



Educational Governance Issues in Post Tsunami Responses In Kesennuma City, Japan

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After the massive disaster of East Japan Earthquake and Tsunami on March 11th, 2011, education sectors such as schools and board of education (BOE) in tsunami-affected area faced many issues and challenges immediately and continuously. This paper describes how educational governance has been implementing the responses for recovering schools and education from the disaster of earthquake and tsunami through the cases of Kesennuma City Board of Education and schools in Kesennuma. Kesennuma City has been promoting the “Education for sustainable Development (ESD)” as a part of school and community linkages. Through documenting the examples of a few specific urgent measures of Kesennuma BOE after the disaster, the paper emphasizes that providing school lunch, arranging schools bus, providing scholarships to the affected children were some of the urgent tasks to restart the regular education process in the post disaster scenario. It is concluded that the ESD program has positive impact on strengthening the school community linkage, and the disaster risk reduction should be part of the future ESD programs.

Keywords: Education for sustainable development (ESD), Education in emergency, Educational governance responses and Tohoku tsunami, Post disaster recovery.

1. Introduction

The massive earthquake and tsunami on March 11th 2011 hit east Japan, especially huge tsunami caused terrible damages of many aspects such as personal sufferings, social, economic, environmental and cultural damages in Pacific coast line area of Tohoku. Educational institutions and schools in tsunami affected area also suffered serious damages of not only facilities but also students and staffs.

12,150 educational institutions in 24 prefectures including 7,988 schools and universities suffered damages by the earthquake and tsunami. Talking about personal sufferings, 659 students and faculties in educational institutions died and 74 in those are missing. 262 students and faculties were also injured because of the disaster.¹

In addition, after the East Japan Earthquake and Tsunami, as many people in affected area evacuated to the schools and educational institutions such as Kohminkan (Community Learning Center), city halls and gyms. So most educational institutions were used as shelters. Especially almost all the schools in tsunami affected area functioned as a role of shelter for many evacuees after the earthquake and tsunami immediately. On March 17th, 2011, 622 schools managed the shelter in the gym or class room at its peak.² And last shelter in school was closed on October 10th, 2011 which was 8 months later from disaster happened. Based on these tragic damages of the disaster of East Japan Earthquake and Tsunami, educational governances such as board of educations had to response to recovery process of schools and education. Its response should be performed from their perspectives of missions and roles depend on the phases of recovery process and needs of schools. Ministry of Education, Culture, Sports, Science and Technology (MEXT) categorizes recovery process and educational governance responses to restart school education into 4 phases from 2 functions as the shelter and the school as follows.³

- (i) Rescue and Evacuation Period – From disaster happened to evacuation
- (ii) Securing Lives Period – For a few days after the evacuation
- (iii) Making Livings Period – For a few weeks after Securing Lives Period
- (iv) Restarting School function Period – After restarting the school education

2. Disaster of East Japan Earthquake and Tsunami in Kesennuma City

In case of Kesennuma City, the recovery process of school education was similar to MEXT's category. But it is needed to put some arrangements and additional phase or stage into the category to adjust actual recovery process of school education in Kesennuma City. Kesennuma City Board of Education (Kesennuma BOE) categorized educational recovery process and governance responses into 5 stages as follows.

- (i) Emergency Response to manage crisis – Evacuation after the disaster immediately
- (ii) Short-term Response to sustain lives – Set up and manage the shelters at schools
- (iii) Mid-term Response to school restarts – Until school restart after set up shelters
- (iv) Long-term Response to recover education – Recover and settle school education
- (v) Further Response to reconstruct future – Response to future disaster and education

Table 1 Main Responses of Educational Governance according to phase and stages in Kesennuma city

Stages of Responses	Situation and Mis-sion	BOE Response (Board of Education)	School Response
Emergency Response to manage crisis	Rescues Evacuations	Collect Information of educational damages	Instruct evacuation Accept evacuees
Short-term Response to sustain lives	Shelter Management Support to students' lives	Manage shelters Sup-port to self-manage	Set up shelters in schools Check stu-dents' safety
Mid-term Response to school restart	Reconstruction of school systems and facilities	Secure transportations Restart school lunch	Prepare for school restart Build up school curricula
Long-term Response to recover education	Support for school life, lessons and activities	Physical, Environmen-tal & Economical Sup-ports	Psychological sup-ports Settle school education
Further Response to re-construct future	Preparation for fu-ture disaster and re-covery	Record experiences Es-tablish diverse links	Improve DRM, DRR & ESD for creative recovery

Therefore, the response of BOE and schools should be done according to these phases and stages. It will be analyzed how main responses of educational governance in Kesennuma City have been implementing so far after East Japan Earthquake and Tsunami. (Table 1)

2.1. Damage of Kesennuma City by East Japan Earthquake and Tsunami

Kesennuma, a city in Miyagi Prefecture, is a region located in the northeast of Japan. With the Pacific Ocean along its eastern edge, it is a region rich in nature. Covering a total area of 333 square kilometers, Kesennuma City is situated at 141 East longitudes and 38 North latitudes. With a population of approximately 69,500 (July 31, 2012), the city is the center of the Kesennuma city area. The region’s coast is called the Sanriku Coast. It extends from Iwate Prefecture to its north and is part of a coastline with complex inlets, also know as a rias coast line. Rivers flow from the green Mountains through the city to Bay. It is surrounded by forests, rivers and ocean, all interconnected by water. It has long been one of the leading fishing ports in Japan. Shell & seaweed farming is also very popular. The region is proud to land some of the highest catches in Japan for tuna, Pacific saury, oyster and kinds of seaweed. It is number one in Japan for bonito and shark’s fin.

At 2:46 p.m. on March 11, 2011, the massive earthquake of M9.0 on the Richter scale hit East Japan. The intense quake continued 5 minutes or more. About 30 minutes later, the huge tsunami which happened once per millennium attacked

the Pacific coastline of Tohoku area. This massive earthquake and tsunami cut all of lifeline, communications network, and means of transportations in pieces in a moment. More than half of city area was attacked by tsunami, and that was flooded and destroyed in no time.

Especially, northern part of the city area, that is Shishiori district, was burning more than 10 days by terrible fire because of oil & gas tanks catching fire after the tsunami. Then those areas were devastated (Fig. 1(a)). Many of boats such as tuna boats, which are moored at port, clashed into the city and they were washed up on roads, rivers and buildings around bay area in Kesennuma City (Fig. 1(b)). Some burning boats pushed into the city and caught the big fire like bombs.

Because of this terrible disaster, Kesennuma City had huge damages in so many aspects, such as human lives, houses, transportations, education, industries and so on. Kesennuma City had more than 1,400 victims including about 260 missing persons and 100 dead persons relevant to the disaster (see Table 2).

The tsunami and fire has brought a great deal of damage to not only fishing industries but also fishery processing industries, freezing companies, distribution industries and tourist industries in Kesennuma those are developing around bay connecting with ocean. So more than 3,300 companies destroyed by tsunami. That would correspond to 80% of whole companies in Kesennuma. And over 25,000 workers of those affected company by tsunami lost their jobs that is 83.5% of whole workers in Kesennuma. (Table 2) These are unprecedented cases in Kesennuma.



(a)



(b)

Figure 1 (a) Fire in Shishiori District, (b) Damaged ship transported inland

Table 2 Damage by East Japan Earthquake and Tsunami in Aug. 2012

Area	Category of Damage	Actual Number	Proportions
Kesennuma City	Dead Persons by the Disaster ^a	1,038 persons	1.4%
	(Unidentified)	(34 persons)	
	Dead Persons relevant to Disaster ^b	103 persons	0.1%
	Missing Persons ^c	264 persons	0.4%
	Dead + Missing Persons ^d	1,405 persons	1.9%
	Damaged Company ^e	3,314 companies	80.7%
	Workers who lost jobs ^f	25,236 persons	83.5%

^{a-d} Aug 2012 from Reports of police office. ^ePresumption of the Ministry of Internal Affairs and Communications. ^fEconomic census

As a result, the population of about 5,000 of Kesennuma City decreased rapidly, and, according to this situation, about 1,000 of householders of Kesennuma also decreased comparing with the numbers before the East Japan Earthquake and Tsunami. Those are reason why many of citizens of Kesennuma City have moved to other cities or prefectures to evacuate from the disaster and to seek for new jobs for their lives.

2.2. Damage of Schools in Kesennuma

Almost all the schools in Kesennuma fell into alone and unaided by the disaster. Tsunami intercepted all of information, traffic, and materials, so each school was surely in "a solitary island in land". The teachers of each school in Kesennuma were burdened with urgent and serious duty "how to protect children's life" in such isolated situations.

In Kesennuma, schools had prepared for the earthquake and tsunami, which would be anticipated in the near future so far, and each school decided upon the disaster prevention manual, and schools had also implemented the evacuation drill in each school many times repeatedly, assuming various disaster situations. However, the scale of this earthquake disaster exceeded their assumptions and manuals by far. It was certainly an "unprecedented" case. And the disaster risk managements were very difficult, since the scale of damage differed from its character distinctly according to the geographical conditions in which the schools located. In addition, the directions from the board of education and connection

with other schools stopped, since the communications network was cut off, so that each school had to make original decision and judgment while any information could not be informed. In each school, teachers beat their brains and courage together and they instructed last-minute refuge and evacuation action. As a result, in Kesennuma, there was no child who lost his life at school then. On the other hand, it is the deep regret that over 10 students' precious lives were lost among the students who were absent on that day, who left school earlier than usual and who had come back home from school before tsunami invaded to the schools. In addition, 65 students in Kesennuma lost their both or single parent by this disaster and 2 teachers of elementary schools of Kesennuma were killed by tsunami at home or on the way to school. (Table 3)

After the massive earthquake of M9.0, the tsunami reached 3 elementary schools, 1 junior high school, 1 high school and 1 kindergarten in Kesennuma City. Amongst these, Minami Kesennuma Elementary School, Shishiori Elementary School, Kesennuma Koyo High School, Ohya Kindergarten were destroyed by tsunami. As for Hashikami Elementary School and Karakuwa Kindergarten, they were seriously destroyed by earthquake.(Fig. 2(a,b)) On the other hand, 18 schools located on the coastline functioned as shelters after the tsunami, while 5

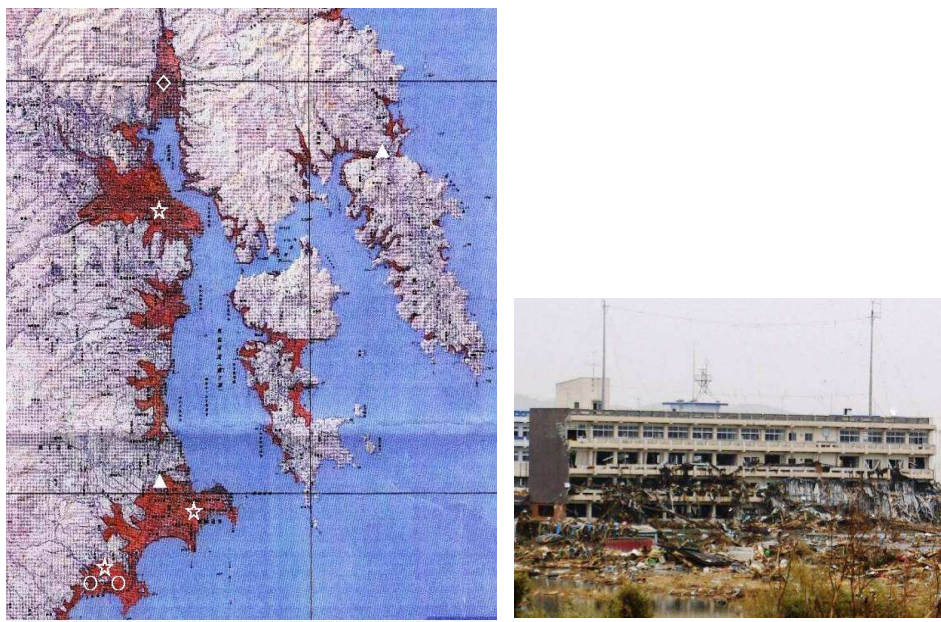


Figure 2 (a) Damaged Schools in Kesennuma City (Red Zone: Tsunami affected area, Tsunami Damaged Schools: star: High, diamond: Middle, circle: Low, Earthquake Damaged Schools: triangle), (b) Kesennuma Koyo high school damage.

elementary schools and junior high schools were used as posts of the Self-Defense Force, police and fire brigade. The gymnasiums of 4 Elementary Schools were also used as mortuaries (see Table 3).

Table 3 Damage of schools by earthquake and tsunami in Kesennuma City in Oct. 2012

Area	Category of Damage	Actual Number	Proportions
Casualty	Victims of Students(Total)	13 students	
	Kindergartner	1 child	0.2%
	Elementary School	7 students	
	(Missing)	(1 student)	
	Junior High School	5 students	
	Orphans by Earthquake and Tsunami	10 students	
	Students who lost the single parent	55 students	
Damage of Facilities	Victims of Teachers	2 persons	
	Serious Damaged Schools (Total)	7 schools	17.5%
	Elementary School	4 schools	19.0%
	Minami Kesennuma E.S. ^a		
	Shishiori E.S. ^a		
	Ohya E.S. ^a		
	Hashikami E.S. ^b		
School that had Shelter, Garrison of Self-defense, Firehouse, and Mortuary	Junior High School	1 school	7.7%
	Ohya J.H.S. ^a		
	Kindergarten	2 schools	33.3%
	22 schools	64.7%	
	Facilities used as shelter (Including classroom)	16 schools (9 schools)	47.1% (26.5%)
	Facilities used as mortuary	4 schools	11.8%
Schools that have Temporary housings in School yard(houses)	14 schools(1143 houses)	41.2%	
Elementary School(houses)	6 schools (143 houses)	28.5%	
Junior High School(houses)	11 schools(1000 houses)	84.6%	

^aDamage by tsunami, ^bDamage by earthquake

3. Response 1 - “Emergency Round School Buses linking Shelters and Schools”

After the East Japan Earthquake and Tsunami, a lot of students took evacuations with their families to shelters and their relatives all over the city immediately, and they had to stay there for a long time. So school districts in Kesennuma City were also destroyed by the earthquake and tsunami. In Japan, public schools usually have school districts of each school. The school district of elementary school is set up for the area where students can come to their school on foot. On other hand, the school district of junior high school is set up for the area where students can come to their school by bicycle or bus on a regular route. Those school districts are defined by the ordinance of each cities or towns. So, public elementary and junior high schools in Japan do not have school buses normally. But in tsunami affected area such as Kesennuma City, students had to move beyond their school district to evacuate to the shelters after the disaster immediately.

In addition, the roads to schools were covered with rabbles and some parts of them were cut by tsunami and sinking under sea level, so that students could not go to their schools by walks using these roads. On the other hand, many of their parents could not use their cars because of losing them by tsunami and shortage of gasoline. And also as time goes by, amount of temporary housings were built in school yards and parks not only in Kesennuma City but also in neighboring Ichinoseki City in Iwate Prefecture, so students moved to the temporary housings from shelters with their families. These situations also made difficult for students to go to their own schools (see Table 4)

Therefore, Kesennuma City Board of Education had to provide students transportations from shelters to schools in order to restart the schools. This matter was an indispensable condition to recover the schools education in Kesennuma City. Kesennuma City Board of Education tried to secure new school bus systems which could link shelters and temporally housings to schools. But it had also many challenges and obstacles. Many of public and private buses were washed away by tsunami, so that most bus companies lost their buses, and some routs between shelters and school were unavailable by tsunami cutting. In addition, the city office and board of education could not afford the budget for new school bus. Kesennuma City Board of Education negotiated with executives of Ministry of Education and city government to get budget and asked bus companies to keep buses as “Emergency School Bus”. At last, just before school restarting, Kesennuma BOE was able to get agreements from Ministry of Education, city government and bus companies. After that immediately, Kesennuma BOE considered the round routs of school buses which link shelters to each school effectively. Finally, establishing of this new school bus system in Kesennuma could be in time for restarting school of new academic year.

Table 4 Number of Evacuate Students in Kesennuma City after East Japan Earthquake and Tsunami

Living Place	School level	April 15 th , 2011	October 1 st , 2011	April 1 st , 2012	October 1 st , 2012
Shelters	Elementary	288	1(0) ^a	0	0
	Junior High	198	4(2)	0	0
	Total	476	5(2)	0	0
Relatives' & Friends' houses	Elementary	598	140(59)	85(29)	81(24)
	Junior High	345	81(27)	73(28)	56(22)
	Total	943	221(86)	158(57)	137(46)
Temporarily Housings	Elementary	0	405(143)	373(89)	366(90)
	Junior High	0	225(75)	229(76)	226(79)
	Total	0	630(218)	602(165)	592(169)
Apartment & Rent houses	Elementary	-	212(104)	154(64)	163(65)
	Junior High	-	131(75)	127(73)	113(61)
	Total	-	343(179)	281(137)	276(126)
Total	Elementary	886	758(306)	612(182)	610(179)
	Junior High	543	441(179)	429(177)	395(162)
	Total	1,429	1,199(485)	1,041(359)	1,005(341)

^a Number in bracket: Number of students who live outside of school district

Table 5 Number of Students using Emergency School Bus and Living Place in Kesennuma City in July 2013

Living place	Own house		Relatives' house		Rental housing		Temporary housing		Total
	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside	
School district									
Elementary students	18	12	0	3	10	16	13	43	115
Junior High students	9	12	0	1	0	14	5	35	76
Total	27	24	0	4	10	30	18	78	191

After that, Kesennuma BOE has been trying to increase and adjust 6 routes according to the situation of students' moving and living places by 2013. This school bus system is still functioning as important transportations for students who go to their school beyond school district even now. (Table 5)

4. Response 2 – “Resupplying School Lunch beyond the Disaster”

To restart schools and to recover education, supplying school lunch was very important after the disaster of earthquake and tsunami immediately. Because many of students evacuated to shelters or houses of relatives with families, they could not have enough meals in the morning and evening for a while. And some of students could not bring lunch boxes (bento) to the school because their families didn't have

kitchens or they could not use electrical products or water for cooking as infrastructures had not recovered enough. Therefore school lunch was indispensable for students to learn at school whole day. The school lunch was life line for restarting school and recovery of education. However, after the East Japan Earthquake and Tsunami, the function of school lunch supply system in Kesennuma City stopped by damage of the earthquake and tsunami. And it had many obstacles for recovery of school lunch centers. Therefore, it was crucial that BOE restarted school lunch as soon as possible for recovery of school education.

4.1. Outline of School Lunch (Kyushoku) in Kesennuma before the Disaster

Kesennuma City used to have 3 types of school lunch system when it faced the disaster of East Japan Earthquake and Tsunami in March, 2011. Kesennuma City merged with Karakuwa Town in 2006 and it also merged with Motoyoshi Town in 2009, so it had complicate system of school lunch supplying.

One is full supply school lunch (Kanzen-Kyushoku) of all elementary schools and 2 junior high schools (Niitushi Junior High Schools and Oshima Junior High Schools) in former Kesennuma City area, as well as all elementary schools and all junior high schools in former Motoyoshi Town area. Second type is semi-full supply school lunch (Hoshoku-Kyusyoku) in former Karakuwa Town area. That system provides milk, soup and dishes other than staple foods for school lunch, so at lunch time, students have them with their rice as staple food which they bring by

Table 6 Outline of School Lunch in Kesennuma City

a. May 1st, 2010 (before the Disaster)				b. Oct. 1st, 2011 (after the Disaster)			
Type of System	School Level	Number of school	Number of Students	Type of System	School Level	Number of school	Number of Students
Full Supply	E.S.	18	3,483	Full Supply	E.S.	18	3,177
	J.H.S	5	535		J.H.S	11	1,920
	Total	23	4,018		Total	29	5,097
Semi-Supply	E.S.	3	320	Semi-Supply	E.S.	3	302
	J.H.S	2	226		J.H.S	2	205
	Total	5	546		Total	5	507
Just Milk	E.S.	0	0	Just Milk	E.S.	0	0
	J.H.S	6	1,492		J.H.S	0	0
	Total	6	1,492		Total	0	0
Total	E.S.	21	3,803	Total	E.S.	21	3,479
	J.H.S	13	2,253		J.H.S	13	2,125
	Total	34	6,056		Total	34	5,604

themselves from their home. Third system is milk school lunch (Milk-Kyushoku) of junior high schools in former Kesennuma City area excepting Niitsuki and Oshima Junior High School. This provides just milk to students, so students at schools of this system have to bring lunches (bento) with dishes to go with the rice every day. The system of Milk Kyushoku was a long-pending problem of school lunch supplying system in Kesennuma City. (Table 6.a) The coexistence of these different systems made difficult and complicated the restoration of the school lunch system in Kesennuma from the disaster of East Japan Earthquake and Tsunami.

These complicated systems lasted until Kesennuma Central School Lunch Center (Chuo Kyushoku Center) was established in Oct 1st. 2011 which was five months later after the disaster. (Table 6(b))

4.2. Restart School Lunch for Recovery of Education in Kesennuma City

Toward school restarting on April 21st, 2011, in advance Kesennuma Board of Education negotiated with all staff of school lunch centers and kitchens in Kesennuma to shorten the term of temporary school lunch (bread & Milk only), and to start full supply school lunch as soon as possible by moving the steps to full supply school lunch forward, because school lunch was a life line to restart the school. But every school lunch centers had many challenges to restart then, so that every staff of each center insisted that it was impossible to start full supply school lunch for a while.

By the disaster of East Japan Earthquake and Tsunami, school lunch supply centers had serious damages, so many problems and obstacles occurred at each center as follows.

- (i) Life lines such as water, electricity and gas for cooking were stopped by disaster, and recovery processes of them differed from its situation according to the conditions in which the centers faced.
- (ii) A couple of school lunch centers had to take a role as centers of distributing boiled rice to evacuees in shelters.
- (iii) So staff of lunch center also had to be engaged in that distributing mission, but not in cooking school lunch.
- (iv) It was difficult to get materials for cooking such as vegetables, meats, fishes, rice and milk because transportation and distribution system stopped by disaster.
- (v) Some school lunch centers had troubles in cooking machine and other facilities by earthquake.
- (vi) Some trucks which were carrying school lunches to each school were washed away by tsunami.
- (vii) Some school lunch centers were used as bases to store provisions for evacuees.

(viii) Sanitary conditions in some lunch centers were poor, because evacuees used the lunch centers to distribute foods and they entered the center with their shoes on.

Therefore, the situations of each center were very difficult to provide full supply school lunch to each school at that time. However, Kesennuma City Board of Education asked staff to restart school lunch and to move to full supply school lunch as soon as possible searching for new methods and systems to overcome many challenges they faced. Staff of each school lunch center beat their brains and did their best to solve the problems for the purpose of restarting school lunch and realizing full supply school lunch as fast as possible. For example, they thought about the menu which was not needed cooking, and about the combination of foods considering supply, amount and nutrition. They also tried to seek for new supplier and supply routes which provided food materials quickly and continuously.

Thanks to these efforts of staff at each school lunch center, all of school lunch center in Kesennuma City could supply school lunches to each school on April 25th, 2011, adjusting to school restart day. (21st was the opening ceremony and 22nd is the entering ceremony in Kesennuma, and 23rd and 24th were holiday,

Table 7 Recovery Process of School Lunch Centers in Kesennuma City after East Japan Earthquake & Tsunami in 2011.

School Lunch Center (Type of Supply)	Provided Schools	April 25 th	April 27 th	May 2 nd	May 11 th	May 25 th
Kesennuma Center (Full Supply)	6 E.Schools	Temporary			Full Supply	
Matsuiwa Center (Full Supply)	3 E.Sschools	Temporary			Full Supply	
Niitsuki Center (Full Supply)	4 E.Schools	Temporary			Full Supply	
Oshima Center (Full Supply)	1 E.School 1 J.H.School	Temporary				Full Supply
Motoyoshi Center (Full Supply)	4 E.Schoos 3 J.H.Schools	Temporary			Full Supply	
Koharagi Center (Semi-Supply)	2 E.Schools 1 J.H.School	Temporary		Semi- Supply		
Nakai ES Kitchen (Semi-Supply)	1 E.School	Temporary		Semi- Supply		
Karakuwa JHS Kitchen (Semi-Supply)	1 J.H.School	Temporary		Semi- Supply		

so these 4 day did not need school lunch.) Moreover, almost all the school lunch centers realized to provide full supply school lunch (including semi-supply) in a week after the school lunch started on 25th excepting a few school lunch centers those could not use water line then. These were remarkable achievements of each school lunch center in Kesennuma City (see Table 7).

However, problems still remained. The students at schools of milk school lunch had to bring lunch boxes (Bento) to school and the students of semi-supply school lunch also had to bring rice as the staple food to school. Some of these students could not bring lunch boxes or staple foods, because the conditions of their lives were not so good for cooking at shelters and relatives’ house. These students could not be rescued by school lunch supply system of Kesennuma City as ever. So Kesennuma City Board of Education considered the strategies for covering such students. At last, from April 25th until September 30th 2011, board of education decided on supplying box lunches (Delivery-Bento) to students at school of milk school lunch who could not bring lunch, and also providing cooked rice to some students at school of semi-school lunch who could not bring it, utilizing National Disaster Relief Law and Study Support System of Kesennuma City communicating with federal and prefectural governments.

5. Response 3 - “Making Substitute School Yard for School Activities”

After the earthquake and tsunami, a large number of temporary housings were built for the people who evacuated to shelters and houses of relatives in Kesennuma City. But Kesennuma has not so much flat land for building temporary housings because it located in Rias coastline and also massive earthquake caused subsidence of flat land of Kesennuma. So the land was short and not enough for temporary housings. These are reason why Kesennuma city government had to decide to build the temporary housings at school yards of elementary and junior high school of Kesennuma City. Beyond half of schools in Kesennuma City provided their school yards to build the temporary housings. Especially, almost all the school yards of junior high schools were occupied by temporary housings for evacuees (see Table 8).

Table 8 Temporary Housings at School Yard of Elementary and Junior High School in Kesennuma City in Oct. 2012.

School Level	Number of Schools	Percentage in total schools	Number of temporary housing	Percentage in total temporary housing
Elementary School	7 schools	35%	143 houses	4.1%
Junior High School	11 schools	85%	1,000 houses	28.5%
Total	18 schools	55%	1,143 houses	32.6%

The school which provided school yards for temporary housings could not use their school yards for physical education and club activities, so that they have been utilizing small spaces of school yards which were remained, gym and hallway. And they also borrowed school yards of near elementary schools which were not occupied with temporary housings. But Oya Elementary School and Oya Junior High School shared same schools yard, so that both of schools lost their school yards. And as Shishiori Junior High School is located far from Shishiori Elementary School, so it is impossible for the junior high school to borrow their school yards of elementary school for P.E. or club activities. These 2 cases are inconvenient cases. Therefore, Kesennuma City Board of Education tried to negotiate with community members and NPO/NGO to afford substitute school yards to these schools instead of their own school yards.

As a result, BOE was able to borrow lands from communities and to get financial supports of NPO, Kesennuma BOE could made 3 substitute school yards beside Oya Elementary and Junior High School as well as Shishiori Junior High School. And Kesennuma BOE is now planning development of substitute school-yards also to Hashikami and Omose Junior High School away from nearest elementary school.

6. Response 4 - "Constructing Electronic Power & Water Resources for Establishing Resilient School against Disaster"

After the East Japan Earthquake and Tsunami immediately, all of power supplies in Kesennuma City were cut off, because electric cables were down in many places and transformer substations were destroyed by the massive earthquake and tsunami. The electronic power supply was stopped also at every school in Kesennuma City. This caused that not only any electronic devises such as telephones, televisions, computers and stoves, but also the waterworks for drinking, cooking and toilets were not available in each schools. This situation was very serious problem for schools to protect students' and evacuees' lives, and also to manage the shelter at each school.

Learning from this experience and lesson, for the purpose of establishing resilient schools for preparing next disasters in future, Kesennuma City Board of Education decide to construct emergency electronic and water supply system at schools those are used as shelters in disaster. Kesennuma BOE selected 16 schools (7 elementary schools and 9 junior high schools) and drilled wells and set solar panels as power resources until 2012, getting financial supports from NPO. (Fig. 3)

And supporting from German City, Kesennuma BOE could set portable solar panels at other 11 schools in 2011 as emergency electronic resource and for daily using outside. So, all of schools in Kesennuma City have solar panels as emergency electronic supplies.



Figure 3 The well with solar panel of Kesennuma Elementary School.

In addition, Kesennuma BOE is planning to set solar panels with storage battery at 5 schools in 2012 getting financial support from the foundation of company, and also BOE is trying to expand these same facilities to more 10 schools until 2015.

7. Response 5 – “Economical Supports for Students and Parents affected by Disaster”

As described above, over 80% citizens in Kesennuma City lost their jobs by the damage of the disaster of East Japan Earthquake and Tsunami. According to this proportion, almost all the parents of students also lost their jobs. But conditions of Job offers had been very hard to seek for new jobs because most factories and business offices, more than 80% in Kesennuma, were devastated by tsunami and they have not reconstructed yet (see Table 9).

It is very serious problem not only for students' economical situations but also for school education in Kesennuma City.

Table 9 Condition of Job Offers in Kesennuma City after East Japan Earthquake and Tsunami.

Month/ Year	Number of People N seeking Jobs (a)	Number of Unemployment Insurance (b)	People without Insurance (a)-(b)	Job offers (c)	Ratio of Job offers (c)/(a)
Feb./2011	1,778			1,019	0.57
Mar.	1,761			923	0.52
Apr.	4,410	1,006	3,404	838	0.19
May	6,169	5,079	1,090	1,069	0.17
Jun.	6,325	5,511	814	1,836	0.29
July	5,417	5,008	409	1,799	0.33
Aug.	4,835	4,660	175	1,800	0.37
Sep.	4,627	4,210	417	1,775	0.38
Oct.	4,321	3,760	561	1,703	0.39
Nov.	4,355	3,523	832	1,886	0.43
Dec.	4,287	3,335	952	1,858	0.43
Jan./2012	4,131	3,056	1,075	1,929	0.47
Feb.	4,042	2,843	1,199	2,229	0.55
Mar.	4,041	2,636	1,405	2,542	0.63
Apr.	3,820	2,289	1,531	2,291	0.60
May	3,424	2,055	1,369	2,228	0.65
Jun.	3,119	1,769	1,350	2,222	0.71

Data from “Hello Work” (Public Employment Security Office) of Kesennuma Office

7.1. Expanding Public Educational Expense Support to Disaster affected Students

After the disaster of East Japan Earthquake and Tsunami, in order to aid the students and parents who were affected by the disaster, Kesennuma Board of Education tried to expand public support system of educational expense into students whose parents lost their jobs by the disaster of earthquake and tsunami. This system covers expenses of learning materials, goods to go to school and school lunches. In addition to normal recipients of this system, Kesennuma BOE had designated 1,060 elementary school students and 654 junior high school students, 1,714 students in total who were affected by the disaster in 2011, negotiating with federal and prefectural government. This number of recipients including normal recipients corresponds to 41.4% of all of elementary and junior high school students in Kesennuma City, despite of fewer than 10% before the earthquake and tsunami. The serious situation has never been experienced in Kesennuma City so far (see Table 10).

7.2. New Scholarships for Students Affected by Disaster

On the other hand, Kesennuma Board of Education ventured to seek and establish new scholarships for students who received physical and economical damages by East Japan Earthquake and Tsunami in 2011, collaborating with National Federation of UNESCO Association in Japan (NFUAJ) and donated by a bank, companies and NPOs.

Table 10 Economical Supports for Students affected by East Japan Earthquake and Tsunami

Economical Support	Recipient	Number of Recipients	Contents of Support
Public Support system for Educational Expense	Needy Parents Affected Students	2,293 students (1,714 ^a)	Learning materials & Goods Expense of School Lunch
Scholarship for Orphans by Disaster	Disaster Orphans	63 students ^a	Lump-sum payment:100,000yen Payment per month: 20,000yen (Until graduation of high school)
Scholarship for Disaster affected Students	Affected Students	632 students ^a	Payment per month: 20,000yen for 3 years

^aNumber of Disaster affected Students of Elementary and Junior High Schools of Kesennuma City in 2011

One of scholarships is for orphaned students by East Japan Earthquake and Tsunami. This scholarship covers 100,000 yen as lump-sum payment and 20,000yen per a month until their graduating from high school. In Kesennuma City, 63 orphaned students were designated in 2011. This scholarship is organized by NFUAJ and big budget was donated by major city bank (see Table 10).

Another scholarship is for students whose parents suffered economical damages such as losing their jobs, houses, shops and their productive facilities. In Kesennuma City, economical damages by tsunami was so huge and serious that public supports system for educational expense was not enough to help a large number of students and parents who suffered serious damages by this disaster. This scholarship covers 20,000 Yen per month for three years. 632 students of Kesennuma City were selected as recipients of this scholarship. This scholarship was also organized by NFUAJ and it was donated by software company, men's suits company and NPO. Both of the new scholarships were very helpful for family budget of tsunami affected students and parents, such as expense of learning materials, excursion, club activities and so on (see Table 10).

Especially, "Scholarship for Disaster affected Students" saved economical difficulties of the student and parents who suffered serious damages by the East Japan Earthquake and Tsunami. Analyzing the damages of recipients those received this scholarship, 502 students, it's about 80% in total suffered some damages in their houses by disaster, above all, 444 students of recipients, which correspond to about 70% of all recipients, lost their houses completely by tsunami and fire of the disaster. On the other hand, analyzing employment situations of recipients' parents, both parents of 61 recipient students lost their jobs, 115 students' fathers and 74 students' mothers also lost their jobs, in addition, 33 students' families had to close their businesses because of the damage of the disaster, so 45% students' parents in total lost their jobs and faced economical difficulties not to get income. Therefore, the scholarship is taking role to cover some parts of these economical damages (see Table 11).

Table 11 Damage of Recipients of “Scholarship for Disaster affected Students” by East Japan Earthquake and Tsunami in Dec. 2011

Damage of Recipients' Houses by Disaster			Damage of Recipients' Jobs by Disaster		
Damage Level	Number	%	Type of business Damage	Number	%
Completely Destroyed	444	70.3%	Both Parents lost Jobs	61	9.7%
Extensively Damaged	37	5.9%	Fathers lost Jobs	115	18.2%
Partially Destroyed	17	2.7%	Mother Lost Jobs	74	11.7%
Partially Broken	4	0.6%	Close family Business	33	5.2%
Total	502	79.4%	Total	283	44.7%

8. Response 6 – Improving DRM & DRR Education for Creative Recovery

After the East Japan Earthquake and Tsunami, Kesennuma City Board of Education and schools in Kesennuma City have been promoting educational recovery as described above. In addition to these strategies, education sectors in Kesennuma City have been proceeding with physical and psychological supports for affected students fostering their resilience.⁴

And they are also improving and rebuilding the DRM and DRR education utilizing lessons from the disaster of East Japan Earthquake and Tsunami. For example, School Principals and BOE in Kesennuma have published two reports of DRM and recovery process of school education from disaster through the experience of East Japan Earthquake and Tsunami.⁵ That will be very useful as a lesson study and research of DRM of each school in Kesennuma before and after East Japan Earthquake and Tsunami. (Fig. 4(a)) And teacher researching group of Kesennuma Board of Education (Kyouiku Kenkyuin) also published a model lesson plan of DRR education from new perspective based on “Education for Sustainable Development (ESD)” which Kesennuma BOE and schools have been promoting over 10 years as key concept of education.⁶ (Fig. 4(b))

Moreover, Kesennuma BOE is now developing “Creative Recovery Education” based on Education for Sustainable Development (ESD) which Kesennuma has done so far, collaborating with Ministry of Education (MEXT), UNESCO and OECD. To realize this educational concept, for example, Kesennuma BOE held UNESCO School International Forum in January 2012 and Kesennuma ESD/RCE Round Table Meeting in October 30th 2012. In addition, OECD Tohoku School Seminar held in Kesennuma City in Mach, 2013. All of these events and practices are expected to foster future leaders who can contribute to recovery process from the disaster locally and globally.



Figure 4 (a) “To Advance forward After the Disaster vol. 1” published by Kesennuma City Principal’s Association, Kesennuma Board of Education and Miyagi University of Education, (b) “Lesson from East Japan Earthquake and Tsunami” published by Kesennuma Board of Education & Ministry of Environment.

9. Conclusion: Lessons from Past Disaster and “N-help” for Response to Recovery

When it is analyzed that the recovery process from the disaster of East Japan Earthquake and Tsunami and it is discussed which kind of institutional response should be done according to phases or stages of recovery process, it is crucial to learn a lot of lessons from past disasters. One of huge disaster of Hanshin-Awaji Earthquake occurred in 1995 gave many lessons to the institutions and schools in affected area of East Japan Earthquake and Tsunami. Some parts of situations of Hanshin-Awaji Earthquake are similar to them of Tohoku area, so that their experiences and method are very useful for the people and institutions in Tohoku area, For example, They suggested how to check students’ safeties at school, how to manage shelters with communities, how to restart schools, how to take care of students’ psychological aspects, moreover, how to improve DRM and also to promote DRR Education and so on. Actually, “EARTH” which is disaster support team dispatched by Hyogo Prefecture came to Kesennuma City after the disaster immediately, and they gave lots of advices and suggestion to Kesennuma BOE and schools on recovery process of school education.

As a lesson from Hanshin- Awaji Earthquake, Kobe City Board of Education established text book of DRR Education that is named "Let's carry happiness over". On the text book, it is emphasized that the importance of life, collaboration, appreciation, bonds of family and volunteer. And Kobe BOE also insists that they don't make use of their experience of Hanshin-Awaji Earthquake as negative experiences, but they tried to make the best use for educational recovery and creation of new education.⁷ These are completely same as concepts of people and institutions in affected area of East Japan Earthquake and Tsunami.

On the other hand, Okushiri Tsunami Disaster in Hokkaido area also gave many suggestions to tsunami affected area in Tohoku, because the disaster in Okushiri was caused by tsunami mainly, so that the character and situations of disaster are same as Tohoku Area. Recovery process of Okushiri Town has been done with 3 major strategies, one is "Reconstructing Lives", second is "Building DRR Town", and last is "Enforcing Industry". They established "Disaster Recovery Foundation" and they built many resilient infrastructures against tsunami using this foundation. They also established Tsunami memorial park to memorize the experience and lessons of tsunami disaster, and to hand them down to their posterity. Talking about DRR Education, Okushiri BOE established DRR education promotion committee and it made DRR manual for students based on Self-help. They disseminated the manual to whole school in town and they are performing evacuation drill repeatedly with whole residents' participation. Moreover, Okushiri BOE developed Practical Guide line of DRR education, and each school put DRR lesson into their curriculum and performs systematically from elementary school to high schools collaborating with community.⁸

Not only Kesennuma BOE but also other educational institutions and schools in disaster affected area in Tohoku are able to learn many informative lessons from two experiences of disaster and to introduce these lessons to their response effectively. In addition, institutions and schools in Japan are also able to learn globally from Indonesia and New Zealand those experienced similar disaster to our country.

Commonalities of recovery processes of both case, Hanshin-Awaji Earthquake and Okushiri Tsunami, are practical action and response at local level, linking with community and collaborating with diverse sectors locally and globally.

Kesennuma BOE and schools are implementing many activities collaborating with community and other institutions based on ESD and community learning (Furusato Gakusyu). Thank to these strong linkages and bonds, almost all the students were able to evacuate safely in the disaster of East Japan Earthquake and Tsunami. And then, these linkages also functioned at management of each shelter surely and will foster Mutual-help in the communities including schools furthermore.⁹

Finally, as described above, Kesennuma BOE are taking many responses to educational recovery depend on phase and stage. All of these responses have been promoted by not only Kesennuma BOE, but also diverse sectors such as many companies, NGO/NPO, banks and other institutions including universities collaborated and participated in these process. Namely, Kesennuma BOE has been promoting recovery process, making collaboration and partnerships with diverse sectors and multi-stakeholders. Kesennuma BOE calls this collaboration for recovery “N-help”. “N” means NPO/NGO and Network, and also Next stage to Self-help, Mutual-help and Public help. Education sectors in Kesennuma are aiming to establish recovery process through participations and collaborations among diverse actors.

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