covering Multi – Hazards	Dr K J Ramesh Ex. DGM, IMD	60 min. 45 min ppt 15 min Q & A
15.00 – 15.30	Closing remarks Training Evaluation and Participation Certificates	SDMC (IU)	
15.30 –15.50	Coffee Break		

16:00 – 19:00 Visit to “DandiKutir” – Gandhinagar

Training Workshop on Regional Severe Weather and Flash Flood Hazard Early Warning Mechanism

15th to 17th October 2019



Day 1: 15th October 2019, Tuesday

Opening Session

On behalf of SAARC Disaster Management Centre, Mr. Sumedh Patil welcomed and introduced all the dignitaries on the dais, participants from respective SAARC Member States and resource persons for the Training Workshop on Regional Severe Weather and Flash Flood Hazard Early Warning Mechanism.

Keynote Address by Mr. P.K. Taneja, Director, SDMC (IU)

Mr. P.K. Taneja welcomed all the delegates from SAARC Member Countries and resource persons. In his speech he said that, South Asia is the fastest growing region in the world and at the same time, it is one of the most vulnerable regions towards hydro- meteorological hazards including floods, cyclones, droughts and extreme temperatures.

Climate, weather and hydrological hazards do not recognize national boundaries. He also informed that during the program, various tools and facilities to enhance currently operational severe



weather and flash flood early warning systems in various countries in support of delivery and communication of warnings for the DRR entities at the regional, national and local levels will be demonstrated. He requested all the present experts to share the case studies & their experience during their talk. Further he said that it would be a great learning experience for everyone and requested all the participants from SAARC member states to give their valuable inputs and solicit their support for maximum participation/ interaction during the sessions.

Session 1: Regional Severe Weather Forecasting Status on Plan



by: Dr. Naresh Kumar, Scientist, IMD (Indian Metrological Department)

Dr. Naresh Kumar presented on the Early Warning Mechanism in Indian region. He explained about the effect of Western Disturbance on the Indian sub-continent. He also explained about the Himalayan wind flow, low pressure zone and high-pressure

zone of the SAARC region. Features associated with extreme precipitation over Himalayas and over plains. He presented case studies of 2013 Monsoon extreme rainfall event from 15-17 June over Uttarakhand and 2014 Monsoon extreme rainfall event from 2-5 September over Jammu & Kashmir, and explained the significance of assessment of low pressure and high-pressure zone in issuing early warning. He also presented about the Early Warning Mechanism in IMD, Monitoring and Forecast Process of IMD.

Session 2: Early Warning Mechanism in South Asia

by: Dr. Naresh Kumar, Scientist, IMD

Country Presentations: Status and Future Plans of Severe Weather and Flash Flood Hazard Early Warning Mechanism

All the eight countries presented on this subject with view of their respective countries.

1. Afghanistan

Mr. Sayed Abdul Baset Rahmani presented about the flash flood management information system of Afghanistan, various early warning sources and dissemination of information. He talked about the constraints and challenges faced, and immediate and short-term needs and planning.



Early Warning Mechanisms"



2. Bangladesh

Mr. Md. Asadur Rahman presented about the weather and climate related hazards in Bangladesh, nodal agencies for monitoring and assessment of natural hazards, warning criterion and SOPs in place, BMD weather app, and public education on aspects of weather and climate related natural hazards.

3. Bhutan

Mr. Tayba Buddha Tamang presented about the vulnerabilities of Bhutan especially the GLOF and floods. He explained the structure of National Centre for Hydrology & Meteorology (NCHM) and the hydrological and meteorological services provided by it. He explained in detail the working of GLOF early warning system. He also highlighted the challenges and future plans.



4. India

Dr. Manorama Mohanty and Dr. Jayanta Sarkar described the flood situation in India. Dr. Manorama presented on the role of IMD in flood forecasting, early warning and now cast - observing system and numerical weather prediction (NWP) modelling. She



presented an analysis for 9th August 2019, for the case of Gujarat by showing the satellite imagery, meteosat and radar products, NWP products, and how the warning is issued. Discussing the future plan, she highlighted on Common Alerting Protocol (CAP).

5. Maldives

Mr. Ibrahim Miflal Fayaz presented about the major environmental problems and vulnerability indicators for the archipelago of Maldives. He highlighted the geographical challenges the region faces like coastal erosion, pluvial flooding, and the effect of changing topography on infrastructure development. He presented on the challenges, adaptation measures and Strategic Action Plan taken up by the concerned agencies of Maldives.



6. Nepal

Mr. Dilliram Acharya, Mr. Sunil Pokharel and Ms. Sajeena Shakya presented in detail on how the National Early Warning System captures the event by presenting a case of July event and how the system was effective in 2019 flood. They presented on the improvement points and future plans. They also highlighted on how regional co-operation can better support monitoring, warning and prediction.



7. Pakistan

Mr. Tariq Masood Farooka in his presentation explained about the institutional structure of disaster management and flood hazard profile of Punjab province in Pakistan. He presented on the water irrigation pattern and river system of Pakistan, early

warning mechanism, and flood simulation at Indus. He showcased the capacity building measures like mobile communication office, DSNG vans, water browsers, satellite-based tracking of rescue boats and OBMS. And preparedness through control room, inventory management system, real time monitoring of relief activities, provincial disaster response plan, disaster management system (DMS), and mock exercises.



8. Sri Lanka

Mr. H M A C Bandara presented on the legal framework and organisational structure of Disaster Management in Sri Lanka. He discussed on Multi-Hazard Early Warning Dissemination System, the role of military in disaster management, early warning dissemination system and national EOC.

Meditation at Fitness Centre

On all the three days of the program, meditation session was also organised for the participants which received a good feedback from them.



Day 2: 16th October 2019, Wednesday

Session 1: Case Study – Kerala Floods, 2018

**by: Dr. Sekhar L Kuriakose, Member Secretary,
SDMA – Kerala**

Dr. Sekhar L Kuriakose presented on Kerala floods, 2018-19. He briefed about the State, geography, capacities, social culture, policies and vulnerabilities. He shared the lesson learned from 2013 flood and disaster management institution working in Kerala.



He explained the rainfall pattern of 2018 floods, compared to which, 2019 had more rainfall, but in 2019 they were able to manage the situation much better with the experience of 2018. He told how floods have started to happen in little pockets (remote locations) and discussed about volunteerism, rescue and relief operation, loss of traditional practices, location based public GIS media, vulnerability linked housing relocation scheme, etc.

Session 2: South Asian Climate Outlook Forum (SASCOF) - A Mechanism for preparing consensus climate forecast outlook for South Asia



by: Dr. O. P. Sreejith, Scientist, IMD

Dr. O. P. Sreejith took session on South Asian Climate Outlook Forum(SASCOF), wherein he presented about Regional Climate Centre, Climate Outlook Forum, South Asia Climate Outlook Forum, basic of seasonal forecast, input for preparation of Regional Climate Outlook, new tool for Flash Flood

Early Warning for South Asia. He explained about the World Metrological Organization (WMO) and the weather observation system. Different type of scale processes, models active in IMD and difference between Weather vs. Climate Forecasts. He also explained in detail how Flash Flood Guidance System caters flash flood guidance at sub catchment scale over the entire South Asian region and the SOP created by SASCOF for the same.

Session 3: Community based Floods Early-Warning Dissemination and Communication

by: Dr. Karna, Nepal

Mr. Karna took the session on Community Based Floods Early Warning Communications and Dissemination - A Case Study from Nepal. He talked about the use of technology in recent time in Nepal, the river basin approach, use of mobile technology and IEC tools.



Session 4: Activities of Regional Integrated Multi-Hazard Early Warning System in SAARC region: Discussion on Establishing and Maintaining end-to-end Early Warning System – Issues and Challenges (Skype call)

by: Dr. S. Jothiganesh, Team Leader - Climate Applications, RIMES, Thailand

Dr. S. Jothiganesh took the session through skype call on Activities of Regional Integrated Multi-Hazard Early Warning System in SAARC region. He gave an overview of Regional Integrated Multi- Hazard Early Warning System and its services in South Asia. He briefed about the RIMES's portfolio of services in South Asia, active regional services centres, time frame of forecasting and share case studies of TNSMART-Platform.

Visit to India Meteorological Department, Ahmedabad



Day 3: 17th October 2019 – Thursday

Session 1: Regional framework for Lightning EWS for South Asia

by: Col. Sanjay Srivastava, Chairman, CROP

Col. Sanjay Srivastava presented on the Regional Framework for Lightning EWS for SAARC Countries, wherein he explained the process of lightning scenario, effects and impacts of lightning on human being. He also mentioned that the subject “Lightning” was referred in CoP Paris (2015) by Hon.PM of India as by product of extremities of climate. He also briefed about lightning resilient India campaign 2019, mid monsoon 2019 lightning report, backcountry lightning risk management, lightning safe areas, lightning protection device, prevention and mitigation for lightning, lightning Early Warning Framework for SAARC Countries, and road map ahead.



Session 2: Climate Change and its Impact on Extreme Weather over South Asia



by: Dr. D.R. Pattnaik, Head, (Numerical Weather Prediction) Division, IMD

Dr. D.R. Pattnaik in his presentation explained about, climate system; climate variability and climate change, observed climate change over India, climate change and extreme weather, future climate scenario, early warning & impact-based forecasting for effective disaster management. Further he said that IMD has taken many steps towards improving the early warning of disastrous weather in recent time, and impact-based forecasting will be very useful in minimizing the adverse impacts of adverse weather through effective Disaster Management.

Session 3: Integration of Space Technology in Severe Weather Warning and Flash Floods Monitoring

by: Dr. Abhinav Kumar, NRSC, Hyderabad

Dr. Abhinav Kumar presented about the global disaster profile (30% SAARC states), India and disasters, space and ground assets for DRR, communication through different types of satellites. He explained the usefulness of space-based observation. He took the case of cyclone Titli to explain the geo location understanding by taking satellite maps. Through images of Kerala flood, he explained the colour code system and identification of low-lying areas. He explained about NDEM, ISRO support to SAARC and Asian countries, ISRO role in Sri Lanka Floods, Bhutan floods, and other disasters data management.



Session 4: Perspectives of Severe Weather Predictions in SAARC Region covering Multi – Hazards



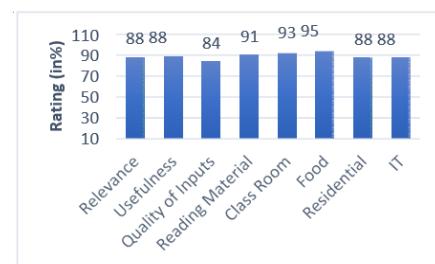
by: Dr. K.J. Ramesh, Ex. DGM, IMD

Dr. K.J. Ramesh, in his presentation, explained about the climate change and increasing risk of natural disasters, integrated modelling efforts (INCOIS, NCCR), ocean-atmospheric coupled modelling - extended range and seasonal forecast, ocean-atmospheric Hurricane WRF (Weather Research and Forecasting) for cyclone prediction, warning services for coastal region.

He also discussed about disastrous weather forecasting: technological limitations and capabilities, role of meteorological information in coastal DRR, monitoring and forecast process of cyclones, MoES agencies dealing with various hazards, operational HWRF Hybrid Coordinate Ocean Model (HYCOM) modelling system.

Feedback from Participants and Closing Remarks

At the end of all technical sessions, feedback from the participants was taken on various criteria. The rating given by the participants is shown in the graph.



List of Participants

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3	Afghanistan	Name : Mr. Mohammad Ishaq Noori Organization : Hydro metrological Advisor, Afghanistan National Disaster Management Authority Email : noorimet@yahoo.com Contact No. : +93 799461756	
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7	Bhutan	<p>Name : Ms. Monju Subba Organization : Engineer, Weather and climate services Division, NCHM</p> <p>Email : msubba@nchm.gov.bt Contact No. : thisismonju@gmail.com +975 77489322</p>	
8	Bhutan	<p>Name : Mr. Pema Wangdi Organization : Engineer, National Centre for Hydrology & Meteorology</p> <p>Email : pwangdi@nchm.gov.bt Contact No. : +975 77746734</p>	
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15	India	<p>Name : Sandeep k. Pandey</p> <p>Organization : Senior Program Manager, GIDM</p> <p>Email : apspm-gidm@gujarat.gov.in</p> <p>Contact No. : 7574802127</p>	
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20	Nepal	<p>Name : Ms. Sajeena Shakya</p> <p>Organization : Meteorologist, Department of Hydrology & Meteorology, Nepal</p> <p>Email : sajeenashankya@gmail.com</p> <p>Contact No. : +977 984 3064482</p>	

21	Pakistan	<p>Name : Mr. Muhammad Tariq Masood Farooka</p> <p>Organization : Director, Provincial Disaster Management Authority</p> <p>Email : tmfarooka@gmail.com</p> <p>Contact No. : +92 3234444205</p>	
22	Sri Lanka	<p>Name : Mr. H M A C Bandara</p> <p>Organization : Assistant Director (District), Vidya Mawatha, Colombo</p> <p>Email : kegalle@dmc.gov.lk</p> <p>Contact No. : +94 773957876</p>	

Annexure - 4

Regional Workshop and Capacity Building programme on Role of Earth Observation in Multi-hazard Disaster Risk Assessment and Monitoring Targets of the Sendai Framework

Training Report : 4th to 8th December 2019



SAARC Disaster Management Centre, Gandhinagar

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Programme Note

Role of Earth Observation in Multi-Hazard Disaster Risk Assessment and Monitoring Targets of the Sendai Framework

Background

Timely insights into natural hazards and the risks they pose to societies are more critical than ever as the Natural hazards exacerbated by climate change threaten to jeopardize sustainable development around the South Asia. Under a scenario of global warming of 1.5°C, an IPCC special report (2018), says that ‘complex disaster risk is a new normal’. Climate risk accounts for 85 per cent of the regional risk landscape. Lesser developed countries are particularly vulnerable to climate induced disasters. Understanding the exposure of people and assets to hazards, forecasting and preparing for the impacts of disasters, and planning emergency response operations require accurate and easy-to-access information. Space technologies such as Earth observation satellites, telecommunication technologies and global navigation satellite systems can provide this information, supporting disaster risk reduction, preparedness, response and recovery.

Asia is particularly struck by disasters; 86 per cent of all people reported as affected by climate-related disasters between 1998 and 2017 were located on the continent¹. Cyclone Fani and Cyclone Bulbul are just two examples of extremely powerful cyclones that recently hit the region.

In order for the SAARC Member States to be able to incorporate the routine use of space technology-based solutions, there is a need to increase awareness, build national capacity and also develop solutions that are customized and appropriate to the needs of the developing world.

The Sendai Framework for Disaster Risk Reduction (SFDRR) has rightly assessed the need to enhance the use of space technology like Geographic Information System (GIS), Satellite based communication for assessment and management of risks and so on. As different nations have different capabilities, the emphasis is also given on International Cooperation for technology transfer and information sharing for comprehensive understanding of risks in the Region.

Acknowledging the utility of Space Technology in Disaster Management, SAARC countries are engaged in development of applications based on space technology and explore its effectiveness

for Disaster Risk Reduction. It is useful for implementation of priorities for action laid down in Sendai Framework for Disaster Risk Reduction (SFDRR) i.e. Understanding Disaster Risk and enhancing Disaster Preparedness for effective Response.

The event is the second regional event in South Asia under the umbrella of SAARC Disaster Management Centre (IU) and United Nations Office for Outer Space Affairs (UNOOSA), through its United Nations Platform for Space based Information for Disaster Management and Emergency Response (UN-SPIDER), in collaboration with International Water Management Institute (IWMI), Sri Lanka and Centre for Space Science and Technology Education for Asia and the Pacific (CSSTEAP), India.

It is built on the outcome of the 1st regional workshop and capacity building programme on ‘utilization of space based and geospatial information for assisting achieving the targets of the Sendai Framework’, which was held in December 2018 at SDMC (IU).

Objectives

1. Impart skills of using Earth observation techniques in multi-hazard disaster risk, with emphasis on climate induced disasters - flood and drought disasters;
2. Demonstrate a pilot project conducted in one of the Member State on creating spatial data repository for monitoring targets of the Sendai Framework;
3. One day workshop to discuss space and geospatial tools and technologies to support disaster risk reduction and emergency response efforts

Expected Outcomes

The expected outcome is the enhanced cooperation and sharing of best practices amongst disaster management agencies and experts in the region, deepen engagement with the countries in the region to serve their specific needs and enhance regional cooperation for better utilization of space based and geospatial information in disaster risk management.

Organisers

- SAARC Disaster Management Centre (IU); and

- United Nations Office for Outer Space Affairs (UNOOSA), through its United Nations Platform for Space based Information for Disaster Management and Emergency Response (UN-SPIDER)

Collaborators

- International Water Management Institute (IWMI), Sri Lanka and
- Centre for Space Science and Technology Education for Asia and the Pacific (UN affiliated), India

Agenda

Day 1: December 4, 2019

Time	Program	Lead
09:30 – 10:00	Registration	SDMC (IU)
10:00 – 10:30	Inauguration & Group Photo	
10:30 – 11:00	<i>Tea/ Coffee</i>	
11:00 – 12:30	Refreshing the DRR terminologies, Sendai Framework and Earth observation	Dr. Shirish Ravan, UNOOSA
12:30 – 13:30	<i>Lunch Break</i>	
13:30 – 15:00	ISRO Disaster Management System and International Charter Space and Major Disasters	G. Srinivasa Rao, ISRO
15:00 – 15:15	<i>Tea/ Coffee</i>	
15:15 – 16:30	Practicing satellite image processing and GIS skills and getting familiarity with data, software, open source satellite images etc.	Mr. Moses Duguru, UNOOSA

Day 2: December 5, 2019

Time	Program	Lead
09:30-09:45	Reflections of previous day	Dr. Shirish Ravan

09:45-10:45	An overview of basic concepts and potential of satellite remote sensing (optical and microwave imaging) & GIS for flood hazards mapping, monitoring and early warning.	Dr. C M Bhatt
<i>10:45 – 11:00</i>	<i>Tea/ Coffee</i>	
11:00 – 12:30	Hands-on session to open source data, tools/processing software's, web portals and online data repositories for multi-hazards assessment.	Dr. C M Bhatt
<i>12:30 – 13:30</i>	<i>Lunch Break</i>	
13:30 – 14:45	Hands-on session Cont.	Dr. C M Bhatt
<i>14:45 – 15:00</i>	<i>Tea/ Coffee</i>	
15:00 – 16:00	Opportunities for enhancing knowledge on application of RS&GIS for natural hazards assessment offered through CSTEAP/IIRS	Dr. C M Bhatt

16:15 – 19:00 Visit to Dandi Kutir, Gandhinagar

Day 3: December 6, 2019

Time	Program	Lead
09:30-09:45	Reflections of previous day	Dr. C M Bhatt
09:45-10:45	Basics of remote sensing, types of satellite images available for multi-hazard risk assessment – open source images, ways to access etc.	Dr. Giriraj Amarnath, IWMI
<i>10:45 – 11:00</i>	<i>Tea/ Coffee</i>	
11:00 – 12:30	Flood risk assessment using remote sensing data and modelling tools	Dr. Giriraj Amarnath Mr. Niranga Alahacoon IWMI
<i>12:30 – 13:30</i>	<i>Lunch Break</i>	
13:30 – 15:00	Flood risk assessment using remote sensing data and modelling tools	Dr. Giriraj Amarnath Mr. Niranga Alahacoon IWMI
<i>15:00 – 15:15</i>	<i>Tea/ Coffee</i>	

15:15 – 16:30	Creating spatial data repository for monitoring targets of the Sendai Framework	Mr Moses Duguru UNOOSA
17:15 – 19:30	Movie Screening (GIDM Auditorium)	

Day 4: December 7, 2019

Time	Program	Lead
09:00 – 09:15	Review/reflection of Day-III	Dr. Giriraj
09:15 – 10:30	Space Technologies for Disaster Risk Management Applications	Dr Nilesh Desai Associate Director SAC, ISRO
10:30 – 10:45	<i>Tea/ Coffee</i>	
10:45 – 12:00	Disaster risk transfer through flood index insurance and bundling insurance solutions using earth observation data and modelling tools <i>Hands-on session on the disaster risk transfer tools and approaches</i>	Dr. Giriraj Amarnath IWMI
12:00 – 13:00	<i>Lunch Break</i>	
13:00 – 14:00	<i>Hands-on session on the disaster risk transfer tools and approaches</i>	Dr. Giriraj Amarnath Dr. Surajit Ghosh
14:00 – 15:00	Open discussion session Working on the rapid response mapping products	Moderator Dr. Shirish Ravan
15:00 – 15:15	<i>Tea/ Coffee</i>	
15:15 – 15:45	Wrap-up & Closing	SDMC (IU)

16:00 – 19:30 Shopping (Ahmedabad)

Day 5: December 8, 2019- SAARC Charter Day

06:45 – 11:30 Ahmedabad City (World Heritage City) Heritage Walk

Time	Program
13:00 – 13:15	Opening session Introduction of the participants

13:15 – 13:45	Launch of Report: Insurance as an Agricultural Disaster Risk Management Tool: Evidence and Lessons Learned from South Asia Presentation by Dr Giriraj, IWMI
13:45 – 14:15	Key findings of South Asia & Pacific Report: Specific to SAARC Region Presentation by Dr. Sanjay Srivastava, UNESCAP (via Skype)
14:15 – 16:15	Panel Discussion Contribution of Earth Observation Information and Sendai Framework for Disaster Risk Reduction: Opportunities, cooperation and challenges Panellists: 1. Mr. P.K. Taneja, Director, SDMC (IU) - Moderator 2. Dr. Shirish Ravan, UNOOSA/UN-SPIDER 3. Dr. Giriraj, IWMI 4. Mr. Moses Duguru, UNOOSA
15:15 – 15:45	Wrap-up
16:30 – 17:00	<i>Group photo and Tea/ Coffee</i>

**Regional Workshop and Capacity Building Programme on
Role of Earth Observation in Multi Hazard Disaster Risk Assessment and
Monitoring Targets of the Sendai Framework**



Day 1: 4th December 2019

Opening Session

On behalf of the SAARC Disaster Management Centre, Ms. Prashansa Dixit welcomed and introduced all the dignitaries on the dais, participants from respective SAARC Member States and resource persons for the 18th Training Workshop on Role of Earth Observation in Multi Hazard Disaster Risk Assessment and Monitoring Targets of the Sendai Framework.

Keynote Address by Mr. P.K. Taneja, Director, SDMC (IU)



Mr. P.K. Taneja welcomed all the delegates from SAARC Member Countries and resource persons. In his speech he talked about the importance of space technologies in modern day disaster management activities like rapid-mapping in all phases of the disaster management cycle, GPS providing precise location and navigation data, helping manage land

and infrastructure, and communications via satellites (SATCOM). He also talked about how Government of India under Disaster Management Support (DMS) Programme, comprehensively addresses various aspects of natural disasters in the country, using space-based inputs.

He explained how Science and Technology is important component of the Sendai Framework, that has rightly assessed the need to enhance the use of space technology like GIS, Satellite based communication for assessment and management of risks and so on. It also emphasis on International Cooperation for technology transfer and information sharing for comprehensive understanding of risks in the Region.

Further he said that this workshop will increase awareness and capacity in the region to take necessary steps in Earth Observation in Multi-hazard Disaster Risk Assessment and requested all the participants from SAARC member states to give their valuable inputs and solicit their support for maximum participation/ interaction during the sessions.



He also expressed his gratitude to UNOOSA/UNSPIDER, IWMI and ISRO for providing the technical and administrative support in conceptualizing the program.

Session 1: Refreshing the DRR terminologies, Sendai Framework and Earth observation

by: Dr Shirish Ravan, UNOOSA



Dr. Shirish Ravan from United Nations Office for Outer Space Affairs (UNOOSA) explained how United Nations Platform for Space based Information for Disaster Management and Emergency Response (UN-SPIDER) is bridging gap between technology provider and technology user. He explained the origin and basics of Sendai

Framework DRR and how it is upgraded from Hyogo Framework. In HFA, progress was made in disaster management but disaster risk was not discussed, which was taken up in SFDRR. Lessons learnt from HFA were applied in SFDRR. SDGs also take lot of elements from SFDRR. SFDRR focuses fully on disaster and has vast outcome. He also explained that SFDRR monitoring is data driven because to identify progress on all seven targets, lot of data is required. But many times, past data for comparison is not available, that is where earth observation plays an important role because from there over past 50 years data can be recovered. He also gave a refresher on all major terminologies in DRR.

Session 2: ISRO Disaster Management System and International Charter Space and Major Disasters

by: Dr G. Srinivasa Rao, ISRO

In his presentation, Dr G.S Rao explained about global disaster scenario and use of geospatial technologies in DRR, as also mentioned in SFDRR. Taking examples of various disasters, he presented satellite imagery study. In his next presentation he



explained about International Charter, countries which are part of the charter that can utilize charter satellite (around 50 satellites) data for any disaster study in their region and how the authorized user (member countries) can request charter activation. He also explained that all the countries (even which are non-member) can request charter activation free of cost (since 2012). Even countries without any space satellite can request satellite imagery/data, provided only for major disasters.

Session 3: Practicing satellite image processing and GIS skills and getting familiarity with data, software, open source satellite images etc.



by: Mr. Moses Duguru, UNOOSA

This was a hands-on session where participants got practical training on software like Q-GIS, R, and ESA's SNAP. The exercise was to determine extent of flooded area. The session was helpful in understanding SAR satellite imagery as a viable solution to process images quickly. And the use of

near real time flooding info to relief agencies that can be used for damage assessment.

Day 2: 5th December 2019

Session 1: An overview of basic concepts and potential of satellite remote sensing (optical and microwave imaging) & GIS for flood hazards mapping, monitoring and early warning

by: Dr C M Bhatt, IIRS, ISRO

Dr C M Bhatt, senior scientist in disaster management studies department at IIRS, presented statistics of previous year's disaster loss data. He explained the situation of floods and rainfall variability and gave example of 2019 monsoon with extreme rainfall events as compared to previous



years. He talked about the importance of international cooperation; cooperation of neighbouring countries required to manage floods. He also explained flood hazard focussing on the urban floods and anthropogenic factors as major cause of these hazards.

While talking about advantages of Remote Sensing for hydro-meteorological hazards, he explained about types of satellite- polar and sun synchronous/ active and passive satellite, their coverage capacity- be it inaccessible or hazardous area (eg. in case of forest fire), use in rapid damage assessment and pre & post disaster changes. He presented various satellite imagery on floods in different region with changing resolution. He also discussed methodology for flood delineation, flood depth/extent, flood hazard zonation, flood inundation simulation, and flood risk analysis.

Session 2: Hands-on session to open source data, tools/processing software's, web portals and online data repositories for multi-hazards assessment



by: Dr C M Bhatt, IIRS, ISRO

This session was about Open Source Data Access for Floods Disasters, in which participants learnt about portals that provide free data like: Disaster Alerts-GDACS, Visualization of Rainfall- JAXA Rainfall Watch System, Flood Extent- MODIS NRT Global Flood Mapping Portal, Visualize NRT data related to Floods- Worldview, Elevation Data-USGS Earth Explorer, Flood Satellite Data (Optical): USGS Earth Explorer, Flood Satellite Data (Microwave): ASF's Data Portal, Administrative boundaries-GADM Portal.

The session demonstrated utilization of online data repositories and tools which could be accessed openly and will be helpful for decision-makers and planners for taking measures to mitigate the impact of flood disaster.

Session 3: Opportunities for enhancing knowledge on application of RS & GIS for natural hazards assessment offered through CSTEAP/IIRS

by: Dr C M Bhatt, IIRS, ISRO

In this session, Dr C M Bhatt talked about Centre for Space Science and Technology Education for Asia and the Pacific, India (CSSTEAP) as the first regional centre of UNOOSA established in 1995. He explained about the educational programmes offered, facilities provided to the participants, and exposure during the course.

Visit to Dandi Kutir, Gandhinagar

Day 3: 6th December 2019

Session 1: Basics of remote sensing, types of satellite images available for multi-hazard risk assessment – open source images, ways to access etc.



by: Dr Giriraj Amarnath, IWMI

Dr Giriraj's talking points were on the hydro-met hazards and Integrated Drought Risk Management (IDRM) framework.

He discussed on the flood and drought indices, maps, insurance options for resilient communities, and how socio-economic loss data and water data is helpful for insurance purpose.

He presented a few cases of using satellite imagery, for example, in Bangladesh 2019 flood claim, Sri Lanka- Climate and Food Security Bulletin 2019, Senegal Drought Risk

Mapping, and Flood proofing communities and agriculture resilience, Bihar.

He showcased a product: Providing farmers with information from datasets- Bundled Solutions of Index Insurance with Climate Information & Seed Systems to manage Agricultural Risks (BICSA). The core idea of BICSA implementation is to adapt agricultural technologies (Seeds + Insurance) and scaling of gender responsive ARM strategies for vulnerable smallholder farmers through bundled solutions. The kit provided to the farmers has resilient seeds, fertilizers and information.

In continuation to this session, Mr. Moses (UNOOSA) explained in detail all the components of UNSPIDER Knowledge Portal.

Also, Surajit Ghosh from IWMI explained about use of Google Earth Engine- variety of dataset available, APIs and code editor. He practically showed working of google earth engine, coding and imposing NDVI on satellite imagery.



Session 2: Flood risk assessment using remote sensing data and modelling tools



by: Mr. Niranga Alahacoон, IWMI

This was a hands-on session on Risk assessment. Mr. Niranga explained the basics of risk, components of risk equation and data required for each component (Hazard, Vulnerability and Exposure) for flood risk assessment. He clarified the difference between risk and risk assessment (assessment as quantification and evaluation i.e. taking measures for reducing risk).

Simple exercise on assessing values of hazard, vulnerability, elements at risk, building value and damage was done by the participants, by showing example of construction on flood prone area.

Session 3: Creating spatial data repository for monitoring targets of the Sendai Framework

by: Mr. Moses Duguru, UNOOSA

Mr. Moses briefly explained about SFDRR and its monitoring. For the Sendai framework, priorities of action cannot be monitored but targets can be monitored. Targets which could be monitored by geospatial information- target B (number of affected people), target C (economic loss in relation to GDP), and target D (damage to critical infrastructure and basic services) and the resources required for monitoring various sub targets.



He explained the Sendai monitoring training server, spatial data repository portal, and Sri Lanka as pilot country for Sendai Asia monitoring. (Link for Sri Lanka spatial data repository portal-
<https://public.tableau.com/profile/unspiderbeijing#/vizhome/SpatialRepositoryforSendaiFrameworkMonitoringintheSAARCRegion/Story1?publish=yes>)

Movie ‘Geostorm’ was screened for the participants at the GIDM auditorium.

Day 4: 7th December 2019

The day started with brief sessions taken by: Mr. Moses- Hands on session on R software, NDVI exercise.

Dr Giriraj- Session on application of Google earth engine and creating maps.

Mr. Niranga- Session on Calculating Risk, Risk Assessment on Excel sheet. (This session was later carried on as session 2)

Session 1: Space technologies for Disaster Risk Management Applications



by: Dr Nilesh Desai, Associate Director, SAC, ISRO

Dr Nilesh Desai from ISRO, explained in detail about ISRO and SAC centre. He also presented vulnerability of India and neighbouring countries to disasters. He described about ISRO's world largest domestic satellite system, in which India has 15

Satcom satellites covering the Indian region. These satellites have application in telecommunication, meteorological data collection, navigation, disaster management support system, development activities, etc. India's DMS and its proposed upgradation. ISRO is also working on tsunami and cyclone early warning communication system. He gave a brief on websites for earth observation and meteorological data: Bhuvan (NRSC), MOSDAC, and VEDAS.

Session 2: Hands on session on the disaster risk transfer tools and approaches

by: Dr Giriraj Amarnath and Mr. Niranga Alahacoon, IWMI

This session was continued for risk calculation and risk mapping using Q-GIS software, by the participants. Dr Giriraj explained creating graphs through flood data which are useful for the insurers to decide on giving out the insurance.

Session 3: Open discussion session-Working on the rapid response mapping products

Moderator: Dr Giriraj Amarnath, IWMI



Dr Giriraj explained the activation of charter on the International Disaster Charter website. He also explained how to prepare a map during the disaster, emergency response map, and its usefulness for the government and policy makers.

Printed maps of different regions were shared on each table for participants to understand and analyse the assessment maps and note down their analysis. Then a round table group discussion was done in which all the participants shared their understanding about the map with the resource person. This exercise, at the end of the workshop, was very helpful for the participants to clearly understand the satellite imagery and the assessment maps. They could easily come up with the analysis points because of the understanding gained throughout the training workshop.

Day 5: 8th December 2019- SAARC Charter Day

Opening Session



On the occasion of 35th SAARC Charter Day, Director, SAARC DMC (IU), addressed all the delegates from SAARC member states. The Charter establishing the Association was signed by the leaders of the seven South Asian Countries on 8th December 1985 during their first Summit meeting in Dhaka, Bangladesh.

Director, SDMC(IU), while explaining the Charter, spoke about how and with what objectives and principles the Charter was formed. The 13th SAARC Summit at Dhaka in November 2005 considered the issues of regional cooperation for preparedness and mitigation of national disasters and approved the offer of India to set up a SAARC Disaster Management Centre (SDMC) in New Delhi. The Centre was inaugurated on 10th October 2006. Later, forty ninth session of the Programming Committee (in 2014 at Kathmandu) decided to close the centre. Based on directives of SAARC Foreign/ External Affairs Ministers Meeting held at Kathmandu in March 2016, SDMC-IU was setup again in the GIDM campus in November 2016 with the expanded role.

Launch of Publications

On this occasion, two publications were also launched by the Director, SDMC(IU) and Dignitaries.

1. Asia-Pacific Disaster Report 2019
2. Policy Brief- Insurance as an agricultural disaster risk management tool: Evidence and lessons learned from South Asia



Session: Key findings of South Asia and Pacific report, specific to SAARC Region

by: Dr Sanjay Srivastava, UNESCAP

Dr Sanjay from UNESCAP joined the session through skype. He presented the findings of Asia-Pacific Disaster Report 2019 with focus on SAARC region. He talked about the disaster risk hotspots in South Asia- transboundary river basin (where large number of floods happen) and South West region (which is prone to drought, dust storm). These hotspots are expanding and becoming more intensified. The report takes into account convergence of disaster risks with critical socio-economic vulnerabilities which are threatening sustainable development in the subregion. The report also covers the slow onset disaster and extreme events to calculate annualised losses. He also explained the computable general equilibrium model to calculate how disaster affect the poverty, overarching goal of SDG ‘leave no one behind’, multi hazard risk hotspots and gave example of Indian policies like AADHAAR that helped to promotes inclusion and empower at-risk communities.



Post this session, Dr Giriraj also presented on IWMI’s Disaster Insurance Program, explained about the policy brief and showed a video on Index based flood insurance- pilot project in Bihar.

Panel Discussion: Contribution of Earth Observation Information and Sendai Framework for Disaster Risk Reduction- Opportunities, cooperation and challenges



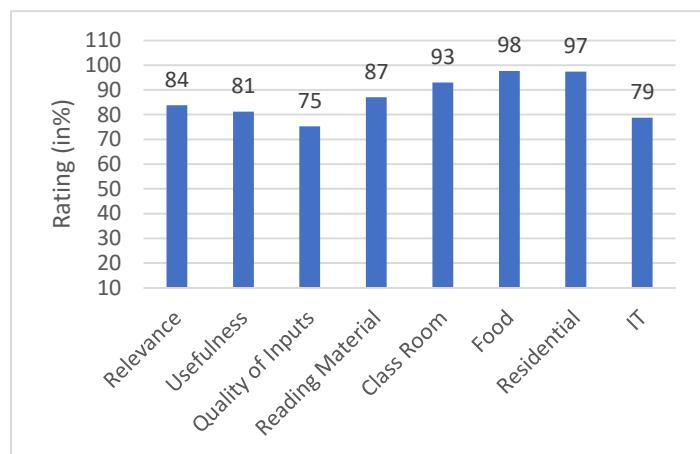
A panel discussion chaired and moderated by Director, SDMC(IU), was held in presence of panellists- Dr Shirish Ravan, Dr Giriraj Amarnath, and Mr. Moses Duguru.

The panel discussed on the questions like: key challenges for the governments in utilizing the space-based technologies to achieve targets of

the Sendai Framework, solutions for risk transfer, Sri Lanka on preparing geospatial repository for achieving targets of the Sendai Framework, etc.

An open discussion on women participation in major activities of DRR in the South Asian Region, was also done. Delegates from member states discussed on how member states can ensure participation of women and ensure gender inclusive implementation of DRR.

Feedback from Participants and Closing Remarks



At the end of all the sessions, feedback from the participants was taken on various criteria. The rating given by the participants is shown in the graph.

During the closing ceremony, feedback from the participants was discussed in detail and points of improvements/suggestions were noted.

In the valedictory session, Director, SDMC(IU), gave a vote of thanks to all the participants and resource persons and ceremony ended with certificate distribution and group photograph.



List of Participants

#	Country Name	Participants Name	Designation & Contact Details	Photograph
1	Afghanistan	Mr. Abdul Ahad Kohdamani	Head of Disaster Risk Assessment, Afghanistan National Disaster Management Authority +93 700254590 abdulahadkohdamani@yahoo.com	
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3	Afghanistan	Mr. Zabihullah Siawash	Manager of Vulnerable Areas of GIS, Afghanistan National Disaster Management Authority +93 792291645 siawash.asdvo@gmail.com	
4	Bangladesh	Ms. Fatima Tuz Zohora	Deputy Secretary, Ministry of Defence, Bangladesh +880 1712655290 fatimazzohora@gmail.com	
5	Bangladesh	Mr. Md. Aminul Islam	Deputy Secretary, Ministry of Disaster Management & Relief, Bangladesh +880 1711447276 dsaudit@modmr.gov.bd aminulislam67@yahoo.com	

#	Country Name	Participants Name	Designation & Contact Details	Photograph
6	Bangladesh	Mr. Md. Korban Ali	Deputy Secretary, Ministry of Disaster Management & Relief, Bangladesh +880 1816414621 korbanbag@gmail.com	
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10	India	Mr. Ajay Kumar Katuri	Sr. Consultant, Policy & Planning, NDMA +91 9998156106 ajay.katuri@gmail.com	
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13	Maldives	Mr. Ibrahim Waheed	Meteorological Technician, Maldives Meteorological Service +960 7977829 ibrahim.waheed@met.gov.mv	
14	Nepal	Mr. Chirinjivi Giri	Deputy Chief of District, District Administration Office, Sunsari +977 9852044151 giribardiya@gmail.com	
15	Nepal	Mr. Himlal Bishwakarma	Deputy Chief of District, District Administration Office, Rolpa +977 9847553025 himalsagar2045@gmail.com	
16	Nepal	Mr. Sagar K C	Administrative Officer, District Administration Office, Nawalparasi +977 9849610282 sagar.kc@nepal.gov.np	
17	Pakistan	Mr. Muhammad Kashif	Deputy Director, Provincial Disaster Management Authority, Peshawar +92 3219169636 kashifmuhammad5@gmail.com	

#	Country Name	Participants Name	Designation & Contact Details	Photograph
18	India	Dr Sandeep Pandey	APSPM, GIDM, Gujarat +91 7574802288 apspm-gidm@gujarat.gov.in	
19	India	Ms. Patel Asha	Assistant Engineer, Flood Control Cell, Gandhinagar +91 9173537008 asha_patel44@yahoo.co.in	
20	India	Mr. Jigar D Patel	Assistant Engineer, Flood Control Cell, Gandhinagar +91 9979487560 jigar.civil87@gmail.com	
21	India	Mr. Sanjay Joshi	Director (F&A) & Director (DM), GIDM, Gandhinagar +91 9978407173 directorfa-gidm@gujarat.gov.in	

Annexure - 5

Rapid Structural and Non Structural Risk Assessment of School Buildings

Training Report : 21st to 24th January 2020



SAARC Disaster Management Centre, Gandhinagar

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Programme Note

Rapid Structural & Non-Structural Risk Assessment of School Buildings

Background

The South Asian Region is highly vulnerable to the impacts of hazardous events. The region frequently suffers from natural hazards including earthquakes, cyclones, floods, landslides, and droughts. This region is also considered to be one of the most seismically active regions in the world. The Himalayan belt extending across Afghanistan, Pakistan, India, Nepal, and Bhutan is identified as a "very high seismic hazard area" in the region. In addition to the Himalayan seismic belt, a large part of Mid-Western Pakistan, some parts of Western India, isolated pockets in Central India, and the Chittagong Hill Tract district of Bangladesh are also considered to be at high risk due to earthquakes. Also, the most vulnerable population lives in the Ganges–Brahmaputra–Meghna (GBM) river basin, which is the world's largest river basin and is shared by four South Asian countries Bangladesh, Nepal, India and Bhutan.

At global level, Sendai Framework for Disaster Risk Reduction identifies "Substantial reduction of disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, through developing resilience" as among its main targets by 2030.

Schools are critical infrastructure where children are expected to spend majority of their time. Natural hazards and climate change events have a devastating effect on children's education. These events can cause direct harm to children, teachers, and the school community, damaging or destroying school infrastructure. A safe and secure environment is a prerequisite for effective teaching and learning. Thus, ensuring safety of children, teachers and staff members during disasters is necessary.

A hazard poses different types of damages to the school buildings. These damages can be structural and non-structural. Structural components of the building are the load bearing system (i.e. vertical and lateral force resisting systems) like walls and building frame. The non-structural components are the architectural elements and building contents which do not affect the integrity of the structural support system like false ceiling, windows, fixture, shelves, etc. During disaster, damage to structural components can render whole building inoperable but in case the structure is intact

and the non- structural components are damaged (falling hazards), the building cannot function when it is most needed. In case of a school building, safety of children during disaster and education continuity post disaster is important. Also, many times schools act as temporary emergency shelters. Thus, as a preparedness measure, assessment and mitigation of structural and non-structural hazards play a key role in maintaining the functionality of school building during any disaster.

Developing structural and implementing non-structural risk mitigation strategy for schools also addresses the component of local DRR strategies of the target E of the SFDRR “Substantially increase the number of countries with national and local disaster risk reduction strategies”

The training aims to highlight the need for robust school infrastructure and understand how different hazards can affect the infrastructure and hamper education.

Objectives

At the end of the training the participants would be able to:

1. List structural and non-structural elements and its hazardous impact on the building
2. Assess structural and non-structural vulnerabilities in the school building
3. Acquire skill to conduct non-structural risk mitigation of the components
4. Understand skill to reduce impact of non-structural elements (i.e. falling hazard) that can cause personal injury or loss of function, if damaged.

Expected Outcomes

The program would be able to develop capacity of regional stakeholders towards understanding of structural and non-structural elements and acquire skill to develop resilient school infrastructure.

Organisers

- SAARC Disaster Management Centre (IU); and
- GeoHazard Society, India

Target Audience

Senior administrative officers from education ministry & department, disaster management authorities and engineers from education ministry & department.

Agenda

Day 1: January 21, 2020

Time	Program	Lead
09:00 - 9:30	Registration	SDMC(IU)
9:30 – 10:00	Inauguration & Group Photo	
10:00 – 10:15	Tea/Coffee Break	
10:15 – 11:30	Disaster Risk Management Terminologies & DRR Strategies <ul style="list-style-type: none">• Introduction to earthquake hazards in South Asia• Understanding structural component of the buildings	Mr Hari Kumar Regional Coordinator for South Asia GeoHazard Society (GHS)
11.30 - 12:45	Rapid Visual Screening of Buildings as per Indian Standards and understanding the impact of earthquake on building	Prof. C S Sanghvi LDCE
12.45 - 13:45	Lunch Break	
13:45 – 14:10	<i>Travel to Amiyapur School</i>	
14:10 – 15:20	Rapid Visual Screening (RVS) of Building (<i>Amiyapur School</i>) as per Indian Standards	Prof. C S Sanghvi LDCE
15:20 – 17:00	Visit to Earthquake Lab (LD College of Engineering, Ahmedabad)	SDMC(IU)

17:00 – 19:30 Shopping, Ahmedabad

19:30 - 22:00 Dinner at GIDM

Day 2: January 22, 2020

Time	Program	Lead
09:30 – 10:45	Multi Hazard profile of South Asia	Mr Hari Kumar, GHS

10:45 – 11:00	Tea/Coffee Break	
11:00 – 12:15	Understanding Non-Structural risks in schools and hospitals	Mr Pranav Sethi, GHS
12:15 – 13:15	Lunch Break	
13:15 – 15:00	Common Internal and external falling hazards (special focus on hospitals and schools)	Md. Mudassir, GHS
15:00 – 15:15	Tea/Coffee Break	
15:15 - 16:00	Cost Benefit Analysis for Structural and Non Structural Risk Mitigation – Skype Session	Dr Padeep Vaidya, T. U. Teaching Hospital, Maharajgunj, Nepal
16:00 – 17:00	Exercise: Action Plan for NSM for Member States (Briefing)	SDMC(IU)
17:00 – 17:15	Review of Day 1 and Day 2	SDMC(IU)

17:30 – 19:30 Movie Screening at GIDM

19:30 - 22:00 Dinner at GIDM

Day 3: January 23, 2020

Time	Program	Lead
09:30 – 10:00	Travel to the Amiyapur School	SDMC(IU)
10:00 -11:15	Group Exercise: Identification of Falling Hazards in school	Mohd. Mudassir GHS
11:15 – 11:30	Tea/Coffee Break	
11:30 – 13:30	Group Exercise: Development of Strategy for NSM	Mr Pranav Sethi GHS
13:30 – 14:30	Lunch Break	
14:30 – 16:00	Techniques of non-structural risk mitigation, issues and challenges	Mr Pranav Sethi & Mohd. Mudassir GHS
16:00 - 16:15	Tea/Coffee Break	
16:15 – 17:30	Fire Hazard Prevention and Preparedness for School Buildings	Mr Abhay Purandre Fire Safety Expert

19:30 - 22:00 Dinner at GIDM

Day 4: January 24, 2020

Time	Program	Lead
09:30 – 11:00	Hands –on Exercise Mitigation of Non-Structural Hazard <ul style="list-style-type: none"> • Participatory NSM in GIDM Building 	Md. Mudassir GHS
11:00 – 11:15	Tea/Coffee Break	
11:15 – 11:30	Travel to Amiyapur School	SDMC(IU)
11:30 – 14:00	Hands –on Exercise Mitigation of Non-Structural Hazard in school	Pranav Sethi GHS
14:00 – 14:45	Lunch Break	
14:45 – 15:30	WayAhead -Action Planfor Non-structural Mitigation Measures in Schools	Director, SDMC (IU)
15:30 - 16:15	Valedictory session followed by Tea Break	

16:15 – 19:00 Visit to Dandi Kutir, Gandhinagar

19:30 - 22:00 Dinner at GIDM

Regional Workshop and Training Programme on **Rapid Structural & Non-Structural Risk Assessment of School Buildings**



Day 1: 21stJanuary 2020

Opening Session

On behalf of the SAARC Disaster Management Centre, Mr. Sumedh Patil welcomed and introduced all the dignitaries on the dais; Mr. P K Taneja Director SDMC (IU), Mr. Hari Kumar from GeoHazard Society, and Prof. C S Sanghvi from L D College of Engineering, participants from respective SAARC Member States and resource persons for the 19th Training Workshop on Rapid Structural and Non-structural Risk Assessment of School Buildings.



Keynote Address by Mr. P.K. Taneja, Director, SDMC (IU)

Mr. P.K. Taneja welcomed all the participants from SAARC Member Countries and resource persons. In his speech, he talked about the importance of school safety in our region which faces adverse impacts of natural and man-made hazards. He said that building safe schools should be of prime concern for all the stakeholders involved like architects, engineers, policy makers, and administrators. Schools serve a dual purpose where children and their caregivers spend their maximum time and also safe schools are used as evacuation shelters during emergencies. He highlighted two targets of the Sendai framework, target D and E, which identify the concern of school safety and making strategies for the same. He also highlighted that non-structural risk mitigation measures at schools might sound like a simple task but if such measures are not taken then the non-structural building elements can pose great damage in terms of life loss, injury, and economic loss.

Further he said that this workshop will increase awareness and capacity in the region to take necessary steps towards implementation of DRR strategies with respect to structural and non-structural risk assessment and management of school buildings with focus towards non-structural risk mitigation and requested all the participants from SAARC member states to give their valuable inputs and solicit their support for maximum participation/interaction during the sessions.



He also expressed his gratitude to GeoHazard Society for providing the technical and administrative support in conceptualizing this program and also to State Project Director of Sarv Siksha Abhiyan for providing the school building for RVS and hands-on mitigation exercise

Session 1: Disaster Risk Management Terminologies & DRR Strategies



By: Mr Hari Kumar, GeoHazard Society

Mr. Hari Kumar started the first session of the day by discussing the terminologies of Disaster Management and DM cycle like disaster, preparedness, response, recovery, relief, rehabilitation, and mitigation; and explained the difference in the meanings. He quoted examples of few big disaster events in India like Bhuj earthquake that happened in 2001 and the losses/injury that occurred due to failure of critical infrastructure. The super cyclone of Odisha and the storm surge that came with it surging 20 km in land destroying the agriculture, infrastructure failed, etc. Rebuilding/recovery was a tremendous job in these events. But now the slogan is ‘Build back better’- which means the recovery processes are an opportunity to build in a resilient manner. Recovery should include mitigation measure. Explaining this he gave example of Japan, the way people in Japan learn from disasters and build accordingly. During Kobe earthquake, 1995 (6.9M) 5530 people lost their lives but post that earthquake (Hokkaido- 8.3M, Honshu- 7.2M, etc) no earthquake event took any life or became a disaster. This shows how one destructive earthquake made them to take onto building resilience. He showed photographs of destructive earthquake that destroyed schools in Nepal, Bhutan, etc. He then explained the equation of Risk Mitigation that involves increasing capacity and decreasing vulnerability.

Further Mr. Hari discussed about earthquakes and how do they occur. He explained the plate tectonics; the different types of plate boundaries- convergent, divergent, and transformative boundaries. How stress develops between plates and is released causing earthquake. Talking about the South Asian region, he explained the rate at which Indian plate is sub-ducting under the Eurasian plate which leads to formation of Himalayas and the reason for major earthquakes in the region.

Session 2: RVS of buildings as per Indian Standards & understanding impact of earthquake on buildings

by: Prof. CS Sanghvi, L D College of Engineering

Prof. Sanghvi explained how earthquake hazard becomes a manmade disaster, because earthquakes don't kill people but buildings do. Earthquakes are unpredictable event, therefore we design earthquake resistant buildings and not earthquake proof. The reason behind this is, designing an earthquake proof building means it will suffer no damage at all but constructing such a building will be very expensive. Also big earthquakes or earthquakes of very high magnitude are not frequent. In earthquake resistant building design, the building will suffer minor damage but not collapse. So this is an economical option, also small earthquakes are frequent. In case of Bhuj earthquake, the expected shaking intensity was VII as per the code but actual it was VIII and buildings were weak in the city hence, they collapse.



He then explained about the structural audit that helps in decision making whether the building needs to be repaired (corrective measure- retrofitting) or demolished & rebuilt. He explained the methodology of structural audit- what all information is to be collected, description of building- what are the areas of damage, detailed visual inspection- what to look at in external inspection. Various NDT (Non Destructive Tests) to know the strength of structural members and choose right retrofitting/repairing measures. To give a better understanding, he showed photographs of various types of building damage during earthquake like open storey failure, short column effect, torsional effect, X cracks, buckling of column, spalling of concrete, etc.

After a half-day session of Mr. Hari Kumar and Prof Sanghvi, participants were taken to a nearby primary government school for better understanding of classroom session.

Mr. Nipun Chowksy, State Project Engineer, Sarv Siksha Abhiyaan (SSA)- Sharing experience on activities taken in SSA for school safety

Mr. Chowksy shared his experience of 2001 Bhuj earthquake when buildings were inclined at 30 degree, lot of stone masonry buildings collapsed like a heap, 2-3 storey height buildings were mostly collapsed, soft storey failure was a common damage. Buildings constructed by government, using building ties were found safe. Under SSA safe school and accommodation buildings are built. Bands are provided at all level of the building. Building height does not go beyond G+1. Only RCC buildings are constructed and no masonry buildings, keeping 2001 earthquake in mind. Post 2001 lot of retrofitting, repairing work in various areas of Gujarat has happened. Recently 33,000 schools have been inspected grade wise and work like demolition, repair, minor repair has been taken up accordingly.

Rapid Visual Screening (RVS) of Building (Amiyapur School) as per Indian Standards

At the school, the participants were divided in five groups for RVS of school building. The school premises had two major blocks assessed by two teams each and few smaller blocks assessed by one team. Each group was given a RVS form for the assessment of building. (**Form attached in Annex 1**)



After an hour of assessment, group discussion was done where all the teams discussed about their observations.

Some of the observations are as follows:

- At most of the places, a common damage was visible that is spalling of concrete causing exposure of reinforcement. Prof Sanghvi explained the cause behind such damage is the maintenance issue. Due to leakage or bad quality material, dampness creeps in causing rusting of reinforcement due to which it expands and the concrete cover over it falls.



- Horizontal crack between roof and parapet on the external wall- mainly because parapet is constructed separately and is not the structural member. Thus, at the joint of roof slab and parapet such cracks occur.



Visit to Earthquake Engineering Lab (at LD College of Engineering, Ahmedabad)

After the assessment exercise at the school, all the participants were taken to the earthquake lab at the L D College of Engineering, Ahmedabad. Here the concept of behavior of different types of building and structural system during an earthquake was explained, by Prof Sanghvi and Prof Patel, with the help of various models and shake table. This helped the participants in understanding how earthquake forces act differently on short buildings, tall buildings, buildings constructed with different materials, mass of the building, building structure type, etc. and how damages occur or are sustained by the building. Also, earthquake resistant techniques were explained by showing example of base isolation model on the shake table.



Day 2: 22nd January 2020

Session 1: Structural Retrofitting and Structural Risk Mitigation

by: Prof. Manish Kumar, IIT Gandhinagar

Prof Manish discussed in depth about the structural damages in different type of structural systems with photos from Nepal Earthquake. He explained how components of structural system (roof slab, beam, column, foundation) transfer load and what the earthquake load path is in this system. He showcased the different structural systems used in the IIT Gandhinagar campus viz RCC frame and confined masonry, and explained what are the major differences between them. He also talked about various vernacular or traditional structural systems like Dhajji dewari, Newari houses, Dry stone construction, Bhonga houses etc. found in various earthquake prone regions because of their resistance quality towards earthquake load.



He explained the use of RVS methodology post 2001 Bhuj earthquake when 300 Reinforced Concrete frame buildings were surveyed immediately after the quake and damage grades were assigned. Additional survey was conducted few years later and based on this study of damage data, a paper was published proposing an RVS method for RC frame buildings in India. He then explained how vulnerability scoring (scores based on different criteria) is done and explained issues due to bad maintenance, re-entrant corners, soft story, and short column and remedial measures for the same. Then damage grade G1 TO G4 is assigned to the building based on the score and buildings are prioritized for detailed evaluation and rehabilitation.

He discussed the IS code 15988:2013- evaluation criteria, preliminary evaluation, detailed evaluation, seismic strengthening. And highlighted other relevant documents like the masonry society code 406, FEMA 310:1998, IITK-GSDMA-EQ6:2005, etc. He then showed examples of seismic strengthening and retrofitting of buildings.



Session 2: Understanding non-structural risks in schools and hospitals

by: Mr Pranav Sethi, GHS

In this interactive session, Mr. Pranav explained what mainly comprises of non-structural elements in a

building. For the idea of safe schools, non-structural or falling hazards must be understood. He asked the participants what can be considered the most preferable time of occurrence of an earthquake to which most of them said day time. He then explained, considering daytime as preferable time because mostly people are out of their homes, at work but at this time more percentage of children are affected, as they are in school.

He quoted examples of day time earthquakes where schools have been affected. Eg. On 8th October 2005 a magnitude 7.8 earthquake shocked Pakistan at 08:50 am. It was a Saturday morning when mostly children were at school. As a result of which 20,000 children were killed because 10,000 schools collapsed. Similarly, the Bhuj earthquake of 26th January 2001 occurred at morning time when children were in school for Republic day celebration. 872 children died in school. Thus school safety is important. He listed out points on what happens in a school during a large earthquake- violent shaking, **falling items**, blocked exit, fire might develop, power outage, etc.

Apart from building collapse causing life loss, he also quoted examples like: In a school during earthquake 12 girls died despite no building collapse, but because of stampede during evacuation. All these aspects are important and should be considered. Steps towards school safety are 1. Basic Disaster Awareness- it does not only involves talking about the disasters and their impact but also discussing the management of them; 2. Preparedness- we are many time so focused on response that we forget to work on preparedness; 3. Drills- is like a mock test before any exam so that one is aware what to do in real situation; 4. Falling hazards; 5. Retrofitting.

Addressing falling hazards (non-structural mitigation) is a cheaper option than retrofitting, it's all about cost. Also retrofit involves specialized help while non- structural mitigation can be done by anyone. The phenomenon of earthquake affecting the building is very similar to that of breaks in a bus and how our body behaves. The earthquake forces work in all directions, buildings sway and so does its content. Building may not collapse but still earthquake can cause losses. It is important to observe the surroundings and imagine the earthquake scenario. He showed photographs of non-structural 'messive' damage in offices, library, labs, etc. disrupting the functioning of the building.

Director, SAARC DMC, also gave his view on how to avoid 'messive damage' by following a **method of 5S** in our daily life. The 5S methodology is about organizing workplace that uses a list

of five Japanese words translated as "Sort", "Set In order", "Shine", "Standardize" and "Sustain".

The list describes how to organize a workspace for efficiency and effectiveness by identifying and storing the items used, maintaining the area and items, and sustaining the new order.



Non-structural hazards can happen anywhere, any building, thus awareness in this aspect is also necessary. For avoiding the non-structural hazard, anyone can do the mitigation (no specialized engineering is required).

Non-structural elements can fall, slide or topple and cause injury or life loss (L), block exit (E), financial loss (F), operational loss (O). Participants identified the non-structural hazards in the seminar hall and what harm they can do from L, E, O, F options- false ceiling (O), camera (F), cupboard (E), etc. Next it was discussed on how to protect oneself from falling hazard during an earthquake, first thing to do is duck, cover, hold.

A participant shared an example of a girl who was taught to follow the universally accepted technique of 'Duck, Cover, Hold' in case of an earthquake. During an earthquake she was playing outside the house, in an open area. On feeling the earthquake shaking she came running inside the house and sat under the table, following the taught technique. And the house collapsed. Similar thing happened during Nepal earthquake also. Thus, it is important to convey the reason and condition behind any such technique, which in this case is - only applicable when one is inside a building during earthquake. Conveying complete information is necessary, the universally accepted technique is not a full proof thing but it is a way of protecting oneself. Discussing further on this, Mr. Pranav explained the correct posture of protecting our head and neck (spine) in case there is no table in a room to do drop, cover, hold. All the participants practiced drop, cover, hold. Also places where drop, cover, hold should not be done are chemistry lab, computer lab.



Session 3: Common Internal and external falling hazards (special focus on hospitals and schools)



By: Md. Mudassir, GHS

Md. Mudassir showed various photographs of schools and hospitals and discussed the non-structural hazard in each photograph. The elements that can cause damage both on the inside and outside of the buildings.

Session 4: Cost Benefit Analysis for Structural and Non-Structural Risk Mitigation – Skype Session

By: Dr Pradeep Vaidya, T. U. Teaching Hospital, Maharajgunj, Nepal

Dr Vaidya discussed why schools are important in disaster? - they hold the life safety of large number of children, they are used as shelters many times, and keep the children occupied and provide learning environment post disaster (which is a difficult task) to avoid distress.



He explained three elements of safe school which are safe structure, school disaster management plan, and prepared staff.

For structural elements, cost is a deciding factor in determining whether to retrofit or reconstruct. If the cost of retrofitting comes out to be higher then it is preferable to reconstruct.

There have been cases where structure was intact but damage to non-structural elements rendered buildings non-functional like hospitals during Nepal 2015 earthquake.

He showed a comparison between investment in structural and non-structural mitigation to enhance the performance of hospitals and the result achieved as cost benefit.

Exercise: Action Plan for NSM for Member States (Briefing)-SDMC (IU)



In order to provide a platform for sharing of and facilitate exchange of experiences amongst the professionals from the SAARC Member States, SDMC (IU) dedicated a session on “Country Presentation: Action Plan for Non-structural Mitigation Measures in Schools”. Participants were briefed on preparing this action plan and present it on

the last day of the program.

Day 3: 23rd January 2020

Session 1: Travel to Shahpur School to identify falling hazards

By: GeoHazard Society

Based on the previous day session on the non-structural risk assessment, participants were taken to a nearby government school. This was a group exercise where each country group covered all the blocks in the school to identify non-structural hazards in classrooms, principal office, corridors and other open spaces. They identified hazards keeping in mind the multi hazard scenario like fire, earthquake, wind, etc. All the participants photographed and noted down their observations.



On returning back, observations of the participants were discussed country wise –

Afghanistan: Discussed their observations that various racks were kept in the school corridor and also a CCTV camera installed, these can be blockage & falling hazard respectively. School had a single staircase which doesn't seem sufficient during

emergency exit. Also, there were few items kept in the staircase like watercooler that can block

exit. The store room at the upper storey was congested with items, even one person inside can get struck in case of shaking because of falling items. There was no warning alarm system. Principal room had many non-structural elements. It should be a standard room but there were TVs, books, oil for cooking, engine oil/diesel (source of fire hazard), cupboards all around.



Bhutan: Added to the above observations that in some classrooms one of the two exits were blocked by few items. They suggested an order of prioritization- Fitting components in room, cleaning the corridor (till here no finances are required- can be done easily by school staff), tree removal (wind hazard), check integrity of steel porch. They also highlighted that playground has dust which can be a health hazard.

Sri Lanka: The team gave positive points- structure of the school looked strong, strong door and windows, to deal with dry period they have a rainwater harvesting system. The ground and first floor are occupied by 1 to 5 class students who are comparatively more vulnerable & second floor occupied by 6-8 class students.



Nepal: The team highlighted that the plinth of assembly hall from the ground level is high for students, also the steps are not throughout. This can lead to injury in case of students are evacuating. The outer unit of AC of neighbouring building is hung on the playground side of school which can be a falling hazard.

Maldives: Discussed about the principal room which is big and has only one exit. Also there were lot of wirings. There were 2 fire extinguishers also but one was expired and other's pin was already out.

India: Discussed on the importance of scrap disposal. For schools it is an easy process, tendering can be done in 15 days. Other observations were- Main gate not properly fixed to the wall. No drainage system in the campus area that can cause vector borne disease. Wiring of light fixtures with the frame of tin shed in assembly is dangerous. Also, a fan with only two wings was spotted. Sitting arrangement under the projector can be avoided. Rooftop has lot of discarded area blocking the water drainage. No railing for the staircase. No fire extinguisher in school building. The steel angle of the classroom door is hazard for children. There was a gas cylinder kept in one of the classrooms. The dish antenna can be properly fixed.

Session 2: Techniques of Non-structural Risk Mitigation, issues & challenges



By: Mr Pranav Sethi & Mohd. Mudassir GHS

Post a non-structural hazard identification exercise, in this session ways of mitigation were introduced like: relocation of objects that can injure, protect through anchoring, brace or restrain or accommodate the movement.

GHS team showed equipment like L brackets, plastic fastener, hex screw (for wall side) and nut & bolt (for cupboard side) for anchoring a cupboard. Flexible cables for accommodating movement of objects like water pipes.

They showed photographs of objects that can slide, topple or fall. Before fixing it is important to check for wires and pipes inside the surface.

They detailed the specifications of the L clamps and other equipment for fixing short, tall, and leaning cupboard. Fixing of free-standing cupboards, for example in library. And solutions for protecting the storage on open shelves, avoiding shattering of glass on doors and windows, fixing electricity boards, AC units, water tanks, gas cylinder, etc.

Session 3: Fire hazard prevention & preparedness for school building

By: Mr. Abhay Purandre

Mr. Purandre presented examples of deadly fire incidents in India like Dabwali tent fire in 1995, Kumbakonam school fire in 2004, and Takshashila arcade fire in 2019. He explained in details about the Takshashila archade, Surat fire case and explained that the real cause of deaths in Surat case was not actually fire, but harmful smoke that came out due to fire. Also there was a single staircase and no emergency exit. The fire took place near the staircase at first floor, blocking the only exit route, which was why children jumped off the building. He also gave understanding of heat and smoke movement, fire growth and development. He also talked about fire incidents and statistics, types of fire and gases, school occupant characteristics in terms of fire. Building characteristics in terms of school and fire safety and common fire hazards & challenges. He also discussed the educational occupancies section of the National Building Code (NBC 2016) which gives specifications like FAR, travel distance and exit locations based on number of occupants, storage of volatile flammable liquid, etc. He also explained the importance of drills in schools and school disaster management plan.



Day 4: 24th January 2020

Session 1: Participatory NSM in GIDM Building

by: GHS

The two day in depth discussion on the non-structural hazards, gave a good understanding to the participants. On the last day of the program, the participants were given responsibility to identify and fix the non-structural components by themselves. The area selected for this hands-on exercise was GIDM library and a staff room. The participants were provided all the necessary equipment and guidance by GHS.

The first location was library where all the participants identified the hazards. Then the participants had to convince the librarian before fixing anything. Based on what they learnt, they could explain the librarian that why non-structural mitigation is necessary and if not done what can be the losses.

With the permission of the librarian, they fixed a printer and computer (sliding hazard) using rubber mat and nylon strap, protected books on shelf (falling hazard) by securing them with curtain string and relocated a cupboard (block exit).



The second location was a staff room where the participants identified a tall cupboard that could be a falling hazard. They convinced the staff person that why fixing it necessary. With his permission, they fixed the cupboard using four L clamps. It was a long process but participants did the fixing themselves with the help of a person for drilling the wall and the cupboard.



Session 2: Country Presentation on Action Plan for Non-structural Mitigation Measures in Schools

Each country representative presented their action plan addressing the following topics:

1. Details of Probable Hazards in Respective Members states and key institutions that require Non-Structural Risk Mitigation (NSRM)

2. Brief on key agencies, institutions involved in Non-Structural Risk Mitigation (NSRM) and their organization structures.
3. Brief about Existing funding mechanism available for the mitigation in Schools.
4. What are the strategy of Capacity Development to ensure Words into Action?
5. Issues, Challenges and Way Ahead
6. Expectations for SAARC Disaster Management Centre in strengthening the mitigation measure.

Afghanistan: Listed down the hazards faced by the country like flood, snowfall, fire, dust, health, chemical, etc. The key institutions that require non structural mitigations are technical institutions, universities and schools. The institutions that can be involved in the task are UNDP, UN Habitat, Polytechnic University, Agha Khan Foundation, Ministry of Education, Afghanistan Disaster Management Authority. For funding mechanism, the Maintenance budget is available for the mitigation in schools. In some cases, the Word Bank gives particular package for resolving specific issue. Security and insufficient funds are main challenges and specially for the remote places in the country. Improving the security through the support of government and local people, and seeking the fund from National and International Organisations are the ways to overcome the challenges. Listed the expectations from SAARC DMC:

- Equal norms for research related to hazards and mitigations for all the SAARC countries
- Sharing of data, and
- Training for GIS mapping system



Maldives: Country representative discussed the probable hazards in Maldives which are floods, strong wind, tsunami, coastal erosion, and fire. She discussed the organizational structure of organisations involved in school safety which are Ministry of Education, Disaster Management Authority, and MNDF. For funding mechanism, tsunami projects are funded by Government and UNDP; and other DRR activities are funded by

Government, WORLD BANK and UNICEF. For capacity building there are activities done and more can be done like regular DRR trainings for relevant staff at MOE; regular DRR trainings for school staff on basic firefighting, basic first aid, School Emergency Operational Plan awareness; and awareness sessions for parents. Challenges faced are geographical formation of the islands, travelling cost, budget, capacity building, and equipment. Expectations from SAARC DMC is to provide more trainings like these and technical assistance.

Bhutan: Country representative presented the major hazards in Bhutan which are earthquake, windstorm, fire (structural & forest), floods, glacial lake outburst flood (GLOF), and landslide. The agencies working for NSM for DM in schools of Bhutan are District Administration, Ministry of Education, Department of Disaster Management, MoHCA, RBP, RBA, Dessung (Guardians of Peace and Harmony) & Bhutan Red Cross Society, Ministry of Finance. She explained the current issues for NSM which are coordination and inadequate fund, and they are looking forward to work on it by expanding coverage of awareness programme and reinforce capacity building. The support they require from SAARC is about capacity building research and necessary technical assistance.



Sri Lanka: Country representative discussed the hazards faced by the country, which are landslides, floods, tsunami, and lightning. She also showed a school distribution map of the country wherein 20% of the population is school children i.e. 4.1 million school going children. She presented the record of damages in school sector during different disasters.

Legal framework and coordination mechanism of disaster management in Sri Lanka was discussed and sources of funding which include Government Treasury at National level, Provincial Council at Sub National Level, World Bank, INGO/NGO/CBO, and Private Sector. Discussed various strategies for capacity development undertaken in the country. Challenges faced and way ahead.

Showed various before and after photographs of different schools where non structural mitigation work was taken up to reduce flood and landslide risk.

Bangladesh: Major hazards in the country are floods, cyclones, storm surge, river bank erosion, earthquake, drought, salinity intrusion, fire, landslides and tsunami. Cyclones and floods particularly cause massive damages. For school safety the agencies involved are Ministry of Disaster Management & Relief, Ministry of Education, Ministry of Primary & Mass Education, Ministry of Home Affairs, Ministry of Water Resources, and Ministry of Defence. Funding mechanism is through Government budgetary provisions supported by many development agencies like ADB, WB etc. Discussing WiA highlighted few points:

- Primary Education Development Programme has been running for 5th time. Remarkable progress done which can be adopted and replicated in others SAARC countries.
- Training programme taken for strengthening human resources.
- Institutional Capacity developed.



Nepal: Country representative highlighted that Nepal is the hotspot for natural disasters like earthquake, flood, landslide, thunder, hailstorm, GLOF. Institutes that require NSRM are schools, universities, hospitals, government institutions, and offices in public domain. And residence, industries, commercial complex, theatres, and stadiums in

private domain. Funding mechanism in school system is through Annual fund through School Improvement Plan (SIP) in each school, I/NGOs initiated projects, integration of training component into the regular budget of teacher training program, non-pool budget under UNICEF support. Pointed out strategy of capacity development and challenges faced like lack of data on hazards, vulnerability and exposure; building consensus among responsible bodies; difficulty in obtaining the support from decision makers; and economic constraints. Discussed way ahead to

overcome these challenges through sustainability and commitments. Expectations from SAARC DMC are policy lobbying, capacity development, and fund mobilizing.



India: The country faces all the major hazards like earthquake, floods, tsunami, landslides, cyclones, and droughts. Key agencies involved in school safety are MHRD and NDMA – School Safety Guideline, State Disaster Management Department under Home Ministry, State Education Department, Samagra Shikhsha Abhiyan, District Education

Office, School Development and Management Committee. Existing funding mechanism available for the mitigation in schools are State Government Level: School Repairing Fund, under CSR “Mukhyamantri Vidyadaan Kosh” (funded by companies), School Develop Fund (through SDMC) and fund for School Safety Program. Major challenges faced are establishment of schools without any master plans, up gradation of existing schools without any infrastructure plan, no certification from certified engineers for construction of school building, and no proper plans of mitigation. Expectations for SAARC DMC are that such training programmes are conducted and support and encourage States to develop their own mechanism for mitigations.

Feedback from Participants and Closing Remarks

At the end of all the sessions, feedback from the participants was taken on various criteria. The rating given by the participants is shown in the graph:



In the valedictory session, Director, SDMC(IU), gave a vote of thanks to all the participants and resource persons and ceremony ended with certificate distribution.

Annex 1: Format for Structural Inspection of the Buildings

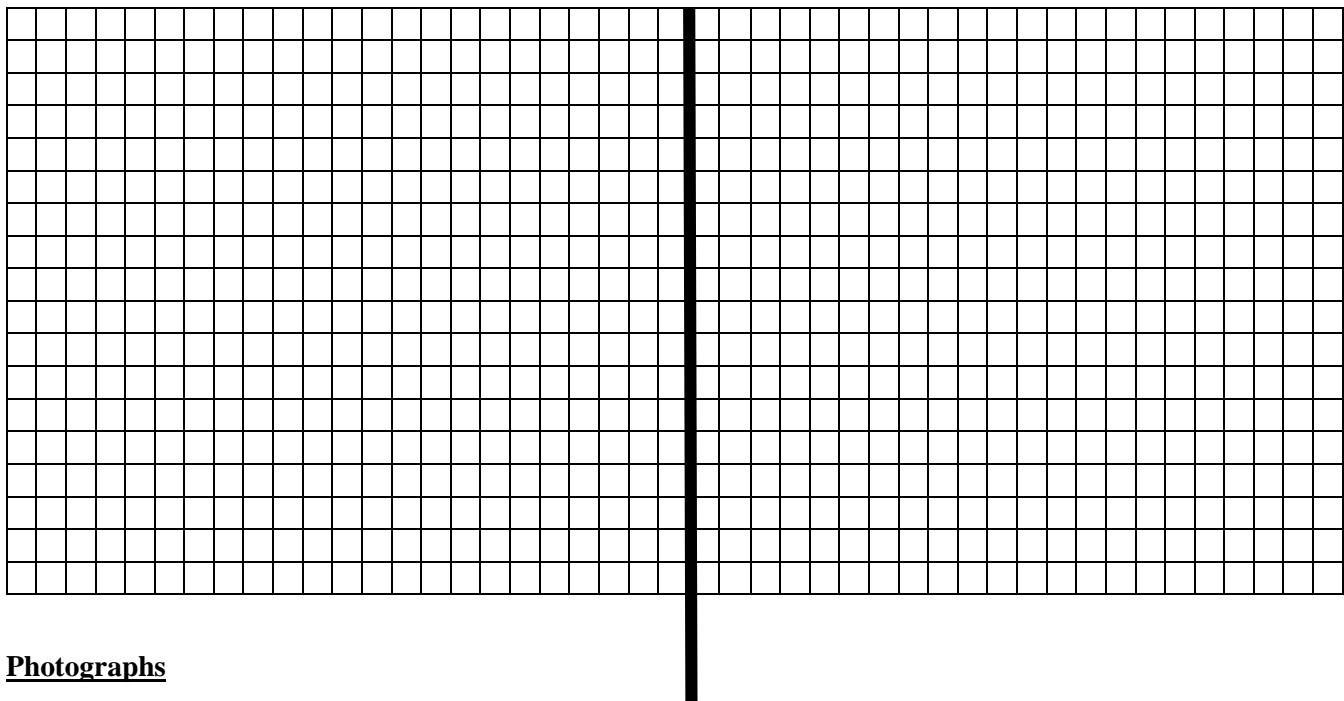
SR NO.	DESCRIPTION	DETAILS
PART 1 : GENERAL INFORMATION OF THE BUILDING		
1	Name and address of the building, Year of the construction	
2	TYPE OF BUILDINGS Load Bearing/ Partly Load bearing & partly RCC /RCC frame	
3	Number of storeys in each block of the building	
4	Description of the main usage of the building: Residential/educational/office/ hostel/workshop/hospital/any other specify	
5	TYPE OF FLOOR & ROOF RCC/Wooden/steel	
6	Year of construction, Maintenance history of the building if known to be mentioned	
PART 2 : STRUCTURAL SYSTEM OF THE BUILDING		
1	Description of the structural forms, systems and materials used in different parts of the building eg RCC, prestressed concrete, steel etc	
2	Description of Soil condition and foundation system, if known	
3	Identification of critical structures (for eg: slender columns, floating columns, cantilever structures, long span structures etc)	
4	Description of any area not covered in visual inspections. State the reasons for the same.	
5	State if the existing usage and loading condition is compatible with the intended purpose of structure	

6	State the misuse, abuse or deviation has given rise to excessive loading		
7	State if there was any addition/alteration works done to the building structure		
PART 3 : SURVEY OF SIGNS OF DISTRESS,DEFORMATION OR DETERIORATION IN BUILDING STRUCTURE (CONDITION ASSESSMENT)			
		YES	NO
1	LEANING OF BUILDING	<input type="checkbox"/>	<input type="checkbox"/>
2	SETTLEMENTS (a) Floor settlement (b) Settlement of Load bearing wall (c) Settlement of RCC foundation	<input type="checkbox"/>	<input type="checkbox"/>
8	CRACK OBSERVATIONS Cracks in various load bearing walls/RCC components. (location, type, measurement, through thickness crack etc.) Attach Separate Sheets for crack details if required)		
9	SEEPAGE/LEAKAGE FROM THE WALLS/SLABS		
10	DISSTRESSING IN RCC PARTS (a) Spalling/delamination of concrete (b) Honey combing (c) Extent of Corrosion of reinforcement (d) Deflection of slabs/beams (e) Any other distressing (termite attack etc.) (Attach Separate Sheets for details preferably with photographs)	YES	NO
11	OVERALL STRUCTURAL CONDITION ASSESSMENT	A) Excellent	<input type="checkbox"/>

	(Based on initial design & construction and present structural condition assessments)	B) Very good <input type="checkbox"/>
		C) Good <input type="checkbox"/>
		D) Poor <input type="checkbox"/>
12	RECOMMENDATIONS 1) No further action required 2) Repair/Strengthening works necessary 3) Detailed Assessment required 4) Barricade/ Non-use needed 5) Reconstruction or Any other suggestions	

Plan

Elevation

**Photographs****INSPECTION TEAM**

Sr. No	Name & Designation	Contact Details
1		
2		
3		
4		
5		
6		

Note : All sketches, plans and photographs should have proper caption

List of Participants

#	Country	Particulars	Photograph
1	Afghanistan	<p>Name : Mr. Atiqullah Jalil</p> <p>Designation : Engineer, Kundaz Education</p> <p>Organization : Ministry of Education, Afghanistan</p> <p>Email : eng.atiqjalil@gmail.comEmail_1»</p> <p>Contact No. : +93 766000082</p>	
2	Afghanistan	<p>Name : Mr. Sayed Mokhles Baazoon</p> <p>Designation : Infrastructure Service Dept/ MoE Director</p> <p>Organization : Ministry of Education, Afghanistan</p> <p>Email : mbaazoon@gmail.com</p> <p>Contact No : +93 728258343</p>	
3	Afghanistan	<p>Name : Mr. Mirwais Sediqi</p> <p>Designation : Afghanistan National Disaster Management Authority</p> <p>Organization : Afghanistan National Disaster Management Authority</p> <p>Email : -</p> <p>Contact No. : -</p>	
4	Bangladesh	<p>Name : Mr. Md. Shawkat Akbar</p> <p>Designation : Joint Secretary, Project Director</p> <p>Organization : Department of Disaster Management</p> <p>Email : shawkat62@yahoo.com</p> <p>Contact No. : +880 1712810679</p>	
5	Bangladesh	<p>Name : Mr. Md. Farhad Hossain</p> <p>Designation : Deputy Secretary</p> <p>Organization : Secondary & Higher Education Division,Ministry of Education</p> <p>Email : farhaduao1973@yahoo.co m</p> <p>Contact No. : +880 1712404354</p>	

6	Bangladesh	<p>Name : Mr. Md. Mijanur Rahman</p> <p>Designation : Executive Engineer</p> <p>Organization : Education Engineering Department</p> <p>Email : mizanur.rh1963@gmail.co mEmail_1»</p> <p>Contact No. : +880 1711314863</p>	
7	Bhutan	<p>Name : Mr. Jigme Wangdi</p> <p>Designation : Engineer</p> <p>Organization : Department of Enginnering Services,Ministry of Works and Human Sattlements</p> <p>Email : jwangdi@mowhs.gov.bt</p> <p>Contact No. : -</p>	
8	Bhutan	<p>Name : Mr. Lalit Kumar</p> <p>Designation : Chief Engineer</p> <p>Organization : Directorate of Services school planning & building division, MoE</p> <p>Email : lalit@moe.gov.bt</p> <p>Contact No. : -</p>	
9	Bhutan	<p>Name : Mr. Tshewang Phuntsho</p> <p>Designation : Disaster Focal Person</p> <p>Organization : Punakha District Administration,Ministry of Home and Cultural Affairs</p> <p>Email : tphuntsho@punakha.gov.b t</p> <p>Contact No. : -</p>	
10	India	<p>Name : Mr. Yagnesh Vyas</p> <p>Designation : Senior engineer</p> <p>Organization : Gujarat Council of School Education, Gandhinagar</p> <p>Email :</p> <p>Contact No. :</p>	

11	India	<p>Name : Mr. Rishabh Choudhary</p> <p>Designation : Chief Engineer</p> <p>Organization : Rajya Shiksha Kendra, Bhopal</p> <p>Email : Email_1»</p> <p>Contact No. :</p>	
12	India	<p>Name : Mr.Arun Kumar</p> <p>Designation : Assistant Director Secondary</p> <p>Organization : Education,Bikaner,Education Department , Rajasthan.</p> <p>Email : aroonk2011@gmail.com</p> <p>Contact No. : (+91) 9828460156</p>	
13	India	<p>Name : Mr.Chintan Pathak</p> <p>Designation : Asst. Professor cum Program Manager</p> <p>Organization : GIDM</p> <p>Email :</p> <p>Contact No. :</p>	
14	India	<p>Name : Mrs.Charu Mishra</p> <p>Designation : Training Specialist cum Program Manager</p> <p>Organization : GIDM</p> <p>Email :</p> <p>Contact No. :</p>	
15	Maldives	<p>Name : Ms. Nazahath Naeem</p> <p>Designation : Engineer</p> <p>Organization : Ministry of National Planning and Infrastructure, Maldives</p> <p>Email : nazahath.naeem@planning</p> <p>Contact No. : +960 7708384</p>	

16	Maldives	<p>Name : Ms. Sahula Wajeeh</p> <p>Designation : Education Officer</p> <p>Organization : Ministry of Education, Maldives</p> <p>Email : sahula.wajeeh@moe.gov.mv</p> <p>Contact No. : +960 913 6137</p>	
17	Maldives	<p>Name : Mr. Yazeed Mohamed</p> <p>Designation : Administrative Officer</p> <p>Organization : Ministry of Education, Maldives</p> <p>Email : yazeedh.mohamed@moe.gov.mv</p> <p>Contact No. : +960 9755756</p>	
18	Nepal	<p>Name : Mr. Nitesh Acharya</p> <p>Designation : Engineer</p> <p>Organization : Engineer, Ministry of Physical Infrastructure & Transport-Kathmandu Nepal</p> <p>Email : acharyanites@gmail.com</p> <p>Contact No. : 977-9825197953</p>	
19	Nepal	<p>Name : Mr. Suman Salike</p> <p>Designation : Senior Divisional Engineer</p> <p>Organization : Department of Urban Development and Building Construction</p> <p>Email : sumansalike@gmail.com</p> <p>Contact No. : 977-9841923660</p>	
20	Nepal	<p>Name : Mr. Shivkumar Sapkota</p> <p>Designation : National reconstruction Authority</p> <p>Organization : Ministry of Education, Science and Technology</p> <p>Email : sapkotashiba@yahoo.com</p> <p>Contact No. : 977-9851091208, 98251178417</p>	

21	Sri Lanka	<p>Name : Mrs. N S Vithanage</p> <p>Designation : Assistant Director</p> <p>Organization : Education and Awareness, DM Centre, Srilanka</p> <p>Email : saranga@dmc.gov.lkEmail_1»</p> <p>Contact No. : +94 772091597</p>	
22	Sri Lanka	<p>Name : Mr. W A P Bamunuarachchilage</p> <p>Designation : Assistant Director</p> <p>Organization : Ministry of Education</p> <p>Email : pdmshantha@gmail.com</p> <p>Contact No : +94 714486911</p>	
23	Sri Lanka	<p>Name : Mrs. I A N D Idirimanna</p> <p>Designation : Scientist (Engineer)</p> <p>Organization : National Building Research Organization</p> <p>Email :</p> <p>Contact No. :</p>	

Annexure 6

Copy of MoMs related to SAARC – STORM Project Meetings

Minutes of the SAARC – STROM Project Teleconference Held on 25th March 2019 at IST 12:00 hrs

A Teleconference was held on 25th March 2019 at ISD 12:00 hrs to discuss and ascertain the current status of the SAARC- STORM Project and deliberate towards necessary completion / conclusion of the project.

The list of the participants is given as Annexure 1.

Following important points were discussed and decision taken during the meeting:

1. At the outset, Director SDMC (IU) welcomed all the participants and set the agenda by briefing on the SAARC - STORM Project. He inquired about the receipt of Minutes of the last meeting held on 8th January 2019 circulated by SDMC (IU), wherein all the members confirmed the receipt of the same.
2. Director- SDMC (IU), thereafter, took up the agenda on Action Taken as per the last minutes of the meeting with respective Member States, and update provided by the member states are as under;
3. Bangladesh:
 - i. Dr Shantanu from ISRO informed that 5 Automatic Weather Station (AWS) out of total installed 24 AWS are working at the moment. To resolve the technical issues (such as battery replacement, issues with temperature & humidity sensors, etc.) with the non-functional AWSs, a Local Vendor needs to be identified in Bangladesh. He further added that Antrix Corporation Limited (a Government of India Company under the administrative control of Department of Space, India) has hired the services of private company called "Astra Microwave Products Limited (AMP)" for installation and maintenance of instruments under the project. It was also informed that AMP has identified the local vendor in Bangladesh.
 - ii. Mr Mannan from BMD informed that the formal communication from ISRO regarding identification of local vendor to resolve the technical issues with AWS has not been received.

- iii. Dr Shantanu from ISRO ensured that all the details related to the identified local vendor by AMP and action taken in the matter shall be shared with BDM/ Mr Mannan immediately.
- iv. Director- SDMC (IU), reiterating the last minutes of the meeting, urged all the members to communicate with each other and share the coordinates of the people involved in the project with all the stakeholders to avoid any communication gaps. This will ultimately serve the purpose for which the project has been taken-up. He also requested BMD and ISRO to give weekly update on the project by email.
- v. It was informed by ISRO that the installation of proposed all 24 AWS will be completed and made operational (by AMP) by second week of May.
- vi. Dr Mannan informed that the Ground Station facility/ technology for Radio Sonde (RS) in Bangladesh has been upgraded from manual to automatic. He requested ISRO to explore the possibilities to install the upgraded RS equipment. Dr Shantanu from ISRO mentioned that the equipments for RS as proposed in MoU is ready with ISRO. However, they will see the possibilities of installation of upgraded equipments. Accordingly, ISRO requested BDM to share technical specifications for the automatic Ground Station facility with copy to SDMC (IU).

4. Bhutan:

- i. Dr. Singay Dorji from the National Center for Hydrology and Meteorology (NCHM), Bhutan mentioned that the operational status of the AWS is the same as it was discussed during the last meeting. He added that no communication has been made between NCHM and ISRO regarding the technical issues since the last teleconference.
- ii. Dr Shantanu informed that they are in touch with the AMP and they confirmed that all installed 10 AWS are working in Bhutan.
- iii. Dr. Singay Dorji mentioned that there may be an issue with communication between Stations and NCHM located in Thimphu as they are not receiving the data from the 5 AWS. Therefore, he requested ISRO to look in the matter and resolve the issues. He also informed that they do not have the coordinates of concerned in AMP who is involved in resolving the technical problems with the equipments installed.

- iv. Director- SDMC (IU) again requested ISRO to officially share details of the company/ persons who is/are supposed to take care of technical issues with all the member states so that they can directly contact them to resolve the issues.
- v. Looking at the pace of implementation and the current status of the project, Director – SDMC (IU) suggested for physical checking of installation of equipment and its operations. Dr. Singay Dorji agreed to the proposal and suggested to visit the sites in Bhutan by end of May as it is anticipated that the installation would be completed and all the equipment will be operational by then.
- vi. Issue of unavailability of Hydrogen Gas for the Radio Sonde (RS) was discussed in detail. It was mentioned that transportation of Hydrogen Gas from India or neighbouring nations is not feasible and therefore, onsite generation of Hydrogen Gas may be viable. On the request for financial support for availability of Hydrogen Gas from NCHM in the meeting, it was suggested that NCHM may prepare detailed project proposal incorporating details on requirement of Hydrogen Gas, generation methods including likely expenditure and share the same with SDMC (IU). Accordingly, SDMC (IU) may explore the possibilities for financial assistance. Dr. Singay Dorji agreed to share detailed project proposal with SDMC (IU) at the earliest.
- vii. ISRO raised the issue of warranty period of AWS, as the same has been installed in Bhutan long back and one-year warranty may have been over by now. ISRO further added that, as per the MoU, Member States have to maintain the equipments after the warrant period.

5. Nepal

- i. Mr. Bikash Nepal from Department of Hydrology and Meteorology (DHM) informed that out of the installed 16 AWS, only 6 AWS are operational. He further added that installation of server for data storage/ transmission is yet to be done for AWS.
- ii. Dr Shantanu from ISRO confirmed the information regarding operational status of AWS as mentioned by Mr Bikash. He informed that the AMP has already identified the local vendor and contacted DHM regarding the same to resolve the technical issues. He further added that officers from AMP are visiting Nepal within a week to rectify the issue.

- iii. Unavailability of hydrogen gas for Radio Sonde has also been raised by Nepal. It was mentioned that DHM is exploring the ways to arrange/generate hydrogen gas and update SDMC (IU) in due course.
 - iv. Mr. Bikash Nepal mentioned that one C band Doppler Weather Radar (DWR) is proposed to be installed under the project in Nepal. However, one C Band DWR is already installed in far - western part of Nepal under some other project. Two more C Band DWR are going to be installed soon. Accordingly, whole area of Nepal would be covered after installation of three C band DWR. Therefore, DHM has recommended to provide X band DWR for Kathmandu Valley instead of one C Band DWR as proposed in the project.
 - v. ISRO informed that the indigenous technology for C band DWR is developed and tested by ISRO as envisaged under the project as per the MoU. Technology for X band DWR is being developed and will take some time.
 - vi. After detailed deliberation on this issue, Director SDMC (IU) suggested that installation of C Band DWR in Nepal may be dropped as the whole of Nepal would be covered by three C Band DWR in near future. Mr. Bikash Nepal was requested to inform SDMC (IU) and ISRO about their requirement of C Band DWR as proposed in the project as soon as possible.
- 6. Director- SDMC (IU) inquired about the status/ use of data being received from the operational AWS from all the Member States. Dr. Sathi Devi from IMD mentioned that the exact status on data is not readily available. However, she agreed to share the same with SDMC (IU) at the earliest.
- 7. Since the MoU signed between ISRO and SMRC expired in 2017, it was agreed in the last teleconference to revive it to achieve the ultimate objectives of the project. Considering the technicality of the project and current status of the equipment installed/ to be installed under the project, Director - SDMC (IU) urged ISRO to prepare a draft MoU in consultation with IMD which will be signed between ISRO and SDMC (IU). He added that the draft MoU prepared by ISRO shall be shared with all the Member States and finalise before signing. Director – SDMC (IU) further suggested ISRO to prepare a template to ascertain status of the project from all the member states as the same shall be helpful in preparing MoU. ISRO agreed to prepare the template and draft MoU.
- 8. It was also agreed to have a follow up teleconference in third week of May.

Meeting ended with thanks to all members.

List of Participants

1. Mr P K Taneja, Director, SAARC Disaster Management Centre -IU, Gandhinagar, Gujarat, India.
(Email: director@saarc-sdmc.org || Ph. +91 79 23275804 || M. +91 9978406146)
2. Mr Sangye Chewang, Director (ENB), SAARC Secretariat, Kathmandu, Nepal.
(Email: dirbhu@saarc-sec.org || Ph. +977 14228928 || M. +977 9803865689)
3. Mr Md. Abdul Mannan, Scientist, Bangladesh Meteorological Department (BMD), Dhaka, Bangladesh.
(Email: mannan_u2003@yahoo.co.in || Ph. +880 2 9123838 || M. +880 1732115759)
4. Dr. Singay Dorji, Chief, Weather and Climate Services Division, National Center for Hydrology and Meteorology, Thimphu, Bhutan.
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8. Dr Shantanu Bhatawdekar, Scientist/Engineer-H, Director, EOS ISRO HQ, Bangalore.
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9. Mr G S Rao, Associate Director, DRR, ISRO Hq., Bangalore, India
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Minutes of the SAARC – STROM Project Teleconference held on 11th June 2019 at IST 12:30 hrs

A Teleconference was held on 11th June 2019 at ISD 12:30 hrs to discuss and ascertain the current status of the SAARC- STORM Project and deliberate towards necessary completion / conclusion of the project.

The list of the participants is given as Annexure 1.

Following important points were discussed and decision taken during the meeting:

1. At the outset, Director, SDMC (IU) welcomed all the participants and set the agenda by briefing on the SAARC - STORM Project. He inquired about the receipt of Minutes of the last meeting held on 25th March 2019 circulated by SDMC (IU), wherein all the members confirmed the receipt of the same. It was informed in the meeting that representative from IMD, India is absent in the meeting due to Cyclone "VAYU" monitoring.
2. Director, SDMC (IU), thereafter, took up the agenda on Action Taken as per the last minutes of the meeting with respective Member States, and update provided by the member states are as under;
3. Bangladesh
 - i. Coordination between ISRO and BMD was discussed. Dr. Manan, BMD informed that a request on behalf of ISRO for invitation letter to visit Bangladesh was received on 2nd April, 2019. In response to that, a reply seeking clarification pertaining dates, purpose and members visiting was requested on 7th April, 2019 by BDM. Since then further communication from ISRO is awaited.
 - ii. Director, SDMC (IU) referred to the previous MoM and discussed the action taken report. It was observed that no communication was done after 07th April 2019 between BDM and ISRO. It was agreed that, to expedite the process, an action plan needs to be drawn. It was agreed that BMD will issue necessary invitation letter to ISRO once the details are shared.

- iii. Director, SDMC (IU) restressed upon communication amongst all stakeholders to avoid any communication gaps. It was agreed by both ISRO and BMD that SDMC(IU) will be kept in loop in all future communications.
 - iv. Director, SDMC(IU) further requested Dr. Mannan to provide necessary information about Radiosonde, as decided in the previous meeting to ISRO at the earliest. He also requested BMD and ISRO to give weekly update on the project by email.
4. Bhutan
- i. It was briefed that communication between NCHM and ISRO is yet to be done. However, the status report has been shared with SDMC(IU). It was further informed that 7 AWS stations are functioning and reporting, however the station centre needs to be calibrated.
 - ii. Mr. Rao informed that quotations from the vendors have been taken to make all 10 AWS operational although warranty period is over. Necessary update will be communicated with NCHM at the earliest.
 - iii. With reference to proposal for additional items made by NCHM (other than whatever mentioned in the MoU), it was clarified that priority will be given to complete the project as per the existing MOU as the outcomes of this project are yet to be delivered in full.
 - iv. It was discussed that operation and maintenance of equipments installed under the project is the responsibility of the concerned country. As far as issue of hydrogen for RS, it was agreed that transportation of Hydrogen gas is not feasible and Indian Meteorological Department (IMD) may suggest suitable option in this regard.
 - v. It was agreed that the installed equipments should be operational as soon as possible to archive overall objective of the project i.e. regional modelling for improved prediction of severe thunderstorms. NCHM inquired about the data reception at IMD and modelling of the same. Director- SDMC (IU) suggested that IMD will give necessary update at the earliest.

5. NEPAL

1. Status of progress from Mr. Bikas, DHM was taken. It was informed that only 5 AWS are functional. DHM is in touch with agency, however, due to some limitation at their end they requested agency to visit Nepal after Monsoon to rectify the technical issues with the installed AWS. It was clarified that there are no issues on the part of ISRO.
2. Mr Bikas, DHM mentioned that one C Band DWR is already installed in far-western part of Nepal under some other project. Two more C Band DWR are going to be installed soon, there is no need for any more C-band DWR in Nepal. Accordingly, DHM suggested to drop the installation of C Band DWR in Nepal as proposed under the project.
3. Mr. Shantanu, ISRO explained that they are ready for the installation of equipment in Nepal on their consent.
6. As mentioned in the last meeting, ISRO has been requested to prepare a draft MoU in consultation with IMD. ISRO has been also requested to prepare a template to ascertain status of the project from all the member states which can further be helpful in preparing draft MoU. ISRO has agreed to share template at the earliest.
7. Mr. Chewang, Director, SAARC Secretariat assured all necessary support to conclude the program.

Meeting ended with vote of thanks with the chair.

List of Participants

1. Mr P K Taneja, Director, SAARC Disaster Management Centre -IU, Gandhinagar, Gujarat, India.
(Email: director@saarc-sdmc.org || Ph. +91 79 23275804 || M. +91 9978406146)
2. Mr Sangye Chewang, Director (ENB), SAARC Secretariat, Kathmandu, Nepal.
(Email: dirbhu@saarc-sec.org || Ph. +977 14228928 || M. +977 9803865689)
3. Mr Md. Abdul Mannan, Scientist, Bangladesh Meteorological Department (BMD), Dhaka, Bangladesh.
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4. Dr. Singay Dorji, Chief, Weather and Climate Services Division, National Center for Hydrology and Meteorology, Thimphu, Bhutan.
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5. Mr. Bikash Nepal, Meteorologist, Network and Supervision Unit Department of Hydrology and Meteorology(DHM), Kathmandu, Nepal
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6. Dr Shantanu Bhatawdekar, Scientist/Engineer-H, Director, EOS ISRO HQ, Bangalore.
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7. Mr G S Rao, Associate Director, DRR, ISRO Hq., Bangalore, India
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Minutes of the SAARC – STORM Project Teleconference

held on 10th February, 2020 at IST 12:30 hrs

A teleconference was held on 10th February, 2020 at ISD 12:30 hrs to discuss and ascertain the current status of the SAARC- STORM Project and deliberate towards necessary completion / conclusion of the project.

The list of the participants is given as Annexure 1.

Following important points were discussed and decision taken during the meeting:

1. At the outset, Director, SDMC (IU) welcomed all the participants and set the agenda by briefing on the SAARC - STORM Project. He inquired about the receipt of Minutes of the last meeting held on 11th June, 2019 circulated by SDMC (IU), wherein all the members confirmed the receipt of the same. It was informed in the meeting that representative from BMD, Bangladesh is absent in the meeting.
2. Director, SDMC (IU), thereafter, took up the agenda on action taken as per the last minutes of the meeting with respective member states, and update provided by the member states are as under;
3. Bhutan
 - i. It was mentioned that the status of the installed AWS is same as discussed earlier in the last meeting. It was further informed that only 5 AWS stations are functioning as of now.
 - ii. ISRO has agreed to fix all the technical problems with the installed AWS. It was also informed by ISRO that the AMC period for the installed AWS is over. However, ISRO will fix the technical issues and make the equipment operational upon confirmation from NCHM about maintenance of AWS, once they are operational.
 - iii. NCHM inquired about the data reception at IMD and modelling of the same for improved prediction of severe thunderstorms. IMD informed that it has a capabilities of doing prediction of severe thunderstorms and the same can be made available to NCHM, Bhutan upon formal request.
 - iv. It was informed that NCHM may drop the installation of Radio Sonde (RS) for upper air observation as envisaged under the project due to unavailability of hydrogen gas. However,

it was conveyed that the formal letter shall be sent to SDMC (IU) and ISRO about the same in due course.

4. NEPAL

- i. Mr Bikas from DHM mentioned that they have received the communications from ISRO to rectify the technical issues with the installed AWS. However, due to some limitations at their end they are yet to send formal invitation to ISRO/ agency to fix the technical issues.
 - ii. It was further informed by DHM that they want to install the RS at a location/site where one more RS is already installed under some other programme. DHM would further check and compare the data with both the RS and upon confirmation on data reception they would request ISRO to re-install the RS under the project at the envisaged location.
 - iii. ISRO has raised the concern over the proposal of re-installation of RS as it is not the part of the original contract/project. Further, it is also mentioned that the installations of these equipments are being done by the private agencies and therefore there are financial implications involved with such proposal.
 - iv. Mr. Bikas from DHM informed that he will discuss the issues with his Head of Department (HoD) and reply back to SDMC (IU) and ISRO at the earliest.
5. Director, SDMC (IU) urged all the stakeholders to respond back quickly with the issues discussed and decision taken during the meeting to clear all the issue related to the project by March 2020.

Meeting ended with vote of thanks with the chair.

Annexure 1

List of Participants

1. Mr P K Taneja, Director, SAARC Disaster Management Centre -IU, Gandhinagar, Gujarat, India. (Email: director@saarc-sdmc.org || Ph. +91 79 23275804 || M. +91 9978406146)
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7. Dr (Ms) Sathi Devi, Scientist F, India Meteorological Department, New Delhi, India (Email: ksathi.devi@imd.gov.in || Ph. +91 11 24629798 || M. +91 9820128060)

Annexure 7

Copy of MoMs related to RRM Project Meetings

Minutes of the 1st Teleconference Meeting of Task Force for Development of draft RRM in the SAARC Region held on 7th June 2019 at IST 12:30 hrs

A Teleconference was held on 7th June 2019 at ISD 12:30 hrs to discuss Development of draft Regional Response Mechanism (RRM) in the SAARC Region under the chair of Mr. P. K. Taneja, Director, SAARC Disaster Management Centre (IU), Gandhinagar, Gujarat. List of participants is given as Annexure - 1.

Following important points were discussed and decision taken during the meeting:

1. Director, SDMC (IU) welcomed all the members and briefed that SAARC Agreement of Regional Response to Natural Disaster (SARRND) was signed and ratified by all the SAARC Member States. As per the mandate given to SDMC (IU), the Task Force was constituted to discuss the mechanism and modalities for development of RRM in the SAARC region as per the SARRND. He further informed that following documents have been shared with all the members for information and discussion;
 - a. Copy of SARRND,
 - b. Proceedings of Study Visit and Policy Level Workshop held at Jakarta 26th - 30th January, 2015;
 - c. Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations (SASOP) by AHA Centre.
 - d. Disaster Response in Asia and the Pacific - A Guide to International Tools and Services by OCHA
 - e. Caribbean Disaster Emergency Management Agency (CDEMA) - Regional Response Mechanism (RRM)

2. Director SDMC (IU) also clarified that the RRM Task Force is formed as per the direction of Inter-Ministerial Committee (constituted by Government of India) and the scope of the work of Task Force is clearly mentioned in the Office Memorandum dated 6th November, 2018. Considering the interim status of SDMC, it was decided to prepare draft RRM which shall further be put up before Government of India for approval. After the approval from Government of India, SDMC (IU) shall follow the SAARC process for finalisation.
3. Prof. Santosh Kumar informed that modalities (like allocation of resources, allocation of HR) towards development of RRM have been agreed by Member States representatives and documented in Jakarta visit report 2015. On suggestions related to best suitable RRM for SAARC regions, it was mentioned that AHA Centre agreement can be guideline for SAARC. It was also mentioned that Govt. of Japan gave financial support for development of AHA centre.
4. Mr. Ajay Gangwar, NDMA informed that the Headquarter Integrated Defence Staff (IDS) is the lead agency for any International Humanitarian Assistance & Disaster Relief (HADR). It was suggested that one member from IDS (Brig. Anupam Sharma) may be added as member in this Task Force for more qualitative inputs. He further agreed to share coordinates of Brig. Sharma with SDMC (IU).
5. Mr Narvekar highlighted that there are certain issues related to entry and exit during international response and the same needs to be taken into consideration in draft RRM. It was informed that AHA response team standards/ model are as per International Search and Rescue Advisory Group (INSARAG) guidelines. It was suggested that AHA model may be more suitable as the geographical areas and region is nearest.

6. System for sharing and development of Multi-Hazard Early Warning Systems (MHEWS) was discussed. Ms. Sathi Devi informed that India is having appreciable capacities for the same and can be used in the RRM. There are SOPs in place and IMD is supporting SAARC Member States for early warnings. It was discussed that there are many bilateral and multilateral arrangements for early warning information sharing however, there is a need to modify and customise them according to the functioning of all the SAARC Member States. Ms. Sathi Devi agreed to prepare draft regional protocols for sharing Multi-Hazard Early Warning Systems (MHEWS) in the SAARC region.
7. Setting up of a Regional Emergent Operation Centre (REOC) is very important component of RRM. Mr. Mahesh Narvekar has been requested to prepare a draft concept of REOC. Mr Narvekar agreed to the same.
8. Director, SDMC (IU) highlighted that several international and experienced agencies like JICA have helped in development of the AHA and there is a need of exploring and identifying suitable agencies that can provide necessary technical support for development of RRM. It was also clarified that sovereignty of member states and related principals cannot be ignored for identification of such agencies.
9. Director SDMC (IU) requested all the Task Force members to Study the existing Regional Response Models and suggest the model best suited in South Asia for effective response based on SARRND. He further suggested that the national response mechanism in each member states also needs to be studied and SOPs may be developed accordingly taking all the members together. It was agreed that the task is process intensive and therefore there is need for more deliberation.

10. It was agreed that respective members will work as per the OM and as per the directions of this meeting. It was decided to have next meeting of Task Force at SDMC (IU), Gujarat on 5th July, 2019 for further discussion.

Meeting ended with vote of thanks to the chair.

Annexure 1 **List of Participants**

- 1 Shri P K Taneja, Director, SDMC (IU), Gujarat
- 2 Brig. Ajay Gangwar, Advisor (Ops.), NDMA, New Delhi
- 3 Shri S K Rana, DIG (Ops), NDRF, New Delhi
- 4 Prof. Santosh Kumar, Professor, NIDM, New Delhi
- 5 Shri Mahesh Narvekar, Director (DM), Municipal Corporation Greater Mumbai
- 6 Ms. Sathi Devi, Scientist F, IMD, New Delhi
- 7 Mr Nisarg Dave, Specialist (DM), SDMC (IU), Gujarat
- 8 Mr Sumedh Patil, Research Officer/ Program Manager, SDMC (IU), Gujarat

Annexure 8

Outcome of the South Asia Forum on Preparedness for Regional Disaster Response on the Implementation of SAARC Agreement on Rapid Response to Natural Disasters

[Draft] Call For Action from the South Asia Forum on Preparedness for Regional Disaster Response for the Implementation of the SAARC Agreement on Rapid Response to Natural Disasters, 4-6 November, 2019, Kathmandu, Nepal.

The participants agreed on the following proposed recommendation for the consideration of SAARC Member States, SAARC Secretariat, National Red Cross and Red Crescent Societies, and international partners. Given the vulnerability of the region to the impacts of disasters and against the backdrop of the current climate crisis, the participants recognised the importance of the SAARC Agreement on Rapid Response to Natural Disasters as an expression of the political will of the Member States. The participants unanimously recommended that its operationalisation should be accelerated through the following recommendations.

For the Field of Information, Communication and Awareness;

Recommendation	Responsible entity	Timeline
SAARC Secretariat to request Member States to urgently nominate national focal points in order to better coordinate and share information among SAARC Member States and the Secretariat in accordance with the agreement. (See Article 14)	SAARC Secretariat in communication with MOFA/MEA of Member States	Nomination within 6 months
Member States are requested to expedite the formal establishment of the SAARC Disaster Management Centre (SDMC) as a key operational institution to support regional cooperation in Disaster Preparedness and Response in line with the provisions of the agreement. (See Article 3.4)	SAARC Secretariat	As soon as possible
Promote the dissemination of the SAARND as well as related national DRM laws to the relevant stakeholders and the general population through all appropriate and inclusive communication tools such as infographics, videos and social media.	All relevant actors	Ongoing
Further strengthen the role of SDMC, <i>inter alia</i> , in data collection and information management through the establishment of an online open source platform, taking into consideration data privacy and protection as well as various levels of access depending on stakeholders.	All relevant stakeholders	As SDMC comes into function

For the Field of Joint Capacity Building and Peer to Peer Learning;

Recommendation	Responsible entity	Timeline
Continue promoting joint capacity building initiatives such as those currently being coordinated by the SDMC, expanding such initiatives to all Member States and relevant actors as stipulated by the agreement. (See Article 4.4)	All relevant stakeholders	Ongoing
Encourage dialogue among Member States and other stakeholders such as the National Red Cross and Red Crescent Societies to promote context specific training initiatives and learning opportunities within South Asia.	All relevant stakeholders	Ongoing
Organise simulations and drills at the regional level to support the operationalisation and awareness of the relevant regional mechanism such as those mentioned in the agreement.	Member States and other relevant stakeholders	Ongoing

For the Field of Domestic Legal and Policy Preparedness;

Recommendation	Responsible entity	Timeline
<p>Conduct a baseline mapping in all Member States to analyse the existing national laws and policies in light of the provisions of the SAARND as well as International Disaster Response Law Guidelines.</p> <p>As part of the mapping, validate the analysis through a consultation with concerned line ministries or authorities of the Member States as well as other relevant stakeholders.</p> <p>IFRC is requested to provide technical assistance to the SAARC Secretariat and Member States in such mapping, building on the expertise and auxiliary relationship of National Societies with each Member State.</p>	<p>SAARC Secretariat; Technical support by IFRC; With the cooperation of National Red Cross and Red Crescent Societies.</p>	<p>Mapping to be disseminated by the end of 2020</p>



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