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East Japan Earthquake and Tsunami

Key Lessons for the Education Sector

E-HFA	Tasks	Key Lessons and Issues				
		Structure, Location, Layout	Function and Educational Continuity	Human Resources and Training	Effectiveness of Disaster Education	New Role of School and Multi-stakeholder Dialogue
E-HFA1	Tasks1					
	Tasks2					
	Tasks3					
	Tasks4					
E-HFA2	Tasks5					
	Tasks6					
E-HFA3	Tasks7					
	Tasks8					
	Tasks9					
	Tasks10					
E-HFA4	Tasks11					
	Tasks12					
	Tasks13					
	Tasks14					
E-HFA5	Tasks15					
	Tasks16					

Legend:
Low Performance, Need improvements
Moderate Performance
High Performance

E-HFA1 : Task1~4

Priority 1:
Developing an institutional basis
for disaster risk reduction (DRR) in education

- Task 1. Engage in multi-stakeholder dialogue to establish the foundation for DRR education
- Task 2. Create or strengthen mechanisms for the systematic coordination of DRR education
- Task 3. Assess and develop an institutional basis for DRR education
- Task 4. Prioritize DRR and allocate appropriate resources for DRR education

- Structure, Location, Layout of Schools
- Function of Schools and Educational Continuity
- Human Resources and Training
- Effectiveness of Disaster Education
- New Role of School and Multi-stakeholder Dialogue

E-HFA

Safe Location,
Safe Building

Community of
Compulsory
Education

Evacuation
Center



Budget

Population Drain

Aging and
Declining
Birthrate

Lack of Teachers
and Educational
Materials

Mental
Health Care



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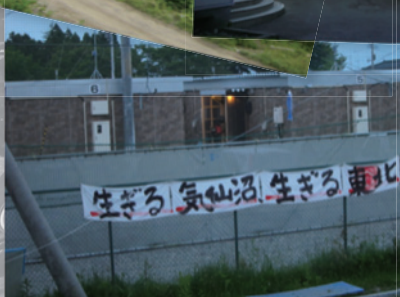
East Japan Earthquake and Tsunami

Key Lessons in the Education Sector



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Overview of East Japan Earthquake and Tsunami

1

A massive earthquake of magnitude 9.0 occurred on Friday 11 March, off the Pacific coast of northeastern Japan (Tohoku Region). More than 15,000 people were killed and the number of the missing persons is more than 3,500 (NPA, 2011). Table 1 and 2 are the overview of the earthquake and tsunami provided by JMA (2011).

The earthquake was the fourth mega earthquake known to date; the other three were the Chile earthquake in 1960, the Alaska earthquake in 1964 and Sumatra earthquake in 2004. The first tsunami reached the Japanese mainland 20 minutes after the earthquake and ultimately affected a 2000 km stretch of Japan's Pacific

Date and Time	11 March 2011 14:46 JST (05:46 UTC)
Magnitude	9.0 (interim value; the largest earthquake recorded in Japan)
Hypocenter	N38.1, E142.9 (130km ESE off Ojika Peninsula) Depth 24km (interim value)
JMA Seismic Intensity (refer to Figure 1)	7 (Max): Kurihara City of Miyagi Prefecture 6+: 28 cities and towns (including Wakuya Town, Tome City, Osaki City, Natori City) in Miyagi, Fukushima, Ibaraki, and Tochigi Prefectures 6- or weaker: Observed nationwide from Hokkaido to Kyushu

Table 1 Earthquake Details

Date and Time	Action	Number of Areas (Total: 66 areas)		
		Warning (3m or higher)	Warning (Up to 2m)	Advisory (About 0.5m)
11 March 2011 14:49 JST (05:49 UTC)	Issued	3	5	15
11 March 2011 15:14 JST (06:14 UTC)	Increased	6	7	23
11 March 2011 15:33 JST (06:33 UTC)	Increased	10	24	11
11 March 2011 16:08 JST (07:08 UTC)	Increased	17	19	17
11 March 2011 18:47 JST (09:47 UTC)	Increased	17	19	18
11 March 2011 21:35 JST (12:35 UTC)	Increased	17	22	19
11 March 2011 22:53 JST (13:53 UTC)	Increased	18	21	19
12 March 2011 03:20 JST (18:20 UTC)	Increased	18	21	27
12 March 2011 13:50 JST (04:50 UTC)	Decreased	4	11	26
12 March 2011 20:20 JST (11:20 UTC)	Decreased	0	4	21
13 March 2011 07:30 JST (22:30 UTC)	Decreased	0	0	15
13 March 2011 17:58 JST (08:58 UTC)	Lifted	0	0	0

Table 2. Tsunami warning and advisories [Source: JMA 2011]

coast (Shaw and Takeuchi 2012).

This disaster caused widespread human suffering and catastrophic damage to housing and infrastructure (Table 3). According to the National Police Agency, the death total is estimated at 15,840 people (2011/12/9). The main cause of death was drowning, with people more than 60 years old accounting for 65% of the dead. The number of deaths was about three times of that of the Great Hanshin Awaji Earthquake. 120,241 houses were completely destroyed and 189,822 houses partially collapsed as of 17 November 2011. The peak number of evacuees reached to

200,000 people, many of whom still remain in temporary housing.

The tsunami hit the prefectures of Iwate and Miyagi at different times, with the closest occurring approximately 22 to 25 minutes from the time of the earthquake, and the farthest occurring approximately one hour after the earthquake. On an average, there was 30-40 minutes time lag between the earthquake and the arrival of the tsunami (illustrated in Figure 1).

In the East Japan Earthquake and Tsunami, the education sector experienced massive damage,

Prefecture	Population		Houses			
	Dead	Missing	Total collapsed	Half collapsed	Inundation above floor level	Inundation under floor level
Hokkaido	1			4	329	545
Aomori	3	1	310	851		
Iwate	4665	1420	20184	4551	1761	323
Miyagi	9503	1994	77034	93568	7053	11009
Akita						
Yamagata	2		37	80		
Fukushima	1605	222	18373	56864	62	339
Tokyo	7			11		
Ibaragi	24	1	3225	23005	1609	726
Tochigi	4		264	2029		
Gunma	1			7		
Saitama				5		
Chiba	20	2	783	9205	153	720
Kanagawa	4			38		

Table 3. Damage situation as of 2011/11/21
(Source: National Police Agency)

along with other sectors such as housing, infrastructure, energy and civil society. In total, 6,284 public schools received damage and 733 school students/teachers died or missing as a result of the 2011 Tohoku Earthquake and Tsunami (MEXT, 2011). MEXT classified the damage each school suffered into three levels. Figure 4 shows the breakdown of school number of damage levels 1-3. 193 schools belong to damage level 1, indicating total destruction rendering the continued use of the school impossible. Level 2 signified heavy damage, necessitating structural repairs. Level 3 signified minor damage, mostly non-structural.

Many schools and learners and educators within them were affected by the disaster. One of the key reasons for this was the proximity of the schools to the coastlines. The Okawa elementary School of Ishinomaki city is one of the few schools, where the students and teachers died in the school building itself since they did not evacuate to higher places. However, not all the coastal schools suffered from loss of the lives of school children, which has been attributed to other factors such as size and structure of school, links with the community, disaster risk reduction education etc.



Figure 1. Tsunami hitting the Iwate [above] and Miyagi [below] prefectures
[Source: National Geographic 2011]

Role of Schools in Japan as Evacuation Center

2

According to the Ministry of Education, Culture, Sports, Science and Technology (MEXT), there were about 42,000 public schools as of Japan in 2009. The school has two social roles: as place of learning and living for children, and the core of the community for hosting different community events in the schools, such as sport festivals. In its role as a place of learning and living for children, the Central Council for Education of MEXT describes schools as the following (Takeuchi and Shaw 2012):

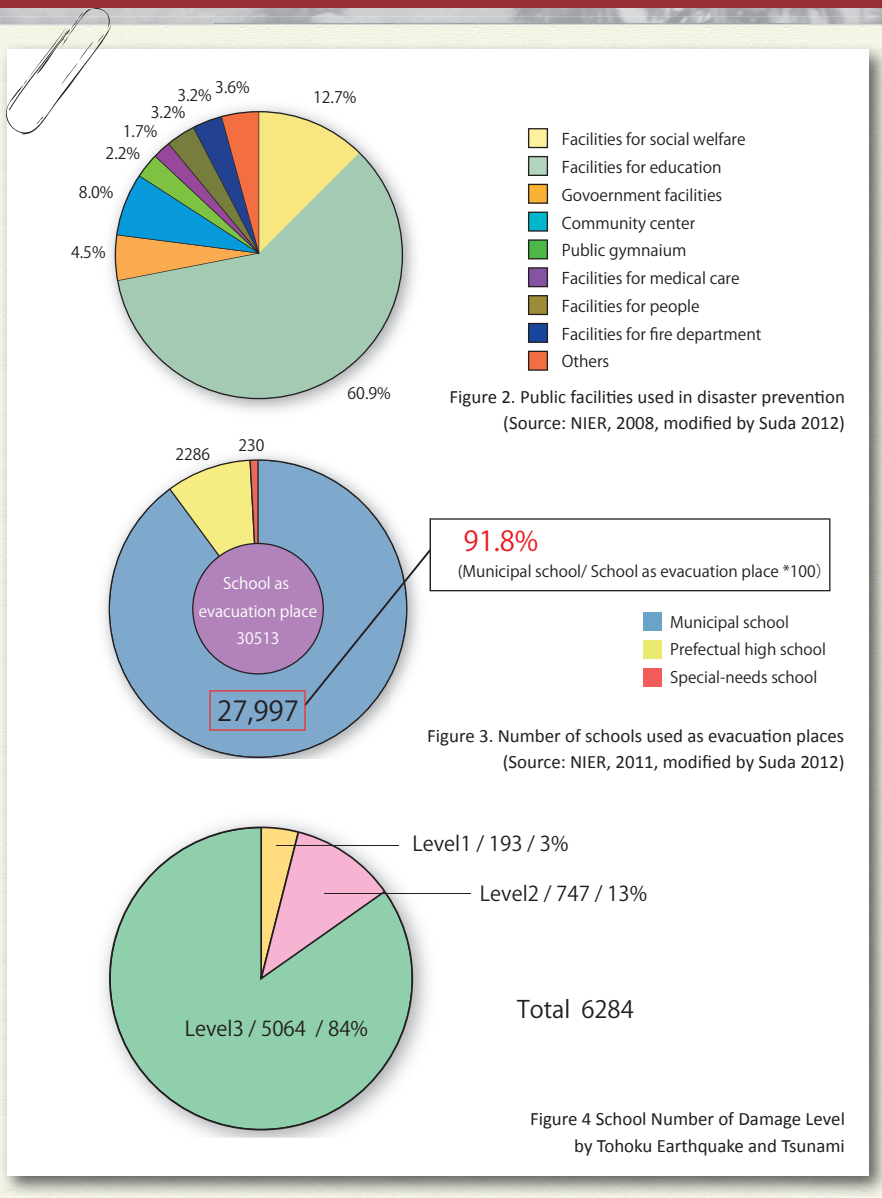
“A school should provide balanced education for the attainment of knowledge and moral and physical health during the developmental stage of children. In addition, schools should contribute to lifelong learning. In particular, focusing on base and accident are important to enhance the academic ability and make a base of learning for life. Also, it is fundamental to develop a good heart in terms of humanity and social relations through communal living with friends of the same generation. Most importantly, it is essential to discover the strength of each child as well as enhance their character and ability. Thus, every public school has course instruction and daily life guidance based on the proposal of the MEXT.” Recently, schools have addressed disaster education in addition to course instruction and values education. The importance of disaster education at the school level has been recognized in the

work of Shaw, Shiwaku, Kobayashi and Kobayashi (2004) and many other publications. Also, Shiwaku, Fujieda, Takeuchi and Shaw (2010) describe that disaster education in school is an effective means to raise awareness of not only students but also their family members and the community (Shaw and Kobayashi 2001).

According to a survey conducted by the Fire and Disaster Management Agency (FDMA) in 2008, schools account for 60% of the public buildings used as disaster prevention facilities (Figure 2). Furthermore, according to the National Institute for Education Policy Research (NIER), in 2011 89.3% of all public schools in Japan are allocated as evacuation sites. Also, municipality schools account for 91.8% of public schools used as evacuation sites (Figure 3). Most of the elementary and junior high schools are administered by municipalities in Japan. Hence, we can see that public elementary and junior high schools are primarily used as evacuation sites. There are three reasons for why schools are often used as evacuation sites during disasters. Firstly, it is the requirement by the Japanese law of Disaster Management that schools will be used as evacuation centers. Secondly, schools have infrastructure and facilities that are well-built to cope with different types of natural hazards, for example earthquake or typhoon-resistant construction that can also

withstand the impacts of other natural hazards. Thirdly, schools, and particularly elementary schools, have a high degree of visibility and

familiarity with local communities, since they have become the center of a range of community activities.



Selected Cases of Impacts on Schools in Tohoku Area

3

This section provides six case studies on how schools were affected by and responded to the 2011 East Japan earthquake and tsunami disaster, which are derived from detailed interviews and field surveys with school principals and municipal education boards in various cities across the region. Figure 5 provides a flow chart on each of these case

studies. The major differences between them were whether the school area was damaged by the tsunami or not. Schools that were damaged were either evacuated or served as evacuation centers for other schools and the local community (Takeuchi and Shaw 2012).

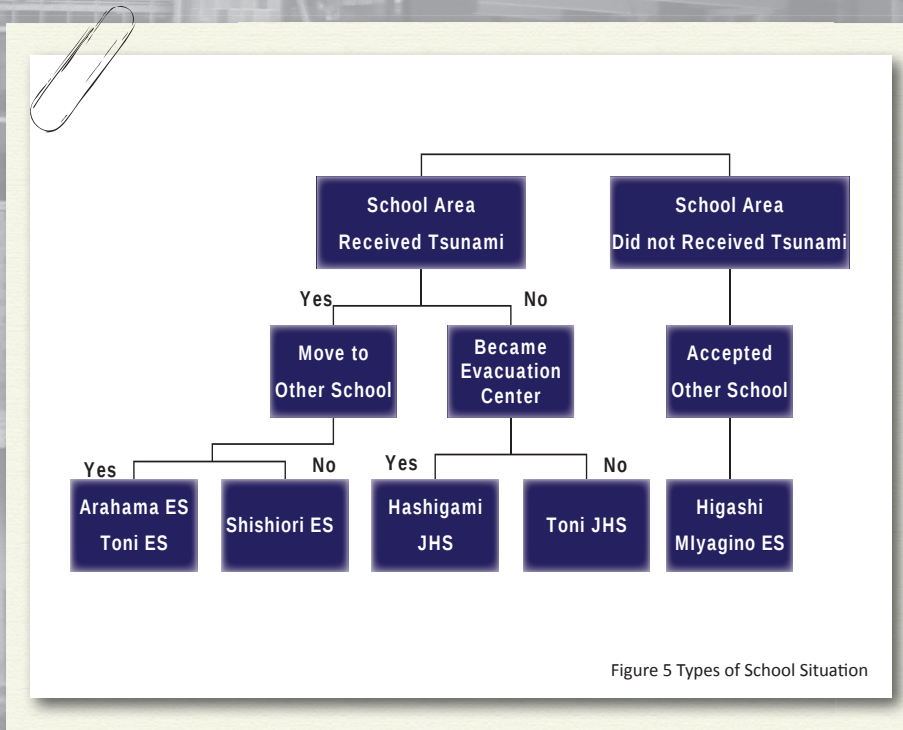


Figure 5 Types of School Situation

3.1 Arahama ES in Sendai City, Miyagi Prefecture



Arahama elementary school (ES) is a public school in Sendai city. This school is located on the Sendai plain, within 200 meters from the coastline. Sendai plain is large flat area, and the school had served as an important evacuation centre in the past due to its height and flat rooftop. The area was affected by the Chile Tsunami on 27th February 2010. After this tsunami, the school principal revised the disaster management plan by increasing the storing capacity of emergency food and utilities and moving the evacuation area from the gymnasium to the 3rd floor of school building. In consideration of the time required to take shelter in another elementary school (4 kilometers away), it was decided that students would be confined to this school during the disaster.

The school had 16 teacher/staff members and 94 students on 11 March, 2011. When the earthquake happened at 14:46, the 1st and 2nd year students were on their way back to their homes, while other students were taking classes in the school building. Arahama ES's building is 4 stories with a flat rooftop. Immediately

after the earthquake, students and teacher/staffs evacuated to 4th floor, followed by around 233 people from the local community. The tsunami came at around 15:55 and reached up to the 2nd floor. At around 17:30, the first helicopter arrived and started rescuing the students (Figure 6, 11A).

Currently, Arahama ES has is temporarily relocated to Higashi Miyagino ES. After receiving the decision to move from the education board of Sendai city, the school received support materials from the government, NGO/NPOs, and others sources, making it easier for the school to resume classes. After the recommencement of schooling, students started to come by school bus from temporary houses or rented apartments that were spread over a vast area. This introduced logistical challenges and the potential for community dislocation and breakdown issues, which have become apparent during the recovery process.



Figure 6. Arahama ES and its surrounding

3.2 Toni ES in Kamaishi City, Iwate Prefecture



Established in 1982, Toni Elementary School is located in the Sanriku mountain area, which is characterized by narrow valleys and steep slopes. 11m concrete dikes were developed along the coast, and Toni ES was located near this dike. The school had 14 teacher/staffs and 68 students on 11th March 2011. At 14:46, students were taking classes in the school building. After the earthquake stopped, students gathered in the grounds and moved to a shrine on a nearby mountain. Some voluntary fire fighters came to school and helped in the evacuation. This area received large tsunami waves three times in this disaster. After the 2nd wave, the school principle was worried that the next one may be even larger than the first, and he moved school students and teachers/staff to an even higher location on National Route 45. After reaching Route 45, they moved to the community

hall and stayed for one night (Figure 7, 11B).

The school was heavily damaged by the tsunami, which reached up to the 3rd floor of the school building. Consequently, the school's facilities could not be used to resume classes, and temporary space was granted by Heita ES. After five months after the disaster, the education board of Kamaishi city made a plan to merge Toni ES with Toni JHS (referred to in a later case study) and other public community facilities. The school principle agreed to this plan, but was worried about differences that existed between the ES and JHS, such as differences in class lengths, as well as requirements of different levels of safety measures for ES and JHS. The Toni ES is currently operating in a temporary school facility built in the Toni JHS premise.



Figure 7. Toni ES and its surrounding

3.3 Shishiori ES in Kesennuma City, Miyagi Prefecture



Shishiori ES had 135 students and 25 teachers at the schools on 11 March 2011. After the earthquake occurred, the students and teachers immediately evacuated to the playground, and then to higher ground once the principal received information about a tsunami. Several parents came to receive their children from the school, however, the principal asked the parents to evacuate with the school. Three children who left the school to evacuate with their parents were affected by the tsunami on the way, and two teachers lost their lives outside the school.

the children to their parents the next day. The principal returned to his school after four days to start the cleanup process, even though his own house had been washed away. Once it had been cleaned, the school was instructed to restart by the municipal education board, and a graduation ceremony was conducted. Today, the school continues to hold special community events and charity marathons with the school children, which have served to deepen its relationship with the local community (Figure 8, 11C).

As evening approached and the temperature fell, the principal decided to move the children to a nearby temple and spend the night there before handing



Figure 8. Shishiori ES and its surrounding

3.4 Toni JHS in Kamaishi City, Iwate Prefecture



Unlike its elementary school counterpart, Toni JHS was located on high ground, and thus was not directly affected by tsunami. However, the building was quite old, had suffered significant damage from the earthquake, and could not be used as an evacuation center. When the earthquake happened, there were 47 students and 11 teachers in the school, and all of them evacuated after the earthquake as a precaution against an approaching tsunami. Based on an earlier simulation, the school principal had knowledge that there would be a time lag of 30 minutes between the earthquake and the arrival of the tsunami. Therefore, he instructed the students to help the aged population from the local community to evacuate with them to Route 45.

The students spent the night together with the local community in a construction site office near Route 45, and were received by their parents on the next day. Since the route 45 was heavily

damaged by the earthquake in many places, the school and the community were isolated had to depend on the locally-available resources for some time. Schooling resumed one month after the disaster, beginning with graduation and welcome ceremonies that were held in the gymnasium. Classes were also conducted in the gymnasium, and in January 2012, the school was relocated to a temporary building on the playground.



Figure 9. Shishiori ES and its surrounding

3.5 Hashigami JHS in Kesennuma City, Miyagi Prefecture

Hashigami JHS was locally renowned for its involvement in disaster risk reduction education before the disaster. The school had conducted several disaster education and ESD (Education for Sustainable Development) programs with the local communities in the past. On 11 March, 2011, there were 167 students and 24 teachers in the school. The 1-2 year students were busy preparing for the graduation ceremony, which was to be held the next day. When the earthquake occurred, students and teachers immediately evacuated to the playground of the school. As the school is located in a relatively higher area near Route 45, more than 2,000 people evacuated to the school after the earthquake, including both the local community as well as the passersby from Route 45.

There was no damage to the school building due to the earthquake or tsunami, and so the school's gymnasium hosted around 800 people from the local community for several nights following the disaster. Many of these people lost their homes to the tsunami, and continued to shelter in the gymnasium for the next 8 months until temporary housing was constructed (Figure 10, 11E), which had a significant impact upon the school's continued operation. To some extent, this impact continues to the fact that some of the temporary housing has been built upon the school grounds.



Figure 10. Hashigami JHS, temporary housing and its surrounding

3.6 Higashi Miyagino ES in Sendai City, Miyagi Prefecture

Higashi Miyagino elementary school is located in the Sendai city, and did not experience any major damages in the current disaster. The school had several vacant classrooms, which were later used by Arahama elementary school. There was no major conflict between the students and teachers of each schools. Rather, both the schools conducted joint outing programs for the students, and other activities related to the communities. This was possible because the school had two wings and

the numbers of the students were less than the number of the classrooms. The Arahama elementary school was able to use a separate wing for their classes, without disturbing the education of the Higashi Miyagino ES. Therefore, it was like two different schools in one large building.

Figure 11 explains with illustration the situation of each school. Table 4 shows the summary of the observations in each school.

	Damage of Building	During Tsunami	After 3.11	Current Situation
Arahama ES	Tsunami reach to second floor	320 people evacuate school building over 4th floor	Rescued by helicopter or move to other evacuation place by oneself	Temporary usage in Higashi Miyagino ES
Toni ES	Tsunami reach to 3rd floor	Move to height area	Stay one day in community hall	Temporary usage in Heita ES. Temporary school building was developed.
Shishiori ES	Tsunami reach to first floor	Mover to some places	Stay three days in temple	Can use all own facility
Hashigami JHS	No Damage	Many people evacuate to school	Established Evacuation center for over 8 month and developed temporary house in ground	Can use own facility. But without ground. Because, temporary house build on the ground
Toni JHS	Building broken by Earthquake	Move to height area	Stay three days in company office	Temporary usage if gymnasium. Temporary school building was developed.
Higashi Miyagino ES	No Damage			Accepted temporary usage

Table 4 Summary of case study school condition

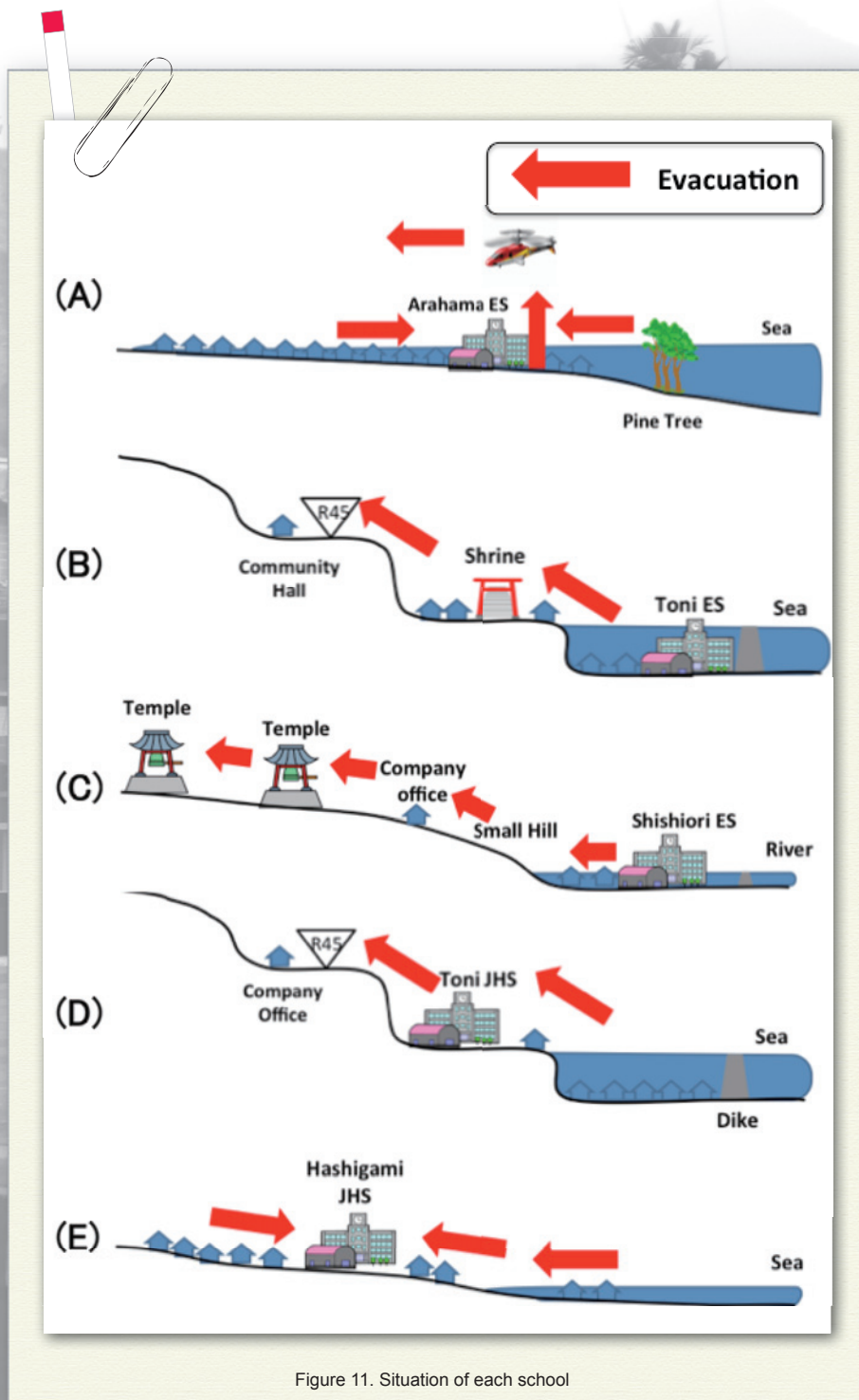


Figure 11. Situation of each school

Priority of Community and School Facility and Evacuation Center

4

After experiencing a disaster of this magnitude, the recovery and reconstruction process of local social and physical infrastructure has been extremely challenging. In the areas that were affected by the tsunami, factors such as the limited availability of suitable land has made the construction of houses under the town recovery plan difficult. While schools have traditionally been the most

important public facility in the community, communities have recently been challenged by the rapidly aging population and decreasing number of school-going kids.

From the above-mentioned case studies, the following key observations can be made in the aftermath of the disaster.

In the Arahama area, the old school building served as an important evacuation area due to the flatness of the surrounding terrain and the building's height. Therefore, it is important that the new school building be able to withstand future earthquakes, should have a flat roof [for people to evacuate to the rooftop], to be constructed away from the coast, and to be kept stocked with emergency food, water and utilities and etc. Since the disaster, a large proportion of the local community has relocated elsewhere, due to a lack of jobs, adequate housing, or infrastructure. It is unlikely that the school will be able to be reconstructed in the absence of these things.

In the Toni area, both the Elementary and Junior High Schools require reconstruction-however, it is difficult to justify the construction of a new school of the same size, because of the smaller number of children due to increasing number of aged population. Therefore, a joint building will be developed housing the elementary school, junior high school, and other public community facilities. The safety of school children also needs to be ensured given that the school building will be shared with the general public.

From Shishiori ES, the school was not located on the coastline but was reached by the tsunami as it moved upstream along the river. While it only reached the schools ground floor, the school was nonetheless evacuated as there was no way of telling whether the upper level would be affected or not.

From Hashigami JHS, the school had been used as an evacuation center for 10 months following the disaster, and is still being used as the location of temporary housing. However, since the school gymnasium was not able to be used for 10 months, the quality of education that students of the school received was affected.

Figure 12 summarizes the needs and issues of school recovery. It is important to keep the balance of the expected roles of schools in general time and in recovery time. There are three elements linked to the school: the school needs to be a safe building since it hosts the children. It needs to ensure the continuity of the education during emergency time in the schools. And, schools also need to serve as an evacuation center.

In the context of the East Japan Earthquake and Tsunami, there are several challenges for the recovery of the education sector: budget related to the school construction is an important issue. There need to be an allocated budget for

temporary schools, followed by site selection and construction of new schools which require significant resources. Population drain, aging population and decreasing number of children are some of the challenging issues which need to be kept in mind for the reconstruction of the new schools in the affected areas.

In many schools, due to death of the school teachers, there is a shortage of the school teachers, which also poses a challenge for the continuity of the education in the affected region. Finally, the mental care of school children suffering from PTSD [Post Traumatic Stress Disorder] is also an important issue for the school recovery.

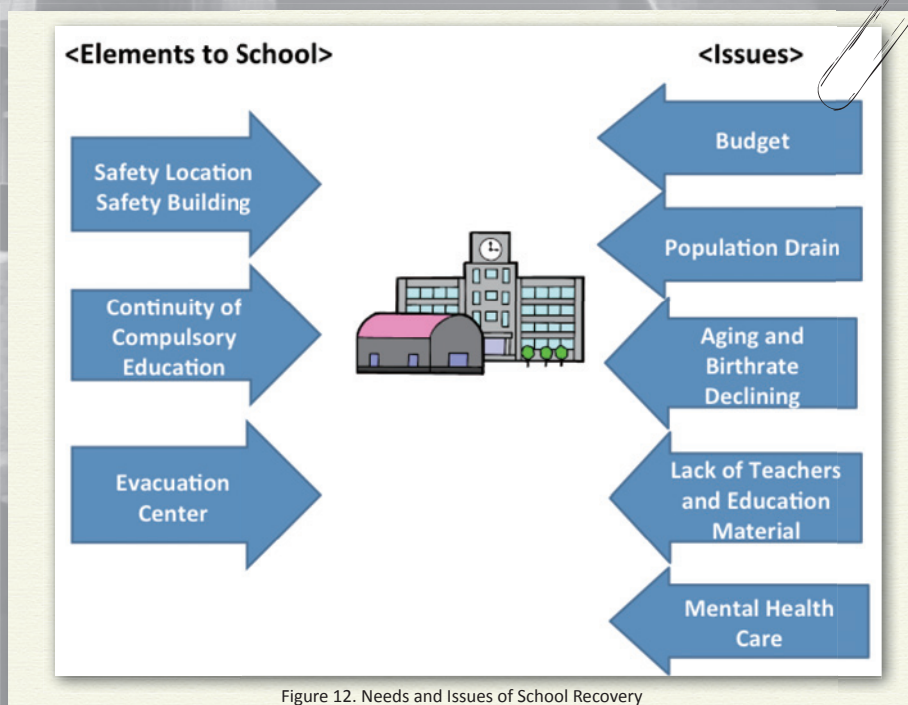


Figure 12. Needs and Issues of School Recovery

Key Lessons Learned from the Disaster and its Aftermath

5

The enormous impact that the 2011 East Japan earthquake and tsunami disaster had on the education sector warrants an in-depth examination of lessons learned from the disaster in order to reduce the risk of future disasters. School damages in the affected areas need further detailed investigations to understand the reasons for the damages and their potential future remedy.

Broadly, key lessons can be

categorized into:

- **Structure, Location, Layout of schools:** Location of school building is a crucial issue. In most cases, the buildings are located in close proximity of the coast [within 100 to 200 m from the coast line]. In most cases, the new schools have slated roof, which prohibited the children and communities to take shelter on the roof. The slanted roof is

Priority 1: Developing institutional basis for disaster risk reduction (DRR) in education
Task 1. Engage in multi-stakeholder dialogue to establish a foundation for DRR education
Task 2. Create or strengthen mechanisms for the systematic coordination of DRR education
Task 3. Assess and develop an institutional basis for DRR education
Task 4. Prioritize DRR and allocate appropriate resources for DRR education
Priority 2: Identifying, assessing, and monitoring disaster risks in the education sector
Task 5. Establish risk assessments for the education sector
Task 6. Strengthen early warning in the education sector through effective communication and dissemination mechanisms.
Priority 3: Building a culture of safety through DRR education
Task 7. Develop program to raise public awareness of DRR
Task 8. Include DRR in the education system
Task 9. Develop DRR training and learning at the school and community
Task 10. Enhance dissemination of DRR information
Priority 4: Reducing the underlying risk factors in the education sector
Task 11. Environment: Understand sustainable ecosystem, environment, and natural resources management
Task 12. Establish measures to incorporate DRR in urban and land-use planning
Task 13. Structures: Strengthen mechanisms for improved building safety and protection of critical facilities in the education sector
Task 14. Disaster recovery: Develop a recovery planning process that incorporates DRR
Priority 5: Preparing for effective emergency response and recovery in education
Task 15. Build on disaster preparedness capacities and mechanisms in the education sector
Task 16. Assess disaster response preparedness capacities and mechanisms through strengthened planning

Table 4. Sixteen Tasks Relevant to the Education Sector (Source: Gwee et al, 2011)

made to avoid water logging and structural decay. Also, it has been observed that schools which were aligned parallel to the coast have higher damage than those which lay perpendicular to the coast.

- **Function of schools and Educational Continuity:** While schools were used as evacuation center, in several schools, people from local communities remained for more than 5 to 6 months. This had serious implications to the educational continuity in the post disaster environment. This needs to be incorporated in the future school level contingency planning.
- **Human Resources and Training:** At the aftermath of the disaster, the schools face a shortage of teachers, which
- has affected the continuity of education. Students from the education faculty from local universities have tried to fill this gap; however, this also needs to be incorporated in the educational continuity planning in post disaster situations.
- **Effectiveness of Disaster Education:** As exemplified in the Kamaishi experiences, disaster education played an important role in the students' evacuation behavior. In the secondary schools, the children evacuated along with the elementary school children. The role of teachers in implementing disaster education in schools needs to be highlighted.
- **New role of school and multi-stakeholder dialogue:** In the

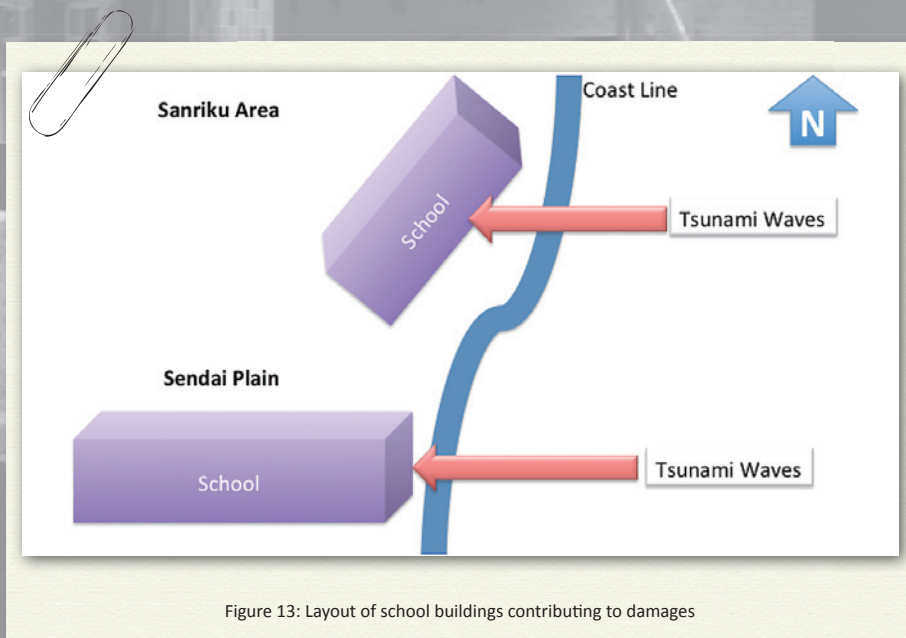


Figure 13: Layout of school buildings contributing to damages

changing demographic condition, schools need to play increasing role in the community as a community facility. Therefore, the reconstruction of the school building needs interactions with a diversity of stakeholders, including community members.

Gwee, Shaw and Takeuchi (2011) identified and adapted 16 of the original 22 tasks suggested for the implementation of the Hyogo Framework for Action (HFA) for use in the education sector. The 16 tasks are referred to as E-HFA or Education in the HFA as shown in Table 5. The following analysis attempts to link lessons learned from the disaster to the E-HFA framework.

In several school buildings, structural design was a critical factor in whether a school building was able to withstand the earthquake and tsunami or not. Despite the magnitude 9 earthquake, few of the school buildings highlighted in the case studies partially or totally collapsed, attributed to their being retrofitted for seismic safety, as part of national and prefecture-led programs. This shows a high level of education governance, linked to the E-HFA Priority 1 [Task 3]. However, the damage as a result of the tsunami was observed to be widespread, and in many cases, multi-hazard approaches were not incorporated, which is linked to E-HFA priority 4 [Task 13].

In terms of structure, many of the school buildings had curved roofs instead of flat roofs, which prevented the students and community members from taking

shelter on the rooftop. The curved roofs were promoted to reduce water logging in heavy rainfall areas, but they became a barrier to evacuation during the tsunami, exemplifying the need for multi-hazard assessment when engaging in DRR. The other important factor relating to school building design within the context of the disaster is layout. It was found that schools positioned perpendicularly to the coastline were not damaged as badly as those lying parallel to the coastline, such as those in the Sanriku area, which received the full force of the tsunami along their entire length (Figure 13).

The location of the school was another crucial issue. Many of the most heavily damaged schools were located within 100-200 meters of the coastline [e.g., the Arahama elementary school, Toni elementary school etc.], relevant to both Priority 2 [Task 5, in terms of risk assessment] and Priority 4 [Task 12, in terms of land use planning]. Schools, being essential social infrastructure, need their risk assessed appropriately, an in-depth understanding of underlying risk factors, and proper land use planning.

Schools can have a life-saving function during emergency periods, as exemplified by E-HFA priority 5 [Task 15 and 16]. They can provide accessible and safe evacuation centers and later provide temporary housing for evacuees when undamaged, as Hashikami JHS did for several months. However, it is important to recognize that this may have a negative impact upon the quality of education delivered

by the school after the disaster has ended. In the case of Arahama ES, students and local communities were required to sleep in the school building, exemplifying the importance of the provision of emergency goods and food, as per E-HFA Priority 5 [task 16, emergency response capacity].

Human resources, teacher trainings, and emergency manuals were other key factors. In most cases, school principals had to spearhead the evacuation of the students, and were forced to make critically important decisions over

evacuations without the availability of clear information on the tsunami timing and height. Although evacuation sites were identified in emergency manuals, teachers also had to make decisions based on their local situation, and in some cases, moved with the students to four or five different places in the face of uncertainty [such as the case of Shishiori ES]. This underscores the need for teacher training in decision making during emergencies. This is related to E-HFA Priority 3 [Task 9: training]. Also, the development of a proper management plan for education in emergency is required,

E-HFA	Key Lessons and Issues					
	Tasks	Structure, location, layout	Function and Educational Continuity	Human Resources and Training	Effectiveness of Disaster Education	New role of school and multi-stakeholder dialogue
E-HFA1	Tasks1					
	Tasks2					
	Tasks3					
	Tasks4					
E-HFA2	Tasks5					
	Tasks6					
E-HFA3	Tasks7					
	Tasks8					
	Tasks9					
	Tasks10					
E-HFA4	Tasks11					
	Tasks12					
	Tasks13					
	Tasks14					
E-HFA5	Tasks15					
	Tasks16					

■ Low Performance, Need improvements
■ Moderate Performance
■ High Performance

Table 6. Key initial lessons of EJET education sectors in terms of E-HFA

as per E-HFA 5 [Task 15: disaster response capacity]. In several cities, disaster education helped respond effectively to the earthquake and tsunami in accordance with evacuation procedures, including those who were not inside the school at the time of the disaster. A classic example of this is the “Kamaishi Miracle,” where many students spontaneously and independently evacuated during the earthquake in line with their DRR education. During the evacuation, the Kamaishi Higashi JHS took with them the Unotsumai ES students, both of the schools were located nearby each other on the coastline, and which had jointly conducted had DRR education and emergency drills. Thus, E-HFA Priority 3 [Task 8: include DRR in education system] was found to be extremely important.

During the school recovery programs, in several cities, multi-stakeholder collaboration was established in cooperation with local residential associations, school principals, education boards, academics and other related stakeholders. As outlined above, there is an increasingly aging population across much of the affected area, and the number of school going children are gradually decreasing. This has necessitated schools to form close relationships with local communities so that schools can be also used as a community facilities. Thus, the community needs and priorities are now reflected in new and reconstructed schools, in accordance with multi-

stakeholder dialogues with the local community leaders, PTA, school principles. and education boards. This process has been supported by MEXT through the initiation of the concept of “school-centered resilient community development” in the affected areas. Therefore E-HFA priority 1 [Task 1: multi-stakeholder dialogue] has had strong significance and importance. Table 6 shows a tentative evaluation of the key lessons and issues from the current disaster.

Fernandez, Shaw and Takeuchi (2012) have made an analysis from 25 specific cases of school damage from 11 different Asian countries and 6 hazard scenarios. In these cases, the most commonly implemented recovery actions relate to Task 14 (disaster recovery), Task 7 (public awareness of DRR), Task 13 (physical structures, i.e., building codes, retrofitting, protection of critical facilities, etc.), Task 15 (disaster preparedness, i.e., drills, standby funds, etc.), and Task 12 (land-use planning, i.e., safe location for schools). Tasks under Priority 4 (reducing underlying risks) were performed in about half of these cases, however neither of the four tasks in Priority 1 (institutional basis for DRR in education) were carried out in any of the 25 cases, including Task 6 (early warning) and Task 16 (assessment of disaster preparedness). The case study lessons, categorized in accordance with the E-HFA priority area they belong to, are then plotted on a graph and compared with the results reported in the 2011 Global Assessment Report on Disaster Risk Reduction (GAR 2011).

According to the GAR 2011, whereas substantial progress is being made globally against the HFA priority targets in early warning, disaster preparedness, and emergency response, many countries are still struggling to address underlying risk drivers (Figure 14). Interestingly, the lessons reflected in the 25 case studies shows almost the opposite tendency (Figure 15), in that Priorities 4 and 3 were performed on more occasions than the other priorities. Figure 15 seems to suggest that perspectives on disaster risk tend to change after one has experienced a disaster, hence the difference in priorities. It is interesting that although the cases are more on post-disaster response and recovery, HFA 4, which focuses on underlying risk factors, is incorporated into the recovery process. This is significant in the sense that it encompasses the future risk reduction perspectives. For obvious reasons, the education system is focused on and has given more emphasis to HFA 3. It should also be noted that the examples presented here are rather randomly selected from different Asian countries on different types of disasters. A more systematic analysis may provide more insight in the progress of E-HFA. The

analysis from the current cases of school damages in the 2011 East Japan earthquake and tsunami disaster shows that all the E-HFA priorities have been treated with equal importance, although in reality they should be performed at different levels by different sets of stakeholders in accordance with their own contexts.

The role of the school goes beyond that of a provider of education. Damage to the school is not restricted to the education sector. School is directly linked to the community, and thus school recovery is linked to community recovery. When considering disaster risk reduction (DRR) education, it should not be limited to the education curriculum only, but should also include related issues such as structural and non-structural safety measures; legislative measures supporting the integration, implementation, as well as funding of DRR in the education sector; risk assessments and early warning systems; DRR training for school staff, etc. An integrated approach is necessary and the E-HFA tasks can help cover the various important issues that need to be addressed.

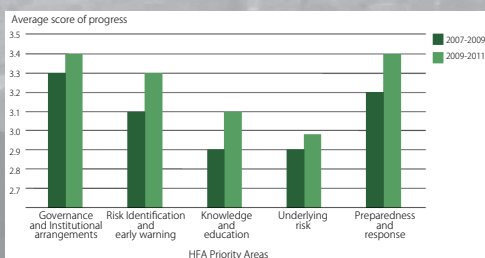


Figure 14. Global progress against the HFA
Source: UNISDR, 2011

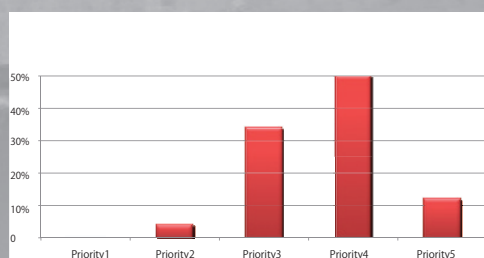


Figure 15. Classification of the Asian Case Studies According to E-HFA
[Source: IEDM 2012, Fernandez, Shaw, Takeuchi 2012]

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