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Safe Habitat

Good Practices for Disaster Risk Reduction

Safe Habitat

Natural and human made disasters pose an ever-greater threat to the lives and livelihoods of millions of people in the Developing World. Especially vulnerable are the large majority of rural populations in these countries who exist in close communion with natural phenomena. Development achievements here can be wiped out by a major disaster and economic growth reversed.

Disasters are frequently caused by vulnerabilities created by human actions, such as uncontrolled or inadequately planned human settlements, lack of basic infrastructure and the occupation of disaster-prone areas. In addition development of safe human habitat is often constrained by limited knowledge of safe construction practices, poor resource availability, lack of technological options, low priority attitude towards safety and social discriminations.

Risks due to natural hazards can be reduced considerably if safety measures are incorporated in planning, design and management of human and natural habitats. These measures include technological, institutional and economic aspects of habitat design and development.

The task of risk reduction of rural communities to natural disasters is urgent and communication of risk reduction measures to agencies working in the area of rural habitat development is critical. The case studies in this document illustrate risk reduction measures taken by rural communities before, during and after natural disaster situations. Although the case studies themselves are small scale, they reveal the potential to be 'scaled up' across the South Asian region.

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Retrofitting of School Buildings,
Delhi, India

Context

Delhi, situated in Seismic Zone 4, is prone to earthquake hazard. The manifestation of such a hazard would be devastating as Delhi has a high density of population with a large number of highly vulnerable buildings. There is thus, an urgent need to work towards raising awareness about the need for seismic vulnerability reduction. *Retrofitting* demonstrations in important public buildings will enable cascading replications that will benefit the city's populace. Also, it is imperative to fortify buildings such as schools as they are used as emergency shelters or medical camps post disaster. Since a large number of children spend much of their time in such buildings, disaster proofing can assure their safety. Addressing the concerns in such buildings is thus the first step towards disaster risk reduction, which in the long run will enable them to withstand earthquakes expected in the region without collapsing or suffering a high level of damage.

Delhi, although situated in Seismic Zone 4, is vulnerable to future earthquakes. With a high density of population and presence of several buildings it is imperative to explore the possibilities of *retrofitting*

The Initiative

Retrofitting of five schools were taken up in 2006 and 2007 by National Centre for Peoples'-Action in Disaster Preparedness (NCPDP) on behalf of Building Materials and Technology Council (BMTPC), Government of India as a demonstration cum training camp. The project provided a number of valuable lessons that could prove to be useful in large scale *retrofitting* programmes for school building safety in urban areas in the city. NCPDP addressed various facets of safe school buildings including:

- Documentation of the building plans;
- Assessment of its vulnerability;
- Designing the *retrofitting* scheme;
- Evolving technical details to suite the ground realities; and
- Execution of the scheme.

Retrofitting of school buildings was taken up with multiple objectives. The first was to reduce vulnerability of the building in order to provide a safer environment for school children. Secondly, the programme created an awareness about *retrofitting* amongst the engineers of Municipal Corporation of Delhi (MCD). Thirdly, the programme also trained local engineers in *retrofitting*. A day long training programme consisting of lectures was conducted for approximately 200 engineers of MCD to impart familiarity with restoration and *retrofitting* of existing structures. Technical details for various measures through actual implementation was outlined step-wise and rates for various *retrofitting* measures standardised so that the option of *retrofitting* becomes a viable intervention at all levels.

All buildings where *retrofitting* was undertaken were load bearing brick masonry buildings, ranging from two to three storeys with reinforced concrete (RC) slabs for intermediate floors as well as the roof. Most structures had long corridors with rooms on one side of them. The corridors had brick masonry piers that, supported the upper storey and corridor floor slab through RC beams. The RC beams that supported the floor slabs were supported directly on the masonry walls.

The *retrofitting* measures that were applied included:

- Seismic belt between eaves and lintel levels and at sill level;
- Encasement of all openings with belts;
- Vertical reinforcement at wall junctions; and
- Encasement of masonry columns.

No technical problems arose during the execution of *retrofitting*.

Lessons Learnt

■ *Retrofitting* of Public Buildings

- Education of building authority and occupants about the purpose of the project must be undertaken in advance to promote a positive view of *retrofitting* and hence, ensure the complete cooperation from the occupants.
- The top down approach in *retrofitting* should be complemented with bottom up awareness so that the demonstrative value of the work is exploited adequately.
- Although coordination with more than one agency i.e., agency that is funding the programme, agency that is occupying the building, and agency that is in charge, tends to slow down the pace of *retrofitting* within the stipulated time frame, it is necessary for retention of knowledge about safety measures.
- Clearing the building of physical encumbrances requires planning in consultation with the building authority. When the building or its portion is handed over to an agency for *retrofitting* it should be free of physical constraints. This includes shifting of all the furniture and clearance of all cupboards.
- Ensuring the safety of children during the implementation of the project can adversely affect the pace of the work since it may involve time restrictions, work area restrictions etc. The cost escalation in such situations need to be assessed before the work commences.

Awareness of the building authority and occupants about the project and its purpose must be done in advance to promote a positive view of the *retrofitting* work

■ The Option of *Retrofitting*

- In a *retrofitting* project executing the work poses great uncertainty.
- It is important that the *retrofitting* plans have 'standardised details' of various situations that may have to be tackled. For each of the detail there should be a financial cost outlay in the government's schedule of rates and also in the tender document.
- The training of contractors needs to be undertaken locally if such projects are to be taken up through tender process and executed with local contractors.
- Unless appropriately skilled artisans are available, it would be difficult for a contractor to take up a *retrofitting* project and deliver quality work.

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Retrofitting of a School Building

Uri Block, Kashmir, India

Context

Kashmir is known for a high level of seismic activity. The earthquake of 2005 amply demonstrated that buildings constructed by the people are extremely vulnerable. The recent earthquake has thus shaken the inhabitants' confidence in local materials and even in the techniques that they have been using in building traditional houses. The immediate reaction during the post disaster survey pointed towards a strong desire amongst the people to abandon rural architecture and building systems and adopt cement and steel based construction without understanding the long term consequences as well as the viability of such a system in the local context. As has been observed in other earthquakes, people are unable to build adaptive structures to mitigate the problem in the absence of policy interventions.

As in all disasters, depending upon a number of factors, such as distance from epicenter, type of construction, condition of the building etc., a large number of buildings have survived with no damage or damage to varying degrees. Undamaged buildings allow unhindered occupancy, but those slightly damaged are a cause of concern. Inhabitants have patched up fissures and breakages and restarted use disregarding the vulnerability of the building. The same is true for a large number of schools in the area. In case of severely damaged schools classes are being conducted in temporary sheds or in the open, adversely affecting the learning process of children, causing undue hardship over a prolonged period. Little effort and interest have been accorded to restoration and *retrofitting*, with primary focus on demolishing and rebuilding school buildings. However, funds are not available for large scale rebuilding. Also, new school buildings are likely to be built with non-local materials, pushing up anticipated costs. Schools located in remote mountain villages will find it even more difficult to manage costs as mules, labourers and complex logistics will escalate the limited outlay. If however, the option of restoration and *retrofitting* is adopted by the Government, the fund requirement and the duration for restarting schools would be a fraction of what would be required to place a new building. In addition *retrofitting* of public buildings would build confidence among the inhabitants, especially with respect to vernacular building technologies.

The earthquake in 2005 has considerably shaken the inhabitants' confidence in the local materials and even the techniques they have been using in building traditional houses

The Initiative

The *retrofitting* programme was undertaken in the school building in Sultan Daki Village, Uri Block, Baramula District. The objective of the programme was to reduce vulnerability of the building and provide a safe environment to school children. Awareness about restoration and *retrofitting* was also envisaged as one of the priorities. A training programme was held for local artisans to equip them with restoration and *retrofitting* know-how. Evolving technical details for various measures through actual implementation and establishing costing have been included as part of the programme. The programme thus intends to create a demonstration of the technology for people to see and learn.

The National Centre for Peoples'-Action in Disaster Preparedness (NCPDP) in collaboration with the Aga Khan Development Network (AKDN) undertook all facets of this project. This included parameters such as:

- Selection of the building;
- Assessment of its vulnerability;
- Designing the *retrofitting* scheme;
- Interaction with the community for their concurrence for the project;

- Raising awareness within the community;
- Identification of local masons;
- Evolving technical details to suit ground realities;
- Execution of the scheme; and
- Hands-on training of masons.

The project focussed on one of the six buildings in the school complex in Sultan Daki in Uri Block of Baramulla district in Kashmir, India. A typical school building made with random rubble masonry walls in cement mortar, the school's CGI roof was supported by heavy timber understructure anchored to the timber attic floor resting on the walls. The building had three 20'x20' rooms in a row, a 4' wide verandah in front with wood posts supporting the roof above it. Like other buildings of the area, window openings were large with small masonry piers in between. The building had suffered earthquake damage up to G3 grade in all rooms and was highly vulnerability to collapse in the event of a future earthquake.

The *retrofitting* measures that were introduced subsequent to restoration of damaged portions included:
- Cast in-situ reinforced concrete (RC) stitching elements;
- Seismic belt between eaves and lintel levels;
- Encasement of all openings with belts;
- Vertical reinforcement at wall junctions;
- Anchoring of attic floor with MS brackets; and
- Strengthening of attic floor diaphragm.

A batch of 15 masons, identified around Sultan Daki Village, were keen to learn the techniques of earthquake resistant construction including restoration and *retrofitting*. Classroom sessions were conducted to teach artisans earthquake resistant construction and methods of *retrofitting*. Over a period of three weeks hands-on training was conducted simultaneously at a site of a demonstration house and at the damaged school building. The artisans worked in two batches, one at each site. Another batch of 14 artisans from adjoining villages, a few kilometers away, also undertook *retrofitting*. In effect, although the programme started with 15 artisans, 29 were ultimately trained. The confidant trainees subsequently retrofitted two more schools independently, on behalf of AKDN. The villagers too begun to repose faith in *retrofitting* in restoring their damaged homes.

Classroom sessions were conducted to teach the stakeholders the basics of earthquake resistant construction followed by the concept of *retrofitting*

Lessons Learnt

- *Retrofitting* in remote rural areas demand improvisations
- Proper awareness of locals is a must in order to ensure their support
- Intensive, hands-on training is effective in technology transfer.
- The policy of 'seeing is believing' works in the case of retrofitting.

Inhabitants were proposing fresh constructions, post earthquake, as they felt that new construction would offer better long term protection. However, awareness shared by the facilitators outlined that building new structures was appropriate only for buildings that were totally destroyed. In fact damaged and undamaged buildings, perhaps still in use in the affected area are vulnerable to a future earthquake and can be made safe through *retrofitting*. *Retrofitting* involves the

application of remedial measures that counter the weaknesses present in the structure. The major advantages of *retrofitting* over reconstruction are:

- It costs 10 to 15 percent of the cost of a new construction;
- It is much faster;
- It can be tackled in phases, thus requiring small outlay at any given time;
- Permits the partial functioning of the building (this is the most important issue for a public building); and finally;
- Eliminates the need to redo all the improvements done in the building.

A large number of damaged and undamaged buildings are still in use in the earthquake affected area. Vulnerable to a future earthquake, such buildings can be made safe through *retrofitting*

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Earthquake Safety Initiative by School Children

Latur, Maharashtra, India

Context

In the wake of the devastation that followed Latur earthquake of 1993, a programme was evolved towards earthquake preparedness by a team of engineers and social workers of Ahmedabad, Gujarat. During the first three years, efforts focused on community level disaster mitigation through awareness, demonstration and training. The outcome however depended on responsible involvement of a community leader who was committed to long term preparedness. With few such leaders available an alternate strategy had to be evolved to bring sustainability to the efforts of disaster mitigation. School children, as it was observed during surveys, were cooperative and enthusiastic. Records have shown that school children have been instrumental in taking vital messages to their parents. Hence, a similar approach was adopted to create a programme. Also the school curriculum was found to be inadequate in terms of earthquake safety parameters. The programme was a challenge to make inroads into local schools, not knowing how receptive the children and how hospitable the school would be.

It was a challenge to make inroads into the local schools, not knowing how receptive the children would be, and how hospitable the school would be

The Initiative

The primary objectives of this intervention were:

- To take the concept of disaster mitigation to adults through their children;
- To initiate a process that would help children grow with the awareness of earthquake risk reduction;
- To influence the District Education Department, and consequently the State Education Department to include a course on disaster mitigation in school curriculum.

The Programme was initiated with a target group of 8th graders (age groups 12-16 years) in a few selected schools. Younger children, it was felt, would be too young to grasp and retain disaster risk reduction concepts. Ground work consisted of identification of schools in villages where a community based programme had been active so that both could be linked to create a synergy. The next step involved getting written permissions from the concerned education officer as well as the principal of the school. Finally, the approach, content of curriculum, pace of interaction and tools required had to be evolved.

The programme began by creating a conducive environment in the classroom, urging the process of new learning. Unlike the usual method of communication for teaching, it is critical to have a dialogue in the classroom. Informality can put all the kids at ease and encourage them to open up. All this was achieved through a number of changes - big and small. Changing of sitting arrangement from rows to circular; addressing the male facilitator as 'bhaiya' (elder brother), and the female one as 'didi' (elder sister), rather than 'sir' and 'madam'; including a broad variety of related topics to avoid monotony; including games that allow participation of many students at a time; using vernacular terminology and local examples to ensure better comprehension; repeating technical words to help students grasp them; limiting group size to 30; and making maximum use of visuals and models, were some of the methods applied.

The most important step was the preparation of curriculum. The programmers evolved a curriculum based on its earlier community level intervention with villagers. The programme was divided into three phases, i.e., six classroom

sessions; interaction with the parents; and kids conducting sessions for other kids. The classroom sessions covered various topics as listed below.

Session's Contents

Earthquake Safety Initiative and recounting of past disasters constituted the first session, which reminded the children that disaster was a real threat. Following sessions compared various earthquakes, explained the mechanics of earthquakes, illustrated how houses were destroyed in the Latur quake, etc. The purpose of this session was to familiarise the children with earthquake terminology and extent of quake prone area. The next session discussed materials that were used for house building, material economics, local versus non-local materials, effect of earthquake on houses etc. The purpose of this session was to test the children's understanding of rural construction, and how an earthquake affects a building. Plan your village, draw village map, dream village, pros and cons of 'local versus non-local materials' issue, need for water in cement based construction, etc., were also included in the programme curriculum. This session identified ways to prepare a village to face future disaster, and to focus on the advantages of local building technologies. Technical issues such as what a quake resistant construction is, how masonry works, what are seismic safety features, etc., were outlined during the next session by using simple items like a matchbox to replicate masonry units. A house model was also made which demonstrated the effectiveness of quake resistant features. With in depth understanding children are likely to extrapolate such knowledge to actual houses.

A total of 12 schools in 11 villages were covered in the first phase. 850 students of eighth grade participated in the programme. The entire team of four facilitators conducted the first session in every school, familiarising the children with all the team members. Two facilitators conducted the subsequent sessions, when the class strength did not exceed 40. One of the two interacted with the students while the other observed the interaction for clues for effectiveness. In addition to the classroom sessions, essay and painting competitions were organised to attract children from schools not covered under the programme, and impart information and awareness to them. Approximately, 450 students in 12 schools participated in the competition.

The intervention programme was christened 'Children's Earthquake Safety Initiative' and badges were awarded to participating students. To the children of rural India, with little experience with frills, a simple badge brought a feeling of responsibility. The eight graders with their newly acquired knowledge of earthquake resistant construction made rounds in the village donning the badge. The children confidently approached masons to 'check out' their work and impart advise. Subsequently a rally was organised in villages of Kasarshirshi and Naichakur where students chanted slogans and sang songs about earthquake safety. A disaster drill through mime was presented during an inter school workshop to demonstrate the disaster management in the event of a fire.

Lessons Learnt

- A felt need for earthquake safety related information could be created as the children were easy to work with, receptive to new ideas and are more concerned about the future than elders.

The intervention programme was christened 'Children's Earthquake Safety Initiative' and badges were awarded to participating students

- Children understood earthquake dangers and importance of information.
- Students were preceptive about earthquake resistant building construction.
- Irrespective of their age and size they felt confident about going around the village and checking out the correctness of the work being carried out by the local masons.
- The process has been efficient unlike meetings with elders in the villages where a lot of time is lost in gathering participants. Absolutely no effort was needed to gather the students through the programme period in each school that lasted over six weeks, with one session per week.
- For students the programme was an exciting learning event. On the day of the scheduled session they wore their best clothing.
- The children, especially the girls, turned assertive during the course of the programme as compared to what they were earlier. The facilitators were informed that girls had begun to ask questions and would interact even during their regular classes.
- The essay and painting competition results showed distinct relationship between living environment and thinking by children.

During the programme it was observed that rural children were better positioned to understand construction related issues as compared to their urban counterparts

After successful completion of the programme, it was understood that interaction with students should form an integral part of any disaster mitigation effort. A well designed programme can build enough confidence to combat disaster mitigation issues and sustain awareness over long period. Also the intervention needs to be planned in the early part of the academic term/semester so that children can give necessary time for meaningful participation. Understanding can also be promoted through school fairs in which children from several schools can participate and where the students themselves could be instructors. This could help achieve greater understanding of various issues in the community.

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Children Develop Preparedness in Quake Prone Villages

Kachchh, Gujarat, India

Context

Gujarat, in western India, lies in zone 5 of earthquake vulnerability classification and is one of India's most affected states. After a devastating earthquake in 2001, Save the Children UK (SCUK) began operating in the State, focusing its programme on providing support and services for early childhood care and development. The extended focus included issues like emergency preparedness. As part of SCUK's mandate children were to be trained to educate the community about disaster risk reduction (DRR). The idea was discussed with Gujarat State Disaster Management Authority (GSDMA), which was supervising the National Disaster Risk Management Programme of UNDP in Gujarat. As the UNDP already had DRR projects, it agreed to provide trainers and expertise in designing modules. The Project sought to reach children through their teachers and reach the community through the children. Persistent efforts make the children aware and knowledgeable about issues that can help change long existing attitudes and perceptions, within their families and neighbourhoods. In other words, children can be the agents of change.

The Disaster Risk Reduction Project sought to reach children through their teachers and reach the community through the children

The Initiative

A 'Village Level Children Based Emergency Preparedness Planning and Response' project was initiated. Its objective were to:

- inculcate a culture of preparedness among children;
- train children from each project village in first-aid, search and rescue, early warning communications and psycho-social care and trauma;
- develop linkages with existing village level plans and village disaster management committees (VDMCs); and
- generate awareness about measures to adopt and actions to avoid before, during and after emergencies among village adults and other children through non-formal platforms created by trained children.

The Project was implemented from March 2005 to November 2005 in 84 villages of the Rapar Block, Kachchh District, Gujarat, India. The Project, which ended with SCUK's withdrawal from Gujarat, was part of SCUK's 'Earthquake Relief Rehabilitation and Development Programme' launched in January 2001 after the major earthquake in Gujarat. Involved in the Project were children, teachers and parents, as well as SCUK programme coordinator, UNDP officers and community mobilisers from SCUK funded local NGOs. The Project targeted 1,680 children, 34 teachers and 18 VDMC members. SCUK designed the Project along with GSDMA and UNDP teams. GSDMA and UNDP provided technical inputs and subject experts; and SCUK supported the Project with funds, human resources and field coordination.

Innovation

The Project enabled children and the community to gain a good understanding about minimising losses during disasters. The Project sought to capitalise as much as possible on the premise that children can be the most effective tool to inculcate a culture of disaster risk reduction. Teaching disaster risk reduction to the children of today is capacitating a generation of adults capable of addressing disasters more effectively tomorrow.

The Project had two innovative features:

- Designing schedules of project components in consultation with children; and

■ Helping children review project implementation.

These two elements instilled strong enthusiasm and sense of ownership among children.

The Project activities were carried out through several orientation meetings, the first step being where partner NGOs and field staff were oriented on various aspects of earthquake preparedness and project design. The groups were then divided among field workers to initiate orientation meetings with children. The meeting involved mapping disaster history of the village, speaking about each disaster that had struck, discussing how earthquakes take place, measures to adopt and actions to avoid during and after an earthquake, educative slogan writing on village walls, describing training, sharing of training schedules and listing of children for each training session.

Group training sessions were organised under four topics: first-aid, search and rescue, early warning communications, and psycho-social care and trauma. The training sessions were scheduled to enable each village to present at least two children trained on each topic. Resource persons were provided by the UNDP and modules were developed in collaboration with SCUK. The training methodology included interactive components such as lectures, demonstrations, role play, posters, activities and practices, video show, sensitisation, subjective games, material distribution and experience sharing. Upon completion of training, children from different schools interacted with each other and shared their learning. Field staff led this component and conducted a participatory rural appraisal of village mapping with all children, followed by a transit walk. Village maps were documented on paper and also in digital format.

Resource persons from UNDP facilitated marking of safe evacuation routes, unsafe buildings, safe areas, pathways to evacuate villages, locations to wait to get collected in case of emergency, etc. A strategy to bring all children together was also drawn to ensure that no child was displaced or lost. Children drew out a list of all children in the village with their parents' names. The resulting action plan was then documented and drawn on the wall of *Aanganwadi* centres along with the names of the children who took part in the training. To check the feasibility of action plans, mock drills were conducted with the help of UNDP experts. A whole disaster scene was created for practicing all that was learnt from early warning to psycho-social care - ending with the collection of children from a designated place. These mock drills gave the children a hands-on experience.

The Disaster Risk Management (DRM) Programme instituted a Village Disaster Management Committee (VDMC) in each village comprising of *Panchayat* members, teachers, village elders and other nominees. A copy of the action plan was submitted to the VDMC along with a tool kit, which comprised of a rope, flags to mark access routes, first-aid requirements including splints, stretcher making material and other essentials. The tool kit was placed at the *Aanganwadi* centre and the children group and VDMC members were assigned the responsibility of keeping it updated. The key to the success of the Project was instilling the need for disaster preparedness. A key failure of the Project, however, was the fact that it could not put up a system for future support after the Project concluded.

The resulting action plan was documented and drawn on the wall of *Aanganwadi* centres along with the names of the children who took part in the training

Lessons learnt

■ An exit strategy should be designed and integrated into the project design;

- It is important to build and maintain a good rapport with local government and involve them in project implementation, facilitating a knowledge of built capacities;
- Mapping community understanding or beliefs about specific disasters is imperative to assess whether the community has a coping system; and
- Participants' consultation is essential to correctly time training sessions.

Project challenges included coordinating teams from different agencies and ensuring children's participation. Coordination ensured that all messages reached every one involved by keeping communication channels open, holding joint meetings and defining roles clearly. Although it was initially difficult to convince team members that children could be active participants, as work progressed innovative ideas put forward by children impressed all.

Convincing communities to devote time during the agricultural season also posed a challenge as the fact that communities could be busy had not been taken into account. When the problem arose, village elders were consulted and meetings were rescheduled accordingly.

The Project brought good results in less time than expected, as SCUK had already worked with the same communities and NGOs for around four years. Also, as SCUK had children groups in each of the villages, a very good rapport existed among community mobilisers and children. Furthermore, the children's parents knew the community mobilisers and agreed to send their children for training and mock drills. Its components are easily replicable the only requirement being a healthy and trustworthy relationship with the target community and children.

Team coordination was managed by ensuring that all messages reached every one involved, keeping communication channels open, holding joint meetings and defining roles clearly

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Children Led Disaster Risk Reduction,
East Godavari District, Andhra Pradesh, India

Context

A safe learning environment for children is of prime importance. Recently reported news of school building collapse, fire accidents and stampede bring to light the need to be continually vigilant to ensure student and staff safety. The Kumbakonam fire tragedy in Tamil Nadu, India took the lives of 93 children, which reinforce the need to have school emergency preparedness and response plans. Time schedules need to be drawn to practice drills that will allow students to respond efficiently and effectively when a disaster strikes. Plans have to be made to ensure that all disaster proofing information is complete and up to date. Most of the schools in coastal regions in India are prone to multiple disasters. However, the Government till date has not initiated interventions for safe schooling. Children are a vulnerable section that have a right to participation, protection, development, survival and non-discrimination. Initiatives need to be taken to mainstream these concerns through interventions.

The objective of this project is that 25 disaster prone villages are better equipped and prepared to face future disasters and mitigate its impact in an effective manner

The Initiative

Children Led Disaster Risk Reduction (CLDRR) is a development sector programme through a child centred approach. Past history of disasters reveals that more children have died during disasters as compared to other vulnerable groups i.e., women, aged, physically and mentally challenged. Children have little knowledge about disaster preparedness and inadvertently end up as victims. Moreover, government and non-government organisations hardly consult children during relief and rehabilitative phases post disasters.

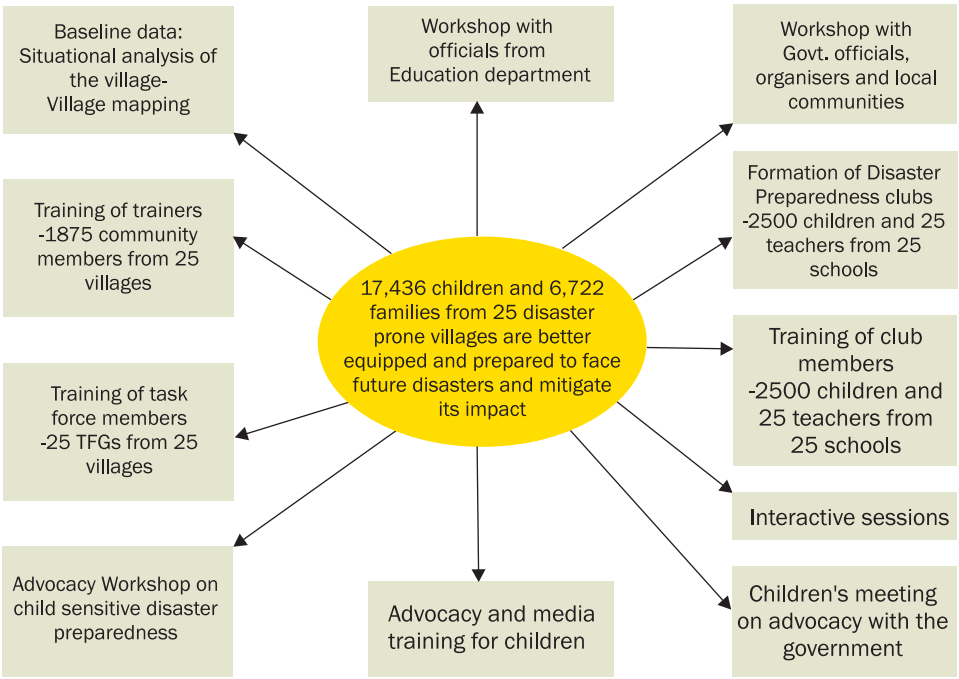
Association for Rural and Tribal Development (ACTION) initiated a child centred disaster preparedness programme to mitigate the effects of future disasters on children in East Godavari District of Andhra Pradesh, India in collaboration with Save the Children (UK). ACTION working in tandem with the District Education Office, State Director for School Education, District Fire Department Fisheries Department, Women and Child Welfare Department, local *Panchayats* of 25 communities, 25 head masters and 250 teachers made an effort of best practice on CIEWS&DP and SBDP. This resulted in gearing 2500 children and 1250 task force members of 25 communities to combat disaster situations at community as well as individual level.

The wider objective of this project was to enable 6,722 families from 25 disaster prone villages learn about future disasters and minimise its effect. The project also promoted self help and voluntarism among vulnerable communities. The operational area of this project covered 25 secondary schools in Mummidivaram, Uppalaguptam, Katrenikona and Allavaram mandals of the Amalapuram region. The target groups consist of children, youth and adults.

The programme sensitised children and the school community about disaster preparedness. Designed to encourage children to identify risks in their schools, the programme assisted the development of a safety plan based on the type of vulnerability and hazard. The findings of the programme were shared with the key stakeholders to associate them with the vulnerability reduction action in each school. Subsequently a district wise school safety plan may be developed.

Achievements

- Over 2300 children have taken a lead in developing risk maps and safety nets of their schools.



- 1960 children acquired additional skills in early warning systems.
- 2100 children were trained in emergency rescue and medical care to help co-vulnerable children in the event of a disaster.
- 2000 children were aware of precautionary measures to be followed in before, during and post disaster situations.
- 2410 children could organise mock drill at school and are now sensitised about disaster management.

The project allowed communities and individuals to adopt best practices to disaster proof hazard prone vulnerable schools in coastal areas. This Programme also built capacities to combat hazard situations and the capacitated children replicated the best practice at their schools. In fact children from schools other than those covered through the programme learned disaster preparedness skills from trained children. Risk maps and safety plans developed by children for twenty five vulnerable schools and contingency plans by the task force groups for twenty five vulnerable communities marked a growing understanding and interest among stakeholders. The contingency plans developed by task force members were approved by local elected bodies and district revenue departments. Also a disaster relief fund was established for school going children at each school. However, there were a few impediments that slowed the pace of the programme. These included:

- Procuring an approval from State and District Education Department to conduct classes at designated schools;
- Understanding the attitude of village communities prior to implementation;
- Integrating disaster preparedness with developmental and livelihood supporting activities to make disaster preparedness more attractive.

All contingency plans developed by task force members were approved by district revenue department and a disaster relief fund was established for the children at each school

Outcome

- 1100 task force members are now aware of disaster preparedness and are ready with the knowledge of early warning systems;
- All 25 villages are capable of situational analysis of each vulnerable village;
- All 1250 task force members are trained in emergency rescue and first aid practices;
- 1100 task force members are prepared with a know-how of relief camp management;
- All 25 villages have full knowledge in preparation of contingency plan development;
- All 25 villages have good practice in mock drill processes.

ACTION has been working with an aim to lend a helping hand to the downtrodden people in the society. Since its inception in 1988, ACTION has been concentrating its efforts towards the development of vulnerable and deprived sections. The organisation is presently functioning in the coastal districts East Godavari and West Godavari of Andhra Pradesh.

1100 task force members are now aware of disaster preparedness and are ready with the knowledge of early warning systems

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Students and Teachers Develop School Disaster Management Plans, Delhi, Gujarat, Andaman and Nicobar Islands in India

Context

Schools are often used as emergency shelters and as such should be resilient to disasters. To promote a culture of disaster safety in schools, Sustainable Environment and Ecological Development Society (SEEDS) India has pioneered a 'School Safety Initiative'. The idea is to reach parents and eventually the community at large, through school students. The initiative sought to build capacity of communities, school students and teachers to help develop school disaster management plans. Seismic *retrofitting* of school buildings was also undertaken to this effect. Teachers were trained, a school curriculum and a text book on disaster management developed.

The Initiative

The 'School Safety Initiative', sought to promote a culture of disaster safety in schools by developing capacities among communities and school students and teachers, helping them to develop school disaster management plans (SDMPs). Its activities included - raising awareness among students and teachers; training student task forces on fire safety, emergency search and rescue, first aid, emergency evacuation plans, earthquake evacuation mock drills and preparing school disaster management plans. The initiative has been implemented since 2005 in Delhi, Gujarat and Andaman and Nicobar Islands. Over 200 schools have been covered by the Initiative in two years of its implementation, and 2,500 teachers and about 1 00,000 students have benefited.

- Delhi Earthquake Safety Initiative included training on search and rescue, evacuation and first aid and non-structural risk mitigation (in one school as a pilot project). The Initiative was completed in 2005.
- Gujarat School Safety Initiative included disaster awareness in schools, training of teachers and development of curriculum books on risk reduction for schools (text books for classes 7, 8 and 9; school safety initiatives in 175 schools, teachers' training for over 1,500 teachers). The two year Project was completed in February 2007 and second phase is underway.
- Andaman School Safety Initiative included disaster awareness to schools and training in developing school disaster management plans (SDMPs) in 20 schools. The Initiative is under way.
- Global Open Learning Forum on Risk Education (GOLFRE) included online certificate course on disaster management for school teachers based on e-mail discussions and a contact workshop at the end of course. The training of a first batch of 45 teachers was completed in March 2007 as a pilot project.

All the above mentioned activities were carried out over the last two years, after SEEDS pioneered school safety initiatives in India in 2005. The main beneficiaries are students and teachers from over 200 schools. The Initiative was supported by various donors such as, Geo Hazards International and USAID for Delhi Earthquake Safety Initiative, the Government of Gujarat for Gujarat School Safety Initiative, Christian Aid and Dan Church Aid for Andaman School Safety Initiative and Christian Aid for GOLFRE.

Lessons Learnt

The Initiative led to a strong awareness of disaster safety issues and involvement in the basics of disaster preparedness among the targeted schools and communities.

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Overall success was achieved despite the fact that some of the schools were busy with their academic activities. Many schools were found to be repeating activities on their own even after the Initiative was completed.

The programme's pioneering character in seeking to promote disaster safety in schools will go a long way in achieving disaster risk reduction (DRR). To this end, the Initiative had a four pronged approach in earthquake prone areas:

- Structural *retrofitting* of schools to prevent collapse in future earthquakes;
- Implementing non-structural mitigation measures to avoid injuries from falling objects;
- Education on safe infrastructure for school management staff and construction workers; and
- Preparing school disaster management plans and training school communities in immediate response, evacuation and first aid.

SEEDS believes that disaster education focusing on the school community should follow Dr Daisaku Ikeda's proposal propounded in 'The challenge of Global Empowerment: Education for a Sustainable Future, for Environmental Education'. The approach should consist in helping school students, teachers and management To Learn, To Reflect and To Empower.

To Learn: Students deepen awareness about hazards and risks when they understand realities and know facts. Recent natural disasters are well documented and shared. These serve as case studies for teachers as well as students. Wherever needed, disasters are simulated with portable models. The learning process is strengthened by curriculum change.

To Reflect: Students analyse factors leading to human casualties and injuries in disasters, so that they can recognise development practices and human actions that can cause disasters or prevent them. Students are connected to their own local communities and families and share their learning with them.

To Empower: Students take action toward reducing risks in their environment. Classroom and school exercises are introduced to help small definitive actions that can become a precursor to bigger investments for DRR.

School students, teachers and management developed disaster management plans for schools. In the process they learnt about existing structural and non-structural weaknesses. Efforts were made to ensure that school community took ownership of disaster reduction plans and made necessary updates. In fact involving teachers is essential for success of any activity with students. Students were trained to identify hazards inside their schools through a 'hazard hunt' exercise. They were also provided with a similar checklist for doing 'home work' - to identify hazards in and around their homes. The DRR message was disseminated as the students shared information with their parents, relatives, friends and neighbours.

The main objective of the various projects involved is to develop a SDMP. A community based disaster management approach is followed, involving several steps. Raising awareness about disaster issues among targeted stakeholders (students, teachers, school management and others) through lectures, discussions, posters, drama (street play) and demonstration is the first step. Then follows the identification and listing of hazards and vulnerabilities outside as well as structural and non-structural hazard within schools. The responsibilities of various,

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stakeholders are identified and teacher training is undertaken on how to prepare a school evacuation plan. An emergency response capacity is then built to focus on skills such as rescue and first aid (training is provided to student groups).

Once everything else is in place, listing contact information of all facilities and resources for emergency management in the school disaster management plan is imperative. Conducting a mock drill to demonstrate the evacuation, rescue and first aid skills acquired by the students needs to be undertaken in the short term. In the long term the interest of the targeted children and the school should be maintained through an informed newsletter. Long term solutions could also include the promotion of School Safety Clubs to sustain risk education after completion of the programme.

The Initiative observed that school management needs to be sensitised to the importance of risk education before implementation. Another key lesson was that master teachers need to be trained first so that they can train other teachers. This model was used in Gujarat and worked well. First, some 100 master trainers from all districts of Gujarat were given orientation training. Then the master trainers imparted their learning to more teachers in each of the districts thereby creating a further chain of master trainers. The trained teachers are now a resource base that can be relied upon to train not only children but even the community.

A key lesson learned from the Initiative was that school management should be sensitised to the importance of risk education before implementing such an initiative

Potential for Replication

The approach used to train for DRR among school children is similar to the one used for communities. Here the school is considered to be a community. The activities carried out raise awareness, build capacity and help to develop disaster management plans.

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South Asia

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