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Role of Education in Mitigating Disasters in India—thus Saving Lives

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"We must, above all, shift from a culture of reaction to a culture of prevention. Prevention is not only more humane than cure; it is also much cheaper.... Above all, let us not forget that disaster prevention is a moral imperative, no less than reducing the risks of war"

— Kofi Annan

Former UN General Secretary at the UNGA 2001[1]

Key Points

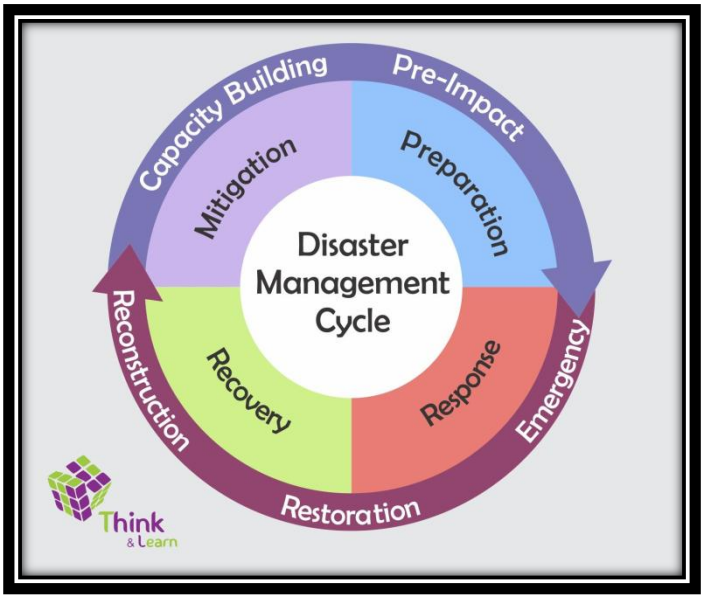
- Strengthening the capacity for building resilience to disasters, though critical, yet is neglected in our country, since "a culture of safety", is yet to become a part of Indian society. So, instead of preparing for disasters, we are still reacting to them.
- Need to shift focus on teaching Disaster Risk Reduction (DRR) techniques in schools and colleges.
- Education has an important role— in creating awareness of disaster risks. Need it at 3 levels viz. 'Elementary knowledge' for Middle School, 'Basic/Advanced disaster skill sets' for Senior School and 'Higher skill sets' for College students.
- A similar Disaster Education Programme (IDMP) could be duplicated across the spectrum to train teachers/ healthcare workers/ civil service probationers/ municipal workers/police and allied services/CAPFs and the Armed Forces—all involved in the practice of DM.
- Disaster Education is thus the key for attaining Disaster Risk Reduction and achieving human security-in pursuit of sustainable development.

Introduction

These words of Kofi Annan, given 20 years back, sum up the need and urgency of disaster prevention, in modern day lives. Towards this, we first need to understand the Disaster Management (DM) Cycle, which has four clear phases: 'capacity-building' i.e. preparedness to deal with any disaster; 'prompt response' to any threatening disaster after assessing the severity or magnitude of effects of any disaster and evacuation, rescue & relief; and lastly, 'rehabilitation' and 'reconstruction'. Each stage or phase involves a

number of activities; within these, the 'response' phase is most crucial in mitigating the effects of a disaster on affected communities. However, this phase, is also the most neglected and has not yet been given due attention by our disaster planners, at all levels— national, state or even the grass root (district) level**.**

Figure 1: Phases of Disaster Management Cycle



Source: www.nidm.gov.in

As an evolving and progressive country, India has come a long way. Yet, what is still lacking is the 'culture of safety', which is yet to become a part of our day to day living, and we are still reacting to disasters, instead of preparing for them. In spite of all advances in science and technology, setting up of various monitoring and Early Warning (EW) stations across the length and breadth of the country,the basics are still missing— an awareness culture and community involvement in teaching people (especially the children/youth) about how to prepare for disasters, both natural and man-made, the basic drills to be carried out in case of crisis/emergencies and therafter, how to tackle such calamities, with the help of NGOs/Govt bodies/Armed Forces and other aid agencies, etc. Hence, it is imperative that our educational institutions, our schools and colleges, prepare their wards for emergencies, in a professional manner, so that this omni-present "lack of safety culture" is got rid off, and our children/youth are conversant in the various Disaster Risk Reduction (DRR) techniques.

Concept of Disaster Management in the Indian Context

India is a country with diverse hydro-graphic and climatological conditions. To visualise our national vulnerability, it is pertinent to mention that 70% of the cultivated land is prone to droughts, 60% prone to earthquakes, 12% to floods, 8% to Cyclones, 85% of the land area is vulnerable to a number of natural hazards and 22 states are categorised as multi-hazardous states.[2]

Traditionally, as mentioned above, India has always been reactive towards disasters, with precious resources being spent on relief, rehabilitation, and reconstruction. However, there has been a major shift in this approach, post the enactment of the Disaster Management (DM) Act (2005) and setting up of the National Disaster Management Authority (NDMA) thereafter—focus has now shifted to pre-disaster aspects that is prevention, mitigation, and preparedness, as it is felt that appropriate mitigation measures can substantially, if not completely, mitigate the impact of disasters.[3]

In Kautilya's *Arthashastra*, disaster management has been mentioned as a primary duty of the state. The Ministry of Human Resource Development (MHRD) emphasised the need for integrating DM in the existing education system in India as a trans-disciplinary exercise, aimed at developing knowledge, skill, and values at all levels.[4]The Government of India (GoI), in its 10thand 12thFive Year Plans, has emphasised the need for disaster management.[5]

Knowledge management and education can help communities, in hazard prone areas, to gain a better grasp of the ways to cope with risks. Though, disasters can happen at any time, it is the magnitude of the related impacts that will reflect the level of preparedness and education of the exposed community, and thereafter, the country's response. Hence, for India, achieving 'disaster resilience' is essentially a process of using knowledge and of learning at all levels.[6]

Why DM is important today

To reduce the impact of climate change and global warming globally, the Hyogo Framework for Action (HFA [2005-15], Priority-3) United Nations International Strategy for Disaster Reduction (UNIDSR), needs to be implemented; it ensures the use knowledge, innovation and education, to build a culture of safety and resilience at all levels. Key activities towards this goal are:[7]

- Information management and exchange.
- Education and training.
- Research.
- Public awareness.

Hence, for India to align itself with the world's goals, especially taking into account the latest Sustainable Development Goals (17 x SDGs), education towards DM, needs to be given top priority, along with skill development, which is one of the defined objectives of the HRD Ministry. This paper thus aims to identify and promote the role of basic education in preventing disasters, specifically in the Indian context, thus saving lives !

Actions towards DM Education by Central /State Government(s)

A case study by the *National Institute of Disaster Management* (NIDM), New Delhi, towards educating the masses and involving the student/teacher community at large, through various agencies/NGOs/ volunteers etc., revealed that a lot has already been achieved in the field of disaster management. However, given the large size and population of India, coupled with diverse regional challenges, terrain & weather compulsions, reluctance of State & Local Governments (and overall lack of urgency/directions at the National level), clearly indicates that more efforts and attention needs to be given to this area of study.

It is only in the last decade, since the implementation of the National Policy on Disaster Management (NPDM) 2009, followed by its upgraded and modified version in 2016 and thereafter the latest amended version (National Disaster Management Plan (NDMP) 2019), need for a change in DM education field in India, has been realised. The mission also got a

push from the highest level, when PM Narendra Modi, while giving his 10 point agenda for DM in 2016[8], exhorted his team of Ministers as well as the PMO, who then collectively pushed for the NDMP's implementation at every level of governance.

Actions by the Central Government

GoI has directed all 28 States of India to set up DM Authorities under the Chief Minister, with Ministers of relevant Departments as members. This holistic and multidisciplinary approach is the key to effective mitigation. Similarly, NDMA is in the process of creating Block/Taluk DM Committees, in the identified 169 multi-hazard prone districts in 17 States.[9] At the village level, each village now has a DM plan encompassing prevention, mitigation and preparedness measures. The Committee comprises elected representatives at the village level and government functionaries including doctors/paramedics of health centres located in the village, primary school teachers etc.

The DM Plan

DM Teams at the village level consist of members of voluntary organisations like Nehru Yuvak Kendra and other NGOs[10],as well as able bodied volunteers from the village. The teams are provided basic training in evacuation, search and rescue etc. States have been advised to enact their own DM Acts; Gujarat and Madhya Pradesh have already enacted such a law. Disaster Management faculties have already been created in 29 State/UT level training institutes.[11] These faculties are being directly supported by the MHA. The State Training Institutions take up several focused training programmes for different target groups within the State. Assistance to State level training institutes is being provided by the NIDM, in development of training modules for different functionaries, at different levels.

Disaster Management as a Subject in Curriculum

DM, as a subject of Social Science, has been introduced in India's school curriculum for Class VIII, from academic year 2009-10, by the CBSE. Several State Governments have also introduced DM as part of their syllabi.

Resource Material by MHA

In order to assist State Governments in capacity building, and to learn from past experiences, including sharing of best practices, MHA has compiled a set of resource materials, developed by various institutions, to be replicated and disseminated by State Governments, based on their vulnerabilities, after translating it into their local languages. The voluminous material comprises of plans to cope with disasters, education & training, construction toolkit, and information, education & communication toolkit including multi-media resources on disaster mitigation and preparedness.[12]

Loopholes that Remain

In spite of various initiatives and steps taken as listed above, most have not been very successful, given the challenge of India's size and numbers, as well as tardy implementation. Hence, the lack of safety awareness with respect to DRR prevails. Notable exceptions are Orissa and Gujarat, wherein the mission has been top driven and need-based, as they faced a lot of calamities in the last two decades (Cyclone Amphan, Cyclone Yass, Cyclone Tauktae etc.).

Role of Education in Reducing Risks of Disasters

Experiences of the last decade and a half (since setting up of the NDMA and NIDM), have shown that the need for DM education is at 3 levels viz.'elementary knowledge' at middle school level; 'basic and advanced disaster skill sets' for senior school students and then 'higher skill sets' at college/UG level. The debate here is the duration of each programme and the content to be covered, which shall be analysed below.

***Understanding India's School System*[13]**

In India, the school system is divided into a number of school boards—some operate at the national level and have member schools in many part of the country, most others are state-specific and their member schools are confined to that particular state only. The curriculum is decided by the respective school boards. The largest national school board is CBSE, an

autonomous education board with around 9,000 schools affiliated, hence considered the most important.

CBSE has introduced DM as a part of its Social Science course in from classes VIII - X since the academic year 2009-10. These courses cover a wide range of hazards, their consequences, mitigation and preparedness measures. Since the courses have been introduced at a relatively senior level, hence, they are expected to also reach out to the families too. In addition, CBSE has introduced elements of DM, as a part of Environmental Studies course in class V, and as a unit subject in Geography for class XI. After class X, students under CBSE board, have the option of choosing major streams for further education In addition, the CBSE has embedded some topics related to DM from class V onwards. The Council of Boards of School Education in India (COBSE), a voluntary association of 51 school boards is planning to start DM education in its affiliated schools. Another national board, the Council for Indian School Certificate Examinations (ICSE), which includes over 600 private schools in major urban areas, has also introduced topics of DM in class IX. Some states have also introduced state-level initiatives for DM in their schools, like Orissa and Gujarat.

Disaster Education for Children at Middle School Level[14]

Though, statistics may vary with respect to the number of children affected by natural and man-made disasters in the world, a study in USA has estimated that around 1 billion children under the age of 15 are living in earthquake affected countries. Similarly, nearly 175 million children each year face vulnerabilities caused by extreme weather induced by climate change. Child specialists acknowledge that children are dependent on adults due to physical, emotional, and cognitive abilities for safety, as well as protection against emergencies and disasters. During recent decades, disaster education programs have been considered for children as an innovative approach towards DRR and some theories have favoured the usefulness of these programs, acknowledging that “education can increase the perception of risk among children”.[15]

As per studies conducted in Japan[16], there is a direct link between education, increased risk perception, and students’ risk reduction measures. Encouraging children to think about the

importance of preventive measures and preparedness can bridge the gap between 'knowing' and 'acting' on knowledge. Hence, today's disaster education should be explicitly addressed as a way to improve the level of child resiliency and information transmission, to reduce the risk of disasters in their homes.

Table 1 below indicates some benefits of starting an education at a lower age and in schools.[17]

Table 1: Benefits of Early Childhood Education in Disaster Management

▪ Earlier onset disaster prevention education makes it easy for children to think about disaster issues, resilience, and risk reduction officials from an early age.
▪ Children tend to define what they have learned from their parents. As a result, education for children can gradually increase the level of awareness of the community.
▪ Individuals familiar with the concepts of hazards and disasters in their childhood can respond better and faster when disasters and accidents occur.
▪ People do not simply forget what they learn at an early age.
▪ In many countries, a high proportion of people in the community are children.

Source: www.ncbi.nlm.nih.gov/pmc/articles/PMC6512217/table/T3

Also, selecting the right population mix is the first step in preparing disaster education for children. Children should be targeted at three levels of education including primary education for families, teachers, school administrators; then at next level comes educating managers and planners of hospitals, and at the third level comes the training of hospital staff. At the time of any disaster, families and schools will be the first respondents for school-going children of. Therefore, training children is entirely dependent on the education of families and schools. Equalising disaster risk education, in the curriculum of schools at all levels, especially primary schools, is therefore a priority.

Major education activities based on Hyogo Framework for Action (HFA) includes promoting school safety programs, and employing children/students for planning community emergency management.[18] New Zealand and USA are two countries which have given due attention, wherein, various types of disaster education programs for children have been registered, including formal and informal school based programs and community and outside

of curriculum programs.[19] Recently, Japan too has recognised the importance of imparting disaster education at an early age and designed a disaster prevention training booklet for elementary schools.

As regards India, we are still at a nascent stage (having begun only in 2009-10) and the programme is still 'progress in motion'. NIDM has urged all School Boards (both National & State level) to introduce this subject from classes VI to VIII (instead of the present class IX onwards, including involving the parents in various disaster awareness and training exercises at middle school level).

Basic and Advanced Disaster Skill Sets for Senior School Students

At the secondary (class VIII and IX) and senior school stage (classes XI and XII), basic skills for handling disasters (secondary stage) are required to be introduced and thereafter practice and refine them as advance skills (senior secondary), so as to have a DM plan for every school, which has an overview of disasters, their possible impact on school infrastructures and the likely mitigation measures (both short/long term) which they can adopt, before external help comes in. These include:

• Infrastructure Development.

• Promoting Awareness and Education Activities.

• Demonstrating Disaster Risk Management.

• Training and Capacity Building.

• Annual Safety Assessment.

• Insurance.

• Integration and Linkages.

College/University Level Initiatives

Since the past two decades, in India and across the world, the need and importance of scientifically validated knowledge on disasters has been felt. Since, the universities are a citadel of knowledge, they are the right places wherein such scientific knowledge can be

cumulatively and fruitfully generated. In this direction, Prime Minister's 10 points towards DRR, as given out in 2016, (agenda 6), focused on the role of higher education in strengthening the field of DM in India. Further, UGC also had issued a notification in 2016, regarding compulsory course implementation on disaster management, for all students, to minimise the risk of disasters, which includes bomb threat, earthquake, explosion, hazardous material spill/release, campus shooting, terrorist incidence, and financial emergency.[20]

Today, at college level, students are getting exposure to higher skill sets in the form of an Integrated DM Program (IDMP). Besides being familiarised with a list of "Dos & Dont's" on various hazards, lessons learnt are re-enforced with every practice, so that the community at large is better prepared if a disaster strikes. In consonance with the national and international objectives of integrating DM at the university level curriculum, an IDMP was started in 2009 at the Symbiosis International University (SIU), Pune, as a pilot programme, to address this pressing humanitarian need.[21]Objectives were:

- Management of the three phases of a disaster.
- Designing a workable DM plan.
- Knowledge of Search, Rescue and Evacuation (SARE) drills.
- Accident prevention and safety measures.
- Environmental laws, rules and audits.
- Knowledge of occupational health and occupational diseases.
- Fire Fighting tutorial and demonstration.
- Skill in handling medical emergencies.
- Hands on training in cardio-pulmonary-resuscitation.

Though a start was made by SIU[22], this programme is yet to be implemented by UGC at the national level for all colleges and universities. India needs to follow the model practised in countries like Japan, USA, where DM is a full-fledged UG level course.

TISS Mumbai Master's Degree in DM

Another notable initiative in this field has been by the Tata Institute of Social Sciences (TISS, Mumbai) which has pioneered a Master's Degree in DM since 2010 wherein its students go through a detailed study of all aspects of disasters, especially those prevalent on the Indian sub-continent, and through in-depth research, case studies, field visits, etc. graduate as Disaster professionals, who are then absorbed into various State Disaster Management Authorities (SDMAs) as well as at the National/ Corporate level as Management trainees. Thereafter, after a one/two year probation in field (generally with the District Collectors/Deputy Commissioners), these professionals then start handling DM issues and help in better tackling of disasters at all levels.[23]

Hence, it's an ongoing and continuously evolving programme, which needs support of MHA and UGC, plus refinement by professionals at the NIDM, so as to make it all encompassing and useful in the field of DM.

Focus Areas for Disaster Education: Prevention and Preparedness

It is now clear that, disasters are the result of natural and social processes. Unlike the natural conditions that have the potential of hazards, social dimension of the disaster risk has much to do with the way human beings interact with nature. Hence, human behaviour is crucial. Here, education (knowledge) plays a significant role. Since, disasters are infrequent in nature and memories are short in terms of passing knowledge from one generation to another, there is a need to promote the culture of prevention. Hence, only educational reform can change this status quo and promote the disaster prevention practice. The education required to build up this new culture for disaster reduction must be permanent and integrative, and cut across all formal and informal educational efforts.

The goal of education efforts is to change people's behaviour. Disaster education attempts to increase protective actions by people, by presenting information about the hazard and the risk it poses. If planned effectively and well implemented, it will make, in long run, people habituate safety practises. Considering education as an excellent opportunity for building awareness about disaster mitigation and for implementing a variety of activities towards

minimising the negative impacts of disasters in all sectors, efforts are on in many countries, to integrate DRR in the education system. Recognising that disaster education can play a significant role to raise awareness among people and to enhance capability of experts as well, India too has embarked upon some initiatives in this field, which are discussed below:-

Disaster Education for Vulnerable People

As per WHO, vulnerability is a degree to which a population, individual, or organisation cannot predict, cope, resist, and rehabilitate after the disaster. Hence, children, pregnant women, the elderly, malnourished, and people with disabilities fall under the category of vulnerable people.[24] The significance of imparting disaster education (DE) to different classes of society, at all levels, has been endorsed by large number of studies. However, it is worth noting that people, who are vulnerable due to their limitations and conditions, need special training and attention with the help of trained professionals. Safe to say that, DE is a functional, operational, and cost-effective tool for risk management in vulnerable people.

Disaster Education for Women

Women faces the brunt of a disaster, being the home-keepers. According to some research, women have great interest in educating and preparing for emergencies and disasters. Hence, DE for women can increase the level of awareness, and readiness among all members of the family, especially children.[25] Teaching women in different centres can be by both formal and informal groups, maybe in religious places, schools, homes, and so on. However, there is still a need for adopting basic measures in this regard. Some women become active members of the group after being trained and act as agents to educate others in the community. Special attention must also be given to reproductive health issues in the proposed DE for women.[26]

Disaster Education for the Elderly and Disabled

Elderly people need special training and in specific ways with regard to physical conditions and cognitive impairment. In addition, psychological support for younger people by elderly is very important in disaster situations, which should be considered as one of the key tutorials. If people with disabilities are informed about their disaster protection practices, they can

save themselves without other people's help in such circumstances. According to some studies, training such people is directly related to their survival after disasters.[27]

Hence, disaster vulnerable groups should be identified and accordingly special training should be adopted for these people. Trained people can protect themselves and others better. As a result, training can reduce human and financial loss due to disasters. There are different methods to train vulnerable people, although no method is the best method. Thus, it is necessary to plan and design comprehensive educational programs for those facing disasters. Finally, it is suggested that DE and training for vulnerable individuals should be designed and implemented by well-known professional trainers, and by adopting a comprehensive and standard training programs for these people.

Disaster Risk Reduction Education (DRRE) in Schools

Basic education and disaster prevention goes hand in hand. Thus, education in schools is considered the most powerful instrument for creating awareness about disaster risks and the need to mitigate them through better preparedness. 'Disaster Reduction begins at School' was the slogan of UNISDR's 2006-08 global campaign. Since then, there has been a growing recognition of the need for school safety as a cardinal feature of disaster prevention at the local level. It is important to recognise that DRR cannot be addressed as a separate topic to an already full school curriculum. Instead, it needs to be viewed as an integral part of the overall orientation of school education, that is by integrating it into different parts of the curriculum.[28]

Schools can be the institutional locations for spreading awareness about the need to be prepared to minimise the impact of disasters. School safety has to be the starting point in this initiative, to include both the structural safety and safety of children, which are intimately linked. A sound school safety plan is a major instrument of disaster prevention at the school level, with significant implications for disaster prevention at the community level as well. For instance, schools are often used as temporary shelters for disaster affected areas.

Hence, safety of school structures and their basic facilities such as water points and toilets are critical for effective post disaster response. In order to make sure that teacher, students and their parents understand the sources of risk at the school and community level, their

active involvement in school based DM plan including a disaster prevention plan, is of critical importance.[29] Disaster Risk Reduction Education (DRRE), thus, is about building students' understanding of the causes, nature and effects of hazards, while also fostering a range of competencies and skills, to enable them to contribute proactively to the prevention and mitigation of disasters.[30]

Mainstreaming DRR into School Curriculum

Students of all ages can actively study and participate in school safety measures, and also work with teachers and other adults in the community, towards minimising risk before-during-and after disasters. Thus, mainstreaming DRR will raise awareness and provide a better understanding of DM for children, teachers and communities. Accompanying structural changes to improve safety in building schools will not only protect children and their access to education, but will also minimise long term costs. In light of this, GoI has launched National School Safety Program (NSSP) with the vision of promoting a culture of disaster preparedness in schools.[31]

Safety of School Programmes

"School Safety" has been defined as the creation of safe environments for children, starting from their homes to their schools and back.[32] This includes safety from large-scale natural hazards of geological/climatic origin, man-made risks, pandemics, violence as well as more frequent and small-scale fires, transportation & other emergencies, and environmental threats that can adversely affect the lives of children. A community based DM approach is followed, involving the following steps:[33]

• Raising disaster awareness in school community.
• Hazard, vulnerability and risk analysis.
• Facility and resource mapping.
• Constitution and training of school DM Committee and task forces.
• Establishing an alert mechanism.
• Preparing a School Disaster Management Plan (SDMP), including an evacuation & response plan and a calendar for preparedness activities.
• Organising mock drills.
• Psycho-social support for children during disasters.

• Consideration of disability and gender based needs.
• Periodic review and regularly updating the SDMP.
• School safety audit.

A SDMP, thus, will always be a work-in-progress, and never a finished document.

Challenges that Remain

Any mechanism, developed for delivery of knowledge and skill, is incomplete without methods and ways to assess the effectiveness. Hence, to gauge effectiveness of any disaster education related program, it is pertinent to have an external audit and a neutral agency reviewing the same. The feedback so received needs to be incorporated in future programs, to make them more realistic, effective and need based, plus evolving as per changing dynamics of future disasters, especially the man-made ones.

Same has also been highlighted by the Indian PM, in his 10 Point Agenda on DRR, which says, "Develop a network of universities to work on disaster related issues". Elaborating it further, it says that 'role of academia in particular of the universities in disaster research and professional advancement is critical.[34] It will thus be helpful to develop a network of universities/academic institutions to work on disaster related aspects. As part of this network, different universities could specialise in multiple disciplines, with a focus on action/ practical research on disaster issues most relevant to them. Towards tackling these challenges, some recommendations are now summarised.

Recommendations: Incorporating Disaster Education in DRR in India

- Knowledge and innovation plus education, are closely linked to disaster reduction efforts.
- Education is the key for attaining DRR and achieving human security in pursuit of sustainable development.
- Education can be viewed in various ways, depending on the target and purpose. Formal education is important—it provides basic knowledge to people. Informal education (including training, awareness raising, community and family education) applies this knowledge to practice. Thus, their synergy is essential, to make people 'disaster aware and better prepared'.

- Learning and teaching approaches need to be linked with competency, community engagement and proactive citizenship ambitions of DRR and the need for interactive, participatory and 'in the field' learning, through which competencies and confidence are built.
- Disaster education is crucial to increase protective actions by people, as it presents relevant information about the hazard and the risk it poses. If planned effectively, it will make, in the long run, people habituated towards safety practices.
- Training a core group of teachers with special techniques and teaching guidelines is vital in providing a sustainable DE. This requires immediate attention by the MHA/NIDM/NDMA and other concerned organisations. More 'teacher orientation workshops' need to be conducted to secure the active participation of those involved in the definition and development of DE content.[35]
- Capability of selected trainees for transferring the material to other teachers, should be assessed through observation by expert groups, to evaluate the effectiveness of training courses.
- During emergencies, it is the children, women and other vulnerable groups who need maximum protection, hence the mission to make our schools and then our homes safe has to succeed, with efforts of all stakeholders.
- Disaster professionals need to develop India specific modules, at all the 3 levels of education, especially for our schools, in the form of a global campaign, which will incorporate best practises from world over (adopting and learning from countries like Japan and USA) so that development is naturally merged with DRR— towards better resilience and a better life for future generations.[36]

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