

Safer Cities 11

Case studies on mitigating disasters in Asia and the Pacific

Towards Technological Hazard Risk Reduction in Ahmedabad Schools as effective institutions for disaster awareness and preparedness

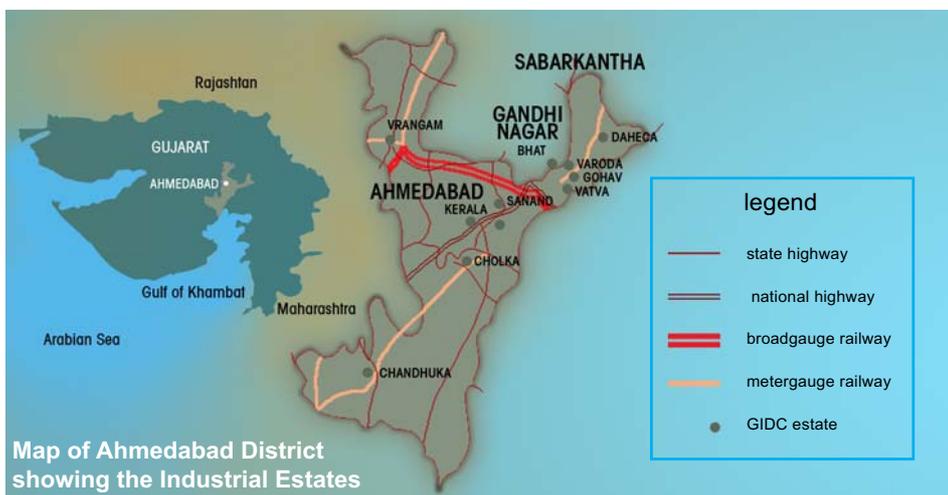


The kites shown above were part of an innovative project wherein schools acted as an effective medium to reach out to the community regarding disaster preparedness and response. The pilot project “Testing Communication strategies for Industrial Disaster Risk Reduction” built upon schools and children as an effective way to create awareness and build up capacities of the community to be prepared for a disaster. Choice of key multipliers and their capacity building, development of educational material which would be long term assets in the school, and involvement of various stakeholders, were consciously kept in mind to make the effort cost effective and sustainable. The project focused on industrial disasters but the strategy and technique is easily adaptable for any natural or human-made disaster.

Introduction

Gujarat, one of India’s most industrialized states, has a significant role in the Indian economy. The Gujarat Industrial Development Corporation (GIDC) is the government body engaged in promoting industries in Gujarat state. GIDC has facilitated the establishment of 182 industrial estates spread all over the state. However, with increased and increasing industrial activity in the state, the chances of accidents and industrial disasters are also increasing.

It is essential that the existing regulations be strictly implemented so that such accidents are minimized and their effects reduced. At the same time, it is necessary for communities to be prepared, as even with the best precautions, accidents, by definition, will happen. Community preparation is a significant, but often overlooked or underemphasized input into reducing disaster impacts. For instance, even in the case of Bhopal, if the community around had the basic knowledge of how to avoid Methyl Isocyanate (MIC) fumes from entering the lungs-e.g. covering the mouth and nose with cloth and walking away quickly in a perpendicular direction to the wind-thousands of lives could have been saved. This paper describes a small initiative to build such community awareness.



Abstract

This case study relates experiences from the implementation of a pilot project - *Testing Communication Strategies for Industrial Disaster Risk Reduction* - in one of the industrial estates of Gujarat state in India. The project looks at evolving a model for community disaster preparedness. The model had the school playing a pivotal role in the communication strategy, along with several other stakeholders. The case study details out how each stakeholder was involved, and their role in the project.

The emphasis is on the school processes, and how schools became a medium of communication, dissemination and reaching out. It finally discusses how the process can be mainstreamed and sustained on a long-term basis.

Steps through which the programme moved included: 1. identifying project site, linking with schools and other stakeholders, 2. working with the schools, 3. schools reaching out, 4. towards mainstreaming the process.

The inside story

-  Schools as the Route?
-  Linking with Key Stakeholders
-  Initiating with School Activities
-  Schools Reach Out
-  Towards mainstreaming



Schools as the Route?

Child to Family and Child to Community as key communication approaches

The project embarked upon developing an effective model to reach out the communities around industries to create awareness about industrial disaster preparedness. Schools in the vicinity of an industrial estate were seen as a key entry point for such a programme. The effort was at creating awareness among and capacity-building of the students to take appropriate action during an emergency situation, and also for channelizing this information to the community through them. With the experience and belief that children are important carriers of information, and can educate families and communities, schools were seen as key multipliers in this project.

The idea also seemed appropriate given Center for Environment Education's (CEE) own experience in working with schools on a variety of concerns related to the environment. CEE is a Centre of Excellence in the field of Environmental Education and one of the thrust areas of CEE's work has been to work with schools on environmental issues. CEE has worked with schools in areas of water and sanitation, wildlife conservation, resource conservation, waste management, etc., for about twenty years, and the experience has been that students not only imbibe the learning but also share it with parents, neighbours and peers.

Another important reason for selecting the schools was that the students coming to these schools are mainly from the housing settlements near the industries and many of them have parents working in the nearby industries. Therefore, in a way, it is a targeted way of reaching out to a critical group.

This approach of working with and through schools has an inherent advantage that an existing institution and system is utilized. Therefore, there is minimal financial and human/time investment in creating an institution or systems. The resource created, both in terms of trained teachers and students, as well as the publications and other media, are available in the long-term and do not end with the close of the project, ensuring longer sustainability of the initiative.



Orientation session for students



Linking with Key Stakeholders

Involvement of key stakeholders to creates wide ownership, leading to greater sustainability of activities

To fulfill the objectives of the project, other crucial stakeholders apart from the schools were identified. These included the Industrial Association, government agencies like the Factory Inspectorate, Gujarat Industrial Development Corporation (GIDC), the Fire Brigade department, and also local NGOs and other institutions working in this field. For each one of these, a different approach was adopted to gain their involvement and ownership in the project.

Identifying and Linking with Industrial Estate

There are 11 industrial estates in the vicinity of Ahmedabad promoted by the Gujarat Industrial Development Corporation. Out of these, the Vatva industrial estate, which is 25 km away from Ahmedabad city, one of the oldest and largest estates of Ahmedabad was identified for the project activities. The estate was appropriate for the project, as it has many hazardous industrial

units like chemical ones, which are engaged in making dye and solvents, with human settlements quite close to the estate. It is spread over an area of more than 491 hectares, and has over 1,800 small to medium scale industrial units. The Estate gives employment to about 80,000 people. Most of these workers live in the vicinity of the Estate.

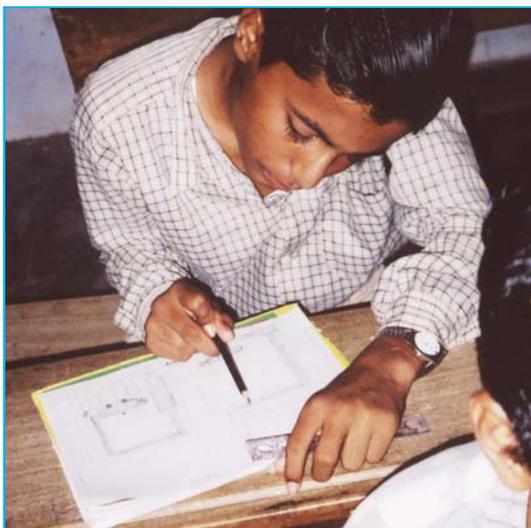
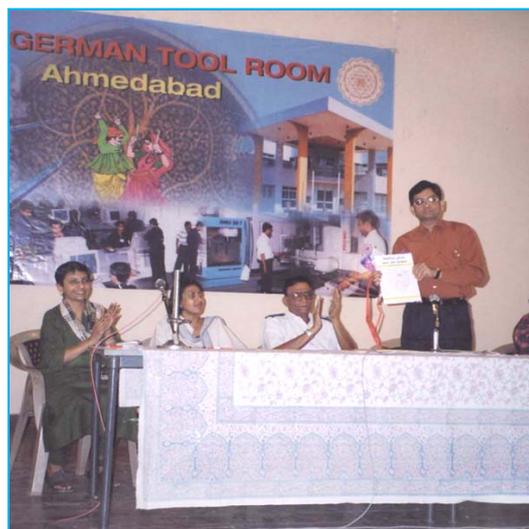
When the Industries Association was first approached for the project, they were somewhat sceptical. The Association office-bearers were open but had an apprehension as to whether the project would strengthen the perception that industries are polluting and dangerous. The project was able to convince them that it would help dispel such doubts and would result in better preparation among the community and the workers for any accident or disaster in the industry and the estate. With these discussions, the Association was cooperative and gave support to the project activities actively.

The active involvement of the Association was an important achievement as they are a major stakeholder in the issue and an important actor for mainstreaming processes.

Identifying and Linking with schools

Vatva Industrial Estate has many settlements around it, mainly occupied by industrial workers and their families. The schools selected for the project were the ones which were near the Estate and which had students coming from houses near the Estate. The area has about 10 schools in the periphery of 3-4 km of the industrial Estate. These are all 'private' schools excluding two which are run by the Ahmedabad Municipal Corporation.

A survey was carried out to find the schools which were closest to the industrial estate and had high proportion of students with parents working in the industries. Finally 6 schools - 5 private and 1 municipal - were selected for the project. The municipal school is located in a village very close to the Estate and is regularly affected by industrial effluents and accidents. In this project, the 9th grade was chosen. CEE's experience of working with schools in India has been that it is good to work with students at this level, since they have been introduced to necessary concepts through the curriculum, and at the same time, they are not burdened unduly by academic pressures compared to 10th or higher grades. One section of 9th grade (age about 15 years) was selected from each school. Each of these sections had about 50 students.



top left. Bulletin board, top right. Grand finale, bottom left. Orientation session, bottom right. Teacher orientation workshop

Involving key government agencies

Several governmental agencies were also important stakeholders in the project and three key agencies were approached for their active support and involvement. The Factory Inspectorate is directly responsible for ensuring safety standards in industries. The GIDC is the line agency responsible for providing basic infrastructure facilities to the industries, while the Ahmedabad Fire Brigade is responsible for fighting any industrial accident or disaster, as well as for spreading awareness on greater safety and preparedness measures.

The response from all these departments was very encouraging. The Senior Factory Inspector gave guidance on the provisions mandated in the law for safety and preparedness, and how the project could make use of those. The Senior Factory Inspector also helped in developing the Teachers' Manual by commenting on the draft and giving relevant information about the Estate. Similarly, GIDC officials were also cooperative and gave maps and other information about the type and scale of industries. The Ahmedabad Fire Brigade agreed to arrange for a fire fighting demonstration for the schools and advised us constantly during the project. Through involving them as an inherent part of the project and not external agencies, they became true partners in the process.



Initiating School Activities

Making links with teachers and students

Schools have their own commitments for completing syllabus, and there is always a limitation of time for extra-curricular activities. Recognizing these realities, it was not sure how the schools would receive the idea of the project. It was encouraging to see the enthusiasm with which all the schools responded to the idea. Several Principals and teachers said that something like this was urgently needed and that this was a very timely activity.

An orientation session was conducted in each school to brief and orient the students about the project, and to get an understanding about their knowledge and perceptions about industry. Emphasis of this first session was on getting an idea of the perception of students about industries, environment, causes of pollution etc. Some of the students pointed out that due to the air pollution from industries, they had problems in breathing. The topic of industrial accidents was also discussed. Many students were aware of such accidents. The students were also asked to draw a picture of the industrial estate - as they had seen it, or if they had not seen inside, as they perceived it to be. Most of them drew chimneys with smoke and effluents coming out.

The students were then briefed about how the activities in the project would help them develop as leaders for community preparedness for any industrial disaster eventually.



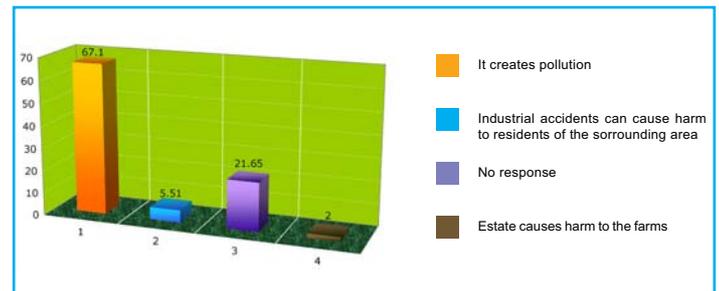
Students drawing their perception of the industrial estate

Questionnaires

Understanding students' perception

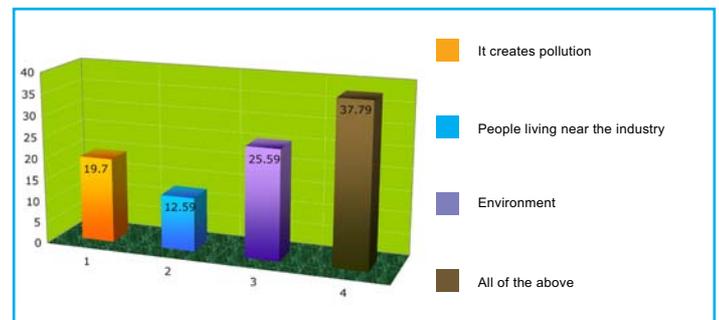
Questionnaires were used to gather information, but also as a means of drawing attention to certain issues, so that people would think about them. Firstly a survey was carried out to gauge the students' level of awareness. Around 250 students from 6 schools participated in these exercises. Some important conclusions from this questionnaire are mentioned below:

- About 30 per cent students said that they have heard about industrial accidents in the Estate. Some of them had heard of gas leak related mishaps, some of fires and others of injuries related to individual accidents. Thus a good percentage of children are already exposed to such information. This also indicated that these occurrences are common in the Estate.
- About 68 per cent of the students also felt that having industries nearby had its harmful effects, as they created pollution in the area, which in turn affects the human health.



Students' understanding of the industrial estate

- The students were aware that industrial accidents can damage the environment (25.59 per cent), and also harms employees working there (19.7 per cent). But the questionnaire revealed that students are unaware about the effects of industrial disasters on the community residing near the estate.



Students' response to the effects of the industrial estate

Students also used questionnaires to conduct surveys with family, friends and neighbors. The purpose of this was not only to get an idea about awareness level of these groups, but also get them thinking about these issues. Following are some of highlights:

- The results of the survey with the parents and the community, revealed that 70 per cent of those surveyed felt that there could be major accidents in the area, while close to 35 per cent had had direct or indirect experiences of accidents in their work area.
- The survey also revealed that only around 10 per cent of those surveyed had even an idea of what to do in case of a disaster like gas leak or fire.

From the above survey findings, it was possible to gather a good perception of the present level of awareness, understanding and perspectives of students and the community regarding industries and industrial accidents. One of the important findings that came out of the survey was that the students are not aware about implications of industrial accidents on their own safety and that of the community living nearby. Thus, the relevance and need for the project was validated.

The survey was also useful to orient and train students for carrying out such exercises and in interacting with the community. These surveys also sensitized the parents and others about safety and preparedness aspects.



Schools Reach out

Industry Visit

A new kind of learning experience

Industry visits were organized for students and teachers. Each school visited one industry. Each student was given a survey form for the visit. They had to fill up this form at the industry, based on the briefings given to them by the industry managers, and by asking questions. The survey format designed for the visit emphasized gathering information on accident potential of the industry and type of damage likely to result, and the working, environmental and safety norms prevailing there. The students filled the forms through interaction with the industry supervisors/managers.

A learning for the students and teachers was that some industry people, especially those dealing with hazardous chemicals, were not open about their practices and shied away from sharing much information.

As this was the first-of-its kind visit for school children, they not only enjoyed the outing, but also gained from the type of exposure and information they got from the visit. The students were keen and eager to learn during the visits and asked many questions of



Students on a visit to an industry



Student looking at an equipment

the concerned persons in the industries. For many of them, this was the first time that they had gone inside an industry, and seen industrial processes and safety equipments inside the industry. Through the survey, they were able to gather relevant information about industrial processes and safety mechanisms in the industries. The students also able to assess whether the industry had the potential of causing harm as a result of pollution or an industrial accident.

After the industrial visits, a session was organized where children shared their information about the processes, the equipments, safety mechanism, disaster preparedness that they had seen inside the industries. They also made drawings based on what they saw during the visit and what struck them most.

School and Community Programmes

Informed, motivated children reach out to friends, neighbours and community

The overall objective of the programme was that the students themselves should become aware about industrial disaster preparedness, and then further share this information with others in the school and the community. Several activities were carried out in this direction.

“The role of the NGOs and the government organizations is to build the leaders and train them. And the role of leaders is to make use of the experiences and facilities of these organizations to benefit the community”

*Mr. Rajesh Bhatt, Divisional Fire Officer,
Memnagar Fire Station, Ahmedabad*

For instance, one activity, called Bulletin Board was aimed at getting the students and teachers, more attention to news about happenings related to industries, their environmental effects and also specifically anything related to industrial accidents and disasters. Every week, students brought in clippings from the local newspapers related with industries and environment, and displayed these on the notice board. While the students of the 9th grade did this, the whole school benefited from the exercise.

Popular local events were also utilized for wider dissemination of the messages. In Gujarat, there is Kite Festival during 13-14 January every year, where everyone - young and old - fly kites. During this festival, the students drew and wrote messages related to industry, safety, and preparedness for disasters on the kites and then flew them in the sky. This was a simple but a very effective way for reaching out to the community as they were displayed not only in the sky but wherever the kite went after being cut. These were literally individual information flyers!



Kites carrying the message(s)

Another popular means for dissemination was a skit based on the traditional mythological characters. This skit was based on characters from *Ramayana*, the epic scripture. A particular incident from the epic was modified to convey information about different industrial disasters and how to deal with them. As the characters and the story had a popular appeal, the skit was able to deliver the information in a very interesting way. The skit was performed by the students at their individual schools on Republic Day, where all students, parents and others had assembled.



Students performing a skit

The Grand Finale

The project ended with an event organized on the National Safety Day in the premises of Indo-German Tool Room, one of the leading institutes in the Vatva Industrial Estate. This was in association with Ahmedabad Fire Brigade and Vatva Industries Association. Other government agencies such as Factory Inspectorate, Gujarat

Industrial Development Corporation were also involved in the event, along with Unnati, an NGO which has been involved in school awareness programmes related to fire safety. The major attractions of the event were the different competitions among the schools and the evacuation drill demonstrated by the Fire Brigade. Elocution and drama contests were organized during the day, which were followed by prizes being given to the winners. Students were enthused by this and other stakeholders also felt a part of the whole initiative.

The Fire Brigade drill started with a demonstration of how they put out fires, including industrial fires, and various rescue operations with the use of latest technology. This was followed by a special simulation of a gas leak. They created a gas leak - like situation by exploding smoke bombs, and the students had to react. This was a test situation to find out whether the children had imbibed the lessons from the activities they had been doing. It was good to see that most of the children covered their faces and with a little hint, also started moving in the direction perpendicular to the wind

direction. This was a live experience of a gas leak and how to evacuate in a gas leakage incident.

The involvement of stakeholders was amply demonstrated during this concluding event. The Industrial Association sponsored the refreshments of more than 300 people. The Ahmedabad Fire Brigade was represented by all the top officials at the event. There was no charge for the demonstration involving more than 50 personnel and specialized equipments.



Drill organized on the National Safety Day



Towards mainstreaming

There were several components designed towards mainstreaming the process within the schools. These were both in the form of publication resources, and capacity-building programmes of the teachers.

Teachers' Manual

Activity approach makes it more enjoyable to teach and learn

The Teachers' Manual is a key input to the whole effort. The idea behind developing the manual was to have a ready reference containing information and activities related to preparedness. This would be available not only in the project period but as long after the project as such had ended. To develop the manual, a very comprehensive search and consultative process was adopted. Visits were made to different institutions, which included offices of Factory Inspectorate, Gujarat Industrial Development Corporation. A visit was also made to Gujarat Safety Council, Vadodara which is an institution involved with developing and conducting many safety related programmes with the industries in the state. Meetings were also held with Safety Managers at Gujarat State Fertilizer Corporation (GSFC) and Gujarat Alkalis and Chemicals Ltd., Vadodara. These industries have carried out community awareness programmes related to industrial accidents. Many other local, state and national level organizations like National Safety Council, Loss Prevention Association, etc. were contacted for collection of background material, especially related to school and community awareness programmes. Extensive web search was also carried out to gather relevant information.

The Manual adopts an activity-oriented approach for conveying the concepts and preparedness measures in detail. The Manual addresses the links of industry and environment, industrial estates etc., in general, and goes on to give specific information about the Vatva industrial Estate, its hazardous

Bharat Prajapati, Headmaster of the A.C. Vishvavidyalaya said, "The activity oriented approach results in more understanding of the subject."

industries, potential threats specifically gas leak, fire and chemical spill and response mechanisms for each. The manual also provides survey formats, and other exercises which educators can use easily. An annexure provides useful contacts - for example, the institutes working in the area of industrial safety, names and the contacts of the members of Local Crisis Group at Vatva, etc. Before finalization, the draft of the Teachers Manual was shared not only among the teachers of the participating schools, but also with relevant experts and other key stakeholders for the project. The manual was brought out in the local language - Gujarati, as well as in English.

Orientation of Teachers

Capacity building key multipliers

Teachers - the crucial stakeholders and key multipliers in the project - were oriented to the project by discussing individually the ideas, concepts, need of the project and their role in carrying out the project. While the project had intended to involve two teachers from each schools for the project as well as for the orientation workshop, of their own interest, from some schools, three teachers participated in the Orientation Workshop held at CEE premises.

The teachers were oriented about the content and the approach of the Teacher's Manual. Apart from the discussion, some activities from the manual were also carried out with the teachers so that they got an idea of how the activity approach helps in effective transmission of information. The teachers participated enthusiastically and made several suggestions, which were incorporated in the Manual. The teachers also suggested the topics for elocution and drawing competitions to be organized at the individual school. They also suggested some modifications in the skit



Teachers' Manual

when two groups of teachers performed it on their own. These practical exercise helped the teachers to later on conduct similar exercise with the students.

Other Media

Innovative ideas and use of media help increase reach

Besides the Teacher's Manual, other communication tools like poster, calendars, and skits were developed to disseminate the messages. The poster was developed keeping in mind the general community living in the vicinity of the estate as the target group. It depicts the sequence of actions to be undertaken in case of three specific disasters - gas leak, fire and chemical spill. Most of the information is communicated visually so that non-literate community members could also become aware of the required responses. The posters were put up at public places - bus stops, hospitals, schools, local offices and some industries.



Poster with preparedness messages

Conclusion

Sustainability and ownership of the activities beyond the project

The ownership of the project, through the course of the project, has slowly shifted to one of the most important players in the project—the schools. Through the orientation sessions, the teacher's workshop and finally the awareness programmes by students in schools and further to the community, the school management, teachers and the students have really begun to take ownership of activities of the project. This has come about due to efforts to involve the schools not just as a 'target' of the project but as the prime stakeholders in developing the project. Other key institutions, as detailed earlier, have also started to develop a sense of ownership for the project rather than being another actor for project activities. The Association, by the end of the project, started feeling that this activity was beneficial for the welfare of their Estate and can bring credit to them for being a safety-friendly industrial estate.

Mr. Kishore Solanki, teacher of Kutir Vidyalay said "It is the social responsibility of the teachers to carry forward the work even after the NGOs move out."

Issues to consider while implementing

- How do we reach out to the community?
- How do we involve various stakeholders—industries and government institutions?
- How do we sustain this initiative?

Another innovative idea was to encourage children make their own calendars. Special calendars were printed for the project. The dates were printed, but the space for the visuals was left blank. Each student could write their name, a slogan related to preparedness and draw a preparedness related scene on the blank space provided. The students enjoyed not only the creative process of drawing but also the fact that they were developing a product by themselves. The students gave overwhelming response to this activity and completed the pictures with the information, which they received through the orientation, industrial visits, etc. These pages were bunched to form yearly calendars and put up in the schools.



above & below. Calendars with industrial safety messages



Lessons Learned and Future Challenges



- The urban poor, especially those living near factories are a vulnerable community as far as industrial disasters are concerned, but not much attention is focused on them.
- Education and communication are non-interventionist, low-resource and wide reaching approaches for vulnerability reduction.
- Schools are an effective high multiplier communication means to widely reach out to communities.
- School-focused initiatives have an inbuilt sustainability.
- A consensus-building or enabling approach helps ensuring greater stakeholder participation, rather than one of confrontation or activism. The cooperation extended by the Industries Association and government agencies was possible due to the effort to be completely transparent, and also understanding their concerns, and involving them at every stage of the project.



Further References

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About the Project

“Testing Communication Strategies for Industrial Disaster Risk Reduction” in Ahmedabad was launched in July 2003 with financial support from the Provention Consortium, The World Bank, through the Asian Disaster Preparedness Centre (ADPC).

The project aims at industrial disaster risk reduction for communities living in the vicinity of an industrial estate. With a low-resource approach and the involvement of the important stakeholders, this project promotes long-term sustainability in preparedness mechanism in industrial estates, vulnerable to the disasters.

The project was also selected as one of the fifteen best projects out of the total 65 projects that were given grants by the Provention Consortium and was shared at the “Global Symposium on Hazard Risk Reduction” held at World Bank HQ, Washington DC during 26-28th July, 2004.

About CEE

Centre for Environment Education, India is a national institution established in 1984. It is a Centre of Excellence of Environment Education supported by Ministry of Environment and Forests, Government of India and is affiliated to the Nehru Foundation for Development. The mandate of the Centre is to raise public awareness and understanding of environmental issues with a view to promote the conservation and wise use of nature and natural resources. To this end, CEE develops innovative programmes and educational material, and builds capacity in the field of education for a sustainable development. It undertakes demonstration projects in education, communication and development that endorse attitudes, strategies and technologies that are environmentally sustainable.

After the Gujarat earthquake in 2001 one of the major focus of the Centre is also working towards disaster rehabilitation, preparedness and awareness.

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Safer Cities

Safer Cities is a series of case studies that illustrate how people, communities, cities, governments and businesses have been able to make cities safer before disasters strike. The series presents strategies and approaches to urban disaster mitigation derived from analyses of real-life experiences, good practices and lessons learned in Asia and the Pacific. This user-friendly resource is designed to provide decision-makers, planners, city and community leaders and trainers with an array of proven ideas, tools, policy options and strategies for urban disaster mitigation. The key principles emphasized throughout *Safer Cities* are broad-based participation, partnerships, sustainability and replication of success stories.

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ADPC

The Asian Disaster Preparedness Center (ADPC) is a regional resource center dedicated to safer communities and sustainable development through disaster risk reduction in Asia and the Pacific. Established in 1986 in Bangkok, Thailand, ADPC is recognized as an important focal point for promoting disaster awareness and developing capabilities to foster institutionalized disaster management and mitigation policies.

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