

KNOWLEDGE NOTE 2-3

CLUSTER 2: Nonstructural Measures

The Education Sector



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Although the education sector sustained considerable damage in the Great East Japan Earthquake (GEJE), it also played a key role in protecting lives. Importantly, it provided both civil protection “hardware” and “software”: school buildings served as evacuation shelters and transition shelters, and the school curricula ensured that children knew how to prepare for and react in emergencies. The performance of schools in responding to the GEJE provided a number of important lessons about the role of the education sector in disaster risk management.

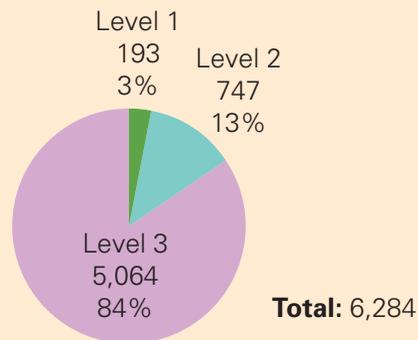
FINDINGS

DAMAGE TO THE EDUCATION SECTOR

The GEJE caused severe structural damage to schools. In total, 6,284 public schools were damaged. The Ministry of Education, Culture, Sports, Science, and Technology classified the schools into three categories according to the level of damage they sustained: 193 schools were completely destroyed (level 1); 747 schools sustained heavy damage and need structural repairs (level 2); and over 5,000 schools had minor, mostly nonstructural damage (level 3) (figure 1).

Seven hundred and thirty-three students and teachers were killed or are missing. The proximity of the schools to the coastline was a contributing factor. The students and teachers in the Okawa Elementary School building in Ishinomaki City died tragically because they did not evacuate to higher ground. Where students in coastal schools survived, the school structure, disaster risk management (DRM) education, and linkages to community preparedness played critical roles.

FIGURE 1: **Structure of the Central Disaster Management Council**



THE ROLE OF DRM EDUCATION IN COMMUNITY PREPAREDNESS

DRM education conducted effectively and in cooperation with other local community preparedness efforts saved many lives after the GEJE (KN 2-2).

For example, in Kamaishi, where the number of casualties reached 1,000, there were 5 deaths reported among 2,900 school children, and not a single child present in school that day was killed. The so-called Kamaishi Miracle is attributed to strong DRM education, including a longstanding local tradition of teaching children the culture of *tendenko*, which means to evacuate to higher ground on their own without searching for relatives or friends. This practice resulted from many years of experience with disasters, and is based on a strong mutual understanding and trust that family members will also evacuate to safety.

Kamaishi City has been conducting DRM education programs since 2005 in cooperation with Gunma University. The programs are not mandatory, but are being implemented in selected schools in vulnerable coastal areas. Two such schools are Unosumai Elementary and Kamaishi-Higashi Junior High School (figure 2). The program engages the local community in preparing disaster risk maps, and holds evacuation drills four times a year—one joint drill with the elementary and junior high school, and one annual drill with the local community.

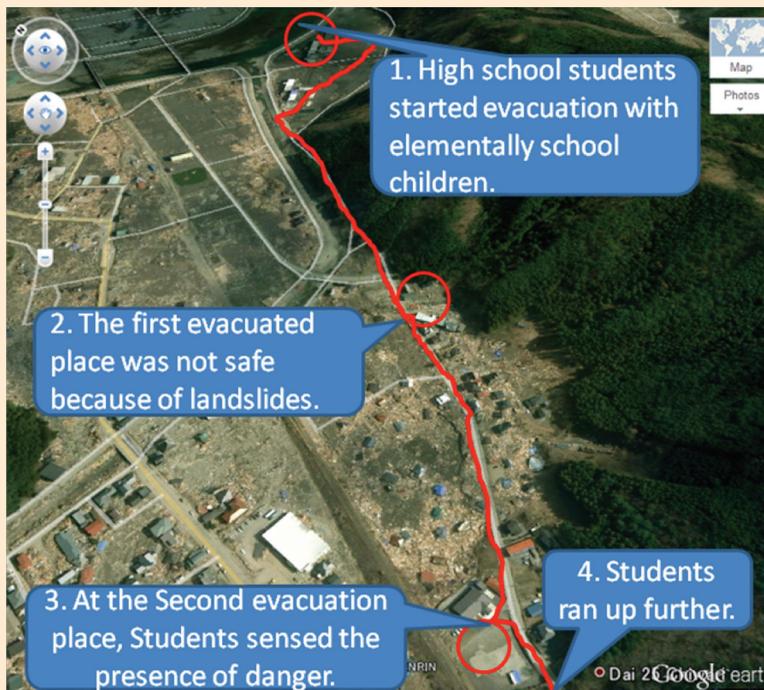
Kesennuma City provides another excellent example of how DRM is integrated into school curricula, where Education for Sustainable Development (ESD) has taught students for years about local environmental issues, and how to value and protect natural resources, the environment, and cultural heritage assets. ESD also includes a strong focus on DRM.

In Kesennuma, students at the Hashikami Junior High School are taught DRM as part of the ESD program. The school served as an evacuation center for more than 1,500 people after

BOX 1: Kamaishi-Higashi Junior High School

On March 9, 2011, the students of Kamaishi-Higashi Junior High School, located 500 meters from the coast, felt an earthquake and evacuated to the 3rd floor of the neighboring elementary school building. When the earthquake hit two days later on March 11, the students evacuated again to the 3rd floor, and were then advised by the local fire volunteer (*shobodan*) to evacuate to higher ground. The children of the elementary and junior high schools evacuated together, since they had conducted joint evacuation drills. They reached the first evacuation point located 700 meters from the school, where they noticed a cliff had collapsed. An elderly woman stated that she had never seen this happen there before and advised the students to move to a safer place. They moved to another point that was 400 meters higher, where they at first felt safe. However, when they heard the tremendous roar of the tsunami 30 minutes after the earthquake, they decided they should go to an even higher evacuation point.

Not one child or teacher present at school that day lost their lives in the event. Unfortunately, two students who were absent died in their homes, two drivers died in the school building, and one administrative staff is missing.



Evacuation routes taken by students

FIGURE 2: Kamaishihigashi Junior High School (top) and Unosumai Elementary School (bottom) are located near the sea



the GEJE, which occurred just before graduation. A graduation ceremony took place in the gymnasium, and was attended by the evacuees. During the ceremony, a student gave a speech in which he honored two students who had lost their lives in the tsunami:

“People are talking about Hashikami Junior High School as the “School of disaster prevention education,” and we are being praised around the world. We trained ourselves thoroughly and have been doing disaster prevention drills regularly. But our power as human beings was dwarfed by nature’s violence, and nature deprived us mercilessly of some of our most important things. This disaster was too cruel to

simply be called a trial sent from heaven...I feel angry and hardened. But our future lies not in blaming God but in helping each other and persevering, as difficult as that may be.”

His words reflect the anguish of the community, and at the same time the recognition, gained from the ESD curriculum, that the community’s responsibility is not to despair, nor to consider the disaster an “act of God,” but to rely on one another for support and to improve their risk management capacity.

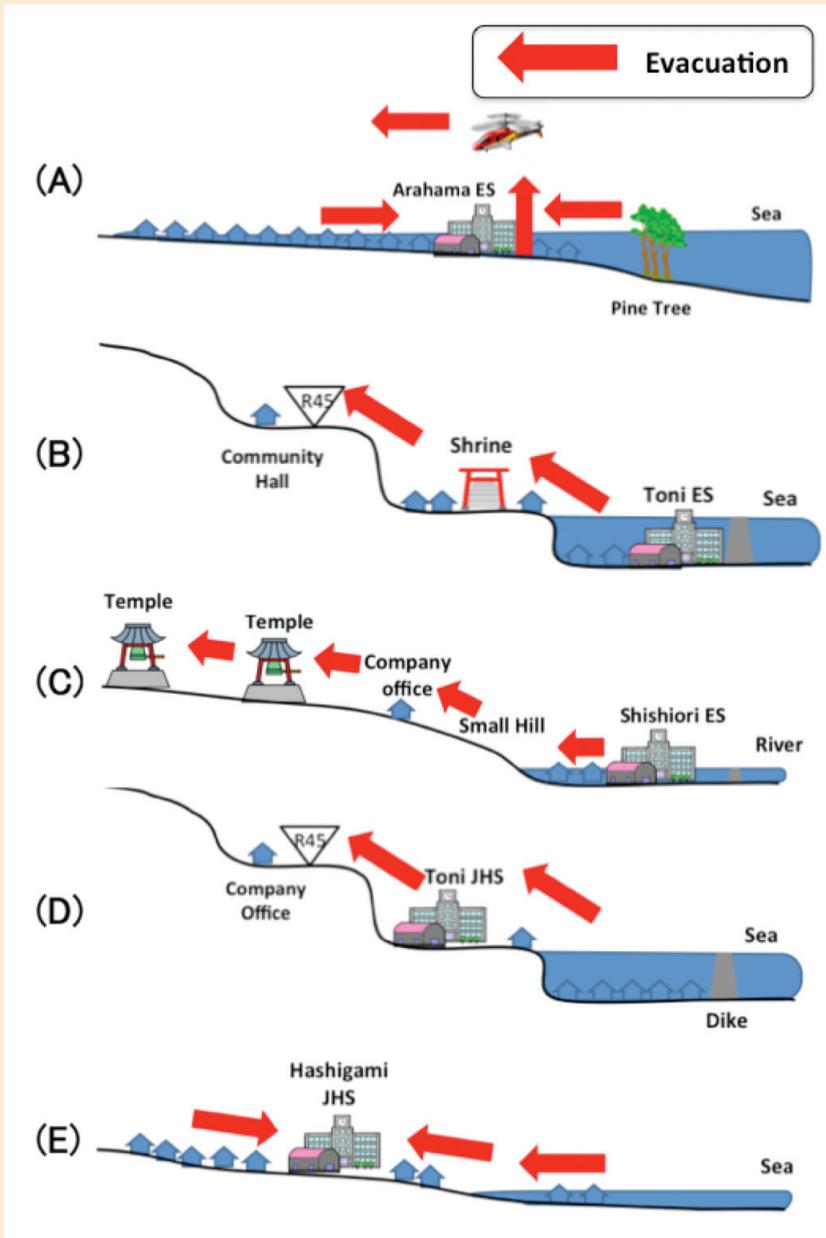
THE ROLE OF EDUCATIONAL FACILITIES IN DISASTER RESPONSE AND RECOVERY

As noted earlier, schools played a critical role in the immediate response to the GEJE (as evacuation shelters) and in the recovery process (as transition shelters) as shown in figures 3. The arrows represent the evacuation routes that people followed. Balancing the need to provide evacuation centers for communities and the need to reconvene classes for students has been a challenge, particularly where limited availability of suitable land has made housing reconstruction difficult, and the move from transitional shelter to permanent housing has been delayed.

Another challenge relates to the future role of school buildings in civil protection as demographics shift. While schools have traditionally been the most important public facilities in local communities, declining birth rates and a rapidly aging population make it difficult to justify rebuilding them in the same numbers and sizes. The following examples illustrate these issues in more detail:

- In the Arahama area, a school building served as an important evacuation shelter because of the flatness of the surrounding terrain and the building’s height. The reconstructed school building should be able to withstand future earthquakes, have a flat rooftop to which people can evacuate, be situated away from the coast, and be kept stocked with emergency supplies. Since the disaster, a large proportion of the local community has relocated elsewhere because of a lack of jobs, adequate housing, and infrastructure. These issues will need to be examined before rebuilding the school (figures 3 [a] and 4 [a]).
- In the Toni area, both the elementary and junior high schools need to be rebuilt. However, it is difficult to justify the construction of new schools of the same size because of the decrease in the number of school-aged children. Therefore, a single building will be developed jointly housing the elementary school, the junior high school, and other public community facilities. The security of school children also needs to be ensured given that the school building will be shared with the general public, and anyone can access it (figure 3 [b] and [d], and figure 4 [b] and [d]).
- Although Shishiori Elementary School is not located on the coast, the tsunami flooded the ground floor as it moved upstream along the river. While it only reached the ground floor, the school was nevertheless evacuated as there was no way of telling whether the upper level would be affected (figures 3 [c] and 4 [c]).

FIGURE 3: Location of schools in various areas



- Hashigami Junior High School was used as an evacuation shelter following the disaster, and is still being used for transition shelters. Since the school gymnasium has not been available for more than a year, the quality of educational services is being affected (figure 3 [e] and 4 [e]).

The loss of teachers who died in the tsunami has created a shortage of staff in many schools, posing an additional challenge for the continuity of the education. Finally, counseling services for school children suffering from posttraumatic stress disorder must also be provided.

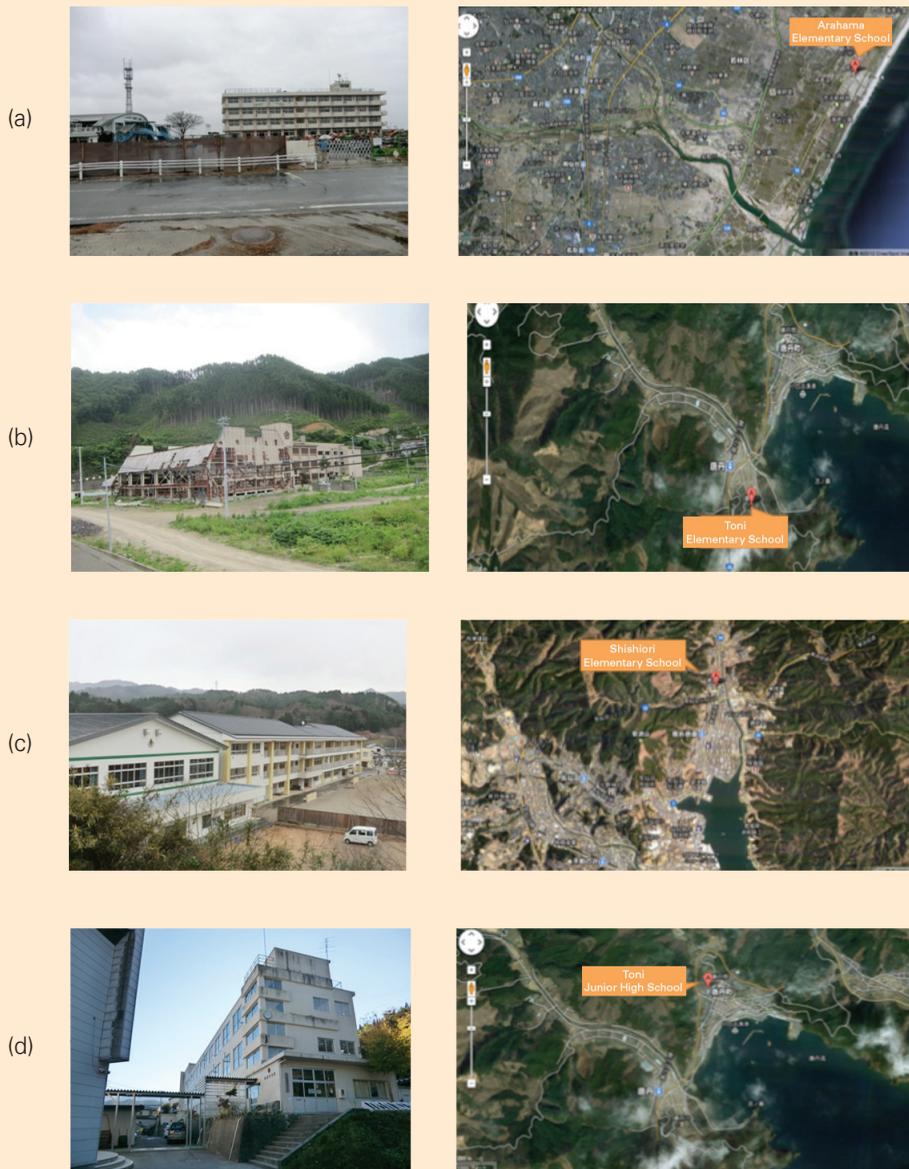
Considerable resources are required if the education sector is to recover fully. Funds need to be allocated for temporary schools, followed by site selection and construction of new schools, and repairs to buildings that remain structurally sound. An aging population and declining numbers of students presents a special challenge, as communities balance using school facilities for both education and civil protection purposes.

LESSONS

Key lessons from the GEJE experience for the education sector are as follows:

- **Importance of DRM education.** As exemplified by the Kamaishi experience, DRM education played an important role in determining the students' evacuation behavior. The role of teachers in implementing DRM in schools should be emphasized.
- **Structure, location, and layout of schools.** The location of school buildings is a crucial issue. In most cases, the buildings were located in close proximity (within 100–200 meters) to the coastline. Newer schools have slanted roofs to avoid water logging and structural decay. However, this prohibited people from taking shelter on rooftops. Also, it has been observed that schools that were parallel to the coast sustained greater damage than those set perpendicular to the coastline.
- **Function of schools and educational continuity.** While schools were to be used as evacuation centers, in several cases, people from local communities remained sheltered in schools for more than six months. This has serious implications for the restoration of educational services and children's educational development. This issue needs to be considered in future school-level contingency planning.
- **Human resources and training.** In the aftermath of the GEJE, schools face a shortage of teachers, which has affected the continuity of education. Students from the education faculties of local universities have tried to fill this gap; however, this also needs to be addressed in planning for educational continuity in postdisaster situations.
- **New role of schools and multistakeholder dialogue.** Given the changing demographic conditions, schools need to play a bigger role as community facilities. Therefore, a broader range of stakeholders, including community members, needs to be included in reconstruction decision making.

FIGURE 4: Schools and locations: (a) Arahama Elementary School, Sendai City; (b) Toni Elementary School, Kamaishi City; (c) Shishiori Elementary School, Kesennuma City; (d) Toni Junior High School, Kamaishi City



RECOMMENDATIONS FOR DEVELOPING COUNTRIES

The education sector plays an important dual role in the provision of civil protection hardware and software: school buildings serve as evacuation shelters and transitional shelters; and school curricula help instill a culture of DRM and preparedness in the community. The recovery of the education sector is directly linked to the recovery of the entire community.

DRM education saves lives. Students save their own lives and the lives of others when they lead evacuations in communities. DRM in the education sector should not be limited to the education curriculum, but should also include related issues such as structural and nonstructural safety measures; legislative measures supporting the integration, implementation, and funding of DRM in the education sector; risk assessments and early warning systems; and DRM training for school staff.

The postdisaster reconstruction process offers an opportunity for communities to reconsider their future needs regarding both the education of their children and their community facilities. A multistakeholder dialogue can help determine the optimal arrangements and design reconstruction plans accordingly.

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