



Quarterly Newsletter of
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2009 Disasters in Numbers

Global data of disasters released recently by the Centre for Research on the Epidemiology of Disasters (CRED), Leuven shows that the total number of natural disasters in which 10 or more persons got killed or 100 or more were injured has marginally increased from 321 in 2008 to 327 in 2009, but the total number persons killed in disasters has registered a sharp decline from 235816 in 2008 to 10418 in 2009. This was mainly due to the fact 2009 did not witness any mega disaster. The largest number of people were killed in flood (3386), followed by cyclones (3258), earthquake (1892) and extreme temperature (1015).

Although the number of disasters in South Asia increased from 25 in 2008 to 39 in 2009, the number of persons killed declined from 4280 to 3145. Largest number of deaths took place in India (1989), followed by Nepal (432), Sri Lanka (280) and Bangladesh (254). Afghanistan accounted for 91 deaths, Pakistan 76 and Bhutan 23. Indian floods of July-September and September-October 2009 which consumed 992 and 300 lives respectively were among the top ten global disasters of 2009.

Disasters in Numbers (2005-2009) - South Asia in Global Context

Indicators	2005	2006	2007	2008	2009
Number of Disasters-Global	360	395	399	321	327
Number of Disasters-South Asia	71	54	49	25	39
South Asia Among Top Ten	4	0	6	3	2
Number of Deaths-Global	244577	77669	73931	235816	10418
Number of Deaths-South Asia	80243	2716	9411	4280	3145

The comparative figures of South Asian disasters for the last five years may provide comfort to disaster managers, but it would be preposterous to conclude that disasters are on the decline, as any catastrophic disaster event in any subsequent year may well upset the trend.

CRED data further revealed that during the past decade, 3,852 disasters killed more than 780,000 people around the world, affected more than two billion and caused damage of 960 billion US\$. In terms of human losses, Asia accounted for 85 per cent of all fatalities. Earthquake was the deadliest of all taking a toll of 60% of casualties, followed by storms (22%) and extreme temperatures (11%). Four out of five most deadly disasters of the decade were in Asia - Indian Ocean Tsunami (226,408), Cyclone Nargis (138,366) in Myanmar; the Sichuan earthquake (87,476) in China and Pakistan earthquake (73,338). The fifth severest disaster of the decade was the heat waves in Europe that consumed 72,210 people in Europe in 2003.

SAARC Workshop on Earthquake Risk Management in South Asia



The SAARC Disaster Management Centre (SDMC) organized the SAARC Workshop on Earthquake Risk Management in Islamabad on 8-9 October 2009, in collaboration with National Disaster Management Authority (NDMA) of Pakistan, coinciding with the fourth anniversary of the devastating earthquake of Pakistan.

The workshop was attended by 34 professionals, practitioners and policy makers from the SAARC countries. The workshop was inaugurated by Nawabzada Malik Aamad Ahmed Khan, Honourable Minister of State for Foreign Affairs, Pakistan. Mr. Shaukat Tahir Senior Member of NDMA welcomed the delegates and explained the workshop objectives and programmes. Lt. General (Retired) Mr. Farooq Ahmad Khan, Chairman, NDMA Pakistan, explained the background of the workshop in the context of the earthquake of 2005 and gave overview of the lessons learnt after the earthquake, which would be useful for the development of a plan of action for earthquake risk mitigation in the region. Mr P.G.Dhar Chakrabarti, Director, SDMC highlighted the objectives and expected outcomes of the workshop. In his inaugural address Nawabzada Malik Aamad Ahmed Khan emphasized the importance of mitigating the risks of natural disasters for safe development and highlighted the need for enhanced regional cooperation. Participants from SDMC include Dr D.D. Joshi, Specialist (Geological Disaster Division), and Mr Ranjan Kumar, Research Assistant.

The Workshop reviewed the strength, weakness and gaps in the current practices of earthquake risk assessment, mitigation, response, recovery and reconstruction in the region and recommended that certain coordinated regional programmes should be

taken up under the auspices of the SAARC Disaster Management Centre to supplement the efforts of the national, provincial and local governments in the respective countries. The Workshop adopted a *Road Map for Regional Cooperation for Earthquake Risk Management* in the region. The Roadmap is divided in three main parts.

A. Earthquake Risk Assessment

The following regional programmes for assessing the hazards, vulnerabilities and risks of earthquake were recommended.

- a) An Expert Group may be constituted under the auspices of the SAARC Disaster Management Centre for reviewing the present status and recommending future studies on:
 - seismicity and fault zones in Himalaya-Hindukush region
 - Review the existing Seismic Hazard Maps of the countries
 - Explore possibilities of facilitating upgradation of seismic networks in the region
- b) Training and Capacity Building on Seismic Hazard and Risks in collaboration with leading seismological research centres in South Asia.
- c) Development of Regional Attenuation Models which are essential for accurate estimation of seismic hazards in South Asian Countries.
- d) First-cut Microzonation study for Select Cities in the Member States as a prelude to full scale microzonation.

B. Earthquake Risk Mitigation

Risks of earthquakes can be mitigated through a combination of structural and non-structural measures, as under:

- a) *Building Codes, Regulation and Enforcement:* The SAARC Disaster Management Centre may constitute an Expert Group to study the existing earthquake resistant building codes of the countries and recommend model building code and guidelines.

- b) *Retrofitting of Life Line Structure*: For the countries that do not have any experience in retrofitting, the SAARC Disaster Management Centre may provide technical support for retrofitting one life line structure provided the basic costs of retrofitting are met by the country from its own resources. The experiences gained from such model retrofitting may be utilized for retrofitting of other life line structures in a phased manner.
- c) *Compendium of Building Typologies*: South Asia has enormous variety of building typologies which need to be documented and assessed from earthquake safety point of view.
- d) *Documentation of Indigenous Technology*: South Asia has rich reservoir of indigenous knowledge of building materials and construction technology that has withstood the test of time. Such knowledge needs to be documented and further promoted if the local conditions permit.
- e) *Capacity Building of Engineers, Planners, Architects and Masons* needs to be carried out through training and education at various levels by making use of the expertise and infrastructure available in the region.
- f) *School and Hospital Safety*: Keeping in view the devastating impact of earthquakes on schools and hospitals and the importance of the safety of these institutions, a Regional Plan for School and Hospital Safety may be developed by SDMC in consultation with the Member States for implementation by the Member States.
- g) *Development of Guidelines for Environment Friendly Debris Management*: The SAARC Disaster Management Centre may take up development of such guidelines which is specific to the diverse conditions of the region.

C. Earthquake Response, Recovery and Reconstruction:

Recent mega earthquakes in South Asia had exposed the limitations of existing capacity to effectively respond to earthquake disasters and provided opportunities to develop the capacities. Initiatives taken by India and Pakistan following the earthquakes in Gujarat and Kashmir have significantly augmented the regional

capacity for earthquake response, recovery and reconstruction, which should be utilized for the benefit of the region. In this context following specific programmes may be taken up by SDMC.

- a) *Documentation and Sharing of Good Practices* in respect of Gujarat and Kashmir earthquakes in a comprehensive manner.
- b) *Regional Framework for Earthquake Response, Recovery and Reconstruction* may be developed by SDMC. Based on this framework each country may develop its own pre-disaster recovery planning which may be relevant for other disasters.
- c) *Sharing of Response under NDRRM*: SAARC Disaster Management Centre has been mandated to develop a Natural Disaster Rapid Response Mechanism. As a part of this mechanism SDMC may develop a regional response plan for mega earthquakes in consultation with the concerned agencies of the Member States.



The *Roadmap for Regional Cooperation for Earthquake Risk Management* was presented before the Fourth Meeting of the Governing Board of the SAARC Disaster Management Centre held in New Delhi on 2-3 November 2009. The Governing Board endorsed the Roadmap and approved a number of programmes to be implemented by the Centre during the year.

Repatriation of SDMC Professionals

Dr. A.A.Khan, Specialist, Geological Disaster Division was repatriated to his parent organization, Dhaka University, on 11 November 2009. Er. Shankar Mahto and Dr Binod Shakya, Specialists, Hydro Meteorological Disaster Division have repatriated to their parent organizations Central Water Commission, India; and Tribhuvan University, Nepal respectively on 16 December 2009.

Fourth Meeting of Governing Board

The Fourth Meeting of the Governing Board of SAARC Disaster Management Centre (SDMC) was held in New Delhi on 2-3 November 2009. The Chair of the Governing Board of SDMC passed on from Bangladesh to Bhutan in alphabetical order. Mr Namgay Wangchuk, Director, Department of Disaster Management, Ministry of Home and Cultural Affairs, Government Bhutan chaired the session. Mr Pema L. Dorji, Director (EBO), SAARC Secretariat represented the Secretary General and conveyed his best wishes for the success of the meeting. Mr P.G.Dhar Chakrabarti, Director, SDMC presented the agenda of the meeting and submitted the Action Taken Report on the various decisions at the Third Meeting of the Governing Board. The Board appreciated the good work done by the Centre and deliberated at length on the programmes, activities and budget of the Centre for the year 2010. The Board approved the following programs and activities of SDMC during 2010.

Natural Disaster Rapid Response Mechanism

The 15th SAARC Summit in Colombo has asked SDMC to develop a Natural Disaster Rapid Response Mechanism (NDRRM) for a well coordinated and planned approach to meet emergencies in South Asia. SDMC has developed a draft agreement on NDRRM through a consultative process, which has already received the approval of six out eight Member States besides the endorsement of the SAARC Environment Ministers. The draft agreement is expected to be signed by the Member States during the sixteenth SAARC Summit in Thimpu in April 2010. The Governing Board approved the creation of a *Disaster Response Division* and a round-the-clock *Regional Emergency Operation Centre* in SDMC with three professionals and 10 General Service staff. These would be set up after the agreement is signed and ratified by the Member States.

Digital Vulnerability Atlas of South Asia

The Governing Board decided that the SDMC shall implement the project on Digital Vulnerability Atlas of South Asia, integrating spatial data on physical,



demographic and socio-economic features of different regions of each country on a WebGIS format over a period of two years in collaboration with specialized agencies of the Member States, wherever such agencies are available. India has identified National Informatics Centre under the Ministry of Information Technology to be the implementation agency. An Agreement in this regard has already been signed and the work has started. Governing Board Members from Pakistan, Bangladesh and Sri Lanka were requested to identify suitable national agencies. Afghanistan, Bhutan, Nepal and Maldives informed that they do not have any specialized agency to implement the project and therefore it was decided that reputed agencies from outside shall be engaged for developing the atlas in these countries.

South Asia Disaster Knowledge Network

Agreement for implementation of South Asia Disaster Knowledge Network (SADKN) as per the technical and operational guidelines developed by the SDMC has already been signed with seven Member States. The first beta version of the network was launched on 4 November 2009. The project will be fully implemented during 2010. The project is being implemented with support from UN/ISDR.

Road Map on Earthquake Risk Management

The Governing Board endorsed the *Road Map for Regional Cooperation for Earthquake Risk Management* adopted during the SAARC Workshop on Earthquake Risk Management in South Asia, 8-9 October 2009,

Islamabad Pakistan and approved the following five items from the Road Map for implementation during 2010:

- Constitution of an Expert Group for Seismic Hazard Assessment in South Asia
- Development of a Regional Attenuation Models:
- Development of methodology for First-cut Microzonation study
- Preparation of a Compendium of Building Codes and Regulations for South Asia
- Development of a Regional Plan for School and Hospital Safety

Workshops for developing Regional Road Maps

The GB approved six workshops to be conducted during the year on the following crucial themes for development of regional road maps on the subjects:

- Flood Risk Management
- Landslide Risk Management
- Drought Risk Management
- Emergency Health Preparedness
- Development of Regional Protocol for Sharing of Tsunami and Cyclone Early Warning
- Developing a Standard Natural Disaster Damage and Need Assessment System
- Needs of Children in Disasters in South Asia

Training Programmes

The GB approved five training programmes to be conducted during the year on the following themes:

- Earthquake Risk Mitigation
- Early Warning of Hydro-Meteorological Disasters
- Geo-Informatics and Spatial Information for Disaster Management
- Emergency Relief Management
- Damage, Loss and Need Assessment of Disasters in South Asia

Research and Documentation

The GB approved the following research and documentation works:

- Feasibility study for development of landslide early warning system using precipitation threshold and numerical weather prediction models

- Sharing of Data Products from Earth Observation Satellites for Disaster Risk Reduction in South Asia
- Development of Guidelines for Integrating Disaster Risk Reduction with Climate Change Adaptation in respect of Flood, Cyclone, Drought and Glacial Lake Outbursts
- Development of Regional Coastal and Marine Risk Mitigation Plan
- Directory of Government, Private, Non Governmental and other organizations and individuals working on Various Aspects of Disaster Management in South Asia
- South Asia Disaster Report 2009
- Bi-Annual South Asian Journal on Disaster Studies
- Quarterly Newsletter SDMC Informs

SDMC Participates in ERRP Regional Workshop in Bangladesh

The workshop was organized by ERRP Regional Programme in collaboration with Disaster Management



Bureau, Government of Bangladesh, SDMC, ADRC, UN-HABITAT and World Seismic Safety Initiative (WSSI), December 10-12, 2009, at Dhaka, Bangladesh.

The workshop was inaugurated by Dr. Md. Abdur Razzak, Minister, MoF & DM, Govt. of Bangladesh who was the chief guest. Mr. Deepankar Talukdar, State Minister, CHT Affairs, Govt. of Bangladesh was guest of honour. The audience was also addressed by H.E. Mr. Tamotsu Shinotsuka, Ambassador, Embassy of Japan in Bangladesh, Mr. Stefan Priesner, Country Director, UNDP Bangladesh, Mr. Atsushi Koresawa, Executive Director, ADRC. In his inaugural speech Dr D.D. Joshi, Specialist (Geological Disaster Division), SDMC, explained the regional activities of SDMC for capacity building and overall earthquake risk management in South Asia.

SDMC Celebrates SAARC Charter Day



SDMC observed the SAARC Charter day on 8 December 2009 to commemorate the 24th Year of signing of the SAARC Charter in 1985 by the Heads of States or Governments of the Member States. Two events were organized on this occasion. The first was a painting competition for school students from the member countries of the SAARC on the theme of *Natural Disasters and their Impact on Life and Environment*. This was a move to create awareness amongst the school children about the natural disasters and to provide an opportunity to the young talents to display the way they perceive at the losses of lives and property due to the disasters. The objective was largely fulfilled as the event received an overwhelming response from the school children. More than 400 paintings were received from the school children of various age groups studying in different schools of the region. The paintings were later displayed in an exhibition, which attracted lot of visitors, particularly art lovers, critics, students, teachers and parents.

The second event was a function organized on 8 December which was attended by a number of dignitaries which included H.E. Ambassador of Maldives, High Commissioner-designate Sri Lanka and Counsellor of High Commission of Pakistan, besides a large number of professionals and



practitioners on disaster management. The paintings were evaluated by a panel of experts and three best entries in two categories of students were selected for presentation of awards.

Mr.P.G. Dhar Chakrabarti, Director SDMC, welcomed the dignitaries, explained the significance of the Charter Day and gave a brief profile of the SAARC Disaster Management Centre. Mr.Yogeshwar Verma, Joint Secretary, SAARC Division, Ministry of External Affairs, India explained the significance of the SAARC Charter Day. Noted environmentalist and Magsaysay award winner Chandi Prasad Bhatt delivered the Keynote address on



Some of the Prize Winning Paintings

Natural Disaster in South Asia. He narrated his experience on community based disaster risk reduction in mountains of Garhwal Himalaya and emphasised the need for involving the youth and children in creating awareness about reducing the risks of disasters. The Chief Guest of the function Mr Amod Kanth, Chairperson, Delhi Commission for Protection of Child Rights lauded the efforts of SDMC towards disaster management activities in South Asia and appreciated the idea of involving the children in spreading awareness of the causes and consequences off natural disasters. The Chief Guest distributed prizes to the winners of the competition. The function was concluded with the vote of thanks by Dr. D. D. Joshi, Specialist, (GDD), SDMC.



Earthquake Recovery and Reconstruction Strategy in Bhutan

Following the 21 September earthquake of magnitude 6.1 on Richter scale with focal depth of 14 km, as reported in detail in the previous issue of



SDMC Informs, the Royal Government of Bhutan initiated coordinated efforts for rapid recovery and reconstruction. A Joint Rapid Assessment Team of the Royal Government, the World Bank and the United Nations made an assessment of damage and loss for recovery, reconstruction and risk reduction. The team assessed that the total approximate loss due to earthquake was Nu 2,501m (equivalent to US\$ 52m), with the largest component in the shelter sector.

The early recovery priorities were discussed with the affected people. It is estimated that 2,000 semi-permanent intermediate shelters are required as soon as possible. This will require the provision of building materials of specified quantities to affected families. Given the prevailing levels of poverty and vulnerability in much of the earthquake affected area, a package of livelihood assistance may be required to ensure people's basic welfare. Such assistance might consist of, among others, small grants for agricultural production, livestock maintenance and income generating activities. Urgent steps are also required to restore the disrupted cold chain system, provide adequate public health and hygiene through the restoration of latrines and basic hygiene training.

The construction of permanent shelters is a matter of particular urgency. House designs should include earthquake-resistant features and technologies and constitute a "build back better" approach. The reconstruction program should be implemented following an owner-driven reconstruction approach, and avoid relocation and resettlement to the extent possible.

Reconstruction and repair of religious and cultural heritage structures (e.g. temples, monuments) would

require specialized expertise.

The earthquake provides an opportunity for improving disaster preparedness and risk reduction. These include in-depth identification and assessment of risks for the preparation of easily understandable, composite risk assessment reports, including development of a seismic hazard map of Bhutan and the establishment of a seismic monitoring network in the country with appropriate instrumentation. Preparedness measures would include setting-up an inter-connected network of Emergency Operations Centres (EOCs) at the national, district and sub-district levels, developing a multi-hazard Early Warning System (EWS), and the strengthening of search and rescue teams and emergency medical response capacities. A training and capacity-building program should be instituted to strengthen the capacity within the Department of Disaster Management, as well as among sectoral disaster management focal points, and field-level staff. Institutional capacity building will be enhanced by the provisions of the Disaster Management Act, scheduled for consideration by the parliament during an upcoming session.

An implementation strategy is required which includes resources for the program, institutional arrangements, a disbursement mechanism, and technical assistance for earthquake-resistant construction. The Joint Rapid Assessment team estimated the cost of early recovery, reconstruction, and disaster risk reduction at Nu 2,192 million (approximately US\$ 45.6 million).

The recovery and reconstruction strategy of the government was approved by the cabinet in December 2009. A resource mobilisation group and a technical working group have been set up to deal with resource and technical aspects of reconstruction. The resource mobilisation group, headed by the finance secretary, would be responsible for taking stock of resources mobilised and modalities of utilising resources. The technical group, headed by the SQCA Director, will be providing earthquake resilient building techniques, codes, standards and guidelines. The main coordinating body for the reconstruction phase will be the steering committee headed by the Home Minister.

Oil Depot Inferno-a Manmade Disaster, Jaipur, India

A massive fire blazed in Indian Oil Corporation depot in Jaipur north-western part of India on 29th Oct 2009 at around 7.30pm.



The intensity of the blaze was so strong that the temperature shot up to beyond 52 degree Celsius upto a distance of 500 metres. The air pollution in and around Jaipur reached far above maximum permissible limits when almost 100,000 kilolitres of oil in 11 vertical storage tanks went up in flames. At least 12 people were killed and over 150 seriously injured. It took five days to contain the fire after all the fuel in the storage tanks got burnt. Experts say that if it weren't for a westerly breeze, Pink City could well have become Black City by now. All the fumes and carbon-rich smoke that were emitted from the fire were going eastwards and not in the direction of the city which lies north of the fire. Smoke, concentrated in the sky started descending on the Sitapura Industrial Area, Pratap Nagar residential colony and the villages situated nearby, making breathing difficult for the people and causing itching in the eyes. Thousands of residents in a radius of 5 km from the site were evacuated after the district administration declared it a danger zone. The fire has caused infrastructure damage to at least 200 small and big industries in the nearby areas. Rail and road transport continued to remain badly disrupted in the area. Total loss was estimated to 5 billion rupees (equivalent to US\$ 106 million). Many factories were damaged and

closed and over 20,000 workers suddenly became jobless.

In a joint operation, Army-IOC-civic administration personnel began digging a five-foot deep trench around the blazing storage tanks which were filled with water to contain any leakage. Foam and fire fighting vans were deployed near the trench. The state government has constituted a committee to assess the details of the disaster. Committees' recommendations would be taken into account while preparing new master plans for the cities in future.

SDMC Participates in Second India Disaster Management Congress



The Second India Disaster Management Congress was organized by National Institute of Disaster Management, 4-6 November, 2009 at Vigyan Bhavan, New

Delhi. The congress was organized with an aim to bring together organizations and individuals from diverse disciplines and sectors together for assembling, synthesizing and further disseminating knowledge on disaster management in diverse sectors. Governing Board members of the SDMC attended the Congress as special invitees. Prof. Dr. A.A. Khan, Specialist (GDD), SDMC, participated in the congress and made presentations on "Importance of Seismic Microzonation in urban safety" and "Pseudo seismic tunnelling vis-à-vis earthquake precursors". Er. Shankar Mahto, Specialist (HMD) has provided technical coordination for facilitating the session dealing with Flood Theme.

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