Guidelines for setting up Centres of Excellence for Disaster Risk Reduction

Part of Deliverable 16

Preparing Long Term Training and Capacity Building Strategy for Disaster Risk Reduction in India, under NCRMP

20 August 2014

Submitted to

Submitted by
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### ACRONYMS

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<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ADRRN</td>
<td>Asian Disaster Response and Recovery Network</td>
</tr>
<tr>
<td>AIDMI</td>
<td>All India Disaster Mitigation Institute</td>
</tr>
<tr>
<td>ALTM</td>
<td>Airborne Laser Terrain Mapping</td>
</tr>
<tr>
<td>AIILSG</td>
<td>All India Institute of Local Self-Government</td>
</tr>
<tr>
<td>ATI</td>
<td>Administrative Training Institutes</td>
</tr>
<tr>
<td>AUEDM</td>
<td>Asian University Network of Environment and Disaster Risk Management</td>
</tr>
<tr>
<td>BAI</td>
<td>Builders Association of India</td>
</tr>
<tr>
<td>BIMSTEC</td>
<td>Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation</td>
</tr>
<tr>
<td>BIS</td>
<td>Bureau of Indian Standards</td>
</tr>
<tr>
<td>CAZRI</td>
<td>Central Arid Zone Research Institute</td>
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<tr>
<td>CEEP</td>
<td>Centre for Excellence in Emergency Preparedness</td>
</tr>
<tr>
<td>CFI</td>
<td>Construction Federation of India</td>
</tr>
<tr>
<td>CMDR</td>
<td>Crisis Management and Disaster Response</td>
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<tr>
<td>COE</td>
<td>Centre of Excellence</td>
</tr>
<tr>
<td>CoEDMM</td>
<td>Centre of Excellence in Disaster Mitigation and Management</td>
</tr>
<tr>
<td>CRC</td>
<td>Cooperative Research Centre</td>
</tr>
<tr>
<td>CRED</td>
<td>Centre for Research on Epidemiology of Disasters</td>
</tr>
<tr>
<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organization</td>
</tr>
<tr>
<td>CSS</td>
<td>Centre for Sustainability Science</td>
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<tr>
<td>DIET</td>
<td>District Institute of Education and Training</td>
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<tr>
<td>DM</td>
<td>Disaster Management</td>
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<tr>
<td>DMHA</td>
<td>Disaster Management and Humanitarian Assistance</td>
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<tr>
<td>DMIS</td>
<td>Disaster Management Information Systems</td>
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<tr>
<td>DMS</td>
<td>Disaster Management Support</td>
</tr>
<tr>
<td>DRAM</td>
<td>Disaster Risk Assessment and Monitoring</td>
</tr>
<tr>
<td>DRDA</td>
<td>Defence Research &amp; Development Organisation</td>
</tr>
<tr>
<td>DRR</td>
<td>Disaster Risk Reduction</td>
</tr>
<tr>
<td>ENVIS</td>
<td>Environmental Information Systems</td>
</tr>
<tr>
<td>EOC</td>
<td>Emergency Operation Centre</td>
</tr>
<tr>
<td>ESCAP</td>
<td>Economic and Social Commission for Asia and the Pacific</td>
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<tr>
<td>EWS</td>
<td>Early Warning System</td>
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<tr>
<td>GIDM</td>
<td>Gujarat Institute of Disaster Management</td>
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<tr>
<td>GNP</td>
<td>Gross National Product</td>
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<tr>
<td>IAY</td>
<td>Indira Awas Yojana</td>
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<tr>
<td>IIT</td>
<td>Indian Institute of Technology</td>
</tr>
<tr>
<td>ICAR</td>
<td>Indian Council of Agricultural Research</td>
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<tr>
<td>ICoE</td>
<td>International Centre of Excellence</td>
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<td>ICS</td>
<td>Indian Civil Service</td>
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<td>ICSU</td>
<td>International Council for Science</td>
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<tr>
<td>IMD</td>
<td>Indian Meteorological Department</td>
</tr>
<tr>
<td>IRDR</td>
<td>Integrated Research for Disaster Reduction</td>
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<tr>
<td>IRIS</td>
<td>Incorporated Research Institutions of Seismology</td>
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EXECUTIVE SUMMARY

This report has been produced as part of Deliverable 16 of the study for preparing long term training and capacity building strategy for disaster risk reduction in India under NCRMP. It is the outcome of a wide range of activities including analysis of existing disaster management institutions and a study of gaps and needs. It is based on an extensive SWOT analysis and on interactions with various concerned stakeholders. A consultative workshop was also organised to brainstorm the concepts with different key stakeholders including government officials, NGO workers, academia and private sector representatives. It presents guidelines towards setting up Centres of Excellence (COE) for quality management approaches for disaster management related research and education.

The report has been divided into five chapters. The first chapter gives an overall introduction about the project and the objective of this report. It also presents the activity of the study under which this report has been prepared and how this report has added to the project activities.

The second chapter focuses on the concept of COE. It explains the idea, vision and objective of a COE. It also presents the types of COEs and their functions and characteristics. Three types of COEs including academic, technical and advanced technical are discussed here. The major functions of a COE include the following:

1. Advance knowledge and expertise on different aspects of disaster management such as mitigation, preparedness, emergency response and recovery.
2. Enhance communications for effective disaster management on the ground vertically and horizontally.
3. Transfer knowledge across local, state, national and global contexts to create new solutions.
4. Create databases and expertise to be readily used.
5. Identify and document best practices; and develop local resources for their contextualised replication.
6. Develop training modules for all levels and train master trainers.
7. Conduct research that is at the forefront of disaster management in India and create new pathways for further research and applications of the findings.
8. Play the role of an incubator – identifying and nurturing institutions that have the ability to be COEs in long-term.
10. Maintain the standards in training and education by providing certification for quality performance.

The need for Centers of Excellence has been summed up under various categories to identify and measure the gaps in the domain of knowledge, training and services to create actual impact. A set of 12 priority areas have been defined to address issues through COEs in the field of disaster management.

The major gaps in capacity building programmes have been assessed at national, state and regional level. This includes capacity building with area and hazard specific expertise; identification and assessment of local and global risks; documentation and developing research agenda; project and process management; expert guidance and specialised training for disaster management; efficient use of funding for research and training; knowledge sharing and communication; policy research, formulation and accomplishing strategic goals. Market research and funding sources of COEs have also been discussed.

The third chapter gives a step-wise approach of building a COE. The stepwise approach required to build a COE is as follows:

1. Goal design
2. Strategy design
3. Environment
4. Organisational Design
5. Task Design
6. People  
7. Leadership  
8. Coordination  
9. Information Systems  
10. Incentives  
11. Institutional setup and programme design  
12. Certification  
13. Quality assurance and accreditation

Taking this approach, a study of current centres and listing of potential centres to be considered for upgrading to COEs was done. Six centres including National Institute of Disaster Management, SAARC Disaster Management Centre, Disaster Management Centre at Administrative Training Institute, West Bengal, The Centre of Excellence for Disaster Mitigation and Management at IIT Roorkee, Centre for Disaster Mitigation and Management at the VIT University and Gujarat Institute of Disaster Management, were studied and 74 potential centres listed. The potential centres include a mix of existing COEs, existing institutes having the potential to be upgraded to COEs and the creation of new institutes where they are non-existent.

The study also considered international and national good practices and drew lessons from them for the purpose. An approach for potential training modules was drawn from the SWOT and the Strategic Framework for Implementation of Training, prepared earlier in the study.

Structural and process guidelines for establishment of COEs have been drawn in chapter four, considering needs and capacities at national, state and district levels. The structure of the COE is envisioned at national and state level to have an optimised use of local information, data and infrastructural resources. While the national and state levels will provide the leadership, the emergency operation centres at the district level will form the base for linking the expertise with the implementation. The structure looks at functions, geography, hazards and sectoral/thematic areas, and COE design will be carried out in accordance to these criteria. Supporting institutions will need to be linked with, for the purpose of deriving domain expertise as required.

**NATIONAL INSTITUTE OF DISASTER MANAGEMENT (NIDM) – Overall Coordinator**

**NATIONAL LEVEL COES**

<table>
<thead>
<tr>
<th>Functional</th>
<th>Education and Research</th>
<th>Training</th>
<th>Policy and advocacy</th>
<th>Media</th>
<th>Public Awareness</th>
</tr>
</thead>
</table>

**STATE LEVEL COES**

<table>
<thead>
<tr>
<th>Zone / area</th>
<th>Arid</th>
<th>NE Hills</th>
<th>NW Hills</th>
<th>Coastal</th>
<th>Island</th>
<th>Urban</th>
<th>North</th>
<th>South</th>
<th>East</th>
<th>West</th>
<th>Central</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Cyclone</th>
<th>Flood</th>
<th>Drought</th>
<th>Landslide</th>
<th>Earthquake</th>
<th>Tsunami</th>
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</table>

<table>
<thead>
<tr>
<th>Thematic</th>
<th>Early warning and last mile connectivity</th>
<th>First response</th>
<th>Mainstreaming DRR into policy development</th>
<th>Public awareness and media</th>
<th>Sector specific DRR plans and policies</th>
</tr>
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**State Level Centres for Disaster Management** (Providing basic research and serving as dissemination points)

**District Level Emergency Operations Centres** (Providing ground inputs and documentation during peace time)
For the purpose of quality assurance, it is proposed to have benchmarks laid down for being recognised as a COE and to remain one. An accreditation process linked to the accreditation strategy developed under the study is proposed as a governing principle for COEs also.

The overall implementation roadmap will thus include earning the title, working in a decentralised but networked environment, exploring public private partnership mode for resource mobilisation, and an outcome based approach for quality management.

The fifth chapter includes the roadmap for implementation of centres of excellence. It includes the key steps for implementation process, ways of working of the centres, and the research strategy and links to academic networks.

This report presents the framework for developing centres of excellence in India in the field of disaster management. It will act as an important tool to guide for decision making and development of COEs in India.
1. INTRODUCTION

This report has been produced as Deliverable 16 of the study for preparing long term training and capacity building strategy for disaster risk reduction in India under NCRMP. It is the outcome of a wide range of activities including analysis of existing DM institutions, a study of gaps and needs and interactions at state and national levels. It presents guidelines towards setting up Centres of Excellence for quality management approaches for DM related research and education, based on a comprehensive SWOT analysis.

The objective of this report is to suggest guidelines for the creation of Centres of Excellence for disaster management and an overview of the scope of activities.

As per Activity D.1 of the project, evaluation of institutions reportedly dealing with DM have been undertaken to establish Centre of Excellence for disaster management. For the evaluation of institutions for DM, state, national and international centres have been analysed for their focus (data collection, research, training and education), ownership (government, non-government and private bodies), location and aim. Learning from these institutions has also been documented, particularly from those of international institutes.

This document discusses the approach to create Centres of Excellence in the area of disaster management, mitigation, preparedness, relief and recovery.

The report also talks about the guidelines for setting up Centre of Excellence for capacity building in DRR (activity D.2). It defines the purpose, vision, objectives and functions of COE. It also talks about various characteristics features of COE that keep it separate from any other centre of DM. It also identifies criteria to be taken into consideration in setting up COE. Focus group discussion has also been conducted to evaluate and develop basic characteristics of centre of excellence for DM in India. The findings of focus group discussion have been included with supporting data from secondary literature sources.

A workshop was held to discuss this on 22nd November, 2013, with various stakeholders from the government, academia and non-profit sectors revealed many insights that have been taken into consideration.

Detailed proceedings of the workshop are attached as Annexure 1.

*Note: Though the title of the deliverable refers to COEs on DRR, consequent discussions with NIDM on the scope of the work changed the mandate to cover all phases of the disaster cycle. Therefore, institutions in this report are referred to as disaster management (DM) institutions rather than disaster risk reduction (DRR) ones.
2. BACKGROUND

2.1 CONCEPT OF A COE

The idea of a Centre of Excellence (COE) has evolved over time. It is characterised by the scope of its operations, mandates, funding, executive sponsorship, commitment, responsibilities and powers. A COE is an organisation committed to be at the forefront of research, innovation and technical skills irrespective of its field of expertise. At present, different organisations have their own definition.

**Meaning:** A centre of excellence refers to a team, a shared facility or an entity that provides leadership, best practices, research, support or training for a focus area. The focus area can vary from a specific skill to a broad area of study. In academic institutions, a centre of excellence often comprises of a team with a clear focus on a particular area of research. This may bring together faculty members from different disciplines and provide shared facilities.

A Centre of Excellence can also refer to a network of institutes and research/training centres/organisations that collaborate with each other in order to enrich the capacities of the officials and other functionaries of the state and district administration (in specific areas). It can also engage in capacity building for the enhancement of research and training/education. Most Centres of Excellence run various kinds of graduate and post-graduate courses to impart knowledge and skills in a specific subject to practitioners in that area in order to improve their competence and to enhance the level of professionalism in that area of work in general.

In the case of COEs for disaster management, excellence in service delivery would be achieved only when there is rigorous adherence to standards for quality research, training and education. In order to ensure excellence, qualified faculty, adequate equipment, infrastructure and updated course materials would be required. Close collaborations with national and international expertise and institutions are needed for teaching, research and resources.

**Vision and Objective:** Different COEs have their specific vision. The vision for COE for DM is to advance the quality of knowledge, expertise and services in DM which makes a difference at the ground level in terms of ongoing DM practices, research and education.

The objective of establishing Centres of Excellence is to augment and strengthen qualitative capacities for disaster management through resource development. Research and Development activities at such centres enable the development of disaster mitigation and management strategies; the development of databases for rapid dissemination of information and knowledge experience sharing; and efficient deployment of quality training modules and trainers.

**Types of COEs**

A COE can be purely academic, technical, advanced technological group or a mix of these that delves deeper into teaching, training and research.

**Academic COE:** The scope of the academic COE is narrow in some cases. A COE though provides guidelines on how projects should be approached, not necessarily conducts all research activities by itself, such as modelling, development of a new technology or its deployment. There can be individual teams within the organisation that can carry out such activities. The COE looks at design and other aspects from a quality assurance perspective and might have enforcement powers in this regard. The COE may also supervise the training and certification. Such a COE develops over time. It may start with an informal group of experienced faculty and then gain its power with its long-term committed contribution in a specified field. The status gained over time also helps to get additional funding, which helps to expand its scope of operations.

**Technical COE:** A technical COE has a broader scope than an academic COE. This type of COE has more funding and powers and is staffed as a full-time operation with dedicated resources. It has knowledgeable and experienced members from other parts of the organisation including both the
business and technical side of operations which also participate in the COE activities. A COE can be asked to select, deploy, and run the infrastructure for a certain period of time. This type of COE is vested with wider powers of enforcement with regard to design decisions, best practices, quality control and testing approaches. In the field of DM, technical COEs are close to national and state DM institutions which conduct research and training for specific disasters or emergency situations.

**Advanced Technical COE:** The advanced technical COE incorporates the activities and salient features characterised by the academic and technical COE. What sets it apart is further responsibility to conduct research into new and moving technological trends for the growth of the institute. This type of COE, apart from having wider scope, powers and funding, might play an influential role in funding decisions for new projects. In the field of DM, an advanced technical COE would be one which is engaged in all aspects of disaster management.

**Characteristics of COEs**

There are some common characteristics which apply to all three types of COEs identified above. A few specific characteristics particularly with reference to DM are as follows.

**Expertise:** The Centres of Excellence stand not just at the forefront of the knowledge domain, but also have high competency in other areas. With its core experts, highly specialised technicians, advanced equipment and resources, it drives innovation on an ongoing process at the national and international scale. It hires and trains professionals who are known for their work and gives them the opportunity to reach their potential through quality performance. COEs for DM must either have hazard-specific, theme-specific or function-specific expertise. In the workshop, it was also noted that COEs can also be built around individuals who are known for their work along a specific disaster or function, who could then play a key role in integrating knowledge around the specific task. This is the idea of ‘transformational leadership’ which led to the formation of ISRO in India.

**Infrastructure:** COEs are also associated with quality infrastructure as expertise and people from diverse background and nations visit them to learn and collaborate. As COEs conduct research on the forefront of knowledge, they need to have advanced labs (both physical and virtual) that bring the best minds together and ignite new ideas and innovative solutions. Overall, the COEs are not just meant to serve as isolated units but need to work together to create a niche of excellence in any specific theme or function. This needs both fixed and flexible infrastructure to promote movement of people, ideas and functions over space and time.

**Location:** The location of a Centre of Excellence is an important characteristic as COEs play an integrative role. Apart from COEs at the national and state level, the experts in the workshop were also of the view that there should be zonal and function-specific COEs. Besides that, enthusiastic institutes should be encouraged and nominated to be COEs, rather than imposing performance standards on unwilling and underperforming institutions.

**Funding:** The cost involved in establishing Centre of Excellence is likely to be enormous given the state of the existing institutions. As these institutions are committed to engage in quality and innovation, they require constant funding sources. In such cases, some funding has to essentially come from the government to promote their role and their existence in the future. Aside from this, a public-private partnership approach can be explored. Consultancies and other service delivery can invite performance based funding for these institutions.

**Outreach:** The outreach of a Centre of Excellence is another characteristic feature of such institutions. Unlike any other research, training and educational institutions, both the collaborative and impact area of a COE is likely to go beyond a particular state, region or nation for its services.

**Duration of operations:** Another consideration is the COE’s duration of operations. A Centre of Excellence can be established with either a short-term tactical role spanning the duration of the main transformation effort with an evaluation of further roles thereafter. Or it can be established as a permanent body. The choice depends on the long-term view of the organisation, funding outlook and cultural and political considerations. The COE leaders might have to overcome obstacles such as...
scepticism and resistance to change among various team members. Usually, such institutions gain more powers and prominence depending on successful outcomes over time.

**Functions**

COEs perform various characterising functions that may range from horizontal to vertical integration of knowledge and flow of information to achieve quality output in the domain of expertise. In the field of disaster management, a Centre of Excellence can play varied roles. Some of the key areas of their contribution may include, but are not limited to the following aspects:

1. Advance knowledge and expertise on different aspects of DM such as mitigation, preparedness, emergency response and recovery.
2. Enhance communications for effective DM on the ground across vertical and horizontal scales.
3. Transfer knowledge across local, state, national and global contexts to create new solutions.
4. Create of databases and expertise to be readily used.
5. Identify and document of best practices; and develop of local resources for their implementation.
6. Develop training modules for all levels and train master trainers.
7. Conduct research that is at the forefront of DM in India and create new pathways for further research and applications of the findings.
8. Play the role of an incubator – identifying and nurturing institutions that have the ability to be COEs in long-term.
10. Maintain the standards in training and education by providing certificates for quality performance. They can also be turned into ‘deemed universities’.

**2.2 NEEDS AND PRIORITIES**

India faces disasters almost every year and is ranked among one of the most vulnerable countries in the world. Even though investment in DM has grown significantly over time, it is found to be insufficient to reduce disasters on the ground and gaps have been noted on various fronts. These need to be identified, precisely measured and the gaps filled in the domain of knowledge, training and services to create actual impact. The need for Centre of Excellence can be broadly summed up in the following categories.

**Capacity Building with Area and Hazard Specific Expertise**

The National Disaster Management Plan identifies the need for capacity building. This need was also identified during a survey of six states in India that involved discussion with the responsible organisations dealing with disaster management in the states. The survey results found that resources for training are limited in terms of faculty and training material, with particular reference to local context and situations. There is an absence of coordinated response for the advancement of knowledge, skills and quality assurance of current trainings and education. Capacity building is practised as a predominantly training based activity and the focus is more on the number of people trained than on the nature of training. Community members across the board suggested that training and capacity building activities need to be sustained programmes and not a one time effort; these should be organised at the village level and area and hazard specific skills should be provided and not very general theoretical inputs. Further research is needed to identify key gap areas and the strategies needed to fill these. In addition to many institutions which are providing capacity building, Centre of Excellences are also required to provide an overarching vision and goals for the advancement of training, knowledge and expertise in specialised areas. Apart from trainings, COE can also help to enhance local awareness and to build human resources in terms of educators, researchers and professionals which can contribute to the DM at the local level.

While there are many institutions dealing with earthquakes, the same cannot be claimed for all hazards. India is exposed to various hydrological, meteorological, geological and climate change
hazards, which need to be assessed individually as well as collectively. Creating hazard-specific COEs is an important requirement. Similarly, there is also a need to create area-specific COEs, as adjoining areas are frequently exposed to similar hazards. Integrated research on different bio-climatic regions can help to build cost-effective and local solutions. They are also required to bring multiple stakeholders onto one platform for knowledge and capacity building.

Identification and assessment of local and global risks

While many research organisations are looking into local and global risks, the research is found to be fragmented in space and time. In view of expanding disaster risks in many Asian countries, there is a growing need to profile hazards and the associated exposure, vulnerability and risks to populations. During community discussions in Bihar, the women expressed their lacking in information and capacity to address all kinds of local risks; they expressed their interest in first-aid training, measures to keep their area clean, being literate, etc. Centres of Excellence could not only identify critical gap areas in research but also place emphasis on the regular assessment of local and global risks; which could result in integrated solutions to create a low-risk environment. COEs could offer services ranging from conducting risk assessments at various levels to building capacities of national agencies and universities to undertake such risk assessment. This could involve a multi-disciplinary team of specialists and GIS/RS capacity for data presentation and analysis.

Documentation and developing research agenda

DM research in India has grown significantly. However, much of this is still uncoordinated and also not adequately documented. There has been little, if any, research and documentation effort found in the study of six states. There are few official documents of even major disasters. No documentation of past disasters has been carried out. In fact, even the SDMAs and state-level training institutes do not have a documentation unit with professional support. This has come in the way of development of case studies and sharing of lessons learned. This has caused repetitive research in various domains of DM. There is thus a need for systematic cataloguing of research and identification of areas that can guide future research agendas. Centres of Excellence can fulfil this gap by documenting and creating an inventory of ongoing research and thus guide new knowledge based on the direction facilitated by the existing studies. For integrated DM research and comprehensive knowledge management at the national level, COEs are required to encourage and define key priority areas. These centres may also be responsible for a National database for all disasters and DM related data.

Developing advanced methodology and leading innovations in technical and social domains

In a developing country like India, which is facing several technical and social issues relating to development, innovation is a critical need to meet the demands and identify solutions to local problems. Centres of Excellence are seen as the key drivers of innovation in the field of research and training enhancing both knowledge and their practical implications.

Due to an overarching view of research in a particular field of DM, COEs are also able to develop new and advanced methodologies for application at the local level. This can lead to innovative solutions, which are both cost effective and readily applicable in areas of urgent need. Apart from identifying such solutions, COEs also can conduct research on their applicability, viability, any particular bias, as well as their impact and effectiveness in addressing local issues. COEs are also able to integrate best practices not just across different subject fields but also across different cultural contexts. They can provide a platform to integrate both indigenous and scientific knowledge. COEs can contribute to the understanding of the impact of disaster management solutions in societal and environmental contexts and demonstrate the need for sustainable development. In the face of rapid urbanisation and deforestation, such knowledge is essential.

Project and process management

Centres of Excellence can keep a track of ongoing projects along with studying the process of knowledge building. The engagement of a COE in DM projects adds not just to the project’s
efficiency but also to broader understanding of DM processes which is frequently ignored. Poor quality of research and training makes quality assurance a key priority for DM in India. During the survey of six states, it was found that there is no system in place to assess the quality of training programmes, except for the training programmes being organised by NDRF. Even in their case, they have no control over the selection of trainees. In research and education area, there is very limited good quality research on issues of importance and research is not informing policy, strategic planning and training. As one of the main purposes of a COE is the pursuit of excellence, it can help ensure quality in DM. A COE can also play a key role in developing and applying ethical principles in the research and practice of DM. The disaster space is noted as one of the most abusive spaces in terms of violation of ethics. COEs can develop risk management compliance rules and capability to monitor and manage these over time. In India many such risk compliances are either not developed or not maintained over time. COEs can help to develop and scrutinise standards and facilitate understanding for various stakeholders.

Expert guidance and specialised training for DM
A gap is also noted in the availability of experts at different levels of disaster management.

During a field survey it was noted that many DM professionals do not have adequate knowledge of DM. In such contexts, a gap is noted for both basic and advanced training for DM. COEs can help in capacity building by providing advanced and specialised training in conjunction with administrative training institutes for all DM professionals. This will not just help to reduce extra pressure on COEs but will also build a network which will help the state ATIs to develop and gain advanced knowledge in the field of DM.

The expertise available with the Centres of Excellence can offer both support and guidance for ongoing research, innovation and training programs in the field of DM. Each year, a large number of students and faculty pursue such research and education in disaster management. However, most of the time, this research is either repetitive or fails to meet international criteria due to lack of adequate supervision. Centres of Excellence could coordinate and set research agendas in which such university researchers could participate, learn, gain degrees and contribute to the gap in research in the real world. While there are many research centres, often researchers face challenges around data, technology and expertise on different DM issues. COEs can facilitate all kinds of support for researchers which will help in fulfilling a two-way research agenda and goals.

International and national collaborations, strategic partnerships and networks
The networking and collaboration between the institutes, be it government or non-government, is a significant gap that is leading to a serious hindrance in the mainstreaming of DRR. There is also a gap in sharing information and training regarding disaster preparedness and management. The MGNREGA programme has done some work on the construction of river embankment. Respondents from Bihar said that there are concerns about its effectiveness. The funds allotted through IAY are not sufficient to construct disaster resistant houses. The disaster management activities and construction of houses lie under different government departments with limited collaborations. This restricts flow of experience from one department to other thereby affecting its working efficiency. In Odisha people said that Panchayat Bhawans are not safe at all. DRR mainstreaming is in the process in Odisha and significant opportunities exist in the form of programmes such as JNNURM, MGNREGA, NRLM supported TRIPTI, which are covering the disaster risk reduction element in some ways.

Centres of Excellence are also required to build international and national collaborations particularly to promote quality research. This not just enhances the research participation, which is found to be low in the international context for India, but also enhances visibility and learning across cross-cultural contexts. COEs provide a platform to interlink multiple stakeholders from different backgrounds. They can also invite other already available network or form new networks to facilitate knowledge exchange as well as collaborative activities for research and capacity building.
Efficient use of funding for research and training

Centres of Excellence can also act as a centre for research and field work relating to areas of particular significance in DM. At present, even though funding for disaster research is available, students or researchers needing funding are not fully aware of their access. The inferences from the study of six states shows that besides these challenges, whatever activities are being carried out with the available resources is not very fruitful since there is no significant thought process linking research and training needs, availability of resources and practical application of research outputs. COEs could provide grants, scholarships and fellowships for disaster research which will promote action research in DM as well as engaging more students and researchers in the field. Similarly, funding for training can also be used efficiently with identified needs and specialised training for different stakeholders.

Knowledge sharing and communication

Communication across different levels of government, various stakeholders and the general public is an important need for efficient DM. A COE can provide a common platform for both producer and consumer of research and training, which can bring awareness of DM to the ground level. On the one hand, these Centres of Excellence can act as facilitators of the advanced knowledge, providing a platform for regional or national conferences where various stakeholders can come and share their ideas. On the other, they can be a hub to translate, simplify and communicate actionable DM knowledge to the general public.

Policy research, formulation and accomplishing strategic goals

Frequently in India, there is an inadequate research base to guide policy in different aspects of disaster management. This results in ineffectiveness of the policy at the ground level. Centres of Excellence could offer a platform to bring scientists and policy makers onto one platform where decision making is supported by the advanced knowledge available at the centre and networks of other institutions and expertise working in the field. They are also likely to have regional and local data sufficient to inform policy decisions. Further, these centres can also monitor and assess the impact of DM policies across states and their implications.

The Disaster Management Act (2005) and Disaster Management Policy specify many key strategic actions, which not just need in-depth research for implementation but also for their relevance in the changing times. COEs can help to accomplish strategic goals for research, education and response for DM.

Priorities

There are a number of issues that Centre of Excellence can address in the field of DM in India. Many of these issues are required to be addressed on a priority basis. The priority areas have been finalised based on the study of survey states and various discussions, interviews and workshops held during the study. The workshop held at IIPA, New Delhi on 2nd November 2013 on ‘Evolving a Roadmap for Centres of Excellence on DRR and CCA’ specially focused on discussing these. A few of these are as discussed below. The sub-sections connected to these themes are further elaborated as potential subjects for COEs in Chapter 4.

Priority Area 1: Community Based Disaster Management

Socio-economic vulnerability is an important factor responsible for recurrent disasters in India. In such cases, disaster preparedness and effective response is an essential need of the time. This requires community participation in local disaster management apart from constant efforts made by the district, state and national organisations. In India, inadequate community preparedness has been noted to turn even a relatively minor hazard into major disaster. The situation can be altered by enhanced community awareness and preparedness which can prevent disasters even from major hazards. Although, many non-governmental organisations are engaged in building community awareness and preparedness, their effectiveness in causing the difference at the ground level remains unchecked. COEs can not only assess their effectiveness but also bring best practices at the
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Surface, which can benefit many more communities where NGOs are not working. Development of need-based innovative training modules according to the local cultural and socio-economic practices and improvement in the quality of such trainings is required. Community institutional mechanisms need to be strengthened and the communities at risk empowered, particularly women, the poor and the marginalised.

Communities are the reservoir of time-tested knowledge of coping with risks and disasters which need to be documented and linked with scientific knowledge in a two-way process. Scientists learn from the indigenous coping mechanisms and communities benefit from scientific knowledge.

This needs to be a cross-cutting area across all COEs.

**Priority Area 2: Integration between Disaster Risk Reduction and Climate Change Adaptation**

South Asia, the home for one-fifth of the humanity, has perennially been a disaster-prone region. Two-thirds of the disasters the region experiences are climate related and there has been a phenomenal increase in their frequency, severity and unpredictability in the recent times. The severest impacts have been visualised in terms of sea level rise leading to submergence of low-lying coastal areas and depletion of Himalayan glaciers threatening the perennial rivers that sustained food, water, energy and environment security of the region. Climate change is surely creating grounds for newer and more severe hydro-meteorological risks in the coming years.

Further, layers of vulnerabilities in the region – poverty, illiteracy, malnutrition and social inequities - are aggravating the risks from stresses on water, agriculture and environment and creating recipes of more disasters. With a climate-sensitive agrarian economy, there will be a serious crisis. Therefore, climate change mitigation and adaptation have emerged as important tools for disaster risk reduction. So far climate change and disaster management communities have been working in relative isolation. The time has come when the implications of future climate projections for the current risks and vulnerabilities are understood and accordingly these are factored into the policies and programmes developed for reducing the risks of disasters.

This needs to be a cross-cutting area across all COEs.

**Priority Area 3: Public awareness and advocacy**

For the most part, Centres of Excellence in DM have been seen from the perspectives of research, education and training. Yet, COEs in the functional areas of advocacy, public awareness and media are also urgently required. These will help bridge some of the other thematic areas. They will also serve to translate core findings, innovations and capacity building into broader knowledge and achievement of actual change on the ground.

**Priority Area 4: Mainstreaming Disaster Risk Reduction in Development**

Disasters are not bound by political boundaries and have no social or economic considerations. They are borderless. They are also merciless, and as such the vulnerable tend to suffer more at the impact of natural disasters. With the alarming rise in the economic impacts of disasters and vulnerability per se, mainstreaming DRR into development is now a necessity. Going beyond the historical focus on relief and rehabilitation after the event, we now have to look ahead and plan for disaster preparedness and mitigation, in order that the periodic shocks to our development efforts are minimised.

**Priority Area 5: Early warning and last mile connectivity**

The SAARC Disaster Management Centre (SDMC) mandates promote regional cooperation for DRR. It envisages putting in place a hierarchical framework facilitating the integration of S&T inputs into DRR practices. The work programme developed at regional level includes hazard detection, forecasts, knowledge management & networking, Early Warning Systems (EWS), research and policy advisories to strengthen national capacities. While early warning systems have improved manifold over the last decade, more work is defiantly required for last mile connectivity and understanding of...
warnings. S&T inputs can help risk assessment, knowledge networks, people centred EWS and last mile connectivity, which in turn would enable better preparedness at community level.

**Priority Area 6: First response**

First response during the critical ‘golden hour’ including both first aid and search and rescue is normally done by the communities themselves. As vulnerabilities grow and disaster impacts become more unpredictable, enhancing research and capacity building on first response issues becomes more essential.

**Priority Area 7: The impact on and of different sectors**

Disaster management goes beyond the scope of just one department or sector. The impact of a disaster (and on the flip side, the ability to build resilience) lies in all the related sectors including education, health, water and sanitation, public works and others. COEs that deal with the active involvement of and consideration of the cascading impacts on these sectors is important to truly build resilience.

**Priority Area 8: Marine, Island and Coastal Risk**

The coastal regions of South Asia have been facing atmospheric depressions resulting in cyclones, storm surges, tsunamis, erosion and coastal flood. Seawater rise has threatened many coastal and deltaic regions from submergence. Over the past three decades the number of tropical cyclones of Category 4 and above has increased sharply from 8% to 25% in North Indian Ocean and 18% to 34% in South Indian Ocean basins – the largest among the ocean basins of the world. This is going to directly increase hazard exposure in existing cyclone hotspots especially when combined with an increase in the concentration of population and economic activities. At the same time, higher sea temperatures may also alter cyclone tracks, meaning that hazard exposure to tropical storms could increase in regions that historically have not suffered cyclones, creating newer hotspots.

Storm surge as the catastrophic feature of cyclones and Tsunamis as an ever-present threat to lives and property along the coasts pose major risks.

The IPCC (2007) report gives alarming scenarios on the potential sea level rise. It is expected to rise by at least 40 cm by 2100, inundating vast areas on the Asian coastline. Coastal erosion is a universal problem and it has been estimated that 70% of all the beaches in the world are eroding. At many places development has been undertaken without adequate measures to accommodate these natural shoreline movements.

**Priority Area 9: Urban Risk**

Fast-growing cities are increasingly at risk due to disasters. Three of the most vulnerable cities in the world are Mumbai, Delhi, and Calcutta. More people (1,140 per day) enter the city limits of Mumbai than any other city in the world, where the growth rate of 4.2 per cent is exceeded only by Karachi. A major proportion of the populations in these three cities and other urban centres across India live in ‘informal settlements’, with enhanced risks of health hazards, fire, flood, earthquake, road accidents, and eviction. The extreme densities in these settlements compound all these dangers. The aims of urban risk management are to reduce human casualties and material damage, to design new disaster-protected investments in urban planning, and to manage assistance and recovery programmes efficiently and equitably.

The dynamics and machinery of urban development are complex. Therefore careful attention is needed to find the best opportunities and effective routes to introduce safety measures. Many authorities fail to recognise the rich range of measures that need to be adopted and integrated into a viable and affordable programme. Thereby there is the need for a Centre of Excellence to take up such a mandate and implement a programme and strategy that incorporates the mechanisms required for effective Urban Risk Reduction.

**Priority Area 10: Earthquake Risk Management**
South Asia is one of the most earthquake prone regions in the world. Six out of the eight countries of South Asia - Afghanistan, Pakistan, India, Nepal, Bhutan and Bangladesh - are located within most seismically active Himalayan - Hindukush belt which has seen some of the worst earthquakes recorded in history. Large parts of the coastal areas are vulnerable to tsunami-genic earthquakes in the Indian Ocean. Earthquakes have caused heavy damages in terms of deaths, injuries, destruction of habitat and disruption of economic activity. Realising the potentially catastrophic consequences of largely unpredictable earthquakes, particularly in growing urban areas in different seismic zones of India, it has become imperative to make this a priority area.

**Priority Area 11: Landslide Risk Management**

Almost every country of South Asia is affected by the hazards of landslides of varying types and intensities. Climate change and associated risks of glacial melts, glacial lake outburst floods and sea level rise have added new dimensions to the risks of landslides. Much of the dynamics of these risks are yet to be assessed and mapped scientifically in most parts of South Asia. Landslides have been causing substantial number of deaths, injuries and damages to human settlements and infrastructure. Yet, as landslides are mostly sporadic, localised and dispersed in nature these do not always create the big news that other natural disasters like earthquake, flood or cyclone and most of the events are not even reported. The current science and practice of landslides risk management in South Asia is far removed from the state-of-art tools and techniques of landslide mitigation and management. Although such tools have been applied in a few areas to protect vital slope and infrastructure, application of such tools in engineering practices are not generally contemplated due to capacity and cost constraints. Not much success has been achieved in developing region and location specific cost effective solutions.

**Priority Area 12: Arid Zones and Drought Risk Management**

Risk arising out of climatic hazards can be addressed by taking preventative measures by issuing early warning and adopting appropriate response measures to manage extreme events including drought. Managing drought, like other natural calamities, depends on how exactly early signs of the impending disaster are picked up, assessed and evaluated, based on which appropriate steps are taken for managing the crisis situation.
2.3 GAP ANALYSIS

The Hyogo Framework for Action and the National Disaster Management Act both note the significance of capacity building institutions. In the post DM act (2005) period, several developments took place in this regard. At the regional level, the Asian Disaster Preparedness Center [ADPC] and Asian Disaster Reduction Center [ADRC] have been proactive in training professionals and practitioners. Besides, there are several ad-hoc theme-based training programmes by different NGOs, UN bodies, bilateral and multi-lateral organisations. At the national level, the National Centre for Disaster Management has been upgraded and designated as the National Institute of Disaster Management. It aims to develop training modules and facilitate training and research in DM at the national level. It also provides an exhaustive information base on DM policies, mitigation and prevention and provides consultancy services to various states. It is also responsible for DM plans and developing strategies for hazard mitigation and disaster response. At the state level, Administrative Training Institutes or District Disaster Management Authorities are assigned with faculties to address the issue. These faculties are assigned with an intention to create future centres of excellence in DM. However, a field survey of six states highlighted that there are numerous gaps that exist in the training, research and knowledge of DM at the local level. There are many other gaps in the capacity building programmes, which can be assessed by COEs to bring effectiveness in capacity building at the state, national and regional level. A few such gaps are discussed below:

Spatio-temporal gaps in trainings: Despite the availability of a three-tier structure, DM trainings are found to be missing in many districts. Officers from the same state mentioned contrasting situations wherein one had regular disaster management training and the other had not come across one. An Additional District Magistrate from Gujarat mentioned that he has not been exposed to any disaster management training anytime during his 23-year service career. It was inferred from the study of six states that although some training is being imparted at State and District level, it has not really made a dent at community level. There is awareness of recurrent disasters but training has not reached the community effectively. DM training to elected representatives (PRI/ULB members) is being provided through inclusion of a very brief capsule in their general training programme; it is neither vulnerability based nor need based. Micro level vulnerabilities and community needs are not being addressed. Thus, DM training is required by all officials of different departments in both rural and urban areas and hence it is important to bring DM training in forefront of every programme. In Gujarat, it was noted that there is a need to have Block Level Project Officers since it is not feasible for the District Project Officer to attend to all work at the grassroots level.

Inadequate human resources: Human resources-related issues that were frequently recorded include inadequate manpower at the district and sub-district administration level; the lack of adequate training of administration for major crises; and inefficient utilisation of trained manpower. A District Revenue Officer [DRO] from Andhra Pradesh mentioned that “it is ironic that nodal district officials have not received any specific training on disaster preparedness and emergency management. They are overloaded due to handling of multiple profiles at a time”. The study of six states presents that there is no human resource development plan and no strategic framework for undertaking training activities of different stakeholders in a focused manner. The State Governments face challenges in having a HR Plan which specifies the numbers to be trained from state to local level. In such cases, even the availability of training may not help. In Bihar, which has a very extensive programme on DM by UNDP, an officer mentioned that only a certain group of people are trained and know how to tackle disaster-like situations. There are limitations on resources for training and DM faculty needs to be strengthened. Similar observations about institutions having limited manpower and no interest in expanding were also made by officers in Odisha.

Inadequate infrastructure: Lack of training infrastructure is noted as a major challenge, especially managing resources before DM trainings. In Andhra Pradesh, the officers mentioned that the administration struggles for the required boats, of which there is only one or two in the risk prone locations at the moment. Also, the numbers of institutions which provide trainings are very few. The study of six states revealed that extensive state training infrastructure exists though in
disaggregated form. State training institutes are under-staffed; even the sanctioned posts, which themselves are inadequate, are not filled up. The training programmes are being imparted on ad-hoc basis. Also, there is no comprehensive system to assess the quality of training programmes. This means that in some cases, where there is infrastructure, inadequate training makes it useless. In Odisha, cyclone shelters are not properly used for this reason.

**Funding:** Funding situations varied from state to state. Through the study of survey states, it was noted that, in most states there was no dedicated funding for disaster risk reduction and climate change adaptation training. NGOs have small funds which they use at times for training. In Bihar, however, it was mentioned that 5% of Calamity Relief Fund (CRF) and 5% of State Disaster Response Fund (SDRF) are committed to be used for disaster preparedness training and capacity building. Similarly, training funds are not a problem in Odisha.

**Training Gaps:** It is a well known fact that the training should be based on needs, which was also suggested during the survey. In Odisha, it was felt that government staff involved in DRR activities are not adequately trained. The officers mentioned that the problem with the NIDM training is that it is too theoretical. Another officer from Bihar who attended administrative training in Hyderabad also found that training was too theoretical and that inclusion of practical aspects would have been useful. In Gujarat, officers mentioned the lack of coordination among different stakeholders involved in training and capacity building. In response, the Inter Agency Group in Gujarat has initiated a process of coordination among different institutions involved in community development. Training on compliance issues is another essential gap, especially since non-compliance with norms is a big issue during disasters. Training programmes should also bridge the gender gap. Across states, a number of other trainings where DM is taught on an intermittent basis hold scope to become regular DM training courses. These include training for women’s empowerment, Self Help Groups (SHGs), Society for Elimination of Rural Poverty (SERP) and others.

**Training modules:** Training modules not only differ according to the topic, but also depend on the organisation facilitating the programme. The study of survey states shows that there is no strategic framework on training and capacity building. There are no focused training modules based on needs assessment and training programmes to address the needs of different stakeholders at different levels have not been adequately attempted. The Panchayati Raj Institution in Bihar mentioned that the department has developed its own modules on DM training and ToT guidebooks which is unique in itself. Red Cross is involved in first aid training and Fire Services in search and rescue (SAR) training. UNDP trainings are found to be more useful at the ground level. According to the Kutch Mahila Nav-Nirman Abhiyan (KMNA) from Bhuj; “There is a need to train the community with specially designed training modules which are user-friendly and should be developed in consultation with the community so that their needs and comprehension levels are duly taken into account”. Further, any information, education and communication (IEC) material should be distributed in local languages to the community.

**Training frequency and duration:** There is no regular training frequency and schedule for DM across spaces. In Bihar, the PRI department conducts periodic trainings on DM as per their calendar. In Gujarat, the Gujarat Institute of Disaster Management (GIDM) organises 30 training programmes every year. Since 2004, it has conducted 250 trainings that have reached out to over 7,000 personnel. According to the Deputy Director (Training), Institute of Health and Family Welfare, Odisha, trainings were frequently conducted after the Super Cyclone; but over the years, the process has lost its vigour and the number of training programmes has declined.

In Gujarat, the training programme for Civil Defence and Home guards, as well as other volunteers, was noted as being conducted over a 12-day period. Most of these trainings at the local level in other places, however, vary from 2-3 days. This is found to be very basic and not substantial. On the other hand, there is a demand to reduce the duration of training programmes for engineers/architects due to their non-availability for such long periods.
Training of stakeholders: Training has been seen as an essential and central activity of the overall capacity development programme, and therefore, a range of training institutes have been established that vary from local to international significance including educational and administrative training institutes with government and NGO set-ups. The outreach of these training institutes to individuals and professionals engaged in DM at the local level is, however, found to be limited due to a variety of reasons including lack of educational qualification, inadequate infrastructural support and interest. Interviews conducted with different state administrations brought forth unrealistic prerequisites of educational background for the training of masons. This has severely limited the participation of masons in the programme as most adopt this profession through tradition and are illiterate. Most of the current DM training programmes have trained senior government officials, current staff, volunteers, engineers, architects and masons. Some of the key stakeholders that emerged during interviews included women, media, school children, teachers, specialists such as IT professionals who can run control rooms and prepare plans, as well as those who are called upon when the need arises like policemen or para-military forces.

Lack of coordination: The lack of coordination is a recurrent gap, not only for different training needs but also in the process of capacity building starting from the design of training modules to its delivery. The study of survey states shows that lack of coordination among different departments at state and district level has negated convergence and DM is still perceived as primarily the responsibility of DM Departments. Further, climate change adaptation initiatives by the government departments are not adequately aligned with DRR initiatives and capacity building for the purpose. An example of such a gap was identified during the field study where it was brought forth that building safety in schools was taken as a separate issue needing the attention of the public works department due to the lack of the awareness that maintenance of school buildings is the responsibility of the Department of Education through their own engineering team. Maintenance of the buildings is a key element of ensuring their safety over time and many of these buildings are very old and in vulnerable condition. Unless the engineering staff of the education department is trained on safety features in maintenance, repairs and retrofitting, the element of safety in building maintenance will be entirely missed. This aspect is currently not part of the school safety training modules being used by various agencies across the country.

Widey varying standards of training institutions: The creation of capacities for disaster management in general and disaster risk reduction in particular currently varies from state to state based on resource availability and the active involvement of respective governments. DM faculties at ATI or SIRDs have been established in most states covering DRR aspects. However, it cannot be said that all of these DM faculty are working with optimum capacity and efficiency. There are gaps in existing training institutes covering organisational and institutional issues. There is a need to consider upgrading at least some of the institutes or establishing new ones as Centres of Excellence. The approach also requires a larger vision of national network of such Centres of Excellence.

Quality assurance: The interviews with state administration of the states covered under the study clearly brought out the fact that, at present, there is no system of assuring quality of ongoing training or accreditation. As most of the programmes are held for very short periods, only a certification of participation is given. In the view of faculty, accreditation can be given only if there is some system of long-term training programmes and certification is in place. In Bihar, it was observed that even certificates were avoided due to legal issues. In most of the cases, the training modules used were also noted to be outdated and not updated with the new research findings. Therefore, the key issue of the training program is strict quality control of the contents along with its delivery process.

System Integration: While most of the trainings are conducted by outside agencies, it is often not linked to the governance system. Through the study of six states it was found that there is no organised system for nomination of trainees. There is no streamlined system of selection of trainees and their deployment, post-training, to positions where training benefits may be optimally utilised.
Below district level, there is no institutional system in place to address disaster risk reduction and climate change activities and capacity building for the same. It is true that DM is given as an additional charge to Tahsildars/ Malmatdars. In West Bengal, there are BDMOs in place. However, all these officers become active only in response related situations and in normal times they are assigned other duties. Government officers usually participate in the training programs. However, the gap is for the integration into the governance system. **Feedback and Monitoring:** It is also important that the trainee’s feedback is properly utilised in the training programs. The key point of the training is utilisation in the implementation. Therefore, the barriers and key challenges of implementation need to have a proper feedback and monitoring system.

**Sustainability:** Sustainability of the training programs is dependent on the availability of resources [supply], trainee [demand] balance. This is often observed as a key challenge on the number of trainee in each course, as there is not much demand for training in DM. There are several training programs run by multiple international, national and state organisations apart from different universities, which are not recognised in the job market. This is a critical issue which needs to be addressed in terms of both provision of specific certificates as well as in employability criteria of various institutes where DM is an essential issue. The sustainability issue of DM training is also linked to earlier stated issues.
2.4 MARKET RESEARCH AND FUNDING SOURCES

Most of the present Centres of Excellence in disaster management / disaster risk reduction domain are run or supported by government institutions (national or state level). Building a network of COEs across India (both new ones and expansion of existing ones) will require a significant amount of money. Not just for their set up, but also for their operation and maintenance in the long-run. Since the government has specified budgets for education, training and research activities, other financial channels need to be tapped that can support future growth.

Many COEs have already started taking on consultancy work, which is an outcome-based source of income. As long as efficient services are upheld, this is likely to continue in future. The effectiveness and efficiency of a COE may also attract international funding to organise events and pursue international research.

Yet apart from the annual and long-term budget, there are other factors which also affect the sustainability of a COE. Some of these are as follows:

Demand side of COE: Centres of Excellence are needed in India for various reasons, some of which are addressed under the gaps in the previous section. The demand of a COE however, should also include a market for its products and services. Some of the potential target markets for COEs, though not limited to the following, are as follows:

a. Political accountability and local administration: Political accountability for disasters often creates the need for immediate solutions for DM where COEs can play an important role. Fieldwork depicted that there is a demand for specialised disaster management training for the local officials to deal with local hazards and disasters. Many officials are frequently transferred to a new location of different physiographic characteristics, where their earlier knowledge of hazards may become irrelevant in dealing with the new situation and vulnerabilities. In the absence of detailed information on local hazards, vulnerability and mitigation methods, the presence of a COE can directly fulfil such needs even from a distance and could provide an information base of immediate response.

b. Educational institutes: The GOI web directory mentions 2237 education and training institutes and 394 science, technology and research institutes for higher education in India (http://goidirectory.nic.in). While DM has been emphasised at the school level, introduction of DM at different levels and measurement of their effectiveness create a new scope and demand for COE in India. As most of the research and teaching institutes deal with different subject matters, their participation would require an integrated research and collaborative platform that can be facilitated by new and selected Centres of Excellence.

c. Individual researchers and students: In the international context, there is a growing demand for emergency professionals who have expert knowledge on dealing with challenging situations. In India, while DM knowledge is not mandatory criteria to work in this field except a few exception of engineering, medical and architecture in some cases, in the future the situation is likely to be more demanding in terms of need for DM professionals, particularly in climate change situation which is likely to be associated with frequent disasters.

d. Non-governmental organisations: There are numerous non-governmental organisations working for the DM in India, which conduct research and engaged in community based disaster management solutions, which need to be brought forth in the mainstream for further research and development. A COE can provide a platform to highlight their role and provide services needed to make the application of new technology of DM at the local level effectively.

e. Families, businesses and local community: Families, businesses and local community also generate need for centre of excellence by asking for specific solutions which may vary from
very basic and low cost solutions to high end technological solutions in the information technology or other related field. Centre of Excellence can also play a role in developing local solutions by suggesting new and innovative solutions.

**Supply side of COE:** Centres of Excellence can fulfil on multiple demands of the market. Some of these include the following:

a. **Research, Innovation and Ground-breaking Technology:** The organisations which are innovative and at the forefront of technology that is useful at the local level are found to be far more successful that the rest. Active innovation in developing new products, services and delivery process generate interest apart from enhancing efficiency and effectiveness of the organisation. National disaster management legislation clearly articulates the need for conducting hazard risk and vulnerability assessments with the idea that these assessments are the basis to formulate disaster mitigation strategies. Following this intensive research related to disaster management has been undertaken by professionals, government institutions and non-government organisations, focusing primarily on risk, vulnerability and losses. Several products, projects, tools and methodologies for documenting and modelling levels of risk and vulnerability have been prepared by different government agencies at national and state levels, e.g. Vulnerability Atlas, National Flood Atlas, etc. which can be drawn upon by state and district authorities to inform state, district and sub-district disaster management plans. Besides, community level risks and vulnerability assessments have been carried out by non-government organisations. While all these assessments have been found useful at the ground level, the efforts are found to be uncoordinated in space and time, and therefore a lack of clear direction is missing towards the needs and gaps in research and innovations. Centre of Excellence are required to stay at the forefront of research and technological skills, which not just require creating new areas of research and technology but also include capacity building to maintain and sustain the calibre. Innovations and sustainability of COE in DM are likely to be interdisciplinary as the field itself stand at the interface of social, scientific and technological domain. Following opportunities are available for COE on the supply side:

i. COE can carry out integrated research that is accessible and applicable at the local level as well as cross-fertilisation of professional, scientific and technical knowledge with traditional local knowledge.

ii. COE with its experts and information base will have rich experience of past events and traditional wisdom based practices are available in abundance in all regions and thus can be a useful knowledge pool.

iii. COE can also play an important role in quality control and assessment of quality by developing national standards in research and teaching. While various universities are already accredited for quality education, an accreditation of research will enhance Indian participation in international research platforms. This will also promote collaborative growth for research.

iv. COE can also provide a platform for many institutions collecting data to partner and build new knowledge. The frequency and spatial coverage of data collection can be further increased with more detailed research at COE.

v. Various national institutes such as ISRO and IMD are also collecting high precision data for various hazards. This data are available to students and research scholars to carry out research either for free or at highly subsidised rates. However, in the absence of adequate training, and knowledge of such data, a huge amount of this data is not used. COE can facilitate both training and guide research for efficient use of this rich data base.

b. **Capacity building by specialised training and best practices:** Centre of Excellence not only can offer highly specialised training and skills for Disaster management but also provide a working model for identifying and bringing in best practice the current learning and training. They can act as a resource base for developing the master trainers as well as best of researchers and human resources associated with DM due to their primary commitment to excellence.
c. **Building social awareness and resilient attitude:** COE can also bring new and effective methods of bringing social awareness regarding hazards and solutions. It also helps to change local attitude which may also reinforce the need and supply side of COE.

d. **Global platform and networking:** Centres of Excellence also provide a platform for local, national and global expertise for research and training. With the excellence in innovation, research and infrastructural facilities they can also contribute to the educational tourism which may help to contribute to both local economy and to further development of the centre itself.

**Institutional Infrastructure:** An extensive institutional Infrastructure is observed to be available for training, research and education in DM from national to district level. These include NIDM at national level, SIDMs or DM cells of State ATIs at state level, training centres of various sectors and departments like Rural Development (SIRDs, RIRDs and DIRDs), Education -District Institute of Education and Training (DIET), Health (National Institute of Health & Family Welfare (NIHFW), State Institute of Health & Family Welfare (SIHFW) and its allied institutes at lower levels), ULBs and PRIs - All India Institute of Local Self-Government (AILLSG) etc. Most of these training institutions across sectors and levels have linkages with the disaster management domain in the sense that they address disaster management concerns in their training. Apart from these, there are numerous research institutions of national and regional significance along with universities and colleges that conduct research in the field of DM. However, despite a significant infrastructure base, their effectiveness is compromised due to different reasons. Among other reasons, lack of vision and appropriate use of the available infrastructure is also noted to be the cause. Centre of Excellence could play an important role in this, and therefore could use the opportunity to fulfil the gaps at different levels. While there are many potential institutes which can be developed as future COE, their infrastructure and resource base has to be immediately expanded in order to be recognised as COE.

**Funding and Subsidies:** Availability of Funding for Disaster Management has increased manifold over the past decade with multiple initiatives already underway e.g.

a. To build the capacities of the state governments’ functionaries and its dispersal to grass root level, GOI has provided support for training and capacity building in DM through dedicated faculty and support to the DM Cells in State Administrative Training Institutes/Colleges and other Institutes. Dedicated funding of Rs. 525 crore has been provided to State Governments which will inter alia include it also.

b. A dedicated fund to the tune of US$ 6717 million has been earmarked for the States under State Disaster Response fund. 10% of this SDRF can be utilised for training and capacity building activities.

c. To build the capacity of the community, a national scheme on revamping of Civil Defence System is being implemented across the country at a cost of US$ 20 Million. Civil Defence Volunteers are representatives from the community and are being involved at the local level in disaster management initiatives.

d. There is an added emphasis to provide training to officials of Local Authorities. NDMA/IGNOU project on training and capacity building of ULBs and PRIs with a cost of 2.18 cr. An initiative in 54 districts of 11 states that has just concluded in 2012 is the most recent targeted initiative for the ULBs and PRIs.

e. Another program on Capacity Development for Local governance (2008-12) has been launched by UNDP and Ministry of Panchayati Raj with an initial budget allocation of US$ 5.9 lakh.

f. A National School Safety Programme has been launched by GOI as pilot project in 22 states across the country covering 8800 schools.

These funding sources offer opportunities for centre of excellence to for capacity building along with research and innovation. However, there is also a need for long-term investment in COE for research, innovation and sustainability. In the presence of national and international competitors, it is important to invest in the quality of services for its sustainability. Some funding would be also
required to support and spread awareness for the need and roles of COE. Availability of funds and created opportunities will not only attract excellent human resources but also create jobs for the new and emerging researchers.

**Legal Framework and Policy:** Even though there is no legal requirements for the Centre of Excellence in Disaster Management, following the international and national efforts to promote DM has generated significant interest for DM among scholars, practitioners and NGOs. Hyogo Framework of Action (2005-2015) not only provides guidelines but also facilitates action at different levels. It has also led to a comprehensive legal framework which mandates training and capacity building from national to local level. A national policy regime that promotes training and capacity building is embodied in national level policies including National Training Policy 2012 and National Policy on Disaster Management 2009. The state level policies as found in Gujarat, Odisha and Bihar, also emphasise on investment in training and capacity building. This lay the significant foundation for creating centre of excellence that can improve on the existing infrastructure and capacity for training, research and education of disaster management.

**Sustainability:** The sustainability of COE depends on various factors. Various aspects of sustainability may relate human, environmental, social, economic, political resources. Innovations can be governed by both local needs and theoretical advancement, which is important to consider by the COE and both should be given due attention and funding for their sustainability. The two other factors noted to be critical for the sustainability of COE are as follows:

a. **Balance between efficiency and effectiveness:** The COE like any other organisations may also need to find a balance between efficiency and effectiveness. As centre of excellence relate primarily with information processing, generation and dissemination, efficiency can be related to first-order learning on a routine basis which is an incremental conservative process that serves to maintain stable relations and sustainable existing rules (March 1991, Burton et al 2011). Effectiveness, on the other hand, refers to second-order learning with new rules and knowledge (Burton et al 2011 13). A balance between the two is likely to contribute towards both demand and supply side of COE.

b. **Building trust in service delivery:** COE by standing at the forefront of delivering consistent and quality services can have long-run commercial impacts. This would mean they need to regularly update their customers, upgrade their services to meet changing pace and build trust in delivering what is promised for, can also enhance sustainability.
3. BUILDING A COE

3.1. STEP-WISE APPROACH

There are numerous factors that need to be considered in the development of a Centre of Excellence. A step wise approach may include evaluation of a set of different criteria that characterises the Centre of Excellence and make it different from any other institute of disaster management engaged in training, research and education. It begins with defining the goal and strategy design to environment to set up, organisation design and so on. These steps are discussed below.

1. **Goal design:** Two fundamental goals for an organisation are efficiency and effectiveness. *Efficiency* is a primary focus on inputs, resource use and costs. *Effectiveness* is a focus on outputs, products, services and revenues. COEs must ideally aim for both high efficiency and effectiveness. While this is more costly as compared to aiming for one, a balance between the two goals is necessary to help govern its sustainability. While a highly specialised expertise, state-of-art infrastructure and intricate national and international collaborations add to the efficiency of the COE, the innovation and application of DM practices bringing national and local shift in DM and reducing vulnerability would mark their effectiveness.

2. **Strategy design:** Strategy is the operation of organisational goals of efficiency and effectiveness, which again separate it from the rest of the organisations in the field. This must include exploration and exploitation. *Exploration* is the process of seeking new technologies or new ways of doing things and includes search, variation, risk-taking and innovation. *Exploitation*, on the other hand, is taking advantage of current or known technologies to do things in a new and novel way. It includes refinement, efficiency, selection and implementation. COEs need to stand high on both, as they are committed to excellence and standing at the forefront of new research, technology and training. It is a dual strategy combining aspects of both a defender and a prospector. COE in DM has to take a balance approach in innovating new methodologies, solutions and services, and at the same time optimising the use of current resources and market positions. The analyser with innovation is both efficient and effective.

3. **Environment:** Environment is everything outside the boundary of organisation which can influence its performance including customers, competitors, suppliers, financial markets and the political systems. It plays an important role in organisational design as it creates both opportunities and limits. The environment of an organisation can be classified based on the influencing factors of complexity and uncertainty.

   In an environment of high *complexity*, more elements have to be monitored and the effects of change need to be estimated. In the case of high *uncertainty*, more plans have to be established and a higher *degree of flexibility* may be needed.

   The four environmental conditions across the uncertainty and complexity dimension include calm, varied, locally stormy and turbulent. COEs for DM and DRR fall into the turbulent environment category with high complexity and high unpredictability. There are many interdependent factors which are not predictable. It requires organisations to have a large and fast information-processing capacity so that they can choose alternate actions and make adjustments quickly. While their regular activity is to bring excellence to various DRR aspects, they are also required to take immediate action and make adjustments in case of sudden and new disasters. Uncertainty, which has always been an important component of disasters, is now being further enhanced by climate change. Additionally, there are multiple agencies involved in local development and actively engaged in increasing and decreasing vulnerability, it is very important for COEs to make sense of this high level of complexity and uncertainty and design their solutions accordingly.
4. **Organisational Design**: Organisational design for centre for excellence is likely to differ depending on the functional area. However, an important aspect of all organisational design is managing work across distances. Therefore, locating the organisation in relation to optimal sourcing and local restiveness is important. *Optimal sourcing* refers to the decision to locate operations in a place that brings the greatest advantage in terms of customer contact, cost efficiency, human resource skill need or other objectives. *Local responsiveness* refers to the decision to distribute work in many locales versus consolidating work in one or a few centralised locations.

COEs for DM and DRR are likely to be multi-domestic with a few being transnational such as SDMC. Multi-domestic COEs take a decentralised approach to organise these centres. In context of India these centres can be organised according to various criteria. This includes functional areas, geographic areas, geographic zones, thematic areas, hazards and ownership.

5. **Task Design**: Task design is decomposing work into subtasks while considering the coordination among the subtasks to meet organisational goals. This can be categorised into the two important dimensions of repetitiveness and divisibility.

If a task is well defined and repeated again and again, then it has higher *repetitiveness*. This brings about greater standardisation in execution and results in low uncertainty. On the other hand, when a bigger task is broken down into subtasks which require little coordination (i.e. the subtasks are independent), it has high *divisibility*.

The tasks design for COEs are likely to range widely in this category.

6. **People**: People or human resources are the basic determinant of the nature of any organisation. This includes number of people and professionalisation. The *number of people* is simply a count of all individuals in the organisation. *Professionalisation* is the collective skill level of the individuals and a measure of their capability for the work tasks at hand. Professionalisation depends upon employees’ education, training and experience (whether accumulated prior to or on the job).

COEs would need a high level of professionalisation, while the number of people would depend on the type of activity and location.

7. **Leadership**: Leadership is one of the essential characteristics of a COE. Leadership style is the predominant mode used by the top management of the organisation to manage employees. Two dimensions used to analyse leadership style include preference for delegation and uncertainty avoidance.

*Preference for delegation* is the degree to which the top management encourages lower-level managers or other employees to make decisions about what and how work is to be done. This means the level of autonomy among lower-level managers and employees is high and decisions can be made without top-management approval.

*Uncertainty avoidance* is the degree to which the top management shuns taking actions or making choices that involve major risks. It is low if top management tend to be risk taking and high where top management is risk averse.

COEs depend on innovation and stand at the forefront of new technology and research areas. Therefore, there needs to be more risk-taking and delegation of work.

8. **Coordination**: Coordination systems support flexibility and adaptiveness within and across departmental and divisional boundaries. This includes formalisation and centralisation.

*Formalisation* is the degree to which the organisation specifies a set of rules or codes to govern how work is done, who is to do it and under what circumstances or constraints. Formalisation is high if these rules are very detailed and consistently communicated to organisational members. It is low if there is not a set of strongly written or accepted rules or
code of conduct. Centralisation is the degree to which coordination and control are managed by a core person or level of the organisation. Decentralisation is the degree to which responsibility for coordination and control lies in the subunits of the firm and individual managers, rather than corporate headquarters or one specific level of hierarchy. Decentralised systems better accommodate diverse needs and allow more local responsibility.

The lack of coordination is one of the major criteria that brought forth the need for COEs which can coordinate and direct ongoing DRR activities. Coordination is required not only within the centre, but also across the centres of excellence and other institutes actively engaged in similar fields. Therefore, the mosaic model can be seen as optimum for COEs. Here, there is a greater tendency for heterogeneity rather than similarity of systems and the rules are not identical throughout the organisation. However, there is a high degree of formalisation.

9. Information Systems: As compared to any other organisation, information systems play a central role for COE and therefore it has been addressed separately. The term information systems is used in a broad sense that includes all systems that collect, store, and process information within the organisation. The supplier of information may be located outside of the organisation. The type of information system can be categorised along the two broad dimensions of amount of information and tacit nature of information.

Amount of information is the overall volume of data that an organisation must collect, process, and store on a regular basis. To some extent it is a function of the size and domain of the organisation. The second dimension is the tacit nature of information which is exchanged within the organisation. Tacit knowledge is characterised by causal ambiguity and difficulty of codification. It is not readily articulated as a set of facts or rules and so is difficult to transfer. It is in contrast to explicit knowledge which can be expressed formally as a system of symbols and facts and therefore more readily communicated.

Event driven models presume low amount of information and low level of tacit information. They are designed to process information associated with specific occasions or results as they occur. They are reactive to needs as they arise.

Data driven systems are designed as the amount of information to be processed increases and system can no longer be based on reactive model and rather needs ongoing capture, analysis and transfer of vital information. It is appropriate for organisations that must process high volume of information and do so in systematic and intelligent manner.

People driven model is used by organisations that process highly tacit information that is relatively low in volume. It emphasises capture, processing and transfer of data that is embedded in the minds and action of people. It presumes that the vital information of the organisation is difficult to codify in a routine way and therefore the priority of systems should be either to bring people together face to face so that they can share tacit knowledge or to use computer or telecommunication based systems that readily support subtle, rich knowledge transfer. Meeting, conferences are also part of this knowledge transfer.

The most complex design is that of relationship driven model which has the greatest potential for promoting firm efficiency and effectiveness. It emphasises capture, processing and transfer of data that is embedded in the links or relationships, between people and data. This is an appropriate design if the overall amount of information to be processed is high and the tacit nature of information is high. It integrates hard (codified) data with soft (interpretational data) to yield rich results for organisational decision making.

The information systems for COE may range from data-driven to relationship driven depending on the focus of a particular centre on DM.
10. **Incentives**: Incentives are the means or instruments designed to encourage certain actions or behaviour from employees. Apart from monetary rewards in the form of salaries, wages, and benefits, incentives also include praise, acceptance, belongingness, recognition or award for their services. These incentives can be strategically designed to bring new local solutions which help to promote a culture of disaster safety and awareness at different levels.

Incentives can be given to individual, centre or research cluster based on their performance. Personal pay relates to the individual behaviour in the organisation, which does not emphasise on results or outcomes, but depends on individual compliance with rules or directives. This includes conditions of the contract, maintaining integrity around time of work and holidays etc. Skill pay include pay differentials as per the skills or position based and is most widely used in organisations which are often measured on the basis of formal education and seniority. Bonus-based incentive changes the focus from behaviour to results i.e. from process to outcomes. For this organisational results can be mapped for accountability and bonus is paid on top of skill pay. On the other hand, profit-based sharing is group based. It can be given to the outstanding results achieved by a particular group. People are rewarded on the basis of effective collaborations with others to yield high performance.

For COEs, the incentives can be both skill based and profit-sharing depending on the project creation and management over time.

11. **Institutional setup and programme design**: COEs can also be classified and established as per their prime purpose. This is likely to influence the number of faculty and nature of infrastructural resources along with programme details. In most administrative training institutes, curricular content is usually ad-hoc and driven by limited faculty and resource persons, while universities dealing with disaster management need to have a full fledged resources for theoretical and practical research along with faculty. The five broad classifications of COEs for institutional setup and programme design include research, training, education, data collection and monitoring and communication.

12. **Certification**: At present certification is ad-hoc, with some organisations giving certification based on quality of performance in the trainings, some having no element of examination of quality of performance and some providing no certification for DM. Except for a few international case studies, there is no evidence of upward linkages, credit systems or cross-linkages in credit accrual, particularly in India. COEs can play an important role in defining the criteria and standardising the process of certification.

13. **Quality assurance and accreditation**: Quality assurance and accreditation vary across the institutions engaged in DM training, research and education. Institutions providing short term training in non-educational institutions are mostly not accredited for their training courses. Universities have umbrella accreditations from their respective core sectors, and these by default apply to the disaster management courses and trainings. The accreditation of COEs for DRR and DM, therefore, needs to be planned at different levels starting with those with highly specialised services at the national level to ATIs, State Universities and Colleges providing education at the state level; and skill based, vocational and polytechnic institutions offering applied DRR education to local people, masons and other first order workers at the district level.
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The accreditation process is a multi-layered one with the first tier involving application, examination and self assessment by the applicant institutions; the second tier looking at evaluation and accreditation of institutions; and the third level addressing the follow-up and re-accreditation requirements. The overall process is illustrated in a schematic figure for NBA is given below. The process can be adopted for accreditation of COE as well.

![NBA Accreditation Process Steps](image)

**The Outcome Based Approach**

For COE, the outcome based model should focus on both efficiency and quality of the outcomes from the institute. The output of the individual faculty, research clusters as well as students and trainees should also be monitored over time to approve accreditation and re-accreditation.

### 3.2 EXISTING CENTRES WITH COE POTENTIAL

Although there are many centres on disaster management in India, and a few claim to be centres of excellence, there is no system of accreditation or hierarchy of centres of excellence in the country. A few centres with potential to be developed as centres of excellence in disaster risk reduction emerged through the study and related consultations. These are discussed below:

**National Institute of Disaster Management**

The National Institute of Disaster Management [NIDM] is set up as a nodal training institute and acts as a COE at a regional level in Asia. The institute is responsible for human resource development, capacity building, training, research, documentation and policy advocacy for disaster management to help build a disaster resilient India. The institute’s mandate lays down the approach of designing its programmes in consultation with central ministries, state governments and other stakeholders (http://nidm.gov.in/). NIDM functions within the broad policies and guidelines laid down by the NDMA. It assists in developing training modules, imparting training to trainers and DM officials and strengthening Administrative Training Institutes (ATIs) in the state. The institute hosts a variety of training programmes, workshops, conferences and self learning programmes relating to disaster management. The institute also facilitates e-Learning programmes on Disaster Risk Management in partnership with the World Bank (GFDRR), Washington. These courses facilitate professional guidance for distance learning whereby materials are sent through CDs or accessed through the online platform. Similar to regular classroom teaching, these courses generate discussion, queries, clarifications, assignments and end-of-course projects which are evaluated by the professional facilitators. For local people, the institute has also started e-learning self study programmes in collaboration with C-DAC. These programmes are free of cost. The institute also holds regular conferences and national platforms on disaster management, hence playing an active role in disseminating information. The duration of the course varies from a few days up to six weeks. With
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an average of 78 workshops per year, the institute trained 7,811 people between 2009 and 2013. NIDM and the World Bank (GFDRR) jointly provide certificates to the successful candidates. Anyone interested in professional learning can register for these programmes for a nominal fee of 1000 to 1500 rupees for a basic or specialised course.

**SAARC Disaster Management Centre**

SAARC Disaster Management Centre (SDMC) was set up in October 2006 at the premises of National Institute of Disaster Management in New Delhi. It is established with a vision to become a vibrant Centre of Excellence for knowledge, research and capacity building on disaster management in South Asia and rest of the world.

The Centre has the mandate to serve eight Member Countries of South Asia Association of Regional Cooperation (SAARC) - Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka - by providing policy advice and facilitating capacity building services including strategic learning, research, training, system development and exchange of information for effective disaster risk reduction and management in South Asia. It connects the central bodies of the member countries which relate to disaster management including ministries, department, scientific, technical, research and institutional bodies within and outside the government bodies. It is engaged in training and research and documents events and reports progress in the member countries. The framework of SDMC brings forth its key roles which support its growth as a centre of excellence. These include:

1. Establish and strengthen the regional disaster management system to reduce risks and to improve response and recovery management at all levels;
2. Identify and elaborate country and regional priorities for action;
3. Share best practices and lessons learnt from disaster risk reduction efforts at national levels;
4. Establish a regional system to develop and implement regional programmes and projects for early warning;
5. Establish a regional system of exchanging information on prevention, preparedness and management of natural disasters;
6. Create a regional response mechanism dedicated to disaster preparedness, emergency relief and rehabilitation to ensure immediate response;
7. Create a regional mechanism to facilitate monitoring and evaluation of achievements towards goals and strategies.

**Disaster Management Centre at Administrative Training Institute, West Bengal**

The Disaster Management Centre at the Administrative Training Institute has been recently approved as the Centre of Excellence for Flood. It aims to act as a resource centre with a digital library for research, training on floods. It is also responsible for carrying out advanced simulation and research, developing training module and documentation as well as publications of journals, newsletters and books. The centre is currently engaged in building historical documentation of floods in West Bengal and best practices apart from developing IEC materials such as radio jingles, posters and videos on flood, landslides and earthquake. The centre also carries out research projects, case studies, training, seminars, and workshops on hazards. It is funded by government of India.

**The Centre of Excellence for Disaster Mitigation and Management at IIT Roorkee**

The centre is established in 2006 at IIT for education, research and training of students for disasters. The program mainly includes mitigation measures, environmental management, and building allied services. The centre has students and faculties with specialisation from architecture, civil engineering, electrical engineering, mechanical engineering and so on. It conducts multidisciplinary research on regional issues such as earthquakes, tsunami, floods, cyclones and their early warning. It aims to achieve international standard in the education and research of disasters and create a national database for rapid dissemination of information and knowledge.
Centre for Disaster Mitigation and Management at the VIT University

The first disaster management centre to be set up after the approval of the National Disaster Management Act in 2005 was the Centre for Disaster Mitigation and Management at the VIT University, Vellore. It was established in 2006 with a focus on research, development and consultancy services for DM along with education, networking and partnership. It aims to pursue excellence in its high quality of research on regional issues including earthquake mitigation, early warning systems and preparedness as per the international standards. The faculty at the centre has expertise in earthquakes, landslides, floods, droughts, engineering, geomatics, cyclones and multimedia technology. The centre also carries out consultancy work and pursues research funded by the Government of India and other donors including UNDP, Asian Disaster Preparedness centre and so on. As a Centre of Excellence it places particular emphasis on innovation in disaster education and training, multi-hazard mapping, vulnerability assessment and developing networks for further research, education and training. Some of its key collaborators include VIT University, India, Mindanao State University – Iligan Institute of Technology, Philippines, Tampere University of Technology, Finland, University of Bristol, United Kingdom, Kunsan National University, Republic of Korea, Council of Scientific & Industrial Research, New Delhi, National Institute of Disaster Management, Delhi, Advanced Technology & Engineering Services, New Delhi Structural Engineering Research Centre, Chennai, Institution of Engineers (India), New Delhi.

Gujarat Institute of Disaster Management

The institute is developed by the Government of Gujarat as a state of the art premier institute for training, education and research. In recent the government of Gujarat also declared it to be global centre of excellence. The institute is set up just after the 2001 earthquake in Gujarat to facilitate rehabilitation and reconstruction in the affected area. It was also established with an aim to promote planning and implementation of disaster mitigation and preparedness. It aims to bring different stakeholders ranging from the governing boards to local people on one platform to deal with disasters. The mission and objectives of the GIDM cover a range of activities including working as a centre of excellence, which broadly brings forth various dimensions to be considered and develop under a standard COE.

1. To serve as apex institute in the state for Disaster Management capacity building.
2. To provide disaster related training to all the stakeholders.
3. To assess the training needs of the different government departments, offices, boards, corporations, local bodies, non-governmental organisations and others who may consent to be associated with it.
4. To undertake activities for human resource development, public education and community awareness, safety etc. in disaster education and management.
5. To undertake quality research project on disaster management and mitigation covering both natural and human induced disasters.
6. To act as a resource centre and clearing house of information on disaster management by documentation of field experiences including case studies, lessons learnt and best practices.
7. To establish and maintain libraries and spread knowledge of disaster management.
8. To facilitate partnerships with willing eminent national and international organisations, universities, institutions, bodies and individuals specialised in disaster management.
9. To serve as a centre of excellence on disaster mitigation and management.
10. To arrange for financial assistance, to raise money through financial instruments, bonds, deposits, etc. permissible under the provisions of Societies, Registration Act 1860 and the Bombay Public Trust Act, 1950 and management, administration, investment and reinvestment of funds so raised or available with the institute.
11. To run and award degree, diploma, certificate courses on disaster management at its own or with the affiliation of any other institute or universities local, national or international.
12. To undertake publication of newsletters, journals, reports, occasional papers, study reports etc.

LESSONS:

- Most of the COEs in DM in India are recent in origin and in the process of expansion and growth.
- The collaborative activities of the current COEs can be strengthened by including more universities, research institutes and data collection organisations.
- At present there is no COE for data collection and monitoring of disasters at the national scale.

3.3 OVERVIEW OF POTENTIAL COES

The list of potential COEs will include a mix of existing COEs, existing institutes having the potential to be upgraded to COEs and the creation of new institutes where they are non-existent. This report focuses mainly on the first two categories to better utilise the existing structures.

**Existing institutes as potential Centre of Excellence:** There are many universities, research institutions and Administrative Training Institutes [ATIs] at the state level which are actively engaged in disaster management work. Many of them can be further developed as Centres of Excellence by expanding their role, responsibilities as well as resource base. While many major universities and research institutes have sufficient resources and intention to develop into Centres of Excellence in DRR, more work may be required to do integrate and develop ATI as centres of Excellence. The following table shows a list of selected institutes at the state, national and international level, from which the potential COE can be identified.

There are a number of non-government/private institutes across the country which has the potential to function of centres of excellence. These institutes do not face problems of resources and adequacy of resource persons required for conducting research and training functions expected from centres of excellence. Some of these institutes are already running certificate courses in disaster management and can serve as regional centres of excellence.

Indian Institute of Human Settlements is an example of such an institute. It has been running short courses on disaster management and is an institute dedicated to education and training on urban issues. The internationally acclaimed faculty, excellent course material and long experience qualifies it to be declared as a centre for excellence for the Southern Region of the country. Due to their experience in urban issues it could be declared as a centre of excellence on urban risk. Similarly Mudra Institute of Communication Technology (MICA) is a reputed institute for education in Media and Communication. The institute can be considered for development as Centre of Excellence for Disaster Management Communication. The examples of institutes have been given only for illustrative purposes and these or similar non government/private institutes that have done notable work can be designated as centres of excellence. Development of thematic centres of excellence would help in the comprehensive development of disaster management training and education.

**Table 3.1: Training or Administrative Training Institutes as Potential Centres of Excellence**

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Institutes</th>
<th>Type</th>
<th>Scale of operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Institute of Disaster Management (NIDM)</td>
<td>National Centre of Excellence*</td>
<td>India</td>
</tr>
<tr>
<td>2</td>
<td>Centre for Civil Defence College, Nagpur</td>
<td>Training Institution</td>
<td>India</td>
</tr>
<tr>
<td>3</td>
<td>National Institute of Rural Development, Rajendranagar, Hyderabad</td>
<td>Education &amp; training Institute</td>
<td>India</td>
</tr>
<tr>
<td>4</td>
<td>Indian Institute of Public Administration</td>
<td>Administrative &amp; research Institute</td>
<td>India</td>
</tr>
<tr>
<td></td>
<td>National Remote Sensing Agency, ISRO</td>
<td>Research and data collection</td>
<td>India</td>
</tr>
<tr>
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<td>-----------------------------------------------------------</td>
<td>------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>6</td>
<td>Indian Meteorological Department</td>
<td>Research and data collection</td>
<td>India</td>
</tr>
<tr>
<td>7</td>
<td>Centre for Disaster Management at Lal Bahadur Shastri National Academy of Administration</td>
<td>Research and training</td>
<td>India</td>
</tr>
<tr>
<td>8</td>
<td>Jamsetji Tata Centre for Disaster Management</td>
<td>Educational Institute</td>
<td>India</td>
</tr>
<tr>
<td>9</td>
<td>National Information Centre of Earthquake Engineering [NICEE], IIT Kanpur</td>
<td>Educational Institute</td>
<td>India</td>
</tr>
<tr>
<td>10</td>
<td>Centre of Excellence in Disaster Mitigation and Management (CoEDMM) at IIT Roorkee</td>
<td>Educational Institute</td>
<td>India</td>
</tr>
<tr>
<td>11</td>
<td>World Bank Institute (through NIDM)</td>
<td>Academic &amp; Research Institution</td>
<td>Global</td>
</tr>
<tr>
<td>12</td>
<td>SAARC Disaster Management Centre</td>
<td>Research &amp; training institute</td>
<td>South Asia</td>
</tr>
<tr>
<td>13</td>
<td>International Federation of Red Cross and Red Crescent Societies (IFRC) / Indian Red Cross Society</td>
<td>NGO</td>
<td>Asia Regional, India</td>
</tr>
<tr>
<td>14</td>
<td>Centre of Disaster Management, HCMRIPA, JLN Marg, Jaipur</td>
<td>Administrative Training Institution</td>
<td>Rajasthan, Haryana, Punjab, Jammu &amp; Kashmir, Himachal Pradesh, Uttarakhand and Delhi</td>
</tr>
<tr>
<td>15</td>
<td>Disaster Management Institute, Bhopal</td>
<td>Training Institution</td>
<td>Madhya Pradesh, Chhattisgarh, Uttar Pradesh</td>
</tr>
<tr>
<td>16</td>
<td>Dr. MCR HRD Institute of Andhra Pradesh, Hyderabad</td>
<td>Administrative Training Institution</td>
<td>Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Pondicherry and Andaman &amp; Nicobar</td>
</tr>
<tr>
<td>17</td>
<td>Yashwantrao Chavan Academy of Development Administration (YASHADA), Pune</td>
<td>Administrative Training Institution</td>
<td>Maharashtra, Goa, Dadar &amp; Nagar Haveli, Daman &amp; Diu</td>
</tr>
<tr>
<td>18</td>
<td>Sri Krishna Institute of Public Administration, Ranchi</td>
<td>Administrative Training Institution</td>
<td>Jharkhand, Bihar, West Bengal and Odisha</td>
</tr>
<tr>
<td>19</td>
<td>Assam Administrative Staff College, Guwahati</td>
<td>Administrative Training Institution</td>
<td>Assam, Meghalaya, Manipur, Tripura, Nagaland, Sikkim and Arunachal Pradesh</td>
</tr>
<tr>
<td>20</td>
<td>Central Arid Zone Research Institute</td>
<td>Research Institute</td>
<td>Rajasthan and adjoining areas</td>
</tr>
<tr>
<td>21</td>
<td>Centre for Snow and Avalanche Study Establishment</td>
<td>Research Institute</td>
<td>Himachal Pradesh</td>
</tr>
<tr>
<td>22</td>
<td>Wadia Institute of Himalayan Geology,</td>
<td>Research Institute</td>
<td>Dehradun, Uttar Pradesh</td>
</tr>
<tr>
<td>23</td>
<td>Centre for Disaster Mitigation and Management at the VIT University</td>
<td>Educational Institute</td>
<td>Vellore</td>
</tr>
<tr>
<td>24</td>
<td>Gujarat Institute of Disaster Management</td>
<td>Training Institute</td>
<td>Gujarat</td>
</tr>
<tr>
<td>25</td>
<td>Himalayan Institute of Disaster Management and Climate Change Adaptation</td>
<td>Training and research institute</td>
<td>Himalayan Region</td>
</tr>
<tr>
<td>26</td>
<td>Civil Defence Emergency Relief Training Institute, Hyderabad</td>
<td>Training Institute</td>
<td>Andhra Pradesh</td>
</tr>
<tr>
<td>27</td>
<td>Administrative Training Institute, Mysore</td>
<td>Administrative Training Institute</td>
<td>Andhra Pradesh</td>
</tr>
<tr>
<td>No.</td>
<td>Institute Name</td>
<td>Training Institute</td>
<td>State</td>
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</tr>
<tr>
<td>28</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Assam</td>
</tr>
<tr>
<td>29</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Delhi</td>
</tr>
<tr>
<td>30</td>
<td>Directorate of Training, UTCS</td>
<td>Administrative Training Institute</td>
<td>Delhi</td>
</tr>
<tr>
<td>31</td>
<td>Central Civil Defence Training Institute</td>
<td>Training Institute</td>
<td>Gujarat</td>
</tr>
<tr>
<td>32</td>
<td>Sardar Patel Institute of Public Administration</td>
<td>Administrative Training Institute</td>
<td>Gujarat</td>
</tr>
<tr>
<td>33</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Haryana</td>
</tr>
<tr>
<td>34</td>
<td>Haryana Institute of Public Administration, Gurgaon</td>
<td>Administrative Training Institute</td>
<td>Haryana</td>
</tr>
<tr>
<td>35</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Himachal Pradesh</td>
</tr>
<tr>
<td>36</td>
<td>Himachal Pradesh Institute of Public Administration</td>
<td>Administrative Training Institute</td>
<td>Himachal Pradesh</td>
</tr>
<tr>
<td>37</td>
<td>Central Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Jammu &amp; Kashmir</td>
</tr>
<tr>
<td>38</td>
<td>J &amp; K Institute of Management and Rural Development</td>
<td>Administrative Training Institute</td>
<td>Jammu &amp; Kashmir</td>
</tr>
<tr>
<td>39</td>
<td>Home Guards and Civil Defence Academy</td>
<td>Training Institute</td>
<td>Karnataka</td>
</tr>
<tr>
<td>40</td>
<td>Institute of Management in Government, Trivandrum</td>
<td>Administrative Training Institute</td>
<td>Kerala</td>
</tr>
<tr>
<td>41</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Madhya Pradesh</td>
</tr>
<tr>
<td>42</td>
<td>RCVP Noronha Academy of Administration, Bhopal</td>
<td>Administrative Training Institute</td>
<td>Madhya Pradesh</td>
</tr>
<tr>
<td>43</td>
<td>Civil Defence Staff College</td>
<td>Training Institute</td>
<td>Maharashtra</td>
</tr>
<tr>
<td>44</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Meghalaya</td>
</tr>
<tr>
<td>45</td>
<td>Administrative Training Institute, Aizwal</td>
<td>Administrative Training Institute</td>
<td>Mizoram</td>
</tr>
<tr>
<td>46</td>
<td>Administrative Training Institute, Kohima</td>
<td>Administrative Training Institute</td>
<td>Nagaland</td>
</tr>
<tr>
<td>47</td>
<td>Gopa Bandhu Academy of Administration, Bhubaneshwar</td>
<td>Administrative Training Institute</td>
<td>Odisha</td>
</tr>
<tr>
<td>48</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Punjab</td>
</tr>
<tr>
<td>49</td>
<td>Mahatma Gandhi State Institute of Public Administration, Chandigarh</td>
<td>Administrative Training Institute</td>
<td>Punjab</td>
</tr>
<tr>
<td>50</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Rajasthan</td>
</tr>
<tr>
<td>51</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Sikkim</td>
</tr>
<tr>
<td>52</td>
<td>Anna Institute of Management</td>
<td>Administrative Training Institute</td>
<td>Tamil Nadu</td>
</tr>
<tr>
<td>53</td>
<td>Combined Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Tripura</td>
</tr>
<tr>
<td>54</td>
<td>State Institute of Public Administration and Rural Development</td>
<td>Administrative Training Institute</td>
<td>Tripura</td>
</tr>
<tr>
<td>55</td>
<td>Central Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>Uttar Pradesh</td>
</tr>
<tr>
<td>56</td>
<td>UP Academy of Administration and Management, Lucknow</td>
<td>Administrative Training Institute</td>
<td>Uttar Pradesh</td>
</tr>
<tr>
<td>57</td>
<td>Uttarakhand Academy of Administration, Nainital</td>
<td>Administrative Training Institute</td>
<td>Uttarakhand</td>
</tr>
</tbody>
</table>
Preparing Long Term Training and Capacity Building Strategy for Disaster Risk Reduction under NCRMP: Guidelines for Setting up Centres of Excellence on Disaster Risk Reduction

<table>
<thead>
<tr>
<th>No.</th>
<th>Institution Name</th>
<th>Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>Central Civil Defence and Home Guards Training Institute</td>
<td>Training Institute</td>
<td>West Bengal</td>
</tr>
<tr>
<td>59</td>
<td>Administrative Training Institute, West Bengal</td>
<td>Administrative Training Institute</td>
<td>West Bengal</td>
</tr>
<tr>
<td>60</td>
<td>Regional Medical Research Centre, Port Blair</td>
<td>Research Centre</td>
<td>Andaman and Nicobar Islands</td>
</tr>
<tr>
<td>61</td>
<td>Natural Resources Data Management System</td>
<td>Data Collection &amp; Research Institute</td>
<td>Karnataka</td>
</tr>
<tr>
<td>62</td>
<td>National Water Academy, Khadakwasla</td>
<td>Training Institute</td>
<td>Maharashtra</td>
</tr>
<tr>
<td>63</td>
<td>Disaster Mitigation and Management Centre</td>
<td>Training and research institute</td>
<td>Uttarakhand</td>
</tr>
</tbody>
</table>

**Private/ Non Government Institutions**

<table>
<thead>
<tr>
<th>No.</th>
<th>Institution Name</th>
<th>Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>Centre for Disaster Management and Studies, Pune</td>
<td>NGO</td>
<td>Maharashtra</td>
</tr>
<tr>
<td>65</td>
<td>All India Disaster Mitigation Institute (AIDMI)</td>
<td>NGO</td>
<td>India</td>
</tr>
<tr>
<td>66</td>
<td>PRAXIS, Institute for Participatory Practices</td>
<td>NGO</td>
<td>India</td>
</tr>
<tr>
<td>67</td>
<td>Indian Institute for Human Settlement (IIHS)</td>
<td>Educational Institute</td>
<td>India, Potential Southern zone COE for Urban Risk.</td>
</tr>
<tr>
<td>68</td>
<td>Indian Red Cross</td>
<td>Civil Society</td>
<td>India, Potential National COE for Public Awareness</td>
</tr>
<tr>
<td>69</td>
<td>RedR India</td>
<td>Civil Society</td>
<td>India, Potential National COE for Training</td>
</tr>
<tr>
<td>70</td>
<td>SEEDS – GOLFRE</td>
<td>NGO</td>
<td>Asia</td>
</tr>
<tr>
<td>71</td>
<td>Asia Disaster Preparedness Centre</td>
<td>Research &amp; training institute</td>
<td>Asia</td>
</tr>
<tr>
<td>72</td>
<td>Tata Institute of Social Sciences</td>
<td>Educational Institute</td>
<td>Maharashtra, Potential National COE for Research and Education (social)</td>
</tr>
<tr>
<td>73</td>
<td>Amity University</td>
<td>Educational institute</td>
<td>Delhi, Potential National COE for for DRR Media training.</td>
</tr>
<tr>
<td>74</td>
<td>Mudra Institute of Communication Technology.</td>
<td>Educational institute</td>
<td>Gujarat, Potential West zone COE for DRR Media training.</td>
</tr>
</tbody>
</table>

**Source:** Compiled from websites

*Reference to reports on accreditation and quality management is made wherein NIDM is seen as the focal point for the national programme on accreditation of disaster management training and education and quality management of research.*

A major component of the above list is ATIs. This is because administrative training institutes are present in nearly all states and are an important component of disaster management training and preparation in India. At present ATIs are responsible for the training of professionals and administrative personnel from central ministries, department and state governments in DM and actively involved with making action plans with NIDM and other technical institutions. Many of these training institutes also work at regional and national level, which offer a resource base to develop...
further as a COE. However, to establish these as centres of excellence, their role, responsibilities and ongoing research at these institutes have to be expanded.

Further, there are agencies responsible for creating required number of trained professionals, such as the National Institutes of Technical Teachers’ Training and Research (NITTTR); the National Institute of Construction Management and Research (NICMAR); the Construction Federation of India (CFI); the Builders Association of India (BAI), and other national bodies, some of which may also be interested in establishing a centre of excellence in their campus for DRR.

A few institutions that possess characteristics to be developed as centre of excellence are discussed in the following paragraphs. While some of these are more advanced than others, infrastructural and human resource support would be required for all from the centre of excellence point of view.

Central Arid Zone Research Institute

The Central Arid Zone Research Institute (CAZRI) was established in 1959 in Jodhpur. It is a premier organisation of the Indian Council of Agricultural Research (ICAR) and stand as an autonomous organisation under the Department of Agricultural Research and Education, Ministry of Agriculture, Government of India. It has six divisions located in Jodhpur and four regional research stations located in different agro-climatic zones looking into location specific problems. Although the institute primarily looks into sustainability of agriculture and afforestation research in the arid zone, it covers a range of issues relating to natural disasters, such as desertification, drought, wind erosion and so on. It develops new and innovative farming and livestock strategies to cope with disasters, and provides consultancy services for the local hazards and resource management. It also acts as repository of information particularly digital database on the state of natural resources and desertification process and its control. (http://www.cazri.res.in)

Centre for Disaster Management, LBSNAA

The Centre for Disaster Management at Lal Bahadur Shastri National Academy of Administration (LBSNAA) provides training for DM with a particular focus on ICS since August, 2003. The main objectives of the centre include adaptation of the ICS to suit Indian conditions; preparation of operation manuals with integrated ICS principles; training of IAS and Group A central service and in-service officers for DM and ICS; conducting national level training of trainers for ICS; coordinating with regional and state training institutes; and finally, to document films, case studies and teaching materials. It collaborates with the United States Department of Agriculture-Forest Services under the GoI-USAID Disaster Management Support Programme. ICS is a standardised method of disaster management and yet flexible and adaptable to suit any scale of natural or man-made emergencies. It is mainly based on five-management principles of command, planning, operations, logistics and finance and administration. Other important features of the Incident Command Systems include management by objectives, common terminology, unity and chain of command, span of control and organisational flexibility.

The centre has six regional centres for training within the country. These include:

1. Dr. MCR HRD Institute of A.P., Hyderabad, Andhra Pradesh. [Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Pondicherry and Andaman & Nicobar]
2. YASHADA, Pune, Maharashtra. [Maharashtra, Goa, Dadar & Nagar Haveli, Daman & Diu]
3. Sri Krishna Institute of Public Administration, Ranchi. [Jharkhand, Bihar, West Bengal and Odisha]
4. Assam Administrative Staff College, Guwahati, Assam. [Assam, Meghalaya, Manipur, Tripura, Nagaland, Sikkim and Arunachal Pradesh]
5. Disaster Management Institute, Bhopal, Madhya Pradesh. [Madhya Pradesh, Chhattisgarh and Uttar Pradesh]
6. HCM RIPA, Jaipur [Rajasthan, Haryana, Punjab, Jammu & Kashmir, Himachal Pradesh, Uttaranchal and Delhi]

It follows the four tier training initiatives from DoPT, for maximum outreach of the training:

- **First-tier Training:** Training of 20 core group of trainers at LBSNAA.
- **Second-tier Training:** Training of four faculty members from regional centres for training.
- **Third-tier Training:** Training of 12 state level master trainers adding up to 350.
- **Fourth-tier Training:** Training of the district functionaries and responders by the state level master trainers. Approximately 100 persons may be trained from each state.

State level ICS teams are managed by the state government. Each state hosts two state level Incident Command Teams at all times for immediate response. However, the deployed officer could be from any other state. The State Relief Commissioner maintains the database for the trainees of ICS positions. After successfully completing the training course, the officers receive certification for ICS. The only prerequisite is holding a designated rank for the course. This certificate is issued annually. The officers are also required to participate in at least one disaster simulation after their training. If there is no participation in a real life disaster response or simulation exercise in the given three years, the ICS certification can be cancelled. [http://www.lbsnaa.ernet.in/lbsnaa/research/cdm/index.htm](http://www.lbsnaa.ernet.in/lbsnaa/research/cdm/index.htm) *(Accessed January 2014)*

**Centre for Snow and Avalanche Study Establishment (SASE)**

The Centre for Snow and Avalanche Study Establishment (SASE) was established in 1969 by the Defence Research & Development Organisation (DRDO) near Manali, Himachal Pradesh. It is engaged in research of snow and avalanche forecasting and control measures for faster mobility of troops. However, over time, SASE has become an important research centre for science and engineering in the cold region. It plays an important role in saving people’s lives through snow and avalanche forecasting for civil areas including Jammu and Kashmir, Himachal Pradesh and Uttaranchal. Apart from various laboratories, the centre also has a data receiving and communication centre. It also has strong networks in India and abroad. [http://drdo.gov.in/drdo/labs/SASE/English/](http://drdo.gov.in/drdo/labs/SASE/English/) *(Accessed January 2014)*

**Indian Meteorological Department**

Although established as a data collection institution, the Indian Meteorological Department (IMD) can be labelled as first DM related research organisation in India. It was established by the Government of India in 1875 after three catastrophic natural hazards of cyclone (1864) and failures of monsoon (1866 and 1871). From a single centre, IMD has now expanded to include six regional centres called Regional Specialised Meteorological Centre (RSMC) and several observation units, such as meteorological centres at state capitals, forecasting offices, agro-meteorological advisory service centres, flood meteorological offices, area cyclone warning centres and cyclone warning centres. IMD is also a nodal agency for monitoring earthquakes in the country and has a separate division on seismology. It also maintains National Seismological Network consisting of 82 seismological stations across the country. The data from all stations are compiled, processed, analysed and archived systematically at the National Seismological Database Centre (NSDC). It also publishes monthly national seismological bulletin for phase data. IMD is also well connected to international centres, such as International Seismological Centre [ISC] UK. It also supplies data for further research to other research agencies. It is also linked with World Meteorological Organisation (WMO) and Economic and Social Commission for Asia and the Pacific (ESCAP) Panel for weather forecasts and publications regarding hazard mitigation. IMD is equipped to provide real time early warning for tsunami. For early warning of tsunami, real time continuous seismic waveform data is collected from three IMD stations i.e. Port Blair, Minicoy and Shillong, which is then shared on global
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platform through Incorporated Research Institutions of Seismology [IRIS], Washington D.C., USA. Apart from data collection various divisions of IMD are also actively engaged in research and development, such as seismology or hydro-met division which is of relevance to DM (www.imd.gov.in).

**Indian Space Research Organisation (ISRO)**

Indian Space Research Organisation (ISRO) runs a Disaster Management Support Programme, under which a Decision Support Centre is established at the National Remote Sensing Centre (NRSC). The centre monitors natural disasters such as floods, cyclone, agricultural drought, landslides, earthquakes and forests fires. It supplies information needed at different phases of disaster management including preparedness, early warning, response, relief, rehabilitation etc.

**Figure 3.2: Structure of the Disaster Management Support (DMS) System**

The core elements of disaster observation systems include the geostationary satellites, low earth orbiting earth observation satellites, aerial survey system as well as ground infrastructure (figure 1). It also has a National Database for Emergency Management (NDEM) that contains GIS based data to support disaster management for the country. The data include close contours for disaster prone areas developed by using Airborne Laser Terrain Mapping (ALTM) system and Large Format Digital Camera (LFDC). ISRO also shares data and information at the international platform. DMS system at ISRO responds to the International Charter on ‘Space and Major Disasters’ and Sentinel Asia project for supporting DM activities in Asia-Pacific region and the initiatives of UNOOSA, UNESCO and BIMSTEC.

**Wadia Institute of Himalayan Geology**

Wadia Institute of Himalayan Geology, established first in 1968 in the Botany Department of Delhi University, was relocated to Dehradoon in 1976. It is now an autonomous research institute of the Department of the Science & Technology, Ministry of Science and Technology, Govt. of India. Among its varied thrust areas of research comes real time geology for society – coping with natural hazards. The division of the Geomorphology and Environmental Geology focuses on the study of landforms and their evolution in Himalayas in relation to geodynamic processes, climate change, natural...
hazards and assessment of water resources including glacier dynamics and their impacts on environment and society. The institute has conducted various studies on landslides and prepared landslide hazard zonation maps which could help in landslide mitigation.


**Environmental Information Systems (ENVIS)**

Environmental Information Systems (ENVIS) is established by the Ministry of Environment and Forests in 1982 as a plan programme. The aim of this programme is to collect, store, retrieve and disseminate environmental information to policy planners, decision makers, scientists and environmentalists, researchers, academicians and other stakeholders. ENVIS is a decentralised computerised network database system with 67 ENVIS centres throughout the country out of which 39 centres are on subject-specific and 28 on State/UT related issues. ENVIS is also designed and act as a National Focal Point (NFP) for INFOTERRA, a global environmental information network of the United Nations Environment Programme (UNEP). The long-term objective of ENVIS is to build up a repository and dissemination centre in environmental science and engineering, to gear up the state-of-the-art technology of information acquisition, processing, storage, retrieval, and dissemination of information of environmental nature, and to support and promote research, development and innovation in environmental information technology. ENVIS also organises workshop relating to its programs in different cities. ENVIS centres are partly funded by the government.

**Table 3.2: Overview of current institutes as potential CoE for DM in India**

<table>
<thead>
<tr>
<th>NIDM</th>
<th>The nodal agency engaged in DM training and research.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active international collaboration for advanced training and research.</td>
</tr>
<tr>
<td></td>
<td>Accountability and commitment of DM in India</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>International Institutes</th>
<th>Active research and training relating to disaster management in Asia, South Asia or disaster specific focus.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Growing inter-linkages across nations for a common resource</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>National and International Networks</th>
<th>Communication across institutional boundaries and expertise.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SIDM</th>
<th>Intensive research on local hazards, vulnerability and disaster response.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>There is a need to extend the focus and place state research in the broad natural and socio-economic context in the national and international scenario.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ATIs</th>
<th>Some of the ATI are actively engaged in disaster research primarily due to availability of expertise in the area, which can be used for building network and knowledge around critical themes.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The research at ATIs may range from academic to action research.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional DM Institutes</th>
<th>RDIM are potential for effective training, research and human resource development for DM.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Their focus on more than one state suggests their potential to attract people for qualifying DM.</td>
</tr>
</tbody>
</table>
International Best Practices

Some of the international best practices, which could also guide the COE for training, research and data collection in India are as follows:

Centre for Excellence in Disaster Management and Humanitarian Assistance, USA

The Centre for Excellence in Disaster Management and Humanitarian Assistance (COE-DMHA), established in 1994, operates under the authority of the Secretary of Defense, USA. It aims to enhance civil-military preparedness and response through collaborative partnership, applied research, education and training. It collaborates with various national and international governmental and non-governmental organisations for research and education to improve DM at the local level.

Bushfire Cooperative Research Centre, Australia

In 1993, Bushfire Cooperative Research Centre (CRC) is started in Australia. It consists of all the fire and land management agencies in Australia and New Zealand, Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Bureau of Meteorology, the Attorney General’s Department and several other fire related organisations. Its mission is ‘to enhance the management of the bushfire risk to the community in an economically and ecologically sustainable manner. It includes the following objectives: 1) To develop an internationally renowned centre of excellence to lead bushfire research in Australia; 2) To provide a research framework that will improve the effectiveness of bushfire management agencies; and 3) To increase the self-sufficiency of communities in managing the risks from bushfires.’

Centre for Research on Epidemiology of Disasters, Belgium

Centre for Research on Epidemiology of Disasters (CRED) was created by the collaboration of WHO and the Belgian Government in 1998. The centre is well known for maintaining the emergency events data base called EM-DAT for the world. It was founded with an objective to serve humanitarian actions at different levels and support decision making. It contains a database of over 18,000 mass disasters from 1900 onwards. It compiles data from UN, NGOs, insurance companies, research institutes and press agencies. The data is created with an aim to rationalise decision making for disaster preparedness, as well as provide an objective base for vulnerability assessment and priority setting. Such a research-based knowledge database for India is critical to support decision making and capacity building.

Crisis Management and Disaster Response Centre of Excellence

The Crisis Management and Disaster Response Centre of Excellence (CMDR COE) was established by the Ministry of Defence of Bulgaria in 2012 to pursue research, development and improvements in capabilities for crisis response. The centre has a structure and staff from the Ministry of Defence. As it is formed as Bulgaria’s contribution to NATO’s commitment, its budget is formed on the basis of contributions by the participating countries. Its aim is to attract expertise to improve capacities of crises and disaster response by providing education and training of military personnel, government officials, civilians and to build organizational structures for the same. The organizational structure for CMDR COE is shown in the following figure, which demonstrates its diversification and key expertise.
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Figure 3.3: Organisational Structure of the Crisis Management and Disaster Response Centre of Excellence (CMDR COE)

Numerous experts from different government and non-government organisations, state agencies and private companies take part in various activities organised by CMDR COE. In one of its seminar events more than 80 Subject Matter Experts from 14 Nations and 150 participants met in Sofia to discuss Interagency Cooperation in Crisis Management and Disaster Response (CMDR), which depicts the scale which is more likely at the national scale. The COE also plays an important role in developing itself as COE and to advance its training and learning programs and policies. It also holds events that look for building cooperation between different organisations in crisis and disaster response operations; CMDR policies and practices; best training practices; simulation systems and tools for CMDR training; and e-learning, strategic communications and leadership in CMDR.

Centre for Excellence in Emergency Preparedness (CEEP)

CEEP is a non-profit organisation in Canada dependent on grants from funding agencies and cost-recovery from consultative and educational relationships with public and private organisations. The mission of the Centre for Excellence in Emergency Preparedness is to promote a standard of excellence in health and define a standard of care for emergency preparedness. For this it also provide resource, promotes research and facilitate emergency preparedness planning by working with local, national and international stakeholders. It shares best practice from one jurisdiction to others, or researches the literature on best practice outside of Canada and adapting it to our specific environments. It emphasises on the creation of needs assessment tools, allows gaps in preparedness to be identified, and development of educational programs to address the gaps. Standards, tools, educational programs and position papers are produced according to need. Many of these do not need to be created from scratch - they already exist in many forms throughout the country. In these circumstances, CEEP will serve as a clearing house for expertise, and a forum to build consensus based on best practices, to promote this consensus through federal and provincial agencies and achieve a high standard of consistency and seamlessness in knowledge and in practice.
Integrated Research for Disaster Reduction -International Centre of Excellence (IRDR-ICoE)

Integrated Research for Disaster Reduction -International Centre of Excellence (IRDR-ICoE) is an international initiative to address issues relating to natural hazards mitigation, response and policy implications. It is sponsored by the International Council for Science (ICSU) in partnership with the International Social Science Council (ISSC), and the United Nations International Strategy for Disaster Reduction (UN-ISDR). IRDR-ICoE aims to serve as an international platform for conducting integrated research on disaster risk from both the natural and social science perspective, establish a partnership network for disaster reduction research in Taiwan and international scientific community, and promote and coordinate interdisciplinary research on disaster risks. It runs several programs to encourage research in the field. Its key programs have been broadly classified as visitors program to host short and long-term visiting scientists, to organise workshops and scientific meetings, capacity building in cooperation with international organisations, calling meeting of board members to consult on scientific issues, and pursue integrated research programs.

Figure 3.4: Organisational Structure of the Integrated Research for Disaster Reduction - International Centre of Excellence (IRDR-ICoE)


LESSONS:
- COE are the hub of highly specialised expertise as well as state-of-art infrastructure which place them separate from individual research, training or educational institutions.
- The active network of COE with different institutions provides a scope to conduct both extensive as well as intensive research in a specific area.
3.4 POTENTIAL TRAINING MODULES

After the 2004 Indian Ocean Tsunami, four universities with the leadership of Kyoto University have undertaken developing training modules through participatory action learning ways. Eight modules were developed as follow by three universities in India [University of Madras], Indonesia [Institute of Technology Bandung] and Sri Lanka [University of Peradeniya]. A detailed need assessment was made with the graduate students in these respective universities [around 350 students]. These are shown in Figure 1 and 2 below.

Further, in order to assist the State Governments in capacity building and awareness generation activities and to learn from past experiences including sharing of best practices, the Ministry of Home Affairs has compiled a set of resource materials developed by various organisations to be replicated and disseminated by State Governments based on their vulnerabilities after translating it into the local languages. The voluminous material which runs in about 10000 pages has been divided into 4 broad sections in 7 volumes. These sections cover planning to cope with disasters; education and training; construction toolkit; and information, education and communication toolkit including multi-media resources on disaster mitigation and preparedness. The Planning section contains material for analysing a community’s risk, development of Preparedness, mitigation and disaster management plans, coordinating available resources and implementing measures for risk reduction. The model bye-laws, DM Policy, Act and model health sector plan have also been included.

Education and Training includes material for capacity building and upgradation of skills of policy makers, administrators, trainers, engineers and so on in planning for and mitigating against natural disasters. Basic and detailed training modules in disaster preparedness have been incorporated along with training methodologies for trainers, for community preparedness and manuals for training at district, block, panchayat and village levels. For creating a disaster-resistant building environment, the Construction Toolkit addresses the issue of seismic resistant construction and retrofitting of existing buildings. BIS Codes, manuals and guidelines for RCC, Masonry and other construction methodologies as also for repair and retrofitting of masonry and low-rise buildings have been included.

Over the course of this study, a number of modules on health, education, PRI, ULB and disaster reporting for senior and junior journalists were developed. These should be widely incorporated into the training units of COEs. A strategy for a public awareness campaign was also developed that may be incorporated in training programmes.

Table 3.3: Potential Training Modules Developed

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Training Theme</th>
<th>Intended Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mainstreaming DRR into development planning</td>
<td>Policy makers, planners and program/project designers at the central and state levels</td>
</tr>
<tr>
<td>2</td>
<td>Mainstreaming DRR into rural development policies and programs</td>
<td>Policy makers and program/project designers at the central and state levels</td>
</tr>
<tr>
<td>3</td>
<td>Mainstreaming DRR into City Development Plans (CDPs) and their implementation strategies</td>
<td>Policy makers and program/project designers at the central, state and city levels</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Target Audience</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4</td>
<td>Strengthening PRIs for mainstreaming DRR into development on the ground</td>
<td>Program/project managers at the district and sub-district levels</td>
</tr>
<tr>
<td>5</td>
<td>Preparing the health functionaries for emergency health services</td>
<td>Program/project managers at the state and district levels</td>
</tr>
<tr>
<td>6</td>
<td>Creating a culture of safety and resilience through knowledge, innovation and education</td>
<td>Trainers and teachers at the state and district levels</td>
</tr>
<tr>
<td>7</td>
<td>Strengthening emergency communication including early warning and last mile connectivity</td>
<td>Program/project managers at the district and sub-district levels</td>
</tr>
<tr>
<td>8</td>
<td>Community Led Hazard Risk Vulnerability and Capacity (CLHRVC) assessment</td>
<td>Civil society functionaries; CBO members; program/project managers at the district and sub-district levels</td>
</tr>
<tr>
<td>9</td>
<td>Participatory training and capacity needs assessment (PTCNA)</td>
<td>Trainers and training planners and managers at NIDM, GIDM and other similar institutes, DMC, SIRDs and other sector level training institutions</td>
</tr>
<tr>
<td>10</td>
<td>Participatory evaluation and action learning (PEAL)</td>
<td>Program/project managers at the national and state levels</td>
</tr>
<tr>
<td>11</td>
<td>Integrating gender approaches in disaster management plans</td>
<td>Program/project designers and managers at the district and sub-district levels</td>
</tr>
<tr>
<td>12</td>
<td>Use of media in generating mass awareness on disaster management</td>
<td>Media people and information officers from within government</td>
</tr>
</tbody>
</table>

**Localisation**: Even though such training modules play an important role in imparting essential skills for disaster management, their effectiveness in the local context needs to be assessed and modified for the local use.

The training module development and delivery are equally important for the sustainability of the training programs. Following are some suggested highlights:

**Static-Dynamic Contents**: Certain amount of the contents of each training module need to be static [basic issues], and certain amount of the contents need to be case study based, which need to come from the research conducted in COE. This will make an interface of training and research activities.

**Mode of Delivery**

The mode of delivery, based on its nature and expected participants can be divided into:

1. Face to face training: which is ideal for participants from Gujarat
2. Online training: using the online system through internet
3. Blended learning program: combination of face to face and online training programs.

**Expected Participants**

The participants of the training modules will differ with the focus, scale and outreach of a COE. While in case of national and state level COE, the primary target of the training modules will be
government officials from the national and state departments, gradually the percentage should increase to attract other participants from national and international levels. Expected number of participants may vary from course to course, but should be between 15 and 25.

**Terms of Course**

The expected duration of each course is one week, which has 5 working days. The same course would be delivered twice within the same academic/financial year, one in the spring [between April to September], and other in the fall [between October to March].
4. STRUCTURAL AND PROCESS GUIDELINES FOR ESTABLISHING COES

4.1 THE STRUCTURE

The COEs are envisioned at National and State level to have an optimised use of local information, data and infrastructural resources.

Ownership: An important criterion to design COEs is their ownership. This has been considered in order to introduce diversity in their maintenance and source of information. It will also increase partnership across various stakeholders, which can play an important role in exposing different areas of research and needs. It is suggested that the COEs at various levels include government, private organisations, NGOs and civil society and academic institutions.

The factors for choosing a COE include functional, geographic zones/area, hazard and thematic expertise. This approach has been taken in order to best address the identified gaps and priority areas in disaster management. It also helps ensure that detailed subject-specific research can be consolidated into broader areas for cross-linkages, better sharing and usage at a policy level; as well as translated into actionable material for widespread dissemination to concerned stakeholders and communities. This outline is further detailed and suggestions of possible institutions are provided in the sections below.

| NATIONAL INSTITUTE OF DISASTER MANAGEMENT (NIDM) – Overall Coordinator |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| NATIONAL LEVEL COES | Functional | Education and Research | Training | Policy and advocacy | Media | Public Awareness |
| STATE LEVEL COES | Zone / area | Arid | NE Hills | NW Hills | Coastal | Island | Urban | North | South | East | West | Central |
| Hazard | Cyclone | Flood | Drought | Landslide | Earthquake | Tsunami |
| Thematic | Early warning and last mile connectivity | First response | Mainstreaming DRR into policy development | Public awareness and media | Sector specific DRR plans and policies |
| | | | | | Health, Housing, Water and sanitation, Education, Rural Development, Public works, Telecommunication, Human settlements and Social welfare and inclusion |

STATE LEVEL CDMs (Providing basic research and serving as dissemination points)

DISTRICT LEVEL EOCs (Providing ground inputs and documentation during peace time)

4.1.1 Functional areas

At the national level, COEs are envisaged across the five core functional areas where gaps lie. These are expected to also help consolidate thematic, hazard and area based inputs from a more functional perspective. Such COEs may help promote consistency and fulfillment of the core purpose.

Research and Education: One of the most important facets of COEs is the conducting of research and academic information. It is recommended that IIT Roorkee could be developed into a COE for
Preparing Long Term Training and Capacity Building Strategy for Disaster Risk Reduction under NCRMP: Guidelines for Setting up Centres of Excellence on Disaster Risk Reduction

Research and Education (Technical) and Tata Institute of Social Sciences (TISS) as a COE for Research and Education (Social).

Training: As mentioned in earlier parts of this report, training at all levels is often ad hoc and insufficient. A COE devoted primarily to coordinating training initiatives is necessary. It is recommended that a training organisation such as RedR could be developed in a national COE on training. Their scale of operations and broad reach will help ease implementation issues.

Policy and advocacy: Though rarely seen as a separate functional area for COEs, the policy and advocacy perspective will play a key role in the DRR sector in the years to come, especially as the impacts of climate stresses on day-to-day life intensify. It is proposed that the national COE on Policy and Advocacy remain within the government system at the Indian Institute for Public Administration (IIPA).

Public Awareness: The knowledge, ability and will of the general public to take action on DRR and during emergencies is one of the strongest determinants of the safety of the communities in question. Public awareness needs to be anchored in a civil society organisation which is both respected and has significant reach across the country. It is proposed that either SPHERE India or the Indian Red Cross be developed as a national COE on Public Awareness.

Media: The media plays a critical role in informing the public during disasters and in promoting risk reduction behaviour during non-disaster times. There is a critical need for future research on the roles of the media and for journalist training. It is proposed that the National COE on Media be anchored in a university setting such as Amity University (which currently has one of the largest communications courses in the country).

4.1.2 Hazards

India is exposed to a range of natural hazards and disasters. However, a few of them cause recurrent and mega disasters. It has thus become important to identify COEs specific to different hazards, so that the research can be directed to specific areas that need focused attention. The following categories have been noted to locate COEs at the state level:

- Cyclones
- Floods
- Landslides
- Earthquake
- Tsunami
- Drought

4.1.3 Geographic areas and zones

India is divided into various physiographic regions, the number of which varies on the basis of the criteria identified. The location of COEs in different parts of India will ensure identification of local as well as national problems; along with solutions across administrative boundaries which often limit the free flow of information and resources. The geographical zones and areas to consider for COEs include the following:

- Arid
- NE Hills
- NW Hills
- Coastal
- Island
- Urban
- North
- South
- East
- West
- Central
4.1.4 Thematic areas

There are certain processes and issues which are closely linked with disaster occurrence, mitigation and response. While there are many institutions dealing with these processes, they do not necessarily focus on disasters. Locating COEs for these specific areas can also help to bring new knowledge and expertise which can contribute to disaster mitigation and management. The following thematic areas are recommended around which to build COEs in India:

- Early warning and last mile connectivity
- First response
- Mainstreaming DRR into policy development
- Public awareness and media
- Sector specific DRR plans and policies
  - Health
  - Housing
  - Water and sanitation
  - Education
  - Rural Development
  - Public works
  - Telecommunication
  - Human settlements
  - Social welfare and inclusion

Other issues will need to be taken into consideration under this thematic focus that may form COEs in themselves, but will need to be integrated into the thinking process. This includes issues such as fire and the training of fire servicemen.

The history of fire services in India is more than 200 years old. The fast pace of industrialisation with the extensive use of hazardous materials and increased construction of multistoried buildings has not only enhanced the risks due to fire accidents, but has also put tremendous strain on the operational abilities of firemen. In addition, as envisaged in the Disaster Management Act 2005, fire services are also responsible to carry out relief, search and rescue operations in case of large natural calamities. Yet there is very little capability to do so. Given the existing state of preparedness and fire fighting capabilities it is clear that very little competency is available with the fire service departments to responding to such emergencies.

However, the Ministry of Home Affairs has drawn up a new scheme for the Twelfth Plan Period (2012-17) to modernise Fire services at a cost of Rs 2000 crores. The Scheme will be covering 28 States and 7 UNION Territories, with a total of 640 Districts and 5576 sub divisions.

4.1.5 Implementing institutions

Centres of Disaster Management (CDMs) at the state level and Emergency Operation Centres (EOCs) at the district level will serve as supporting and implementing institutions. They can help both to document at the local level and present specific needs; as well as serve as dissemination points for information to the general public. In order to enable this, every district must have a functioning Emergency Operation Centre at all times.

Research Clusters: Apart from individual research centres as centres of excellence for research in DM, research clusters should also be identified and developed based on location, ownership, focus on specific hazards and so on. Development of research clusters with help to generate quality infrastructure and may attract both national and international visitors and collaborators interested in particular area of research.
4.2 BENCHMARKS TO BECOME AND REMAIN A CENTRE

Table 4.1: Benchmark characteristics a for COE

<table>
<thead>
<tr>
<th>S. No</th>
<th>Benchmarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic facilities (including physical infrastructure and hardware)</td>
</tr>
<tr>
<td>2</td>
<td>Institutional set-ups and information systems</td>
</tr>
<tr>
<td>3</td>
<td>Qualified faculty and staff</td>
</tr>
<tr>
<td>4</td>
<td>Fundamental research and application</td>
</tr>
<tr>
<td>5</td>
<td>Training and outreach</td>
</tr>
<tr>
<td>6</td>
<td>Future plans in place</td>
</tr>
<tr>
<td>7</td>
<td>Meets at least a minimum level of collaboration with other institutes/COEs</td>
</tr>
<tr>
<td>8</td>
<td>Certification through internal and external linkages</td>
</tr>
<tr>
<td>9</td>
<td>Quality assurance with accreditation in every 5 years</td>
</tr>
</tbody>
</table>

4.2.1 Accreditation

The accreditation of COEs can be done by National Assessment and Accreditation Council which accredits institute rather than National Board of Accreditation which is mainly engaged with the accreditation of programmes. However, since COE have different characteristics and roles as compared to any other educational, research or training institute, some qualifying criteria need to be separately developed for them considering the above benchmarks.

Criteria: NAAC has developed seven criteria for the accreditation of the institute, which may also apply to COE. However, a different level of standard and requirement needs to be defined for COE. The seven criteria that are considered by NAAC include the following:

- Curricular Aspects
- Teaching-Learning and Evaluation
- Research, Consultancy and Extension
- Infrastructure and Learning Resources
- Student Support and Progression
- Governance, Leadership and Management
- Innovations and Best Practices

Accreditation Parameters

The accreditation parameters have been more clearly established by NBA than NAAC. These parameters, however, needs to be redefined for COE and some of these have been addressed in the previous sections. The NBA parameters include:

1. Research and knowledge building
2. Problem analysis
3. Conduct investigations of complex problems
4. Modern Tool Usage
5. Science and Society
6. Environment and Sustainability
7. Ethics
8. Individual and Team Work
9. Communication
10. Project Management and Finance
11. Life-long learning

**Accreditation Policy and Process**

Some of the accreditation policies and processes can be defined following the existing policies adopted by NBA. These may include:

- **COE as an institute and not individual programmes will be accredited.**
- **The application for COE will be considered for assessment and accreditation only at the written request with evidence of specified criteria and parameters meeting the standard of a COE.**
- **The institution will have to pay accreditation fees.**
- **Institutes will be evaluated in accordance with the accreditation criteria given for various categories of institutes falling in education, research or training domain. Accreditation will be based on satisfying the minimum standards.**
- **A two/three day onsite visit shall be a part of the accreditation process. An evaluation team appointed by the authority will carry out the evaluation of the programme. The evaluation team consists of one (or) two evaluators for each programme and is headed by a Chairperson. The institute shall propose such a set of dates for the visit when the regular classes and all academic activities are on.**
- **The final decision made by the accreditation authority will include comments on strengths, weaknesses and scope for improvement. In case of no accreditation, the institute can reapply for accreditation in the second round with suggested changes.**
- **Accreditation will be granted for a specific term based on the recommendations of the concerned Evaluation and Accreditation Committee. After that term application for its renewal of accreditation is mandatory.**
- **After accreditation, the institutions are expected to submit their annual self-assessment report online. If any aspect of the programme is found to be sufficiently unsatisfactory and/or does not comply with norms, the accreditation authority may reserves the right to revoke the accreditation. If necessary, the authority may appoint a maximum of two members to form an Evaluation Team to act as mentors at the request of institution.**

Source: National Board of Accreditation
5. IMPLEMENTATION ROADMAP

5.1 KEY STEPS

Detailed mapping: A detailed mapping exercise needs to be undertaken that looks at all possible ATIs, NGOs, civil society organisations, academic institutes and private organisations. This is required in order to identify potential COEs at the State levels in accordance with the criteria defined above.

Strengthening of NIDM: NIDM needs to be strengthened in terms of budgets, infrastructure and faculty in order to transition from a COE to an overall coordinator of the COE network in India.

Creation of detailed plans for individual centres: Once individual organisations are identified, the process of creating actionable plans with fixed timelines and projected budgets needs to be undertaken. This will be the roadmap to becoming a Centre of Excellence.

5.2 WAYS OF WORKING

5.2.1 Earning the title

It is important that an institute or organisation earns the title of a Centre of Excellence. According this title at the beginning itself and then having the institute only work to maintain it takes away the value attributed to it. Having the title be a coveted one will change the perception and bring importance to standards and quality of work.

5.2.2 Decentralised but networked

One of the major roadblocks in the functioning of current COEs is the lack of autonomy in decision making. In order for innovation to thrive and fast decisions to be made, it is proposed that power be decentralised and COEs be given freedom to run (within the established boundaries of the accreditation process). However, it is important that this decentralisation doesn’t translate into working in silos. Therefore, networking is an important component of the way the COEs will function. Rather than a vertical hierarchy, these will function more as horizontal partnerships, supporting and helping strengthen each other’s work. In order to ensure that this is actually implemented, collaboration is a core component of the accreditation process.

Aside from the actual COEs, there will need to be resource institutions which form a part of this network to provide advice and expertise. These include institutions such as the Indian Meteorological Department (IMD) and the Central Water Commission (CWC).

5.2.3 Public-private partnerships

A PPP approach should be adopted for the running and long-term development of COEs. Not only is this important for long-term sustainability in terms of funding, but it can also help bring products and ideas into the mainstream market. In terms of broader change and adoption of innovative ideas on a large scale, involvement of private institutions will be necessary.

5.2.3 Outcome-based approach

The fundamental research, training, policy advocacy, public awareness and media activities should not be judged on the basis of what has been carried out alone. Rather the impact or outcomes need to be monitored and evaluated to actually determine the value of the work. This is another component that must be built into re-accreditation schemes.

5.3 ACTION RESEARCH AND LINKS TO ACADEMIC NETWORKS

The interface between science and governance requires research that is multidisciplinary, interdisciplinary and trans-disciplinary in approach (Pereira et al. 2010). Multidisciplinary approaches refer to the study of an issue from the perspective of several disciplines; with minor changes in
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methodology of individual disciplines (goal-oriented). Interdisciplinary approach involves the
transfer of methodology from one discipline to another; at advanced levels leads to changes in
epistemology. In trans-disciplinary approaches, there is simultaneous integration of knowledge from
various disciplines and perspectives, involving various stakeholders. Researchers and practitioners
create synergies, drawing on explicit, tacit and indigenous knowledge as well as inputs from
stakeholders to develop various policy (regulatory, economic, voluntary etc.) communication and
assessment tools. The goal is knowledge that is policy relevant, which facilitates informed decision-
making at various levels (i.e. international, regional institutions, federal, state and local,
organisational). Stakeholders include government, industry, investors, non-government
organisations, community based organisations, scientific organisations and professional bodies,
among others. Peers in academia are also a stakeholder and they play a critical role in quality
assurance for the research through the production of reviewed journals.

The Asian University Network of Environment and Disaster Risk Management (AUEDM) is a great
example of this kind of collaboration. It brings together prominent Asian universities to share
knowledge resources related to environment and disaster risk management; both amongst
themselves and with the larger group of stakeholders working on these issues. AUEDM members
work in close collaboration to conduct education and research, share findings and find ways forward
in a region that is increasingly at threat due to climate change impacts. AUEDM also works closely
with governments, international agencies and corporate and civil society organisations to establish
collaborations that eventually lead to resilient communities. AUEDM reflects each member’s
commitment to implementation-oriented education and research in the field of environment and
disaster risk reduction.

It has three main imperatives:

- Educational imperative: To discuss the status and scope of environment and/or disaster
management curriculum in the higher studies in each university. Each country has its own
perspective. Some countries have full two years DRR master program. Some universities have
some modules of DRR in the postgraduate programs. Therefore, the attempt is not to
standardise the program, but to learn and understand the process in DRR. The challenge is how
effective the process can be customised into each context.

- Research imperative: To discuss the possibility of climate change adaptation as the key entry
point of collaborative research. Each country has a high prevalence of impacts of climate change
being borne by the most vulnerable communities. Impacts are most visible on coastal,
mountain, urban poor and migrant communities. Since adaptation is a relatively new subject,
heavy investments need to be made in research on effective local adaptation as a means for
coping with imminent climate change impacts and linked disasters.

- Network imperative: To discuss the establishment of the Asian Universities network. While
there are integral commonalities in the vulnerability context and the nature of impacts, the local
setting and contextual nuances are highly varied across Asian countries. Networking is the only
way to share knowledge and experiences, and to draw lessons based on principles derived from
practices. The network is thus expected to go a long way in the development of a regional
knowledge base, making it accessible for practitioners, and using it to influence the policy
environment.

To establish the unique approach, a few specific approaches have been undertaken as follow:

First, a strong relationship is established with the ADRRN [Asian Disaster Reduction and Response
Network], which is the network of national and local NGOs. ADRRN has a strong presence in the
community levels in the Asian countries, and the network members possess several community
based projects on different aspects of disaster risk reduction as well as post disaster recovery.
These projects can be considered as field laboratories, from where different education and research
elements can be obtained. The cooperation of collaboration of local civil society and local university would be extremely important.

The second point is the collaboration among different universities. Ideally, a south-south collaboration is needed to be established among the universities, where the students can conduct joint projects on a similar cross-boundary topic. This is considered to be effective for solving local problems collectively from different universities. This will also be a good educational process for the young researchers and graduate students.

The third point is the collaboration with the cities network. CITYNET is the local government network in the Asia-Pacific regions, and has a disaster cluster, which focuses on the disaster related activities in the urban areas. Many of the urban risk related research is not utilised into action due to lack of linkages to the city administration. AUEDM has started strong collaboration with CITYNET to provide training to the local government officers from the member cities, and undertake participatory risk reduction projects in the selected cities in the Asia Pacific region. This will ensure the link of the research into practice and policy.

**Learning for the COE network in India:** A similar approach can be tried at a national level connecting not only the academic institutions but also with the governmental, NGOs and private organisations.
ANNEXURE
Workshop on Evolving a Roadmap for Centres of Excellence for DRR and CCA in India

22nd November, 2013

Preparing Long Term Training and Capacity Building Strategy for Disaster Risk Reduction in India, under NCRMP

03rd December, 2013

Submitted to

Submitted by
Roadmap to Centres of Excellence workshop

Introduction

Centres of excellence are ‘institutions possessing special knowledge or expertise in a particular area of concern and incorporated into the collaborative environment to facilitate development of the products supporting (key) functions and operations.’

The creation of capacities for disaster management in general and disaster risk reduction in particular currently varies from state to state based on resource availability and the active involvement of respective governments. DM Faculties at ATIs or SRDs have been established in most states covering DRR aspects. However, it cannot be said that all of these DM faculties are working with optimum capacity and efficiency. There are gaps in existing training institutes covering organizational and institutional issues. There is a need to consider upgrading at least some of the institutes or establishing new ones as Centres of Excellence. The approach also requires a larger vision of a national network of such Centres of Excellence.

The objective of establishing Centres of Excellence is to augment and strengthen qualitative capacities for disaster risk reduction through resource development. Research & Development activities at such centres enable the development of disaster mitigation and management strategies; the development of databases for rapid dissemination of information and knowledge; experience sharing; and efficient deployment of quality training modules and trainers.

The workshop was organised by Indian Institute of Public Administration (IIPA), SEEDS Technical Services and Knowledge Links which is linked to the World Bank supported programme on Long Term Training and Capacity Building for Disaster Risk Reduction in India, being currently implemented by the National Institute of Disaster Management. The workshop schedule and list of participants of the workshop is annexed as Annexure I and Annexure II respectively. The workshop deliberated with experts the concept of Centres of Excellence, towards evolving national guidelines for setting up a network of such centres in India. It brought together experts in disaster management, senior trainers, government officials, academics and professionals to discuss a roadmap for creating centres of excellence. The conversation revolved around key questions of what a COE is, where they should be, what they should do and what the most practical approach could be to ensure that these are made functional.

There were 27 participants in the workshop from various departments and agencies to put their insights. The welcome note by Dr. V K Sharma, Senior Professor, IIPA provided a national perspective on environment, climate change and disasters which defined the context of the workshop. Dr. Anshu Sharma, from SEEDS Technical Services discussed briefly about the Centres of Excellence component in the national capacity building approach under NCRMP through a presentation which is annexed as Annexure III. This was followed by special comments from Dr. Rajib Shaw, Professor, Kyoto University and Shri M P Sajnani, DM expert, National Capacity Building Study, NCRM which provided deeper insights about the subject. A plenary discussion on way forward on Centers of Excellence in India was chaired by Dr. Anandha Kumar, Coordinator, National Capacity Building Study, NCRM.

The following views and insights emerged from the workshop.

The idea of a ‘COE’

• ‘Excellence’ evolves over time. Calling an institution a ‘centre of excellence’ from the beginning takes away this drive to evolve and already puts them in a position of prominence. Instead they need to reach eminence by virtue of their performance.

• Create capacities in an identified institution and work out a roadmap. Then plan, hire and train professionals. After that, give them a timeframe to achieve their performance.
Expertise
• The COEs must have either have disaster-specific or function-specific expertise.
• Some people commented that rather than centres should be built around an individual, rather
  than a specific disaster/function. This is the idea of ‘transformational leadership’ (something along
  the lines of how ISRO was first formed).

What should the COEs do?
• Develop training modules for all levels and train master trainers.
• Take up research. Have labs (both physical and virtual) that bring the best minds together, ideate
  and find solutions.
• Document and come up with lessons learnt after any disaster.
• Play the role of an incubator; indentifying and nurturing those institutions that have the ability to
  become COEs in the long term.
• Public policy consulting?
• Perhaps also become ‘deemed universities’ that issue certificates to those that pass their courses.
• Overall, the COEs should serve not just as isolated units or infrastructures, but serve to create a
  broader niche area in the study of disaster management. They should develop the younger
  generation.

Where should they be?
There were a lot of conflicting views on this and no consensus could be reached.
• Some stated that each COE should cover national, state, district and community level. Others said
  there should be separate
• Don’t impose COEs on every state. See the willingness and ability of the institutions.

Funding
• Funding will have to come from the government to some extent.
• Public-private partnership (PPP) approach could be adopted for funding
• Must be performance-based funding

What process should be followed?
• Map all institutions, government centres, non-profits, academic institutions and private
  companies that could house centres of excellence.
• Define the audience and end-users.
• Be clear about the objectives of the centre
• Create measurable and quantifiable indicators and criteria to measure performance
• Ensure that the centres are ‘free from shackles’. They must have the authority to sanction posts
  and funds. Hiring and firing must be under them.
• Develop the quantity, but maintain the quality. DRR is rapidly changing and mutating, so there is a
  critical need to maintain the quality.

Other projects to study for insights
• ENVIS centres – partly funded by the government. The funds are approved there are 67 ENVIS
  centres across the country that are linked through a web portal. The state wings of the Ministry of
  Environment are also automatically ENVIS centres.
Preparing Long Term Training and Capacity Building Strategy for Disaster Risk Reduction under NCRMP: Guidelines for Setting up Centres of Excellence on Disaster Risk Reduction

- Rural housing portal: The site/network works at many levels. It integrates both ground level voices (taking into account the needs of the people) along with newer technologies and projects. The systems of information collection and multi-level involvement could be studied.

The discussion ended with a way forward for National Network of Centres of Excellence on DRR and CCA by Dr. V K Sharma, Senior Professor, IIPA. The workshop was concluded with a vote of thanks to all the participants.

Annexure - I

Workshop on Centres of Excellence on DRR and CCA – Evolving a Roadmap

Date: 22 November, 2013
Venue: Indian Institute of Public Administration (IIPA), New Delhi
Time: 02:00 pm to 04:00 pm

Workshop Schedule

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<th>Item</th>
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<td>1.</td>
<td>Welcome and Keynote: National Perspective on Environment, Climate Change and Disasters</td>
<td>Dr. V K Sharma, Sr. Professor, IIPA</td>
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<td>2.</td>
<td>The Centres of Excellence Component in the National Capacity Building Approach under NCRMP</td>
<td>Dr. Anshu Sharma, SEEDS Technical Services</td>
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<td>3.</td>
<td>Special Comments</td>
<td>Dr. Rajib Shaw, Kyoto University, Shri M P Sajnani, DM Expert, National Capacity Building Study, NCRMP</td>
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<td>4.</td>
<td>Plenary discussion on way forward on Centres of Excellence in India</td>
<td>Chair Dr. Anandha Kumar, NIDM, Coordinator, National Capacity Building Study, NCRMP</td>
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<td>5.</td>
<td>Way forward for a National Network of Centres of Excellence on DRR and CCA</td>
<td>Dr. V K Sharma, Sr. Professor, IIPA</td>
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## Annexure - II

### Workshop on

**Centres of Excellence on DRR and CCA – Evolving a Roadmap**

### List of Participants

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<tr>
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<th>Organisation</th>
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