

Synergy of Education for Sustainable Development (ESD) and
Disaster Education in the Post-Tsunami Recovery Context of
Kesennuma, Japan

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List of Abbreviation and Acronyms

ACCU	Asia Cultural Centre for UNESCO
ASP	Associated Schools Project
ASPnet	Associated Schools Project network
ASPUnivNet	Interuniversity Network Supporting the UNESCO Associated School Project Network
AY	Academic Year
BOE	Board of Education
CCA	Climate Change Adaptation
CCE	Climate Change Education
CLC	Community Learning Centre
DESD	Decade of Education for Sustainable Development
DIG	Disaster Imagination Game
DPI	Department of Public Instruction
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EEC	Environmental Education Center
EFA	Education for All
EJET	East Japan Earthquake and Tsunami
ES	Elementary School
ESD	Education for Sustainable Development
ESD-J	Japan Council on the UN Decade of Education for Sustainable Development
FDMA	Fire and Disaster Management Agency
GAP	Global Action Programme on Education for Sustainable Development

GDP	Global Gross Domestic Product
HFA	Hyogo Framework for Action
ICT	Information and Communication Technologies
IDNDR	International Decade of Natural Disaster Reduction
JFMF	Japan Fulbright Memorial Fund
JHS	Junior High School
JMA	Japan Meteorological Agency
JNCU	Japanese National Commission for UNESCO
MDGs	Millennium Developing Goals
MEXT	Ministry of Education, Culture, Sports, Science and Technology in Japan
MLIT	Ministry of Land, Infrastructure, Transport and Tourism
MTP	Master Teacher Program
MUE	Miyagi University of Education
NFUAJ	National Federation of UNESCO Association in JAPAN
NIER	National institute for Educational Policy Research
ODA	Official Development Assistance Grants
OECD	Organization for Economic Co-operation and Development
ProSPER.Net	Promotion of Sustainability in Postgraduate Education and Research Network
RCE	Regional Centres of Expertise
SD	Sustainable Development
SDGs	Sustainable Development Goals
SEAMEO	Japan ESD Award in collaboration with the Southeast Asian Ministers of Education Organization
TVET	Technical and Vocational Education and Training

UNDESD	United Nations' Decade of Education for Sustainable Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISDR	United Nations International Strategy for Disaster Reduction
UNU	United Nation University
UNU-IAS	United Nation University, Institute of Advanced Studies
WCESD	World Conference on ESD
WCDR	World Conference on Disaster Reduction
WCDRR	World Conference on Disaster Risk Reduction

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Executive Summary

1. Background of the thesis

In the 2014 academic year, Japan had two crucial world conferences related to the sustainability of human being. One is “UNESCO World Conference on Education for Sustainable Development (WCESD)” in November 2014 which launched “Global Action Programme on ESD (GAP)”, and another is “The 3rd UN World Conference on Disaster Risk Reduction (WCDRR)” in March 2015 which also launched “Sendai Framework for Disaster Risk Reduction (SFDRR)”. On the process to two conferences, Japan experienced unprecedented tragedy that is called “East Japan Earthquake and Tsunami (EJET)” in Mach, 2011. Not only Japan but also other countries in the world have been facing massive and many types of disasters and suffering serious damage. The commonality of GAP and SFDRR is to emphasize “Sustainable Development”, “Education”, “Cooperation” and “recovery and reconstruction to Build Back Better”.

In this context, the linkage of ESD and DRR should be identified. Disaster education takes a crucial role to realize sustainable society by accelerating the progress of disaster risk reduction toward disaster resilience as well as increasing awareness and developing proper knowledge and skills among individuals. Also ESD accelerates DRR promotion and opened the door to disseminate disaster education in the world. In Japan the schools which promote disaster education as ESD are getting more after the EJET.

With regard to the synergy between ESD and disaster education, it is discussed as three types (patterns) of synergy so far (Fig.E.1): A) ESD and disaster education are individual category, B) Some part of ESD and disaster education is overlapping, and C) ESD includes whole disaster education. In this research, the synergy between ESD and disaster education should be identified as “Pattern B” mainly, therefore, overlapping part is very important and it would be catalysts for the synergy between ESD and disaster education as concepts, methods and promotion systems.

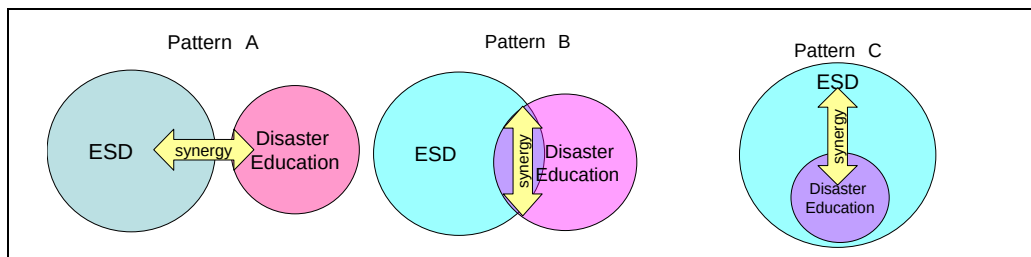


Fig.E.1 Patterns of Synergy between ESD and Disaster Education

2. Research objectives and questions

With the background, the study aims to analyze the synergy between Education for Sustainable Development (ESD) and disaster education in the post-tsunami recovery context of EJET. The research attempt to analyze how ESD and efforts made by schools (UNESCO Associated Schools) are utilized and how they contribute to disaster risk management, disaster risk reduction and the process of recovery and reconstruction in critical situations caused by disaster of EJET from the synergy perspective, with disaster education, taking the specific case study and analysis from target study city, Kesennuma City, Miyagi Prefecture in Japan. In addition, for the purpose of the promoting ESD and disaster education, the synergy concept, the strategies for governance, and the methods for curriculum development and network bindings which are brought by this research are suggested as way forward to other regions and schools which have similar issues and attempts including building consortiums for accelerating ESD and DRR activities.

Hypothesis of this research is “The synergy of ESD and Disaster Education can be effective for disaster risk reduction and recovery”, especially to the post-tsunami recovery process of EJET. Through infusing the concept and method of ESD to disaster education, it is possible to raise the quality of disaster education and DRR. As a result, it could contribute to the recovery process. However, the synergy between ESD and disaster education is many aspects. Therefore, interview, questionnaire survey, group discussions, workshop and action-based research were conducted under this hypothesis with BOE, school principals and teachers, specialists and community members that covered the following four research questions and structure of thesis (Fig. E.2).

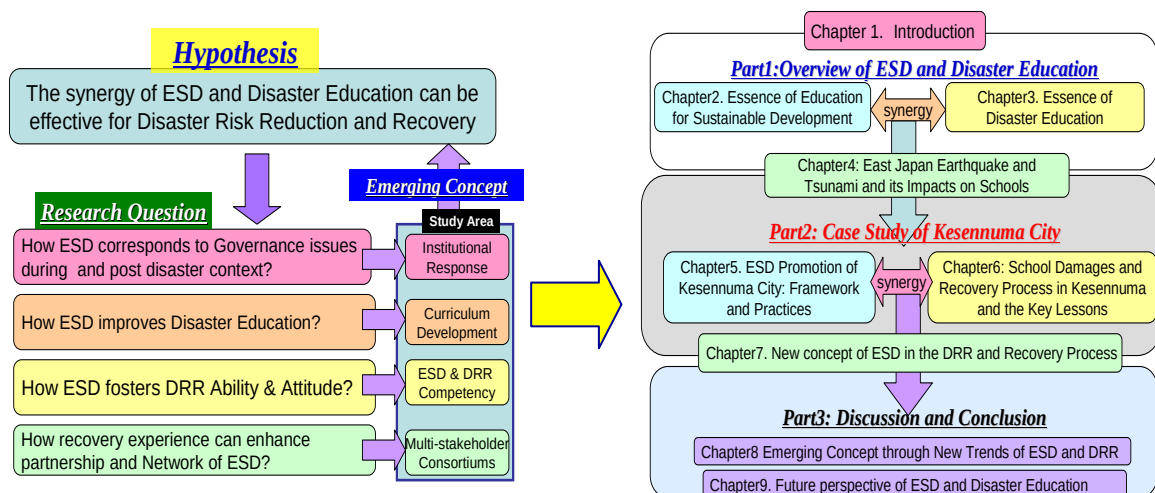


Fig.E.2 Research Questions and Structure of Thesis

- (i) How ESD corresponds to Governance issues during and post disaster context?
- (ii) How ESD improves Disaster Education?
- (iii) How ESD fosters DRR Ability & Attitude?
- (iv) How recovery experience can enhance partnership and Network of ESD?

3. Key findings

With regarding governance issue, ESD enhances governance functions for recovery in the midst and aftermath of disaster. Governance, such as the board of education (BOE) takes a significant role to the progress of educational recovery and reconstruction in education sector. Physically, BOE make up and implement the plan of rebuild building and facilities of affected school. Logistically, BOE tends to supply the manpower for educational recovery and psychological supports to affected students and parents. And, instructionally, some BOEs are promoting the new concept of disaster education and recovery education from the lesson of EJET with developing the curricula and teaching method. Through analyzing institutional response of affected Board of Education such and new trend of international initiatives in the midst and aftermath of EJET disaster, it was found out what kind of strategies are needed and effective to the DRR and recovery process as governmental measures.

Firstly, through the analyzing the linkage and relation between damage level to educational governance and educational recovery based on the observation of some case of educational governance in tsunami affected areas, the critical measure of educational governance could be identified for educational recovery in the aftermath of EJET. In the high level damaged case of BOE which lost superintendents by tsunami and the function of educational governance was collapsed, the school principals should take key role of making the decision such as conducting evacuation and shelters to protect students and residents instead of superintendent or BOE. Moreover, the leadership of principal initiated other schools' evacuation and school restart, and contributed to educational recovery process of whole city. In the case of BOEs which lost officials by disaster and faced the shortage of manpower for educational recovery, the manpower support from prefectural BOE and other cities' BOE was very helpful. To get this support, BOEs in affected area needs to establish partnership with prefectural BOE and other BOEs inland preparing for the disaster. In affected area devastated by tsunami, BOE had to determine to evacuate all whole school students to the safe place in other

city inland. This supports was very crucial for affected schools and BOE to protect students and resume the school education. To achieve this, it is necessary for affected BOE to build a good relationship with other city's BOE from daily time. In many affected area, BOE had to move or merge serious damaged schools to other schools or facilities which are available to evacuate and restart school. This measure was important and main governance measure of affected BOE to rebuild school education in the aftermath of EJET. In the process of the measure, BOE needs to consider the damage level of school, prospect the transition of number of children, and consult with parents and residents. In the case of low level damaged area, as BOE maintained governance function and took a key role of educational recovery, to organize joint events for affected schools is effective measure as the driving force for educational recovery. In low level damaged area, accepting transfer students from other affected area such as nuclear incident area was one of the important missions of educational governance. The schools and students in some affected areas had to evacuate to wide range of area beyond city boarder. In this situation, the partnership and collaboration between affected BOE and non-affected BOE as well as high level damaged BOE and low level damaged BOE are very important to promote disaster recovery in education sector.

Secondary, it can be learned many lessons which have been done by Kesennuma City Board of Education for the educational recovery in the midst and aftermath of EJET. Kesennuma city has been promoting ESD since 2002 establishing the linkage and partnership with diverse sectors and multi-stakeholders in local community and outside institutions and agency. Therefore, in the midst and aftermath of EJET, Educational Governance such as city board of education could took measures to solve many difficulties occurring after EJET utilizing linkage and partnership which were fostered through ESD promotion in Kesennuma. Securing transportation of students is first step for disaster recovery. Resupplying School Lunch is life line for school education. Economical Supports contribute to long-term recovery of affected families. Facility improvement is needed for education and forthcoming disaster. Multi-stakeholder approach establishes Network-help for recovery.

Regarding to Disaster Education, ESD improves and enriches Disaster Education so that it can foster abilities and attitudes for DRR and recovery. After the disaster of EJET, because of catastrophic experience of unprecedented disaster, the importance and significance of disaster education were recognized at schools all over Japan, so that schools especially in tsunami affected area tried to fulfill disaster education in school curriculum and disaster risk management of the schools systems after the EJET. Especially, as to ESD schools in Kesennuma City, schools which had been promoting

ESD as UNESCO Associated School from pre-disaster of EJET shifted their main focus of ESD from Environmental Education and International Understanding Education to Disaster Education more comparing with pre-disaster in order to reinforce disaster education at each school based on the lessons learned from EJET. On the other hand, ESD schools are also strengthening Understanding of Local Community at the same time. This means that people including teachers and students recognized the value and importance of their community for recovery from the disaster through the experience of EJET. Especially, when the school promotes disaster education, it is vital that students should know and understand their each local community as first. And the linkage and collaboration with local community is necessary for school to fulfill disaster education. Therefore, many schools in Kesennuma are focusing disaster education linking and collaborating with local community and various sectors. Schools in Kesennuma also tried to improve and accelerate DRR perspectives in all educational activities and school systems. Disaster education has been incorporated into school curriculum in many of schools and DRR practice has been reinforced in variable school systems since EJET in 2011 through the catastrophic experience and vital lessons of EJET. The schools have been renewing various managements or educational practice from DRR perspectives such as safety checking (school building/yard, school zone and school districts), the disaster prevention manual including evacuation route/place and evocation drills, and storages for emergency situation. Disaster education was also improved more practically and systematically by incorporating into syllabus and implemented by taking expertise of specialists and inviting parents

On the other hand, during Decade of Education for Sustainable Development (DESD), especially after the EJET, the synergy between ESD and DRR was highlighted and comprehended by schools and educators more and more as the new concept of ESD in the context of DRR and recovery process. Making the best use of this synergy concept, the Kesennuma City Board of Education (BOE) have researched and proposed the new strategy by developing “Disaster Education Sheets and Matrix” as a method to incorporate disaster education into school curriculum and educational activities involving parents and residents. Disaster Education Sheets and Matrix were afforded to school teachers as a method or tool of disaster education curriculum development in order for teachers to design DRR program and curriculum at each school. According to the Disaster Education Sheets and Matrix, school teacher could develop and implement suitable disaster education program/curriculum depend on the situation of school curriculum and developmental stage (grade level) of students.

Through these learning of disaster education, abilities and attitudes for DRR and recovery could be fostered, such as the critical, systematic and holistic way of thinking, the ability of communication, collecting and analyzing information, and decision making and action, in other words, the abilities for problem solving, imagination and creativity to overcome the difficulties for the future. These are also common abilities and attitude for ESD.

With regarding network, ESD builds linkage and network for DRR. ESD emphasizes and establishes the linkage and collaboration with the local community, other regions and related organizations or institutions, and ESD is being promoted through collaboration and cooperation with them. Following the disaster, these ESD ties or solidarities also functioned to disaster risk management and disaster risk reduction effectively in each local community in terms of evacuation actions and evacuation center operation. Under these circumstances, rooted in and having promoted ESD in cooperation with their local communities, schools were able to play a leadership role as evacuation bases in this crisis situation while working in cooperation with local residents. It also helped to progress partnerships with domestic and international institutions so that Kesennuma City and schools could make the best use of the support from other regions and countries. And also in the process to recovery and reconstruction of communities in future, it is sure that ESD becomes more crucial concept again. These concepts and links were very useful and effective in the recovery process. In this context, ESD surely functions as a key concept of DRR and also as the concept towards recovery from the disaster.

Following the EJET, those areas where there are good ties between schools and their communities had high potential for successful evacuation, evacuation center operation, and reconstruction. Accordingly, cultivating good relationships between schools and communities by promoting ESD is extremely important for post-disaster recovery.

Furthermore, global networks with overseas institutions and organizations also provide tremendous power and strength for reconstruction. In this way, from the perspectives of both educational approaches and network-building, ESD is regarded as providing an undoubtedly important function as a major principle and means for promoting disaster education and carrying out reconstruction. In future, Kesennuma intend to continue to stride towards recovery and reconstruction by creating and establishing rich learning with the participation and collaboration among diverse actors through ESD. These linkages expand as “Self-help”, “Mutual-help” and “Public-help” including collaboration with NPO/NGO. Kesennuma City Board of Education calls this

linkage “N-help”. “N” means NPO/NGO and Network, that’s a Next and New help. In this context, ESD surely functions as a key concept towards DRR and recovery process from the disaster.

4. Emerging Concept

As international perspective, United Nations Education for Sustainable Development (UN-DESD) ended in 2014, and Hyogo Framework for Action also ends in 2015. However, new momentum of ESD and DRR are emerging by new frameworks and proposals in the world such as Global Action programme on ESD (GAP) and Sendai Framework for Disaster Risk Reduction (SFDRR). There is the linkage and synergy identifies in both concepts and priority action areas of GAP and SFDRR. Through the promotion of disaster education according to five priority action areas, disaster education could be more effectively enhanced and brushed up. Because disaster education is one of the crucial components and priority action themes of ESD, therefore, whole five priorities of GAP can be adapted to the promotion and improvement of disaster education. Thus, adapting GAP for the disaster education is very significant for further promotion of disaster education.

On the other hand, SFDRR has also close synergy with ESD. SFDRR is emphasizing sustainable development as well as sustainable world, society and community through the promotion of Disaster Risk Reduction. To achieve this, disaster education takes a key role as the bridge between also ESD and DRR. Also, cooperation, collaboration and partnership, which are kinds of “Linkage (Kizuna in Japanese), is very important to accelerate the implementation of SFDRR. In this context, ESD also can be done in the framework of SFDRR from DRR perspective thorough disaster education in contrast of GAP. For this reason, disaster education should be contained ESD curriculum or program and DRR activity should be introduced to ESD practices in not only formal education but also non-formal and informal education.

In this context, it can be said again that ESD and disaster education have very close linkage and synergy each other. Some of objectives and components of both educations are overlapping and complemented mutually. Therefore, disaster education should converge in the learning process of ESD which is the learning from the mechanism of disaster to the recovery and reconstruction (Build Back Better) introducing the components of science, climate change, DRR and ESD in order to foster knowledge, understandings, awareness, skills, attitudes and visions for disaster resilience. It will be

emerged as sustainable developing process and it can be proposed as the new type of disaster education based on ESD concept.

As a new proposal for the curriculum development method of disaster education based on ESD at national level, the synergy between ESD and disaster education also can be identified in the method of curriculum development and abilities or attitudes to foster thorough their learning. ESD curriculum development methods are very useful and effective to the curriculum development also in disaster education, because its approach is same as one of ESD such as community-based, experience-based, inquiry-based as well as interdisciplinary and integrated learning method. It could be proposed three types or steps of curriculum development methods: i) Infusion Approach, which utilizes existing curriculum of each subject, ii) Integrated Approach, which organizes specialized disaster education curriculum incorporating DRR activities to integrated learning, and iii) Holistic Approach which promotes disaster education not only in lessons but also school management, teacher trainings and PTA activity etc. as whole school approach. Those methods are expressing stage of curriculum development, so that, very helpful to develop the curriculum of disaster education depends on the progress of disaster education of each school. Schools can select the approach to adjust their school curriculum or progress of disaster education. These three curriculum developing methods could contribute to enrich learning and raise the quality of disaster education. It could be disseminated to schools not only in Japan but also foreign country (Fig.E.3).

On the other hand, as local and regional perspective, it will be established regional consortium for the disaster recovery though the disaster education based on ESD learning from the lesson of East Japan Earthquake and Tsunami. The Consortium is expected to consist of multi-stakeholders such as city board of education, schools, universities and business enterprises especially, in addition, prefectural board of education, NGO/NPOs, non-formal education institutions and sectors. To establish ESD consortium, it is crucial to respect the diversity of characteristics and backgrounds of each prefecture and city in Tohoku. Therefore, on the process of building up the consortium, multilayer method should be taken into consideration: i) the first layer is the city level consortium, ii) the second layer is regional consortium which is Tohoku consortium and iii) the third layer is domestic and international consortium or exchange network. Thus, regional consortium broadens its possibility of ESD and disaster education promotion and collaboration through the process of building up the consortium locally to globally to achieve disaster recovery in Tohoku (Fig.E.3).

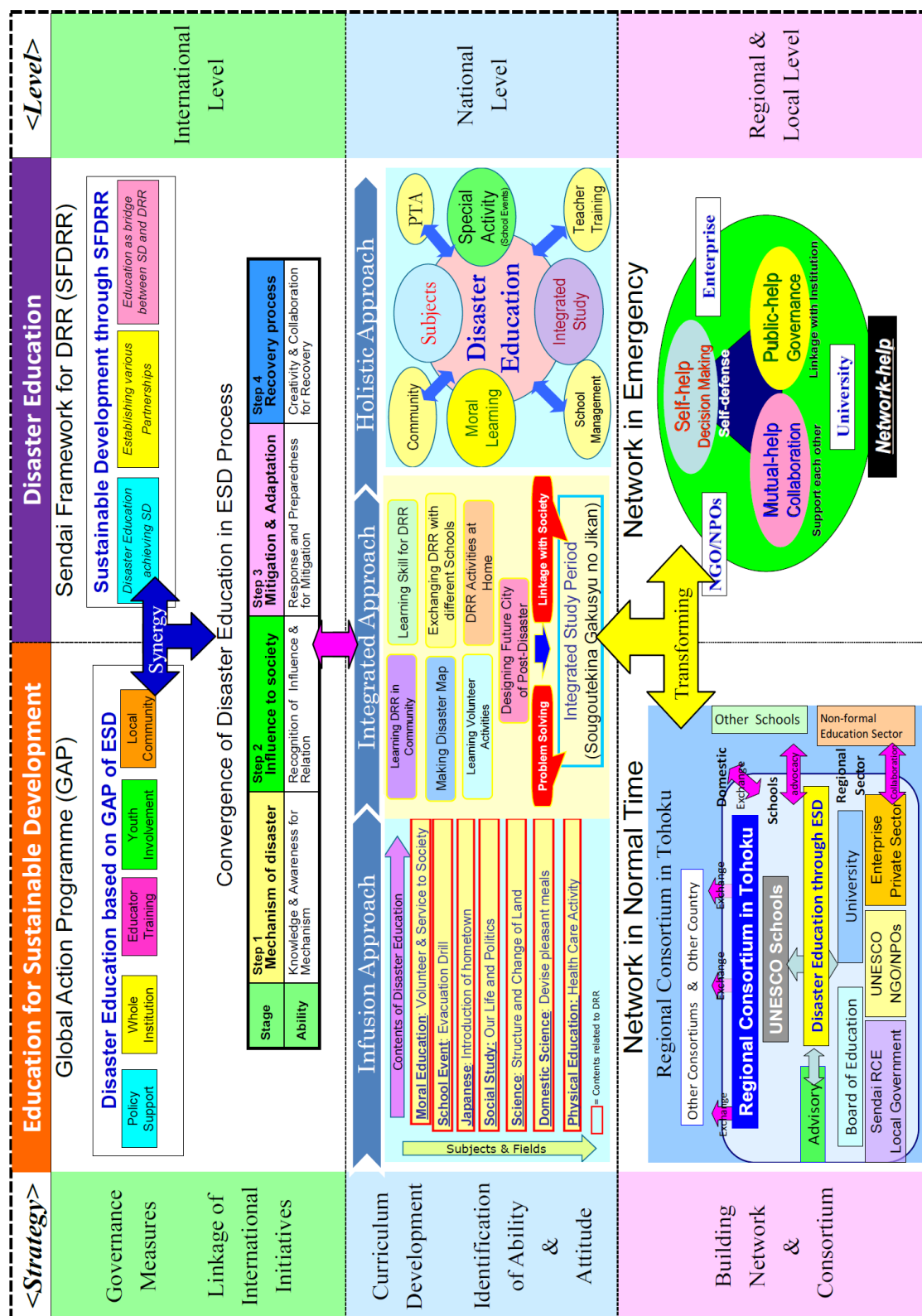


Fig.E.3 Emerging Concept for Further Promotion of ESD and Disaster Education

This consortium is the network in normal time, in order to promote ESD and disaster education for preparing future disasters. But, in emergency time of disaster, Mutual-help, Public-help and Network-help are necessary to response to and recover from the disaster, as mentioned above. At that time of critical situation, the consortium of normal time is transforming to the emergency linkage as Mutual-help, Public-help and Network-help with strong bonds. Thus, another objective of establishing regional consortium is also to foster the bonds in normal time for the emergency situation of disasters (Fig.E.3).

Lastly, this research was conducted based on the case study of Kesennuma City as evidence-based research, so that findings are provided by the evidences through the analysis and observation of case study of ESD and disaster education in Kesennuma. However, although the performance of governance, education and network through ESD in Kesennuma after EJET is outstanding comparing with other cities in affected area as discussed in the thesis, there are some possibilities that all of findings and results related to governance issues, disaster education, DRR ability and attitude, and networks are provided by the effects of not only the synergy of ESD but also other factors such as other education practices, linkage of community, indigenous knowledge and culture for DRR, and other initiatives. Therefore, comparative analysis should be needed to identify the effect of synergy and linkage of ESD and disaster education more clearly by selecting another case study in affected area of EJET which is not promoting ESD. That is the limitation and future challenge of this research to analyze more academically.

Part 1 Overview of ESD and Disaster Education

Chapter 1 Introduction

1.1 Research Background and Problem Statement

1.1.1 Linkage between Education for Sustainable Development and Disaster Risk Reduction

In the 2014 academic year, Japan had two crucial world conferences related to the sustainability of human being. One is “UNESCO World Conference on Education for Sustainable Development (WCESD)” which was held in Nagoya City and Okayama City on 4-12 November 2014, and another is “The 3rd UN World Conference on Disaster Risk Reduction (WCDRR)” held in Sendai City on 14-18 March 2015. On the process to two conferences, Japan experienced unprecedented tragedy that is called “East Japan Earthquake and Tsunami (EJET)” on 11th March, 2011. Not only Japan but also other countries in the world have been facing massive and many types of disasters and suffering serious damage, which are caused by mega-earthquake, volcano and climate change.

These disasters often make local community and regional society unsustainable. Therefore, Education for Sustainable Development (ESD) has emphasized disaster risk reduction (DRR) as a pillar of its priority action theme, especially during UN-Decade of Education for Sustainable Development (2005-2014). Although DESD has ended in 2014, “Global Action Programme on ESD” (GAP) was launched at WCESD in Aichi-Nagoya as the follow-up to DESD and it was adopted at UN General Assembly in December 2014. The Global Action Programme also urges member states to accelerate DRR through education in order to achieve sustainable development and society all over the world. On the other hand, WCDRR in Sendai launched “Sendai Framework for Disaster Risk Reduction” as the new DRR framework post Hyogo Framework of Action and it was adopted at UN General Assembly in June 2015. The Sendai Framework is also seeking for sustainable development by building disaster resilient community and society. The commonality of Global Action Programme on “ESD” and Sendai Framework for “DRR” is to emphasize “Sustainable Development or Society”, “Education or Learning”, “Cooperation or Collaboration” and “Creation and Build Back Better”. In this context, the linkage of ESD and DRR should be identified.

With regard to the synergy between ESD and disaster education, it is discussed as three types (patterns) of synergy so far (Fig. 1.1): A) ESD and disaster education are individual category, B) Some part of ESD and disaster education is overlapping and other part is individual, and C) ESD includes whole disaster education so that disaster education is part of ESD. In this research, the synergy between ESD and disaster education should be identified as “Pattern B” mainly, therefore, overlapping part is very important and it would be catalysts for the synergy between ESD and disaster education as concepts, methods and promotion systems.

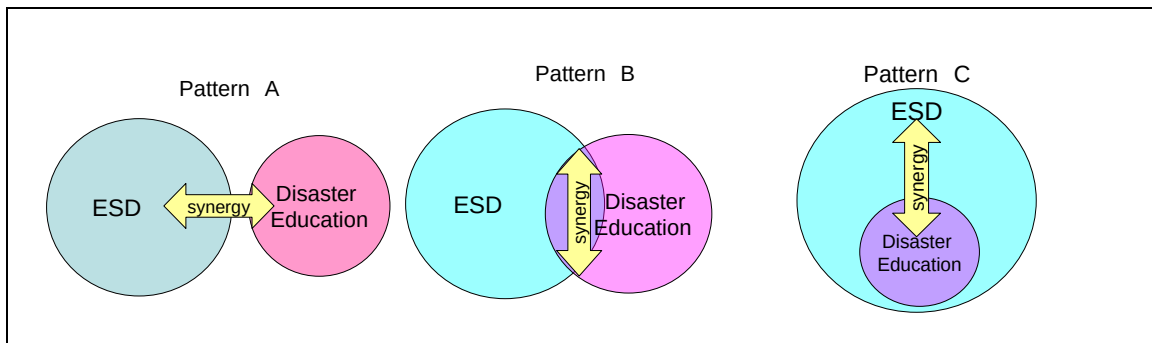


Fig. 1.1 Patterns of Synergy between ESD and Disaster Education

1.1.2 Education for Sustainable Development accelerating Disaster Education

Since the latter half of 20th century, human beings have been facing a lot of environmental, social and economical crises at local and global level, so that “Sustainable Development” is getting a common and crucial issue around the world. To realize Sustainable Development, it is recognized by many people and nations that “Education” could take key role for the future so that “Education for Sustainable Development (ESD)” was proposed as the key concept to build the sustainable future of human beings. The significance of ESD was indicated at the Earth Summit in Rio de Janeiro, Brazil in 1992. And then, Japan proposed the “Decade of Education for Sustainable Development (DESD)” at the World Summit on Sustainable Development in Johannesburg South Africa in 2002. The proposal was adopted unanimously to launch the “Decade of Education for Sustainable Development (DESD)” from January 2005. UNESCO was designated as the lead agency for the Decade, which developed a draft International Implementation Scheme for DESD (Oikawa 2014). In 2010, at beginning of the 2nd half of the DESD, UNESCO stated three priorities in addressing global sustainable development challenges through ESD, by focusing on the following: I) climate change, II) biodiversity, III) disaster risk reduction and preparedness. They

are key action themes for the second half of the DESD (2010-2015) as UNESCO strategy (UNESCO 2010). This means that DRR is one of the pillars of ESD to be promoted as a key action theme.

Pursuant to the resolution of United Nation for DESD in 2002 and the launch of DESD in 2005, the Japanese government established the Inter-ministerial Meeting on UNDESD” in 2005, and decided on an Implementation Scheme for the UNDESD in Japan. The Japanese Implementation Scheme of UNDESD was renewed based on the experience and lessons of East Japan Earthquake and Tsunami in 2011. That includes the significance and roles of ESD which contributes to disaster risk reduction and disaster recovery/reconstruction. Japanese government also introduced ESD concept to reforms of educational law and national curriculum. Especially, Integrated Learning Period (Sogotekina-Gakushu-no-Jikan) is very useful and effective to promote ESD including disaster education. As a result, the schools which promote disaster education as ESD are getting more day by day, especially after the East Japan Earthquake and Tsunami. Thus, ESD accelerates DRR promotion and opened the door to disseminate disaster education all over Japan as well as around the world.

As the key strategies for Promoting ESD at formal and informal education sectors, it should be indicated the projects of “Regional Centres of Expertise (RCE)” by United Nation University (UNU) and “UNESCO Associated Schools Project network (ASPnet)” by UNESCO. Both of them are Global Networking Projects of ESD, but RCE is based on regional network and ASPnet is based on schools’ network. Japan has taken an initiative to establish RCEs in 2005. At present, there are six RCEs in Japan acknowledged by United Nation University following Greater Sendai RCE and Okayama RCE as two of initial 7 RCEs. Greater Sendai RCE located in the affected area of EJET including Kesennuma City, so that Greater Sendai set DRR as a main issue of their ESD practice and is promoting disaster education from ESD perspectives. On the other hand, Ministry of Education, Culture, Sports, Science and Technology in Japan (MEXT) has been promoting ASPnet to disseminate ESD in formal education. Especially, during 2nd half of the DESD, ASPnet Schools (MEXT calls it UNESCO School) have been increasing drastically from 20 schools in 2006 to 913 schools in 2014. Out of these UNESCO Schools, the schools which are learning DRR as ESD focus are increasing and exchanging each other.

In 2014, at the end of DESD, “UNESCO World Conference on ESD (WCESD)” was held in Nagoya Aichi and stakeholder meetings were held in Okayama. Through the WCESD, the declarations or proposals were stated by the conference and stakeholder meeting for ESD promotion in the future (UNESCO 2014a). At the

WCESD, UNESCO also launched “Global Action Programme on ESD (GAP)” to sustain and enhance ESD momentum at post-DESD in the world. GAP set five priority action areas (UNESCO 2014b): i) Policy Support, ii) Whole-institution Approach, iii) Educators trainings, iv) Youth involvement, and v) Local community. These action areas enhance the significances of ESD beyond the UNDESD. And this framework is also very useful and effective to promote disaster education.

1.1.3 Disaster Education toward Sustainable Development

Through the experiences of huge disasters such as mega-earthquakes, super-typhoons, heavy floods and volcanic eruptions, the public awareness for disaster risk reduction (DRR) is gaining more importance under the recognition of “Disasters, many of which are exacerbated by climate change and increasing in frequency and intensity, significantly impede progress towards sustainable society”. Education takes a crucial role to realize sustainable society by accelerating the progress of disaster risk reduction toward disaster resilience as well as increasing awareness and developing proper knowledge and skills among individuals.

At global level, the Hyogo Framework for Action (HFA) has emphasized the role of knowledge and education, and highlighted formal and non-formal education and awareness-raising as important components for disaster education, along with other global educational initiatives such as Education for All (EFA) contributing to Millennium Developing Goals (MDGs) and Education for Sustainable Development (ESD). In order to promote disaster education effectively, it is important to incorporate DRR components into school curriculum and non-formal learning program, developing disaster education curriculum/program by various approaches to fit each situation, and creating tools and methods for its promotion.

In Japan, some cities and schools have been promoting advanced disaster education developing a systematic curriculum and linking with community and local government based on the lessons learned from past tragic disasters such as Hanshin-Awaji Earthquake, Okushiri Tsunami and East Japan Earthquake and Tsunami (Oikawa 2013). Ten years after the HFA, “Sendai Framework for Disaster Risk Reduction” was launched at the World Conference on Disaster Risk Reduction in 2015 and it enhances disaster education to achieve DRR, disaster preparedness and response, and “Build Back Better” (UNISDR 2015).

1.1.4 Education for Sustainable Development and Disaster Education in the context of East Japan Earthquake and Tsunami

East Japan Earthquake and Tsunami (EJET) was the largest disaster on its scale, extent and intensity among the disaster which Japan has been experienced so far. Its impact on education sectors was enormous on various aspects. However, the impacts warrant an in-depth examination of lessons learned from the disaster in order to achieve well-rounded disaster education for the disaster risk reduction of future disaster and the recovery from EJET.

After the massive disaster of East Japan Earthquake and Tsunami in 2011, education sectors such as schools and board of education (BOE) in tsunami-affected area faced many issues and challenges immediately and continuously. Educational sectors have been implementing the responses to the disaster and recover process of schools and education from the disaster of East Japan Earthquake and Tsunami. After the disaster of EJET, the importance and significance of disaster education were recognized at schools in Japan, so that schools, especially in tsunami affected area, are trying to improve and enforce DRR and DRM perspectives in educational activities and school systems. Thus disaster education has been incorporated into school curriculum and DRM practice has been reinforced in variable school systems since EJET in 2011 through the catastrophic experience and vital lessons of EJET.

On the other hand, the synergy between ESD and DRR was highlighted and comprehended by schools and educators more and more as the new concept of ESD in the context of DRR and recovery process after the EJET. New concept of ESD is emerging in the DRR and recovery process after the East Japan Earthquake and Tsunami (EJET) based on the lesson learnt from its disaster. In some of the cities disaster affected area such as Kesennuma City, the city board of education and schools have been promoting the “Education for sustainable Development (ESD)” as a part of school and community linkages. The ESD program has positive impact on strengthening the school community recovery, and in this context, the disaster risk reduction should be part of the future ESD programs with the method to incorporate disaster education into school curriculum and educational activities involving parents and residents. Some of UNESCO schools in Japan, especially in Kesennuma, have been improving their DRR and ESD programs and activities based on this concept. They have been implementing DRR activities from ESD perspectives; students-centered, experience- based, action-oriented, enquiry-based and problem-solving process, linking and collaborating with local community and diverse sectors. These innovative practices

of the schools are the evidences of new concept of ESD and DRR in the context of lessons from East Japan Earthquake and Tsunami.

1.2 Research Location and Rationale

The Location of this research is Kesennuma City, Miyagi Prefecture in Japan (141 East longitudes and 38 North latitudes), which is a region located in the northeast of Japan. With the Pacific Ocean along its eastern edge, it is a region rich in nature (Fig. 1.2). Covering a total area of 333 square kilometers, Kesennuma City has a population of 67,179, householders of 26,142 and a population density of 201.49 persons/km² (as of April 30, 2015), the city is the center of the Minami-Sanriku area, which has a population of approximately 90,000 (Oikawa 2012).

Kesennuma City was hit by massive tsunami of East Japan Earthquake and Tsunami which occurred on March 11, 2011, and suffered huge damage: approximate 1,400 people died or missing, 80% companies collapsed and over 80% people lost their jobs, which is one of the serious affected cities in the Pacific coast line of Tohoku region (Oikawa 2013). Because of this suffering the tragic disaster, the population of Kesennuma City decreased more than 6,000 people in several years (Table 1.1)



Fig. 1.2 Map and Photo of Study Area

Table 1.1 Demographic Profile of Study Area before and after EJET

Classification	Before EJET 28-Feb-11	After EJET 31-Mar-14	Transition
Population	74,247	67,951	-6,296
Male	35,950	33,001	-2,949
Female	38,297	34,950	-3,347
Householders	26,601	25,846	-755

[Source: Kesennuma City, Miyagi Prefecture in Japan] Modified by author

On the other hand, since 2002, Kesennuma City has developed and implemented a systematic, community-based ESD program that centers on school education in collaboration with specialized agencies such as universities, overseas schools and organizations. These efforts and innovative challenges have played a leading role in pioneering ESD not only in Japan but also in the world. In June 2005, the Greater Sendai area including Kesennuma City was designated by the United Nations University as one of Regional Centres of Expertise (RCE) on the UN Decade of ESD (DESD). Since 2008, under the leadership of Kesennuma City Board of Education, schools in Kesennuma City has been becoming members of UNESCO Associated Schools (ASPnet School) with the aim of further improving the quality of ESD practice. And all elementary schools and junior high schools along with some kindergartens and senior high schools (35 schools in total, as of 2014) in Kesennuma have been acknowledged as ASPnet Schools and have promoted characteristic ESD practice based on their communities and resources. Thus, Kesennuma City is pioneer and leading city of ESD promotion in the world, and also the city is one of the worst affected areas which suffered unprecedented damage from the EJET. Therefore, Kesennuma is perfect and only study area to research the Synergy between Education for Sustainable Development and Disaster Education in the Post-Tsunami Recovery Context of East Japan Earthquake and Tsunami.

1.3 Research Objective

The objective of this research is to analyze the synergy between Education for Sustainable Development (ESD) and disaster education in the post-tsunami recovery context of East Japan Earthquake and Tsunami (EJET). At the time of disaster, environmental, economic, social and cultural “Unsustainable Situations” emerge, in a

complex manner and extremely. The research attempt to analyze how ESD and efforts made by schools (UNESCO Associated Schools) are utilized and how they contribute to disaster risk management, disaster risk reduction and the process of recovery and reconstruction in critical situations caused by disaster of EJET from the synergy perspective, with disaster education, taking the specific case study and analysis from target study city, Kesennuma City, Miyagi Prefecture in Japan.

In addition, for the purpose of the promoting ESD and disaster education, the synergy concept, the strategies for governance, and the methods for curriculum development and network bindings which are brought by this research are suggested as way forward to other regions and schools which have similar issues and attempts including building consortiums for accelerating ESD and DRR activities.

1.4 Hypothesis and Research Question

Hypothesis of this research is “The synergy of ESD and Disaster Education can be effective for disaster risk reduction and recovery”, especially to the post-tsunami recovery process of East Japan Earthquake and Tsunami (EJET). Through infusing the concept and method of ESD to disaster education, it is possible to raise the quality of disaster education and disaster risk reduction. As a result, it could contribute to the recovery process. However, the synergy between ESD and disaster education is many aspects. Therefore, under this hypothesis, four research questions are identified as follows (Fig. 1.3):

- (i) How ESD corresponds to Governance issues during and post disaster context?
- (ii) How ESD improves Disaster Education?
- (iii) How ESD fosters DRR Ability & Attitude?
- (iv) How recovery experience can enhance partnership and Network of ESD?

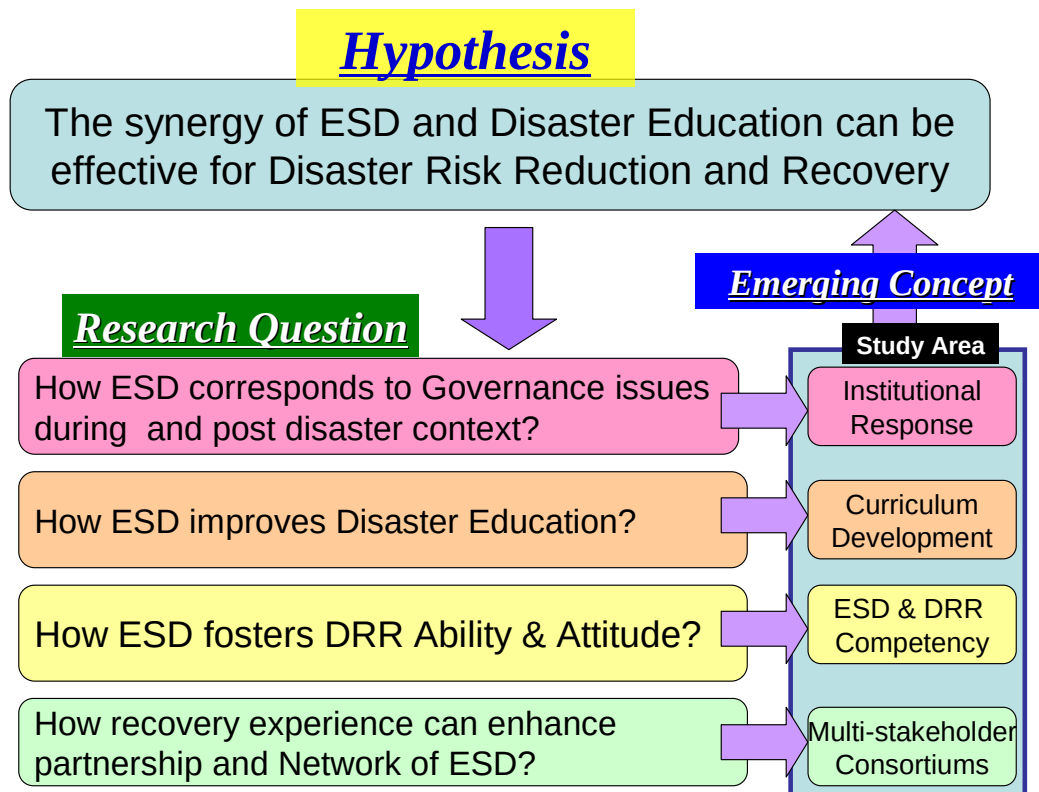


Fig. 1.3 Hypothesis and Research Questions

First question is governance issue. Governance is very important to promote ESD and disaster education as well as DRR and disaster recovery, as the Global Action Programme on ESD and Sendai Framework for Disaster Risk Reduction state (UNESCO 2014b, UNISDR 2015). To respond to this question, the disaster responses or measures of educational institutions such as board of education which has been promoting ESD should be analyzed. Next question is related to innovation of disaster education. It should be identified how ESD learning styles and curriculum developing methods contribute to raise the quality of disaster education. Especially, its study area is ESD curriculum development which can adapt to disaster education curriculum development. Third one is the linkage of ability or attitude between ESD and disaster education. The research tries to discuss on the commonality and similarity of competencies fostering through ESD and disaster education. The last research question is concerning with network or linkage, in other words, collaboration and partnerships which will support DRR practices and disaster education. Linkage and collaboration with community and outside institution is very useful and effective for both to promote ESD and disaster education activities. Therefore, to research the commonality of

building network is very informative for the promotion of disaster education and recovery process.

Thus, through the research to respond to these questions by surveying each study area, the new synergy concept to contribute to the post-disaster recovery could be emerged (Fig. 1.3).

1.5 Research Methodology and Process

The research is carried out using following methodologies: i) literature review, ii) direct interviews, iii) questionnaire surveys, iv) focused group discussion (including workshops), v) School lesson Observation, and iv) action-based research (conducting the survey and research lesson of teachers, and governmental measures). As the concepts of ESD and disaster education contain wide range of areas and topics, the literature review on these topics is ranging from linking schools and communities, educational governmental issues, disaster education, disaster risk reduction and management and international initiatives of ESD and DRR. Data and documents related the damage and recovery of EJET have been continuously collected to renew latest data and information. Through the comparison of literature reviews of ESD and disaster education, some elements of the synergy concept between ESD and disaster education could be found out. On the other hand, direct interview conducted to key person such as superintendents and supervisor of board of education as well as school principals and teachers utilizing teacher training workshops and round table meetings. Through these interviews, it will be indentified how educational governance and instructions functioned and contributed to recovery process of education sectors in the aftermath of East Japan Earthquake and Tsunami (EJET). Questionnaire survey was implemented to all schools in Kesennuma City after EJET as a study of teachers' researching group conducted by author. This survey aims to analyze the situations of the school in the recovery process from EJET immediately through the observation of the evacuation actions of kindergartener and students as well as the responses of faculties on the day of EJET occurring. The survey also analyzes the efforts of disaster education at schools and the consciousness of school faculties for disaster risk reduction. In addition, as author used to be an administrator and supervisor of Kesennuma City Board of Education, school lesson observation and action- based research was conducted to get information and analyze the outcomes and evidences related to this research, such as conducting research lessons at school and actual governmental measures to ESD, DRR and recovery process in the midst and aftermath of the disaster of EJET (Table 1.2).

Table 1.2 Research Methodologies

Methodology	Objective	Place	Targeted Group / Contents	Date / Term
1.Literature review	Overview of ESD and Disaster Education		Selected Source	
2.Direct interviews	Identification of governance and instructions functioned in recovery process	Kesennuma City Board of Education	Superintendent Supervisors	Several times between Apr. 2011 and Jun. 2015
		Schools and Kindergartens in Kesennuma City	Principals Teachers	Several times between Apr. 2011 and Jun. 2015
3.Questionnaire surveys	Analysis of school situations in midlist & aftermath of EJET	Schools and Kindergarten in Kesennuma City	Principals (N:40 schools) Teachers (N:148 teachers)	Jan. 19-26, 2012
4.Focused group discussion	Analysis of Practice of ESD and Disaster Education / Teacher Training / partnership and cooperation for the promotion of ESD & Disaster Education	Kesennuma ESD/UNESCO School Training Workshop (Twice per FY year)	Principals Teachers	May 17, 2012 Jan. 29, 2013 Jun. 11, 2013 Jan. 24, 2014 Jul. 9, 2014 Jan. 23, 2015
		Kesennuma ESD/RCE Round- Table Conference	Community Member Specialists (University) Administrator (MEXT etc.)	Oct. 30, 2012 Oct. 25, 2013 Nov.28, 2014
5.Observing School lessons	Analysis of lessons of ESD and Disaster Education	Schools in Kesennuma City	Teachers Students	Several times between Apr. 2011 and Mar. 2014
6.Action-based research	Verification of BOE and school measures for recovery	Kesennuma City Board of Education Schools in Kesennuma City	Research Lesson Curriculum Development Governmental measure	Between Apr. 2011 and Mar. 2014

Author has promoted ESD practices of Kesennuma City as former vice director of Kesennuma City Board of Education and used to be a vice principal of elementary school in Kesennuma City. He initiated Regional Center of Expertise (RCE) and UNESCO Associated School in Kesennuma City. He is also member of Japanese National Commission for UNESCO and UN Decade of Education for Sustainable Development Round-table Meeting of Japanese government, so that he is engaged in promotion and dissemination of ESD at national level. However he suffered massive disaster of East Japan Earthquake and Tsunami (EJET), and he engaged on educational recovery of Kesennuma City as administrator of board of education, on the other hand, he also conducted the research of Kesennuma Educational Researching Group which consists of selected school teachers in Kesennuma focused on disaster education as supervisor. In the process of disaster recovery in the aftermath of EJET, he recognized deeply the linkage and synergy between ESD and disaster education. Therefore, author

was motivated to research on this synergy, and tried to propose and disseminate the lessons of this research to other areas for disaster preparedness for coming disasters.

1.6 Structure of the Thesis

The structure of the thesis consists of three parts with a total of nine chapters (Fig. 1.4). Part 1: “Overview of ESD and Disaster Education” consist of three chapters. Following to chapter 1 of Introduction, chapter 2 and chapter 3 are essentially described the evolution of ESD (chapter 2) and disaster education (chapter 3) at global and local level, reviewing the international initiatives and local practices. In this comparative literature review of ESD and disaster education, some elements of synergy could be identified.

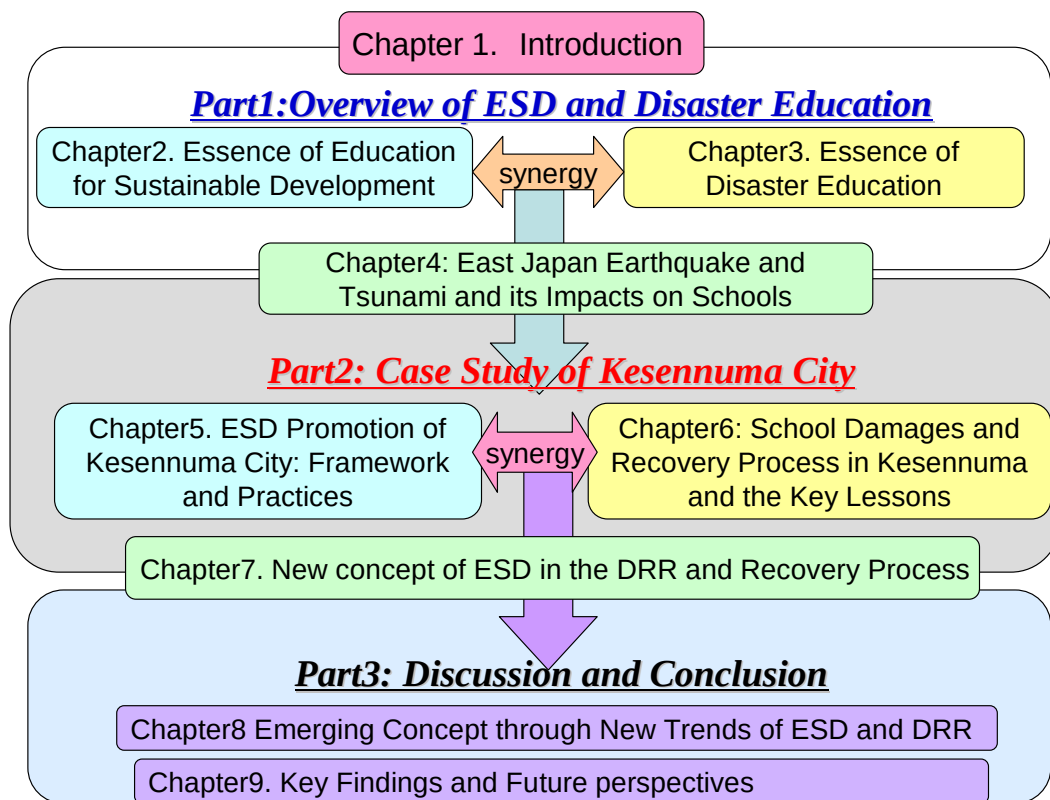


Fig. 1.4 Structure of Thesis

Part 2: “Case Study of Kesennuma City” is composed of four chapters. In advance of case studies, chapter 4 is the overview of the damage of the “East Japan Earthquake and Tsunami (EJET)”, especially focused on the impact on the school. Categorizing the

different features of damages between Sanriku and Sendai plane area, unsustainable situations in the disaster and significance of disaster education linking with community would be recognized. This chapter is also the bridge from first part to second part. As first case study from ESD perspectives, chapter 5 surveys ESD promotion of Kesennuma City through describing its advanced ESD framework and practices so far. Following to this chapter 5, chapter 6 analyzes school damages and recovery process of Kesennuma in the midst and aftermath to identify the key lessons from DRR perspective. Through linking those two chapters, the new concept of ESD in the DRR and recovery process was analyzed in chapter 7. This is the chapter of synergy concept which comes from the experience of ESD and DRR practice in Kesennuma City as well as the lessons learned from EJET. This chapter is also the bridge linking to the following discussion part.

Last part (Part 3) is the discussion and conclusion part consists of two chapters. Based on the survey of practices and challenges on ESD and disaster education in Kesennuma City as well as the latest international frameworks and initiatives related to ESD and DRR, Chapter 8 discusses on emerging concept of ESD and disaster education through the new trend of ESD and DRR. Finally, Chapter 9 states future perspective of ESD and disaster education.

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Chapter 2 Essence of Education for Sustainable Development (ESD)

Abstract: This chapter will analyze the essence of Education for Sustainable Development (ESD), mainly in case of Japanese practice during UN-Decade of ESD. Since the latter half of 20th century, according as human beings had been facing a lot of crises at local and global level, “Sustainable Development” was getting a common and crucial issue around the world. To realize Sustainable Development, it was recognized by many people and nations that “Education” could take key role for the future so that “Education for Sustainable Development (ESD)” was proposed as the key concept to build the sustainable future of human beings. The origin of ESD was indicated at the Earth Summit in Rio de Janeiro, Brazil in 1992 and Japan proposed the “Decade of Education for Sustainable Development (DESD)” at the World Summit on Sustainable Development in Johannesburg South Africa in 2002. Pursuant to resolution of United Nation for DESD, the Japanese government established the Inter-ministerial Meeting on UNDESD” in 2005 and decided on an action plan for the UNDESD in Japan. Japanese government also introduced ESD concept to reforms of educational law and national curriculum. As the key strategies for Promoting ESD at formal and informal education sectors, it will be analyzed the projects of “Regional Centres of Expertise (RCEs)” and “UNESCO Associated Schools Project network (ASPnet)” in Japan. Lastly, in 2014, at the end of DESD, “UNESCO World Conference on ESD” was held in Nagoya Aichi and Okayama, Japan along with related conferences and side- events. Through these conferences, the declarations or proposals were stated by each conference for ESD promotion in the future. At world conference, UNESCO also launched “Global Action Programme on ESD” to sustain and enhance ESD momentum at post-DESD in the world. It can be surveyed the significances of ESD beyond the UN-Decade.

2.1 Evolution of the Concept of ESD

2.1.1 Emerging ESD Concept to UNDESD

Since the latter half of 20th century, according as human beings had been facing a lot of crises of environment such as global warming, desert spreading, crisis of bio-diversity, disruption of ozone layer and rain forest, pollutions of water and air, and also social problems such as poverty in many developing countries, disputes in cause of religious

and racial problems, gender problem and so on, all of those were not able to sustain society and future at local and global level, “Sustainable Development” was getting a common and crucial issue around the world. Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” in “Our Common Future” of Brundtland Report (WCED 1987). And in order to realize “Sustainable Development”, it was recognized by many people and nations that “Education” could take key role for the future so that “Education for Sustainable Development (ESD)” was proposed as the key concept to build the sustainable future of human beings. The significance and importance of Education for Sustainable Development (ESD) was emphasized by many international conferences, and that was reflected in key documents (Oikawa 2012a).

In 1992, the Earth Summit in Rio de Janeiro, Brazil, has recognized the critical role of education in achieving sustainable development and future. Chapter 36 of Agenda 21 specifically addresses reorienting education towards sustainable development, and encompasses all streams of education, both formal and non-formal, basic education and all the key issues related to education for sustainable development (UNU-IAS 2005). The four major thrusts as identified in the Chapter 36 of Agenda 21 are:

- Public awareness and understanding
- Access to quality basic education
- Reorienting existing education
- Training programmes for all sectors

In the process of negotiating a Plan of ESD Implementation of the World Summit on Sustainable Development in Johannesburg South Africa in 2002, Japan proposed the “Decade of Education for Sustainable Development (DESD)” in response to the proposals of Japanese NGOs, and a recommendation to the UN General Assembly to consider adopting this idea was included in the Plan. According to this, Japan submitted a resolution as one of the 40 co-sponsors to designate the 10 years as the UN Decade of Education for Sustainable Development (UNDESD) at the 57th UN General Assembly in 2002. The proposal was adopted unanimously to launch the “Decade of Education for Sustainable Development (DESD)” from January 2005, following the Johannesburg 5/11/2014 Plan of Implementation. UNESCO was designated as the lead agency for the Decade, which developed a draft International Implementation Scheme for DESD (Oikawa 2014).

2.1.2 Progress of ESD during the UN-Decade

2.1.2.1 Stating the UN-Decade of Education for Sustainable Development

ESD advocated by UNESCO aims to help people develop the attitude, skills, and knowledge required to make decisions for their own life and others, now and in the future, and to act on these decisions. Four major aspects focused in ESD are as follows; (i) improving quality of basic education, (ii) reorienting educational programs, (iii) developing public understanding and awareness, and (iv) providing training (UNESCO 2005). UN Decade of Education for Sustainable Development (DESD) which was launched from 2005 to 2014 by the UN General Assembly in 2002 aims to promote the following in the educational scheme: (i) interdisciplinary and holistic learning rather than subject-based learning; (ii) value-based learning; (iii) critical thinking rather than memorizing; (iv) multi-method approaches: word, art, drama, debate, etc.; (v) participatory decision-making and locally relevant rather than national information (UNESCO 2006). The primary aim of DESD is to encourage government to consider the inclusion of measure to implement the ESD in their respective education system and national development plans with four key objects: (i) facilitating networking and collaboration among stakeholders in ESD, (ii) fostering greater quality of teaching and learning of environmental topics, (iii) supporting countries in achieving their MDGs through ESD efforts, and (iv) providing countries with new opportunities and tools to reform education (UNESCO 2005). UNESCO which is designated to lead the DESD seeks to integrate the principals, values, and practices of sustainable development into all aspect of education and learning, in order to address the social, economic, cultural and environmental problems face in the 21st century. Implementation focused on the following seven building blocks: (i) advocacy and vision-building, (ii) consultation and ownership, (iii) partnership and network, (iv) capacity-building and training, (v) research and innovation, (vi) information and communication technologies, (vii) monitoring and evaluation (UNESCO 2006).

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2.1.2.2 ESD at the Second half of the DESD

In mid-term of DESD, UNESCO World Conference on Education for Sustainable Development was held in Bonn, Germany on 31 March to 2 April 2009. The conference issued Bonn Declaration of following statement and call for action. The declaration pointed “The progress of ESD remains unevenly distributed and requires different approaches in different contexts. In the coming years, there is a clear need for both developed and developing countries, civil society and international organizations to make significant efforts”, so that it requires five calls for action at policy level and 13 calls for action at practice level. And it also welcomed the intention announced by the Government of Japan to host jointly with UNESCO the end-of-decade world conference on ESD in 2014 (The Interministerial Meeting on DESD 2009). In 2010, at beginning of the 2nd half of the DESD, UNESCO stated three priorities in addressing global sustainable development challenges through ESD, by focusing on the following: I) Climate change, II) Biodiversity, III) Disaster risk reduction and preparedness. They are key action themes for the second half of the DESD (2010-2015) as UNESCO strategy (UNESCO 2010a). On the other hand, UNESCO set the UNESCO Strategy for the Second Half of the ESD to support Member States and other stakeholders in addressing global sustainable development challenges through ESD and thus addressing the

challenges of learning for bringing about a more sustainable world. The strategy suggested the “Key regional challenges and opportunities for the 2nd half of the DESD” according to the issues faced, and the progress development and ESD promotion depend on each region such as Africa, Arab States, Asia-Pacific, Latin America & the Caribbean, Europe and North America. And also, it focused its efforts on four “Key Areas of Strategic Action for the 2nd half of the DESD” as follows (UNESCO 2010b):

- A) Enhancing synergies with different education and development initiatives such as Education for All (EFA), Millennium Development Goals (MDGs), United Nations Literacy Decade (UNLD), Global Initiative on Education and HIV & AIDS (EDUCAIDS), and strengthening partnerships among ESD stakeholders:
 - a) Strengthen its leadership and coordination role for the DESD
 - b) Continue and further extend dialogue with governments and other key stakeholders in order to facilitate global and regional partnerships
 - c) Further integrate ESD into UNESCO programming processes
- B) Developing and strengthening capacities for ESD
 - a) Support Member States and other partners in implementing the DESD
 - b) Support Member States to reorient teacher education and training programmes towards sustainability
 - c) Assist Member States in the further development of monitoring and evaluation frameworks, tools and indicators to assess ESD progress
- C) Building, sharing and applying ESD-related knowledge
 - a) Promote ESD-related research through UNESCO’s programmes, institutes and networks
 - b) Strengthen UNESCO’s performance as a clearing house
 - c) Mobilize and make full use of the expertise that exists within UNESCO’s programme sectors and its networks
- D) Advocating for ESD, and increasing awareness and understanding of sustainability
 - a) Strengthen its lobbying/advocacy role to increase the visibility of the Decade
 - b) Develop advocacy resource tools
 - c) Intensify UNESCO’s efforts and initiatives to put ESD higher on the international agenda

Twenty years later from the Earth Summit in Rio de Janeiro in 1992, “United Nations Conference on Sustainable Development (Rio+20)” was held in Rio de Janeiro,

Brazil in June, 2012. The conference addressed the agenda, “The future we want” as outcome of the conference. It reaffirmed the importance of ESD to achieve the sustainable development. In the Chapter V, “Framework for action and follow-up - A. Thematic areas and cross-sectoral issues - Education 233”, it is described “We resolve to promote education for sustainable development and to integrate sustainable development more actively into education beyond the United Nations Decade of Education for Sustainable Development” (United Nation 2012). Along with this statement, in this section of education, it is emphasized these points related to ESD in the section of Education:

- “229. We reaffirm our commitments to the right to education and in this regard, we commit to strengthen international cooperation to achieve universal access to primary education, particularly for developing countries
- 230. We resolve to improve the capacity of our education systems to prepare people to pursue sustainable development, including through enhanced teacher training, the development of curricula around sustainability, the development of training programmes, and more effective use of information and communication technologies
- 231. We encourage Member States to promote Sustainable Development awareness among youth by promoting programmes for non-formal education in accordance with the goals of the United Nations Decade of Education for Sustainable Development
- 232. We emphasize the importance of greater international cooperation to improve access to education including through building and strengthening education infrastructure, increasing investment in education
- 234. We strongly encourage educational institutions to consider adopting good practices in sustainability management on their campuses and in their communities with the active participation of inter alia students, teachers, and local partners
- 235. We underscore the importance of supporting educational institutions, especially higher educational institutions in developing countries, to carry out research and innovation for sustainable development”

These resolutions give a further momentum to the promotion of ESD, and it has a critical significance on clarifying the commitment of the international community to further action after DESD.

2.2 Practices of Global ESD

Since the latter half of the 20th century, as international conflicts and global-scale environmental problems that threaten the continued existence of humankind and society have emerged, “Education for Sustainable Development” - that is, ESD - has drawn increasing attention as awareness has increased of the importance of education to nurture future leaders of sustainable societies in order to overcome these global issues. Against this background, at the Johannesburg Summit in 2002, Japan proposed the establishment of the United Nations Decade of Education for Sustainable Development (DESD), to begin in 2005 (Interministerial Meeting on ESD 2009).

During the Decade of Education for Sustainable Development (DESD), ESD has been progressing and disseminating over the world by the efforts of many countries and stakeholders in the world. ESD practices also have been getting good effects and fruits through good practices such as “Regional Centres of Expertise on ESD (RCEs)” and “UNESCO Associated School Project network (ASPnet)”. Those ESD practices have contributed to enhance the quality of education in not only school education but also non-formal and informal education, by changing values and idea for education. On the other hand, ESD also have progressed to establish network and collaboration among diverse actors and sectors in the community, inter-community and in the world. That enhances the power of community for sustainable development. ESD aims to solve global issue such as “Bio & Cultural-diversity”, “Climate Change”, and “Disaster Risk Reduction (DRR)”, but ESD also should be promoted locally tackling local urgent issues and problems which are different depend on each community and region.

As mention below, Regional Centres of Expertise on ESD (RCEs) and UNESCO Associated Schools Project Network(ASPnet) are based on their communities and so that their practices and activities focused on local issues or legacies for the purpose of building sustainable regional society and city mainly. On the other hand, it facilitates to establish global networks to exchange and collaborate with each other. By taking actions locally and globally, ESD has been spreading and move forward to world.

2.2.1 Role of Regional Centres of Expertise (RCEs) for DESD

Flowing to the resolution on the Decade of Education for Sustainable Development (DESD) of the UN General Assembly in 2002, which based on the Johannesburg Plan of Implementation, United Nation University (UNU) launched the Education for Sustainable Development Programme in 2003 with funding support from Japanese

government, in order to contribute the UNDESD, spanning from 2005 to 2014. The programme of UNU focuses on advocacy and dissemination of education for sustainable development principals, strengthening of ESD activities in regions and at higher education institutions, and contributing to evidence-based policy dialogue through research, capacity development and strategic engagement with international processes. The programme should be to help in the creation of a Global Learning Space for sustainable development. It promotes research and actions to advance partnerships for ESD across geographic, knowledge and sectoral boundaries (UNU-IAS 2005).

2.2.1.1 Regional Centres of Expertise (RCEs) as Regional ESD Initiative

“Regional Centres of Expertise on ESD (RCEs)” is a key project of the ESD programme of UNU. United Nation University Institute of Advanced Studies (UNU-IAS) assists in developing RCEs all over the world. RCE is not a physical center or building, but rather a network of individuals, organizations and experts who are committed to using education as a tool for building a sustainable future. An RCE is a network of existing local-regional institutions mobilized to jointly promote all types of learning for a sustainable future. Each RCE is regionally-based and RCEs members bring in-depth knowledge of the challenges facing their respective regions. RCEs aspire to achieve the goals of the DESD by building an innovative platform for multi-sectoral and interdisciplinary information-sharing, dialogue and collaboration at local and global levels. Their networks include formal learning institutions, like schools and universities, as well as informal learning establishments, such as museums, private enterprises, local governmental institutions, NGO/NPOs and the media (Fig. 2.1). RCEs, both individually and collectively, aspire to achieve the goals of DESD and beyond by disseminating global goals to activities of governments and societies at level. Collaborative undertakings within and across RCEs include:

- (i) Governance (Policy work) to build the platform for the dialogue among multi-stakeholders and multi-sectors (Fig. 2.1)
- (ii) Collaborations with formal ,informal and non-formal education sectors, and university as centre of network and expertise
- (iii) Research and Development in the key thematic areas of ESD and sustainable development
- (iv) Innovative teaching and learning method to change existing learning and training systems for the achievement of local Initiatives related to sustainable lifestyle

The regional initiatives which can satisfy these core factors could be acknowledged as RCE by UNU officially (Takemoto 2014). The RCEs have significantly contributed towards the implementation of the DESD. Designed as networks of formal, non-formal and informal education organizations to deliver education for sustainable development (ESD), RCEs have generated excitement, relevance and value in engaging various stakeholders to foster sustainability (Fadeeva and Mochizuki 2014).

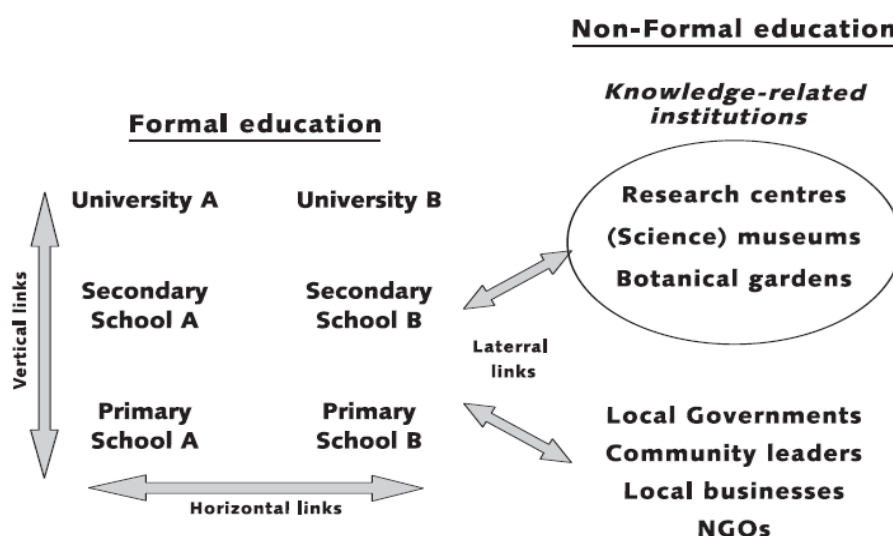


Fig. 2.1 Structure of Regional Centres of Expertise (RCE) on ESD
[Source: “Mobilising for Education for Sustainable Development” (UNU-IAS 2005)]

2.2.1.2 Spreading RCEs around the world – History of RCEs

The first batch of seven RCEs was acknowledged at the UNU-UNESCO Conference on Globalization and Education for Sustainable Development in Nagoya, Japan, June 2005. These first RCEs consist of Greater Sendai and Okayama in Japan, Toronto in Canada, Penang in Malaysia, Pacific Island Countries, Rhine-Meuse which is part of Netherlands, Belgium and Germany, and Barcelona in Spain. They are called “Initial Seven RCEs”. Five more RCEs followed toward the end of 2005 and early 2006. The Ubuntu Alliance, in its meeting in April 2006, established the Committee of Pears for the RCEs, to discuss ways to promote RCEs, to review applications and provide recommendations to UNU to acknowledge new RCEs. The Committee recommended UNU to acknowledge 23 new RCEs at its first meeting in December 2006 in Paris. The RCEs network continues to expand and today there are RCEs in Africa, the Americas,

Asia, Europe, the Middle East and the Pacific. There are 129 acknowledged RCEs as of August 2014 around the world (Fig. 2.2).

While RCEs are developing their practices in each region, RCEs have held Regional RCE Conference in each continental region such as Africa, Asia, Europe and North America, as well as Global RCE Conference every year since 2006. Global RCE Conference is growing year by year and highly evaluated by international society. At the conference in 2013, for the purpose of contribution to the discussion of ESD at global level, it was analyzed the following main thematic areas (Fadeeva and Mochizuki 2014):

- Sustainable Consumption and Production(SCP)
- Traditional Knowledge and Biodiversity
- Poverty Eradication and Sustainable Livelihoods and Well-being
- Higher Education
- Climate Change
- Health and ESD
- Teacher Education and Better Schools



Fig. 2.2 RCEs around the World, as of April 2014

[Source: United Nation University-IAS (2014)]

The action plan for future in these thematic areas was included in “Tongyeong Declaration on RCEs and ESD” which was adopted at the 7th Global RCE Conference in Tongyeong City of Korea in 2012 (UNU-IAS 2012). It needed to be more discussed further in RCEs network and the 9th Global RCE Conference held in Okayama City, Japan at the end of DESD, in order to input to the UNESCO World Conference on ESD (WCESD) held in Nagoya City, Japan 2014(Takemoto 2014). It was adopted as “Okayama Declaration on RCEs and ESD Beyond 2014” at closing session of Okayama Global RCE Conference (UNU 2014).

2.2.1.3 Core Elements and Functions toward Goals of RCEs

There are four core elements of RCEs. One is governance – RCEs is addressing issues of RCEs management and leadership. Second is collaboration – RCEs is addressing the engagement of actors from all levels of formal (primary, secondary and higher education), and informal education sectors in RCEs activities. Third is research and development – RCEs is addressing the role of research and its inclusion in RCEs activities, as well as contributing to the design of strategies for collaborative activities, including those with other RCEs. Last is transformative education – RCEs contributes to the transformation of the current education and training systems to satisfy ambitions of region regarding sustainable living and livelihood.

RCEs aim to achieve the goals of the UNDESD from 2005 to 2014 both individually and collectively. While each RCE contributes to the DESD by translating its global objectives into the context of the local communities in which they operate, the worldwide network of RCEs is envisioned to constitute what “The Global Learning Space for Sustainable Development”. The Global Learning Space is the articulation of a vision of the DESD put toward by UNESCO: “a world where everyone has the opportunity to benefit from education and learn the values, behaviors and lifestyles required for a sustainable future and for positive societal transformation.

As to the function of RCEs, the RCEs is a network of existing formal, non-formal and informal education organizations, mobilized to deliver ESD to local and regional communities. RCEs build an innovative platform for multi-sectoral and interdisciplinary information-sharing, dialogue and collaboration for promoting ESD among regional/local stakeholders. It also creates a regional/local knowledge base to support ESD activities. As an innovative platform for dialogue and local knowledge base,

RCEs promotes four major goals (four thrusts) of ESD, which the Chapter 36 of Agenda 21 described, in a resource-effective manner. (UNU-IAS 2010)

2.2.2 Role of UNESCO Associated School Network Project (ASPnet) for DESD

UNESCO (United Nations Educational, Scientific and Cultural Organization) has a network called the UNESCO Associated Schools Project Network (ASPnet). The system of UNESCO Associated Schools was started as ASPnet (Associated Schools Project Network) in 1953 for the implementation of the idea indicated in the UNESCO charter in schools. Each participating school must continuously make efforts in line with the ideals of UNESCO. In order to develop the contents and the methods of new education enabling young people to tackle global issues, they cooperate and exchange with other associated schools concerning their educational activities while making their own efforts in each associated school. When the network was started in 1953, there were 33 associated schools in 15 countries. The network is constantly expanding, so that now the number has been increased to about 9,700 schools in 180 countries, throughout the world (2013). Growth rate is 23% during the last decade. It includes pre, primary and secondary schools as well as technical/vocational teacher training institutions. The year of 2013 is 60th anniversary and it was held International Forum for 60th anniversary of UNESCO ASPnet in September, 2013 in Republic of Korea.

ASPnet tries to refine its four themes of study, those are “World concerns and the role of the United Nation system”, “Education for Sustainable Development”, “Peace and Human Rights”, and “Intercultural learning”. In the sixth decade, goal of ASPnet is to promote quality education for all in pursuit of justice, liberty, peace and human development. There are five objectives of ASPnet. The first is reinvigorating a global network of school committed to over-all quality improvement in support of EFA. The second is focusing on and promoting quality education as a right of all learners. The third is reinforcing, disseminating and mainstreaming good practices. The forth is promoting local expression as beacon of UNESCO ideas. The last is contributing to sustainable socio-economic and cultural development, which is related to “Education for Sustainable Development (ESD)”.

The plan of actions was structured along the different levels. At international level, it is required as examples to strengthen International Coordination, reinforce ICT, to develop flagship projects, to provide resource materials, to mainstream good practices and to increase visibility. At national level, it is also required to appoint National Coordinators, to mainstream ASPnet innovations into national education systems, to

plan activities, to elaborate fundraising strategy and to involve national media. At regional level, it is indicated to develop training/capacity building and partnerships. Finally, at school level, it is recommended to involve all teaching staff, to draw up annual school plan, to establish participatory democratic approaches and to display ASPnet logo at school.

2.3 ESD in Japan and its Implication

2.3.1 ESD Policy in Japan

At the beginning of the “UN Decade of Education for Sustainable Development (UNDESD), Pursuant to this resolution for sustainable development, in 2005, the Japanese government established the Inter-ministerial Meeting on UNDESD” within the Cabinet to strive for close coordination among administrative bodies concerned with implementing the measures related to the UNDESD and to promote the effective and comprehensive implementation of the measures. The Inter-ministerial Meeting has examined this matter while giving full consideration to opinions from various sources and has decided on an action plan for the UNDESD in Japan.

2.3.1.1 ESD policy driven by diverse Ministries

ESD policy driven by diverse Ministries is coordinated by the Cabinet of the Japanese Government while the organ corresponding to UNESCO activities is located as Japanese National Commission for UNESCO at the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The International Implementation Scheme elaborated by UNESCO emphasizes the importance of the building of national plan and inter-ministerial team for promoting DESD (UNESCO 2005). The Interministerial Meeting coordinated by Cabinet composed of 11 ministries, including four Vice-chair Ministries which are the Cabinet Secretariat, the Ministry of Foreign Affairs, the Ministry of Education (MEXT), and the Ministry of Environment, established in December 2005, according to UNESCO’s recommendation (Iwamoto 2014). The Interministerial Meeting established Japanese Action Plan for the UNDESD in March 2006. The action plan states the guideline for the implementation of ESD, such as programs leading to community building, diverse places of education and Implementing actors, integrated and approaches under various agendas, learning from participation, and communication and collaboration among diverse actors. This represents the nature

of multi-stakeholder for promotion of ESD well (Interministerial Meeting on DESD 2006).

At the mid-term of DESD, Interministerial Meeting renewed the Action Plan for DESD in June 2011, based on UNSCO's review and lessons of Great East Japan Earthquake and Tsunami which occurred on March 11, 2011. New paragraphs are added to the preamble of the action plan as follows (Interministerial Meeting on DESD 2011);

“The Great East Japan Earthquake and Tsunami occurred on March 11, 2011, and the status of the nuclear power plant accident and power shortages due to it, has given great impact to the modality of ESD practice in our country. This earthquake admonished us that prudent preparedness for natural disasters is an absolute prerequisite for the sustainable development, more than ever, this incident was allowed to re-recognize that it is necessary for us to think seriously about the way of coexistence with nature as well as understanding of the nature. In addition, by facing the Great East Japan Earthquake and Tsunami, and the nuclear power plant accident and the situation of power shortage caused by the accident, almost all the people feel that they must rethink the image of "sustainable society" including the way of use and supply of energy. Moreover, Japan must continue to promote the initiative of new community building and social development that goes beyond recovery throughout the country especially around the affected areas. "Sustainable society" is probably one of the concepts that are the pillars of this case.” (Translated tentatively by author)

Thus, ESD framework and practice in Japan was rebuilt from the perspectives of disaster risk reduction, recovery and reconstruction through the experiences and lessons of Great East Japan Earthquake and Tsunami. In 2014, at the end of UNDESD, Interministerial Meeting published “Japan Report” as second version collecting information and advices from diverse initiatives in order to review and disseminate the results and good practices of Japanese ESD promotion during DESD to the world at WCESD (Interministerial Meeting on DESD 2014). It also emphasizes the significance of roles and contributions of ESD to DRR, recovery and reconstruction through the experience through Great East Japan Earthquake, and describes new momentum in the context of the synergy between ESD and DRR as an ESD good practice from affected area such as Kesennuma City (Kesennuma BOE and MUE 2014).

2.3.1.2 ESD policy by Japanese National Commission for UNESCO (JNCU)

The Japanese National Commission for UNESCO (JNCU) was established in 1952 according to the recommendation of UNESCO Charter. JNUC is a special organization

attached to MEXT, in accordance with Law Concerning UNESCO Activities (1952 Law no.207). JNUC is comprised of up to 60 members who represent their respective competences in the field of education, science and culture (JNCU 2014).

Main activities of JNCU are;

- (i) to provide advice, make plan, serve as a liaison and conduct studies or survey concerning UNESCO activities to realize UNESCO's objectives in Japan
- (ii) to conduct studies and deliberation in order to advise Ministers concerned on such issues as the selection of the Japanese government representatives for the UNESCO General Conference as well as matters related to the Conference agenda, and those related to the conclusion of treaties and conventions
- (iii) to draw out the basic policies of UNESCO activities in Japan
- (iv) to exchange information with UNESCO-related institutions and organization in Japan

Since the resolution of the UNDESD at UN General Assembly, JNCU has deliberated the issues of ESD. Already in July 2003, JNCU elaborated "Proposal to the UNESCO's Implementation Scheme on the DESD" which was highly taken into account in International Implementation Scheme on the DESD (JNCU 2003). JNCU had been proposing actively to UNESCO and the inside of Japan for advocating and promoting ESD during UN-Decade as the organization of the country which proposed DESD to the world. Main proposals from JNCU related to DESD promotion are as follows (JNCU 2014):

- A) Proposal to UNESCO regarding further promotion of the United Nations Decade of Education for Sustainable Development (UNDESD)

This proposal presents to UNESCO new approaches for further promotion of UNDESD (JNCU 2007). It was adopted at 121st JNCU General Assembly in August 2007 and leads to the resolution adopted at 37th session of the General Conference of UNESCO.

- B) Proposal regarding the effective utilization of UNESCO Associated Schools for the promotion and dissemination of Education for Sustainable Development (ESD)

This proposal addresses how to concretely utilize UNESCO Associated Schools in order to disseminate ESD at schools (JNCU 2008). It was adopted at 122nd JNCU General Assembly held in February 2008.

- C) Recommendation to the Japanese Government for further dissemination of Education for Sustainable Development (ESD) and promotion of support to ESD

Based on the firm recognition that Japan, as the proposer of UNDESD, should further strengthen its efforts to promote ESD on the occasion of the mid-year of the Decade in 2009, this recommendation requests the Japanese Ministers concerned to take necessary actions to attain the goals (JNCU 2009). It was adopted at 124th JNCU General Assembly held in March 2009.

- D) Proposal to UNESCO regarding strategy formulation for the second half of the UN Decade of Education for Sustainable Development (UNDESD)

This proposal is to request UNESCO, as the lead agency of UNDESD, to take necessary actions to guide an international society so as to accomplish the goals of UNDESD, by formulating effective strategies for the second half of the Decade in view of bringing a successful conclusion (JNCU 2010). It was adopted at the 126th JNCU General Assembly held in March 2010.

- E) Guideline for UNESCO Associated Schools

The guideline consolidates important matters for schools which are already registered as UNESCO Associated Schools to conduct more fruitful activities, as well as for those which will join in the near future to plan more effective activities (JNCU 2012). It was reported at the 131st JNCU General Assembly held in September 2012.

- F) Proposal regarding invigoration of UNESCO Activities in an Era of Diversity

This proposal addresses how to mobilize youth and business enterprises in UNESCO activities as indispensable actors for vitalizing them, and how to further promote ESD in view of the UNESCO World Conference on ESD, to be held in November 2014 in Japan (JNCU 2014). It was adopted at the 134th JNCU General Assembly held in March 2014.

Through the elaborating these proposals and recommendations, JNCU has been contributing to promotion of ESD not only in Japan but also in the world during UNDESD as a lead organization. At the end of UNDESD in 2014, the working Group for the UNESCO World Conference on ESD to be held in 2014 was established in JNCU in 2011 in order to discuss the principle of the World Conference on ESD. Moreover, JNCU also aims to further promote ESD post-UNDESD as a key mission

and strategy. To achieve it, JNCU set the working Group for further promotion of ESD in JNCU in 2015 after the UNESCO World Conference on ESD in 2014.

2.3.1.3 ESD policy by MEXT

As the secretariat of the Japanese National Commission for UNESCO and the Ministry responsible to education, Ministry of Education, Culture, Sports, Science and Technology in Japan (MEXT) takes various measures and strategies for promotion of ESD, collaborating with Ministry of Environment which has responsibility to make and implement policies for preserving good natural and social environment.

(a) ESD and Education Reform in Japan

There was an on-going reform in school education in Japan at the beginning of 21st century. In keeping up with a changing society, MEXT had recognized the need to train students to be rich in heart and become able to contribute to sustainable society, acquire the basic skills for educating themselves, and cultivate their "Zest for Living (Ikiru-Chikara)". The Course of Study is the guideline for the school curriculum, and almost every 10 years the revision is undergone. The Course of Study renewed to seek for Zest for living, in effect April 2002, in which the World Summit on Sustainable Development was held in Johannesburg South Africa, required schools to set aside time for integrated studies period. So that schools and teachers had possibilities to promote ESD program through subjects and integrated studies at each school level. In 2006, Organic Law of Education in Japan was reformed in 60 years, and it prescribed to drawing up the Basic Plan for Promotion of Education by the article of 17th. The Basic Plan for Promotion of Education states that the concept of ESD corresponds with the concept of renewal Japanese Organic Law of Education as well as the Key Competencies which OECD proposed. ESD fosters "Zest for Living" to children. Therefore it is a very important educational idea which fosters global and local citizens who should shoulder and cultivate sustainable future. ESD fosters abilities and attitudes such as critical thinking, system thinking, holistic thinking, ability of communication, ability for collecting and analyzing information, and ability of decision making and action. All of those are very important and indispensable abilities for future leaders. On other hands, ESD also emphasizes the linkage and collaboration with community, other regions and institutions for promoting it. These bonds of ESD worked effectively on solving and overcoming the issues in each community or country, such as social, economical and environmental issues. In 2013, the Basic Plan for Promotion of

Education has been renewed as the second term plan after the Great East Japan Earthquake. It also defined the significance and promotion of ESD in its chapters. The New Course of Study, in effect April 2011 also includes the concept of ESD to the objects and contents of each subjects at each grad and school level. And it still requires schools to set aside time for integrated studies, so that schools and teachers are able to spread the possibility to promote ESD through each subject and integrated studies at each school level based on national course of study (Oikawa 2014).

(b) Utilization of UNESCO Associated School for ESD

With the publication of “Proposal regarding the effective utilization of UNESCO Associated Schools for the promotion and dissemination of Education for Sustainable Development (ESD) by National Commission for UNESCO, MEXT has been engaging to promote UNESCO Associated School eagerly. To disseminate the existence and significance of UNESCO School to education sectors, especially school teachers, MEXT proposed to call “UNESCO Associated School” “UNESCO School” shortly and authorized it as centers or bases for ESD promotion in formal education. As a result, the number of UNESCO Schools has increased dramatically, from 24 in 2007 to 913 as of April 2015 (MEXT 2014).

On the other hand, to guarantee the quality of the UNESCO Associated Schools, JNCU issued “The Guideline for UNESCO Associated Schools” in 2012 as pointed above. Taking into account the importance of the linkage between these schools and the surrounding community for promoting ESD, the Guideline emphasize the importance of the network through collaboration with such organizations as local social education institutions and NPO/NGOs. The Guideline also insists on the necessity of enhancement and utilization various types of in-school and out school training and learning (Iwamoto 2014). To support this achievement, MEXT has been organizing annual “UNESCO School National Conference” since 2009. The aim of this conference is to facilitate the information exchanges and sharing of good practices to improve the quality of ESD practice of each school. And in this conference, the ESD awards are given to the good practices of schools as the incentives.

The Cultural Centre for UNESCO (ACCU) provides support to schools who apply for UNESCO Associated School, through management of website, production of relevant education materials and instruction of application. The interuniversity network (ASPUivNet) composed of 18 universities (As of April 2014), also support the ASPnet through the teacher trainings and support to making application.

(c) Joint Programme and International Activities on ESD

Through “Japan-UNESCO Partnership Programme”, MEXT has organized the “Global Citizen’s Conference on DESD” with ESD-J which is a big forum of discussion with various actors and stakeholders of ESD, the management of the ASPUnivNet, and the management of the UNESCO Associated Schools website together with Asia Pacific Center for UNESCO (ACCU), and so on. And through “Official Development Assistance Grants (ODA)” for UNESCO Activities, MEXT helps the UNESCO related activities targeting ODA countries such as support to the Disaster Risk Reduction (DRR) education in Myanmar collaborating with Japanese NPO - SEEDS Asia. In this framework, “Save Our Future—ESD-DRR International Workshop for Future Leaders in Asia” was organized in Miyagi and Tokyo in February 2013, with participation of the teachers and students from Asia-Pacific countries, utilizing the lessons learnt from Great East Japan Earthquake and Tsunami in 2011.

On the other hand, MEXT established the “Japanese Funds in Trust” for ESD with contribution of 200 Million Japanese Yen in 2005 at UNESCO and continues to give the funds since then. The Funds are used for the collection of the best practices in the field of the Disaster Risk Reduction, Biodiversity and Climate change. MEXT also encourages the teacher exchanges with the Republic of Korea in the field of ESD. Similar programmes are undertaken respectively with the United States of America and China. As a recent initiative, MEXT established in 2012 the SEAMEO-Japan ESD Award in collaboration with the Southeast Asian Ministers of Education Organization (SEAMEO). With partnership of UNESCO Bangkok Office, the Award is given to three schools implementing the best practices on ESD in the region (Iwamoto 2014).

(d) Research of National institute for Educational Policy Research on ESD

National institute for Educational Policy Research (NIER), which is the one of the institutions of MEXT, has researched the method and framework of ESD curriculum development at school in cooperation with specialists, teachers and administrators of board of education. According to outcomes of the research, NIER proposed “Six Constitutional Concept of Sustainable Development (SD)” and “Seven Abilities and Altitudes to foster on Education for Sustainable Development (ESD)” to the schools in Japan. It also emphasizes the linkage among outside sectors, subjects or fields, and learners to promote ESD learning at school. This research outcome of NIER has rapidly influenced ESD practice of not only formal education at schools, but also other ministries and institutions such as Ministry of Environment and Japanese National

Commission for UNESCO. Especially, teachers who tried to start ESD lesson adopted this method and framework to their curriculum development and evaluation of ESD learning as a basic concept of ESD promotion (NEIR 2012).

2.3.2 ESD by Diverse Stakeholders Establishing Linkage and Partnership

In order to realize and reap the benefits of ESD, it is essential to establish links with diverse actors and stakeholders such as school, community, professional organizations and institutions, and promote educational activities with the support of a broader partnership framework. In particular, ESD, including such integrated aspects as environmental education and international understanding education, need to devise and implement their own original learning programs, and create and realize distinct, unique educational activities based on local and global issues. By involving community, universities and other professional organizations in this process, ESD practices can apply the latest expert knowledge, techniques, data, information, and research findings to their practice and activities in pursuit of more in-depth and comprehensive learning programs of ESD. When all parties form linkages, collaborate to create and implement learning programs, and cultivate these relationships, it should be realized that learning programs tailored to the individual learning styles and educational needs of each learner, expanding possibilities and opening doors for education. Building this new education networks meets the needs of their future. Under the concept, in Japan, diverse initiatives and stakeholders have implemented their ESD practices utilizing their expertise and establishing linkage and networks for ESD promotion during the UNDESD. Major efforts of main institutions or organizations in Japan could be described as follows.

(a) United Nations University (UNU)

As a strategy for framework of ESD promotion, the United Nations University (UNU) decided to build a network of universities committed to ESD in the Asia-Pacific region for higher education institutions, and it officially launched the Promotion of Sustainability in Postgraduate Education and Research Network (ProSPER.Net) in June 2008, in addition to Regional Centres of Expertise on ESD (RCEs). The activities undertaken in this network include the development of ESD curriculums for administrative officials and business schools through cooperation among Asian universities (UNU-IAS 2007).

(b) Japan Council on the UN DESD (ESD-J)

The Japan Council on the UN Decade of Education for Sustainable Development (ESD-J) founded in 2003, is a networking organization dedicated to promoting ESD in Japan and overseas through partnerships. ESD-J has formed the network of 100 organizations including NGOs/NPOs, educational institutions, enterprises, and other groups active in such fields as environmental education, development education, human rights education, and youth development. ESD-J is currently engaged in such efforts as policy proposals, training, and information dissemination, and international networking. ESD-J plays an important role both at the central level with their policy proposals and forming networks related to ESD promotion, and at local level with implementation of concrete ESD projects collaborating with diverse sectors such as training for ESD coordinator (Shige 2014).

(c) Asia-Pacific Cultural Centre for UNESCO (ACCU)

Asia-Pacific Cultural Centre for UNESCO (ACCU) was establishment in 1971 as Japanese organization which has the partnership with UNESCO and JNCU. ACCU has been implementing various regional cooperative programs in the fields of culture, education, and personnel exchange in close collaboration with the countries of Asia and the Pacific. Since UNDESD launched by United Nations, ACCU has promoted the DESD to response it by reviewing its past projects from the perspective of ESD and conveying the principles of ESD to governments, NGOs, universities, UNESCO Associated Schools and other partner organizations in Japan and abroad through trainings and projects. It also collects and provides the information on ASPnet and ASPUnivNet. ACCU implements the ESD related projects such as “ESD Rice Project” with Asian countries with support of the UNESCO-Japanese Funds in Trust, and coordinates teacher exchange projects between Korea, China and USA focused on ESD (Shibao 2014a). Moreover, with regard to disaster education, after the Great East Japan Earthquake and Tsunami, ACCU launched and implemented the “Japan Solidarity Project – Solidarity and DRR in Education” with the UNESCO Asia and Pacific Regional Bureau for Education, Bangkok for the purpose of giving comfort and hope through messages sent from ASPnet schools in the Asia Pacific region to children affected by the East Japan Earthquake and Tsunami. Also in 2003, ACCU coordinated and held “Save Our Future – ESD-DRR International Workshop for Future Leader in Asia” in Miyagi and Tokyo, learning the lessons from Great East Japan Earthquake and Tsunami (Shibao 2014b).

(d) National Federation of UNESCO Association in JAPAN (NFUAJ)

Lastly, National Federation of UNESCO Association in JAPAN (NFUAJ) was established in 1947 as non-governmental federation of UNESCO associations established in each region of whole country. Since then, NFUAJ has carried out various activities aiming at the international peace and the common welfare following the philosophy of the UNESCO Constitution. To contribution to ESD promotion, NFUAJ, in collaboration with a city bank, provides financial support for ASPnet schools' ESD activities. In 2013, NFUAJ launched the programme for promotion activities of UNESCO Associated School ESD volunteers that is called "ESD Passport". And since 2014, they have started to promote disaster education programme supported by insurance company in collaborating with university, schools, board of education and NPO utilizing lessons learnt from Great East Japan Earthquake and Tsunami, which programme combines financial support, teacher training, implementation and evaluations. In addition, around 200 UNESCO Clubs at schools and universities are under NFUAJ and they can be locomotive of promotion of ESD at community level if the staffing structure is reinforced at each club (Terao 2014).

2.3.3 Case of Regional Centres of Expertise on ESD (RCEs) in Japan

At present, Japan has six acknowledged RCEs, which are Greater Sendai RCE, RCE Yokohama, RCE Chubu, RCE Hyogo-Kobe, RCE Okayama and RCE Kitakyushu. These RCEs in Japan have been developing various activities utilizing the character and resources in each region. RCEs abroad, especially Asian RCEs like to learn the experience of Japanese RCEs so far, which is expected as one of the contribution from Japanese RCE to the world also in future (Takemoto 2014).

2.3.3.1 Case of RCE Okayama

On the process of DESD, it should be introduced typical two cases of RCEs in Japan. One is Okayama RCE and another is Greater Sendai RCE. Both of them were acknowledged in June, 2005 and they are Initial 7 RCEs. Two RCEs have typical characters of RCEs in the world, but backgrounds, experiences, strategies and practices of two RCEs make contrast each other.

RCE Okayama has been promoted by Okayama City. Okayama City is the capital of Okayama Prefecture in west Japan and it is located on the north shore of the Seto Island Sea within National Park. The city is a major hub of transportation as a gateway to

Shikoku Island in Chugoku Area of Honshu Island. Okayama City is a city designated by ordinance, and it has a population of approximately 700,000 and the area of 790 square kilometers. Okayama City is recognized as one of the leading City of ESD promotions in western Japan. At the end of UN-Decade of ESD in 2014, the UNESCO World Conference on ESD will be held in Okayama City as well as Nagoya City of Aichi Prefecture, Japan.

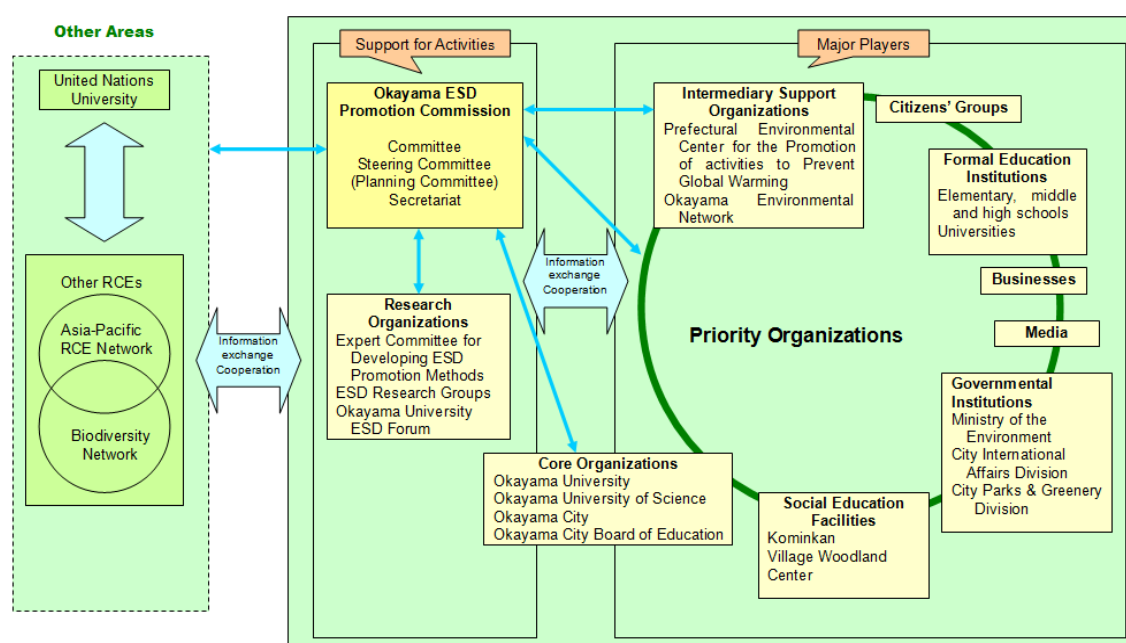


Fig. 2.3 Structure of RCEs Okayama

[Source: Okayama ESD Promotion Commission, 2013]

In April 2005, at the beginning of DESD, the “Okayama ESD Promotion Commission” was established in order to propose to RCEs. This commission consists of organizations and groups related to ESD activities. By leading of this council, “Okayama ESD Project Fundamental Plan” was formulated and launched the “Okayama ESD Project” for the purpose of promoting ESD in Okayama region as a role of Initial 7 RCEs. The number of project participants has increased to more than 160 organizations by September, 2013. Okayama City takes a central role as a secretariat and has set ESD coordinators to help organizations that promote activities in relation to ESD in order to encourage local linkage and to build strong network. Based on these linkages through local and community center and junior high school districts, ESD activities are spreading widely and the practice is gaining attention around world (Fig. 2.3).

The goal of RCEs Okayama is to promote ESD which reflects the nature of the region and to create of community where people learn, think and act together towards realizing a sustainable society through collaborations among diverse individuals and sectors such as schools, universities, Kominkan (community learning center), enterprises and administrations those are involved in ESD. Multiple individuals and organizations within and outside the region, implement ESD with various themes focused on natural environment, international understanding, community development, agriculture, foods, energy, and so on. And objectives of the ESD Project by RCEs Okayama are as follows (Okayama ESD Promotion Commission 2013);

- Improve knowledge and understanding about sustainable lifestyles among people living in Okayama region.
- Expand the circle of people who take initiative in building sustainable programs throughout the local community.
- Develop each organization involved in ESD and enhance its capabilities.

The ESD activities and networks of RCEs Okayama have been developed year by year. As “The Okayama ESD Model”, RCEs Okayama is trying to disseminate their good points, such as strategies and structures which they have practiced and established since 2005 when RCEs Okayama was acknowledged by United Nation University.

Okayama ESD Promotion Commission indicates following five points to be noticed as good practices (Okayama ESD Promotion Commission 2013):

1. The first point is providing opportunities for diverse organizations and individuals to engage in ESD. That indicates that opportunities strengthen the network and platform for promoting ESD. These opportunities lead making dialogue and learning, so that they build supportive networks where various organizations can learn from each other. As a result, it leads to increasing the number of organizations and residents who engage in ESD and expanding area of activities.
2. Second point is promoting ESD continuously by government organization proactively. Basically, RCEs Okayama is operated by Okayama City government, so that it is insured providing useful and reliable safety procedure, and building organizational power and strong networks. City Government announced ESD to residents as the new public issue, and tried to develop acceptance of ESD as a public measure by whole community. This top-down method is very effective on occasion, in order to disseminate ESD concept to not only residents and enterprises, but also formal sectors such as schools and public organizations.

3. Third point is support from ESD professional coordinators at secretariat. ESD coordinators provide continued support to individuals and organizations, for example, connecting various groups inside and outside community and building trusting relationships and cooperative networks with ESD parties. They are also researching new understandings by utilizing experiences of external professionals.
4. Forth point of RCEs Okayama is promoting ESD with Kominkans (Japanese Community Learning Center) as the central hub. Kominkans provide learning places for each community and Kominkan staffs also can build networks among NPOs, citizens, and local organizations. According to the promotion of ESD by Kominkan as a central hub, Kominkan was re-acknowledged as a social educational organization and it gave new meaning to community activities.
5. Finally, universities in Okayama City is cooperating with practices of Okayama RCEs and supporting local ESD activities, utilizing special perspectives to reevaluate community resources and uncover their true merits. That is the function of “Expertise”, so that it is called RCEs (Regional Centres of Expertise)”.

Especially, at the beginning of RCEs Okayama establishment, Kominkans, such Kyoyama-Kominkan, took key roles for the promotion of ESD and building RCEs structures (Okayama ESD Promotion Commission, UNESCO Chair at Okayama University 2013). This process and function is a specific character of ESD promotion of RCEs Okayama.

2.3.3.2 Case of Greater Sendai RCE

Greater Sendai RCE is a wide regional RCE, not only one city. At first, The Greater Sendai RCEs consists of three areas, Sendai City, Kesennuma City, and Osaki City. In 2008, Shiroishi-Shichigashuku area also joined Greater Sendai RCEs. Sendai City is the capitol of Miyagi Prefecture which has population of approximate one million people. It is located in the center of Miyagi Prefecture and it is also center of transportation, industry, commerce and politics in not only Miyagi Prefecture but also Tohoku Area. Kesennuma City is one of famous fishing port in Japan. It faces to Pacific Ocean and located in rias coast line of Sanriku Area which is north east of Miyagi Prefecture. Its main industry is related to ocean environment, such as fishing industry, processing industry, freezing industry and tourist industry, especially fishing industry of Kesennuma City is composed of all fields, coastal, deep-sea and fish-raising industry. Osaki City is located in Sendai Plan and its main industry is agriculture area. Rice field is spreading in the area and it is famous for a granary of rice in Japan. It also contains

the wetlands which are acknowledged by the Ramsar Convention. More than 80% wild geese gather to the wetlands in winter. Shiroishi-Shichigashuku area consists of Shiroishi City and Shichigashuku town. The area is located in south of Miyagi Prefecture and it contains mountain area and the dam which provide drinking and industrial water to urban area including Sendai City, therefore, this area is important as the catchment area of Miyagi Prefecture. As described above, Greater Sendai RCEs is composed of various characteristic areas of urban, coast line, agricultural and mountain area, as compared with RCEs Okayama.

In June 2005, the United Nations University RCEs Promotion Committee was set up in Miyagi University of Education as a secretariat of Greater Sendai RCEs, and at the same time, the activities of the Greater Sendai Area with Miyagi University of Education as the axis of cooperation were acknowledged first in the world (Initial Seven) as one of the RCEs for promoting ESD by United Nations University. The Greater Sendai RCEs was expanded from three areas and one university to four areas and one university in October 2008. To promote the regional cooperation without eliminating the characteristics of each area, it was a challenge to develop common awareness of ESD by collaborative activities. The current regional cooperation of the Greater Sendai Area is a peaceful information exchange network where each area has one or two specialties and good point. At present, Miyagi University of Education are trying to introduce the know-how of their specialties in each area to other areas, and to make ESD activities in each area comprehensive while considering the situation of each area (Miyagi University of Education 2009).

In the ESD activities of the Greater Sendai Area, the areas forming the Greater Sendai Area practice the following activities respectively, connecting mutually the efforts for ESD in each area.

- Sendai City is conducting mainly environmental education/learning, aiming at a recycle-based society, initiated by Environmental Division of Sendai City Office.
- Kesennuma City is promoting the practice of classes of environmental education, food education, disaster education, education for international understanding, etc. in collaboration with elementary schools, junior high schools and high schools, initiated by Kesennuma City Board of Education.
- The Osaki/Tajiri Area is promoting sustainable agriculture and environmental education in the Kabukuri wetlands registered as a wetland designated by the Ramsar Convention initiated by Environmental NPOs

- The Shiroishi/Shichigashuku Area is working on the preservation of Satoyama that is a water source area, initiated by Shiroishi UNESCO Association and NPO.

Miyagi University of Education serves to connect these four areas, and has also been promoting the research and development of education, teacher training, and the development of human resources to create a new sustainable society as knowledge base (Mikami & Oikawa 2012).



Fig. 2.4 Main Body and System for Implementation of Greater Sendai RCEs
[Source: Miyagi University of Education (2009)]

The Greater Sendai RCEs is administered by the Steering Committee consisting of 26 committee members representing four areas and 2 universities, Miyagi Prefecture, the Ministry of the Environment, United Nations University, companies, NPO, etc. Thirteen selected secretaries are in charge of organizing agenda, preparing documents, etc. for the Steering Committee. Each area has respective promotion committees, and in the Steering Committee held several times a year, representatives in each area report their activities (Fig. 2.4).

2.3.3.3 Comparison of RCE Okayama and Greater Sendai RCE

As described above, RCE Okayama and Greater Sendai RCE are very famous and representative RCEs as Initial Seven RCEs not only in Japan also in the world. Both are appeared on the UNDESJ Japan Report as “Pioneering efforts involving the

community through councils made up of a diverse range of entities in the community” along with their good practices (Interministerial Meeting on ESD 2014) and UNESCO DESD Final Report as “Japan – Raising local awareness in Okayama” and “RCE – Advancing ESD at the local level (Greater Sendai RCE)” (UNESCO 2014). However, Comparing between Okayama and Greater Sendai, it can be found some differences and commonalities on their systems, strategies and activities.

As first different features of them, the framework and Regional area of both RCEs contrast sharply. RCE Okayama is driven by just Okayama City, so that it is the RCE within one city area. Therefore, RCE Okayama had been promoted under the strong governance and efforts of Okayama City since their establishment in 2005. This whole city approach generated good policy supports for ESD promotion in Okayama, and it also enabled to hold “UNESCO World Conference on ESD” in Okayama City, 2014. Before the World Conference, Okayama City adopted the “Ordinance for ESD Promotion” to enhance ESD practice beyond DESD. On the other hand, Greater Sendai RCE is a wide range RCE which is composed of four cities and areas spreading to almost whole Miyagi Prefecture. Greater Sendai RCE is managed through the linkage and communication among each area. However, the characters and resources they have, and the issues they are facing are very different because of their background and geographical conditions, so that the focus and priority of ESD are divers depend on each area. Therefore, Greater Sendai RCE has been promoting ESD valued on the strong point of each area and utilizing rich resources and issues they have, such as Slow Food movement and ESD at ASPnet schools throughout all schools in Kesennuma City, preservation of wetlands and agricultural activities under the Ramsar Convention in Osaki City, Environmental learning based on recycling-oriented society in Sendai City, and preserving water resource in Shiroishi-Shichigashuku area. To accelerate the linkage and collaboration among these ESD practices in each area, Greater Sendai RCE organized “ESC/RCE Promotion Committee which is steered by Miyagi University of Education as the secretariat along with city governments, board of education and stakeholders of member cities and area.

Secondly, the origin and background is pointed out as the contrast between RCE Okayama and Greater Sendai RCE. In the case of Okayama, “Kominkan” like the community learning centre (CLC) took a key role of promoting ESD and establish the linkage with relevant sectors and stakeholders at the beginning of RCE establishment, and then, it has expanded to other sectors such as formal education and civil education. This ESD initiative by social education as a main actor is distinctive feather of RCE Okayama, which was called Okayama Model. Indeed, in October 2014, Okayama City

hosted “Kominkan-CLC International Conference on ESD” in conjunction with World Conference on ESD (Kominkan-CLC International Conference on ESD 2014). In contrast, in the case of Kesennuma City, one of the Greater Sendai RCE, formal education sector, such as schools and the city board of education mainly, has been promoting ESD activities with advanced ESD program. Supported by Kesennuma City board of Education and Miyagi University of Education, the school in Kesennuma such as Omoso Elementary School has developed integrated and systematic ESD program collaborating with community and institutions to utilize their resources and expertise for ESD practice since 2002. The city board of education has facilitated schools to become UNESCO Associated Schools for promoting ESD at each school since 2007, so that all elementary schools and junior high schools along with some kindergartens and high schools have been acknowledged as UNESCO Associated Schools (as of 2014). This is the pioneer to promote ESD in whole city utilizing UNESCO Associated Schools as centers of promoting ESD in Japan (Kesennuma BOE et al. 2009). This whole city approach of UNESCO School driven by city board of education had been spreading to other cities around Japan such as Nara City, Kanazawa City, Tama City and Omuta City, and it accelerated to disseminate ESD practice in formal education and increase the number of UNESCO Associated School in Japan dramatically.

Third point is the mission and activity level of both RCEs. The area of RCE Okayama is within on city which is mainly urban area, and where urgent issues or problems such as disasters don't so occur at present. So that the purpose of RCE is to create sustainable society for future and they are promoting environmental, international and local, educational activities with establishing the linkage and network among the diverse sectors and stakeholders to achieve its purpose. In the case of Greater Sendai RCE, basically, the purpose and activities are common to RCE Okayama, however, issues are different depend on each constitution area, some areas have serious and urgent problems such as depopulation, low birthrate and aging, and industrial decline. Especially, Great East Japan Earthquake and Tsunami in 2011 affected this region seriously and gave huge damages to Kesennuma City and coast area of Sendai City in particular. So that the disaster risk reduction (DRR) and recovery and reconstruction from Great East Japan Earthquake and Tsunami are urgent and crucial mission and focus of Greater Sendai RCE (Oikawa 2014b). In 2015, “UN World Conference on Disaster Risk Reduction 2015” (WCDRR) was held in Sendai City and “Sendai Framework for Disaster Risk Reduction” was launched as follow-up to Hyogo Framework for Action. During the WCDRR, Greater Sendai RCE had the public forum of WCDRR as “Great East Japan Earthquake and Sustainable Education on Disaster

Risk Reduction”, and Miyagi University of Education along with MEXT and Japanese National Commission for UNESCO also held a forum “Fostering DRR through Education for Sustainable Development: Towards a Better Future for Children”. Both forums proposed the possibility of Education for DRR and recovery from the perspective of synergy of ESD based on the lesson of Great East Japan Earthquake.

2.3.4 UNESCO Associated Schools (ASPnet) for Promoting ESD in Japan

2.3.4.1 Transformation of Japanese UNESCO Associated Schools (ASPnet)

In 2008, on the process of promoting DESD at national and international level, Japanese National Commission for UNESCO in Ministry of Education, Culture, Sports, Science and Technology in Japan (MEXT) proposed to UNESCO on the “Utilization of UNESCO Associated Schools for the promotion of ESD”. According to this proposal, UNESCO Associated Schools (ASPnet) has become the center for Promoting ESD in formal education sectors. Especially in Japan, Japanese National Commission for UNESCO along with Division of Primary and Secondary Education, MEXT also notified all schools of same object as the proposal above.

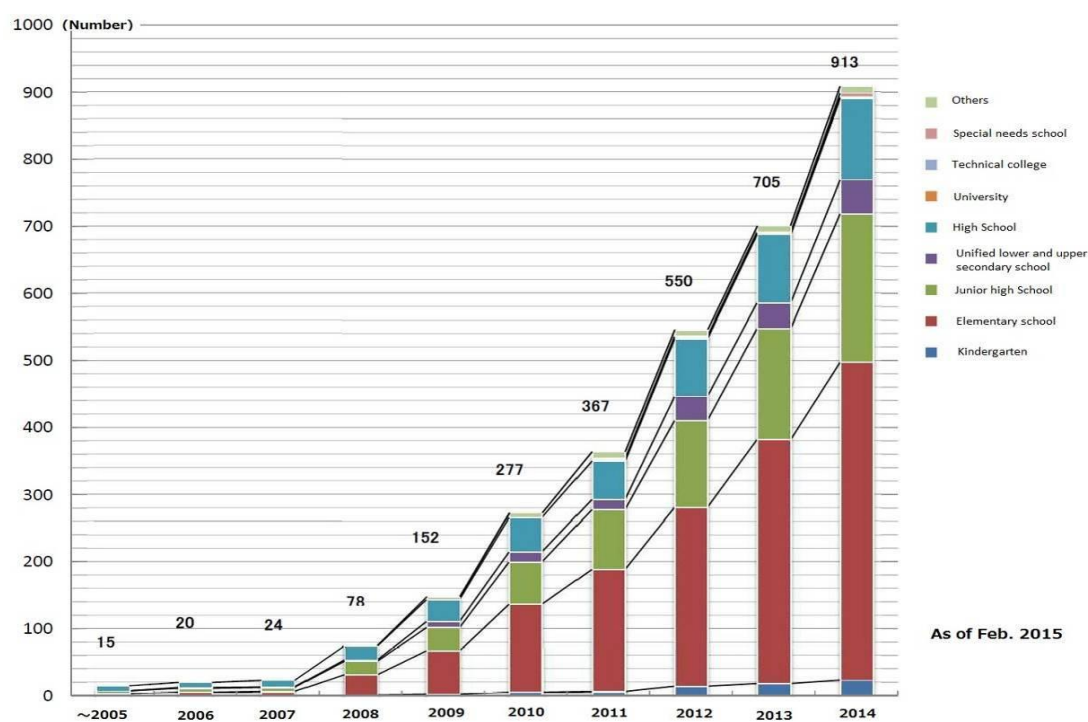


Fig. 2.5 Transition in the number of ASPnet Schools in Japan
[Source: MEXT 2015]

In addition, MEXT tried to disseminate UNESCO Associated Schools to other schools in Japan by calling it “UNESCO School” shortly. The proposal and notification made Japanese schools and teachers recognize the system and role of UNESCO Associated Schools for promotion of ESD. As a result, the number of UNESCO Associated Schools is increasing year by year after the proposal of UNESCO Associated Schools. Although there are only 20 UNESCO Associated Schools around Japan in 2006, it has increased drastically up to 913 schools in February, 2015 (Fig. 2.5). It’s a remarkable dissemination of ASPnet in Japan (MEXT 2015).

2.3.4.2 Characteristic of Japanese UNESCO Associated Schools (ASPnet)

Talking about trends of Japanese UNESCO Associated Schools (ASPnet), as for the component of Japanese ASPnet schools, elementary school account for 51.1%, the ratio of middle (junior high) schools is 23.1%, high schools’ is 14.9% and other schools’ is 10.9% (Fig. 2.6). That explains that the mainstream of UNESCO Associated Schools in Japan is elementary and secondary education. On the other hand, in world total, the component ratio of elementary/primary schools is 35.7% and one of middle (primary/secondary) schools is 12.6%, high (secondary) schools account for 42.0% (MEXT 2013). Therefore, it can be indicated that the mainstream by elementary and middle school is one of the characteristic of Japanese ASPnet comparing with the world (Shibao 2014).

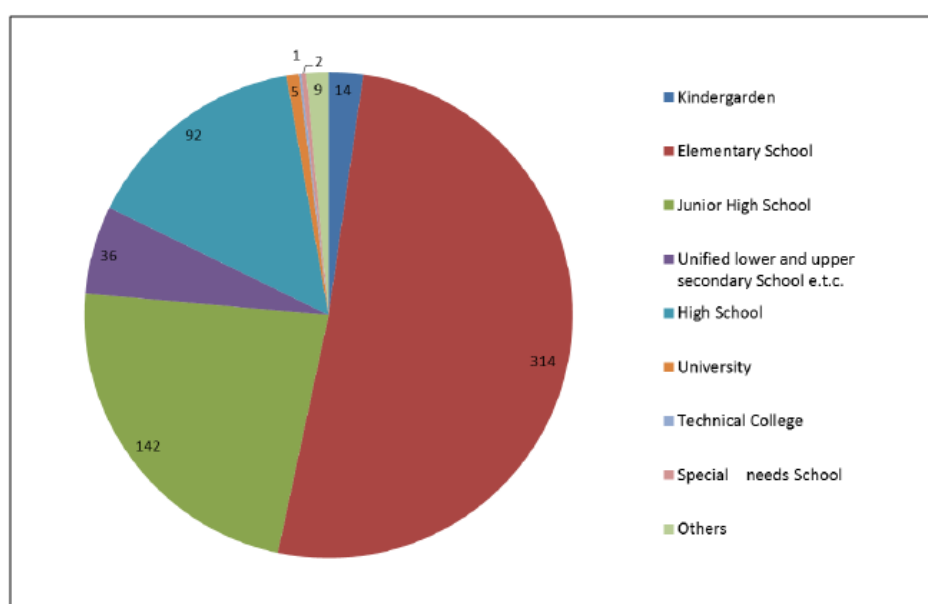


Fig. 2.6 Component of Japanese ASPnet Schools
[Source: MEXT 2013]

The second point which characterizes Japanese ASPnet is that Japanese UNESCO Associated Schools tend to be promoted and administrated by city government, especially, the city board of education (BOE). This is the reason why the number of UNESCO Associated School has been increasing rapidly for a couple of years after the notification of MEXT in 2008. Accepting the notification, some BOEs such as Kesennuma City, Nara City, Kanazawa City, Tama City and Omuta City, noticed and recognized the concept of ESD and UNESCO Associated School Project network (ASPnet), and they tried to adopt this concept and system in order to improve their education and foster students who shoulder sustainable future, and also to solve issues and to enhance good points in their communities (Oikawa 2011).

These BOEs also tend to integrate ESD with their characteristic practices which have been done in each city so far effectively, as UNESCO School activities. For example, Nara City Board of Education is integrating ESD into Word Heritage Learning, because Nara City is ancient capitol and has very rich world heritages around the city. They are going to enhance their good point trough the activities of ESD/ASPnet. Kesennuma City tried to develop ESD and UNESCO School activities based on International Environmental Education and to make a linkage with Slow Food Movement in Kesennuma City. Before DESD, Schools in Kesennuma, mainly Omoso Elementary School, have been promoting international environmental education collaborating with schools in USA, supported by university, domestic and international institutions, and some regional organizations. Kesennuma City also declared as “Slow Food City” in 2003, utilizing rich nature, marine lives and culture (Oikawa et. al 2007). However, Kesennuma City, including educational facilities such schools and Community learning centers, suffered huge damages by Great East Japan Earthquake and Tsunami which occurred in March 2011 (Oikawa 2012a). So, the schools and the board of education in Kesennuma City tackled on educational recovery from the perspective of ESD (Oikawa 2012b). Considering damage and changed conditions by the massive disaster, all of the schools in Kesennuma City have been improving their ESD practices in order to foster the students who will contribute to the reconstruction and creation the future since Great East Japan Earthquake ant Tsunami (Kesennuma BOE et. al 2013). And also, they have been promoting the Education for DRR and Reconstruction based on the lessons learnt from Great East Japan Earthquake and ESD practice they have done so far (Oikawa 2014b). Kanazawa City also integrated ESD and their “Kizuna Education” which means linkage or bonds. Kanazawa is historical city and has a lot of traditional legacies and cultures. They also tend to make a linkage with foreign countries through exchange of cultures. So they are promoting ESD and

UNESCO School activities through integrated study period as Kizuna Education. At present, Kanazawa is the city that has the largest number of UNESCO Schools in Japan. Omuta City used to be famous for coal-mining area in Japan, and contributed to Japanese industry development of modern period. But the colliery in Omuta was closed in 1997. Omuta City lost their main industry, so that population is decreasing year by year. In this situation, Omuta City Board of Education initiated that all of elementary and junior high schools as well as one special education school in Omuta City submitted UNESCO Associated School in order to promote ESD utilizing remains of colliery as Heritage of Industrial Modernization. In 2012, all schools in Omuta, 22 elementary, 11 junior high schools and 1 special education school, were acknowledged as UNESCO Associated Schools, so they call their city “The City of UNESCO School” (Oikawa 2014a).

2.4 Key Findings and Trends of UNDESD

At the end of UN Decade of Education for Sustainable Development 2005-2024 (UNDESD), UNESCO published Final Report of UNDESD which is “Shaping the Future We Want” in 2014. The report points out that member states have committed to integrate sustainable development into education systems.

2.4.1 Trends and Challenges of UNDESD

The Final Report states that the following key findings highlight major trends and leverage points for ESD and are based on evidence from 10 years of work around the world (UNESCO 2014a).

A) ESD, an enabler for sustainable development

1. Education system are addressing sustainable issues
2. Sustainable development agendas and education agendas are converging

B) Importance of stakeholder engagement for ESD

3. Political leadership have proven instrumental
4. Multi-stakeholder partnerships are particularly effective
5. Local commitments are growing

C) ESD is galvanizing pedagogical innovation

6. Whole-institution approaches practice ESD
7. ESD facilitates interactive, learner-driven pedagogies

D) ESD has spread across all levels and area of education

8. ESD is being integrated into formal education
9. Non-formal and informal ESD is increasing
10. Technical and vocational education and training advances sustainable development

On the other hand, the final report also points out that member states and stakeholders have indicated considerable challenge remain in realizing the full potential of ESD. These challenges include;

1. The needs for Further alignment for education and sustainable development sectors
2. The need to do more work for institutionalizing ESD to ensure strong political support to implement ESD on a systemic level
3. The need for more research, innovation, monitoring and evaluation to develop and the effectiveness of ESD good practices.

2.4.2 Highlights and Challenges of Policy, Pedagogy and Stakeholders

The Final Report of UNDESD emphasizes the highlights and challenges of policy, pedagogies and practice, stakeholders and partnerships on its chapters describing data of results, examples and good practices as evidences around the world of UNDESD. Table 2.1 shows the abstract of the highlights and challenges on each approach of policy, pedagogies and stakeholders during UNDESD (Table 2.1).

Table 2.1 Highlights and Challenges of Policy, Pedagogy and Stakeholders on DESD

Approach	Highlights	Challenges
Policy: Leadership matters	1. Political leadership is crucial for ESD. 2. ESD is increasingly a part of policies to address sustainable development issues (e.g. climate change). 3. Sustainable development and education policies are becoming more and more aligned. 4. ESD has become an important part of the global policy discourse.	1. Major work remains to ensure full policy coherence between the education sector and the sustainable development sector. 2. ESD is not integrated coherently across relevant sectorial or sub-sectorial policies
Early childhood care and education: ESD starts with early childhood care and education	1. Early childhood care and education (ECCE) contributions to ESD have increased, supported by national initiatives, networks of experts and research activities. 2. ECCE is the foundation for sustainable development and the beginning point for ESD. 3. Reorienting ECCE towards ESD must begin from birth, and not only through pre-primary school settings, but also in the home and wider community. 4. Play-based learning for sustainable development contributes to a child's acquisition of social understanding and nature awareness.	1. ESD in ECCE remains fragmented within and among countries, with considerable variations in the availability, accessibility and quality of programmes. 2. ECCE educators / primary care-givers lack capacity to incorporate ESD into their teaching / care-giving activities.

Primary and secondary education: Preparing young people for the future	1. ESD-related topics, initiatives, programmes and projects are increasingly being included in primary and secondary education curricula. 2. ESD pedagogies encourage teachers to shift away from traditional pedagogical approaches to learner-centered approaches. 3. ESD in schools contributes to intergenerational learning and sustainable development at the local level. 4. The whole-school approach represents a higher level of ESD integration. 5. Certification of teachers and accreditation of teacher education programmes can be important levers for change.	1. Obstacles to progress in ESD implementation in schools include the absence of clearly articulated ESD strategies and policies and the lack of ESD educator competencies. 2. ESD implementation requires enhanced capacities among policy-makers, curriculum developers, school leaders, assessment experts and, most importantly, teachers.
Technical and vocational education and training: Unlocking the workforce potential for sustainable development	1. There is convergence between international sustainable development policy and planning and Technical and Vocational Education and Training (TVET) policy and planning (the green economy-green skills agenda). 2. Knowledge and skills gaps for sustainable development can be filled through not only school-based TVET, but also work-based learning and other non-formal and informal learning. 3. The reorientation of TVET systems, including curriculum, requires all actors – government, business and industry, and TVET educators – to work together. 4. Models and tools for reorienting TVET to support sustainable development now exist that recognize the importance not only of the development of skills, but also of mindsets, that can influence change in the workplace and community.	1. Much remains to be done to accelerate the actual implementation of ESD programmes in both formal and non-formal TVET. 2. Much less is understood about how TVET in non-formal and informal can support transitions to sustainability. 3. At the national level, the coordination between environment and SD policy and TVET policy remains limited. 4. Skill shortages impede a smooth transition to green-oriented growth. Changes in occupational profiles and skills for existing jobs that are becoming greener and for new green industries are needed.
Higher education: Graduates for a sustainable future	1. Higher education has stepped up its efforts to support sustainable development. 2. Higher Education Institutions (HEIs) have made significant efforts to address sustainability in campus operations, supported by the development and sharing of tools and reporting frameworks, followed by various examples of good practice in the reorientation of learning and teaching practices and advances in sustainability research. 3. New ESD-related specialist programmes/courses are on the rise. 4. Networks of HEIs build capacity and expand influence on ESD. 5. HEIs are extending the value and impact of their teaching and research at the local level and catalyzing community change.	1. Translation of commitments into implementation requires coordinated change at multiple levels – in governance, planning, academic programmes, facility management and financial systems. 2. Deeper innovation in staff development and across institutions is necessary to transform curricula and pedagogy. 3. Disciplinary boundaries continue to be barriers to the exploration of complex issues, and to the preparation of learners with the capacity to address complexity.
Non-formal education, public awareness campaigns and media: ESD is for everyone	1. Non-formal learning opportunities for sustainable development such as community volunteering, programmes with outdoor learning centres and other hands-on experiences have increased over the DESD. 2. Adult learning and education (ALE) is being recognized in national strategies and planning documents as appropriate means to achieve sustainable development. 3. Public awareness and media coverage of sustainable development is reported to have improved in many countries. 4. Social media and online social networks are being used increasingly to raise public awareness on SD.	1. The provision of ALE remains a challenge and impedes progress on introducing concepts and practices of sustainability to adult learners. 2. An ESD capacity gap exists within organizations and individuals who work with adult learners. 3. Increased partnerships between civil society and the public sector are needed in order to align and reinforce resources and actions. 4. Evidence remains limited on the links between awareness raised and changes made in people's behavior and lifestyles.
Capacity-building and training: “Know-how” for	1. Large businesses and multinational corporation leaders and managers have an increasing awareness of sustainability, through entry-level formal education at business schools, executive education programmes, workplace training and peer learning in non-formal settings.	1. While 65% of signatories to the UN Global Compact have committed to sustainability at the CEO level, only 35% are training managers to integrate sustainability into business operations. 2. Technical know-how will not be sufficient

sustainable development	2. Networking and multi-stakeholder learning have been particularly effective in moving the private sector towards sustainability. 3. Education related to sustainable development has substantially increased in the curriculums of business schools. 4. Business and industry are now looking beyond learning about the business case for sustainable development towards more technical education and training for implementation of sustainability-related practices.	to advance the private sector. There needs to be a shift in private sector education and training from teaching general awareness, frameworks and models to developing skills and competencies for critical whole-systems analysis, decision-making and collaborative problem-solving. 3. There is a need for planned, strategic efforts to undertake training and capacity-building in particular for small, micro and medium sized enterprises.
Stakeholders and partnership: Building bridges for ESD	1. The DESD, with UNESCO as the lead agency, helped UN agencies to act on a shared agenda, and to mobilize other stakeholders to work with the UN on implementation. 2. At the Member State level, interdepartmental collaboration has advanced ESD. 3. Inspiring examples of private sector support for ESD in schools, universities and their surrounding communities can be found throughout the world. 4. National, subnational and local governments often appear to rely on civil society organizations to undertake ESD initiatives. Leveraging these civil society partners has been a key to successful implementation in many countries. 5. Multi-stakeholder approaches are helping to advance whole-system change.	1. Continued and increased leadership, both by UNESCO and across all UN agencies will be needed to align agendas, scale up mandates for action, mobilize resources and work together. 2. Civil society organizations would benefit from appropriate frameworks and resources to implement ESD in partnership with the public sector. 3. Increased capacities among all stakeholders to work in partnership, including improved understandings of the process of social learning and measures to assess and improve outcomes, are needed.

Main Data from UNDESD Final Report (UNESCO 2014), Analyzed by author

2.5 New Trend of ESD post-2015 beyond DESD

2.5.1 UNESCO World Conference on ESD

At the end of Decade of the United Nations Education for Sustainable Development (UNDESD), UNESCO held UNESCO World Conference on Education for Sustainable Development (ESD). The conference took place from 10-12 November 2014 in Aichi-Nagoya, Japan, along with Stakeholder Conferences from 4-8 in Okayama City including Kominkan-CLC International Conference on ESD which took place from 9-10 October 2014 in advance. The World Conference on ESD marked the end of the UN Decade of ESD (2005-2014) and saw the new framework of ESD post-DESD. Under the banner of “Learning Today for a Sustainable Future”, the Conference celebrated the achievements of the UN Decade of ESD and identified lessons learnt while setting the stage for the future of ESD. Over 1,000 formal participants from 150 countries including 76 cabinet ministers level attended to the world conference in Nagoya City. And about 1,800 people participated in Stakeholder Conferences in Okayama City such as Global Regional Centres of Expertise (RCEs) Conference by United Nations University, UNESCO School World Conference including Students Forum, Teachers Forum and UNESCO School National Conference, and Youth Forum.

It also showcased initiatives, key players, networks and ideas that the Decade had stimulated. Such examples from all over the world helped to generate future action under the new framework of ESD post DESD. The outcomes of the World Conference will inform the deliberations of the World Education Forum to be held from 19 to 22 May 2015 in Incheon, Republic of Korea.

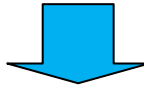
2.5.1.1 Aichi-Nagoya Declaration on ESD at World Conference

As the achievement of UNESCO World Conference on ESD, “Aichi-Nagoya Declaration on Education for Sustainable Development” was adopted at closing session of the conference on 12th of November to sustain and scale-up ESD for future beyond DESD. The declaration is celebrating the significant achievements made by the UN Decade of ESD as first, and it is noting that the Global Action Programme (GAP) on ESD as a follow up to the Decade of ESD and, aims at generating and scaling up ESD actions in all levels and areas of education, training and learning. It is also reaffirming ESD as a vital means of implementation for sustainable development, as recognized in intergovernmental agreements on climate change, biodiversity, disaster risk reduction, sustainable consumption and production, and children’s rights, among many others, also it is welcoming the growing international recognition of ESD as an integral and transformative element of inclusive quality education and lifelong learning and an enabler for sustainable development, as demonstrated by the inclusion of ESD as a target in the Muscat Agreement of Education for All (EFA) and in the proposal for Sustainable Development Goals (SDGs). Moreover, it is recognizing the establishment of the “UNESCO-Japan Prize on ESD” (UNESCO 2014b). After these evaluations, the declaration is requesting to three levels of initiatives; all participants (stakeholders), governments of UNESCO Member States and UNESCO’s Director-General to accelerate the progresses of ESD (Fig. 2.7).

Aichi-Nagoya Declaration on ESD

Evaluation of DESD

1. **CELEBRATING** the significant achievements made by the UN DESD
2. **EXPRESSING** the appreciation to many stakeholders
3. **RECALLING** the international commitment to further promoting ESD
4. **NOTING** that the Global Action Programme (GAP) on ESD
5. **REAFFIRMING** ESD as a vital means of implementation for SD
6. **WELCOMING** the growing international recognition of ESD
7. **RECOGNISING** the establishment of the UNESCO-Japan Prize on ESD



Requests for Accelerating ESD in Future

To Stakeholders (participants)	To UNESCO Member States	To UNESCO's Director
• EMPHASISE the potential of ESD to empower learners to transform themselves and the society • STRESS that ESD is an opportunity and a responsibility that should engage both developed and developing countries • UNDERScore that the implementation of ESD should take into consideration local, national, regional and global contexts • APPRECIATE the commitments to ESD expressed by all concerned stakeholders through the GAP Launch Commitments • COMMIT to building and maintaining the momentum of the launching of the GAP in its five Priority Action Areas • CALL UPON to set specific goals, develop support and implement activities, create platforms, and strengthen monitoring and evaluation approaches in GAP • URGE to engage in knowledge production, dissemination and utilization, and promotion of innovation with involving and respecting youth as key	• Review the purposes and values that underpin education, assess the extent to which education policy and curricula are achieving the goals of ESD, and ensure the education, training and professional development to integrate ESD into teaching and learning • Allocate and mobilize substantial resources to translate policies into actions along the Priority Actions Areas of the GAP • Reflect and strengthen ESD in the post-2015 agenda and its follow-up processes a) integrated in SDGs b) taken into consideration at the World Education Forum 2015	• Provide global leadership, support policy synergy, and facilitate communication for ESD within the framework of the UNESCO Roadmap to Implement the GAP • Harness partnerships and mobilize networks including the UNESCO ASPnet, UNESCO Chairs etc. • Advocate the importance of ensuring adequate resources including funding for ESD

Fig. 2.7 Structure of Aichi-Nagoya Declaration on ESD

Main data from "Aichi-Nagoya Declaration on Education for Sustainable Development" (2014), Analyzed by author

2.5.1.2 Messages from Aichi-Nagoya Declaration

Aichi-Nagoya Declaration emphasizes the importance of international and inter-sectoral cooperation to accelerate ESD for the future. In section 2, the declaration is expressing the appreciation to many governments, UN entities, non-governmental organizations, all types of educational institutions and setups, educators and learners in schools, communities and workplaces, youth, the scientific community, academia and other stakeholders who had actively committed to and participated in the implementation of the UN Decade of ESD, and to UNESCO for the leadership role it has played as lead agency of the Decade of ESD. On the other hand, the declaration calls upon all concerned stakeholders, including governments and their affiliated institutions and networks, civil society organizations and groups, the private sector, media, the academic and research community, and education and training institutions and centers as well as UN entities, bilateral and multilateral development agencies and other types of intergovernmental organizations at all levels, to set specific goals, to develop, support and implement activities, to create platforms for sharing experiences (including ICT-based platforms), and to strengthen monitoring and evaluation approaches in the five Priority Action Areas of the GAP in a synergistic manner. Furthermore, to all governments of UNESCO Member States, the declaration urges to reinforce the integration of ESD into education, training, and sustainable development policies, with a special attention paid to system-wide and holistic approaches and multi-stakeholder cooperation and partnerships between actors of the education sector, private sector, civil society and those working in the various areas of sustainable development on reviewing the purposes and values that underpin education and assessing the extent to which education policy and curricula are achieving the goals of ESD. In addition, it requests UNESCO's Director-General to provide global leadership, support policy synergy, and facilitate communication for ESD, in cooperation with governments, other UN entities, development partners, private sector and civil society, and also to harness partnerships and mobilize networks including the UNESCO ASPnet, UNESCO Chairs, Centres under the auspices of UNESCO, the World Network of Biosphere Reserves and World Heritage Sites, as well as UNESCO Clubs and Associations as well (UNESCO 2014b).

Aichi-Nagoya Declaration is also affirming the necessity of integrated, interdisciplinary and inter-regional approach to promote ESD by multi-stakeholders. In section 5, the declaration recognizes significance of the linkage and intergovernmental agreements on climate change (Article 6 of the UN Framework Convention on Climate Change and its Doha work programme), biodiversity (Article 13

of the Convention on Biological Diversity and its work programmes and related decisions), disaster risk reduction (Hyogo Framework for Action 2005-2015), sustainable consumption and production (Sustainable Lifestyles and Education Programme of the 10-Year Framework of Programmes on Sustainable Consumption and Production 2012-2021), and children's rights (Articles 24[2], 28 and 29 of the UN Convention on the Rights of the Child), among many others. And it also underscores that ESD should take into consideration local, national, regional and global contexts, as well as the contribution of culture to sustainable development and the need for respecting peace, non-violence, cultural diversity, local and traditional knowledge and indigenous wisdom and practices, and universal principles such as human rights, gender equality, democracy, and social justice in section 10 (UNESCO 2014b).

Lastly, the declaration is enforcing to put ESD into next global framework and action for sustainable development, reflecting and strengthening ESD in the post-2015 agenda and its follow-up processes, such as "Muscat Agreement" adopted at the 2014 Global Education For All Meeting, "Global Action Programme (GAP) on ESD" endorsed by the 37th session of the General Conference of UNESCO, "Sustainable Development Goals (SDGs)" by the Open Working Group of the UN General Assembly on SDGs, and "World Education Forum 2015" to be held in Incheon, Republic of Korea from 19 to 22 May 2015. Especially, it emphasizes the inclusion of ESD in the proposal for SDGs as a cross-cutting theme and the commitment to five Priority Action Areas of GAP as a follow up to the Decade of ESD and a concrete contribution to the post-2015 agenda. Global Action Programme (GAP) will be discussed in next section.

2.5.2 Framework of Global Action Programme (GAP) on ESD beyond the DESD

To build on achievements and create new momentum when the UN Decade of Education for Sustainable Development (DESD) closes in 2014, UNESCO, as the lead agency of the Decade, has developed the "Global Action Programme on Education for Sustainable Development (GAP)". Based on broad consultations and input from a wide range of stakeholders, the Global Action Programme on Education for Sustainable Development was endorsed by the 37th UNESCO General Conference in 2013 (UNESCO 2013). It comes at a time when the international community is charged with proposing a new set of sustainable development goals that are action-oriented, global in nature and universally applicable. As a follow-up to the Decade of ESD, the Global Action Programme is also designed as a concrete, tangible contribution to the post-2015 development and education agendas (UNESCO 2014c). The Global Action Programme

was submitted to the United Nations General Assembly on 19 December 2014 and it was adopted as the resolution of “Follow-up to the United Nations Decade of Education for Sustainable Development (2005–2014): Global Action Programme on Education for Sustainable Development”, which set out the future direction for promoting ESD (UN 2014). The GAP seeks to generate and scale-up ESD action. It is intended to make a substantial contribution to the post-2015 agenda.

The overall goal of the GAP is to generate and scale up action in all levels and areas of education and learning to accelerate progress towards sustainable development. The GAP has two objectives (UNESCO 2013):

- i) to reorient education and learning so that everyone has the opportunity to acquire the knowledge, skills, values and attitudes that empower them to contribute to sustainable development – and make a difference;
- ii) to strengthen education and learning in all agendas, programmes and activities that promote sustainable development.

The Global Action Programme (GAP) focuses on five priority action areas in order to enable strategic focus and stakeholder commitment. These action areas are considered as key leverage points to advance the ESD agenda. While ESD action at all levels and in all areas of education and sustainable development is encouraged, action under this Global Action Programme focuses in particular on the following areas and the following strategic objectives (UNESCO 2013):

2.5.2.1 PRIORITY ACTION AREA 1: Policy Support

Advancing policy - Mainstream ESD into both education and sustainable development policies, to create an enabling environment for ESD and to bring about systemic change:

The GAP states to integrate ESD into international and national policies in education and sustainable development. An enabling policy environment is crucial for mobilizing education and learning for sustainable development and the scaling up of ESD action in formal, non-formal and informal education and learning. Relevant and coherent policies should be grounded in participatory processes and designed through interministerial and intersectoral coordination, also involving civil society, the private sector, academia and local communities. Creating an enabling policy environment, which must be properly linked to implementation, requires in particular the following (UNESCO 2013);

- (i) ESD is systematically integrated into education policies that cover the education sector as a whole or a subset of the sector. This includes the integration of ESD in curricula and in national quality standards and indicator frameworks that establish standards for learning outcomes. It also includes integrating ESD as an important element of international education agendas.
- (ii) ESD is systematically integrated into policies relevant to key sustainable development challenges. This includes reflecting the role of education and learning in national policies related to the three Rio Conventions, in line with the important role the Conventions ascribe to communication, education, training, and public awareness. It includes integrating ESD into relevant international agendas in sustainable development.
- (iii) ESD is a systematic element of bilateral and multilateral development cooperation frameworks.

2.5.2.2 PRIORITY ACTION AREA 2: Whole-institution Approach

Transforming learning and training environments- Integrate sustainability principles into education and training settings:

The Gap promotes whole-institution approaches to ESD at all levels and in all settings. Whole-institution, or institution-wide, approaches require not only the reorientation of teaching content and methodology, but also campus and facility management that is in line with sustainable development as well as the cooperation of the institution with sustainable development stakeholders in the community. Particular successes in this regard can be found in the areas of higher education and secondary schools. These need to be scaled up and expanded to other levels and types of education, including early childhood care and education, technical and vocational education and training and the non-formal education of youth and adults. The promotion of whole-institution approaches requires in particular the following (UNESCO 2013);

- (i) An institution-wide process is organized in a manner that enables all stakeholders – leadership, teachers, learners and administration – to jointly develop a vision and plan to implement ESD in the whole institution.
- (ii) Technical and, where possible and appropriate, financial support is provided to the institution to support its reorientation. This can include the provision of relevant good practice examples, training for leadership and administration, the development of guidelines, as well as associated research.

- (iii) Existing relevant inter-institutional networks are mobilized and enhanced in order to facilitate mutual support such as peer-to-peer learning on a whole-institution approach, and to increase the visibility of the approach to promote it as a model for adaptation.

2.5.2.3 PRIORITY ACTION AREA 3: Educators

Building capacities of educators and trainers- Increase the capacities of educators and trainers to more effectively deliver ESD:

The Gap strengthens the capacity of educators, trainers and other change agents to become learning facilitators for ESD. Educators are one of the most important levers to foster educational change and to facilitate learning for sustainable development. There is therefore an urgent need to build the capacity of educators, as well as trainers and other change agents, on relevant issues related to sustainable development and appropriate teaching and learning methodologies. This requires in particular the following (UNESCO 2013);

- (i) ESD is integrated into pre-service and in-service education and training for early childhood, primary and secondary school teachers, as well as teachers and facilitators in non-formal and informal education. This may start with the inclusion of ESD in specific subject areas but will ultimately lead to the integration of ESD as a cross-cutting issue. It includes ESD training for head teachers.
- (ii) ESD is integrated into the pre-service and in-service education and training of teachers and trainers in technical and vocational education and training. This includes building capacities on sustainable consumption and production modalities as well as skills for green jobs.
- (iii) ESD is integrated into faculty training in higher education institutions to enhance capacity in teaching sustainability issues, conducting and supervising solution-oriented interdisciplinary research, and informing policy-making on ESD and sustainable development.
- (iv) Sustainable development perspectives – including, for example, resource efficiency and social and corporate responsibility – are integrated in an enhanced manner in post-graduate education, capacity-building and training of decision-makers, public sector personnel, members of the business sector, media and development professionals, and other sectoral and thematic specialists relevant to sustainable development. This includes, among others, “train-the-trainers” ESD programmes,

the integration of ESD into executive education, as well as aligning in-house training programmes of private company staff with ESD.

2.5.2.4 PRIORITY ACTION AREA 4: Youth

Empowering and mobilizing youth- Multiply ESD actions among youth:

The Gap supports youth in their role as change agents for sustainable development through ESD. Youth have a high stake in shaping a better future for themselves and generations after. Moreover, youth are today increasingly drivers of the educational process, especially in non-formal and informal learning. Supporting youth in their role as change agents through ESD requires in particular the following (UNESCO 2013);

- (i) Learner-centered non-formal and informal learning opportunities in ESD for youth are enhanced. This includes developing and enhancing e-learning and mobile learning opportunities for ESD.
- (ii) Participatory skills that empower youth to act as change agents in global, national and local sustainable development processes become a specific focus of formal and non-formal education programmes within and outside of ESD.

2.5.2.5 PRIORITY ACTION AREA 5: Local communities

Accelerating sustainable solutions at local level - At community level, scale up ESD programmes and multi-stakeholder ESD networks:

The Gap accelerates the search for sustainable development solutions at the local level through ESD. Effective and innovative solutions to sustainable development challenges are frequently developed at the local level. Multi-stakeholder dialogue and cooperation play a key role in this, for example, between local governments, non-governmental organizations, the private sector, media, education and research institutions, and individual citizens. ESD supports multi-stakeholder learning and community engagement, and links the local to the global. The full mobilization of education and learning for sustainable development calls for enhanced action at the local level. This requires in particular the following (UNESCO 2013);

- (i) Local networks that facilitate multi-stakeholder learning for sustainable development are developed, operationalized and enhanced. This includes the diversification and expansion of existing networks, so that new and more stakeholders are integrated, including indigenous communities.

- (ii) Local authorities and governments enhance their role in providing learning opportunities for sustainable development. This includes, as appropriate, supporting, at the local level, the integration of ESD in formal education, as well as the provision of, and support to, non-formal and informal learning opportunities in sustainable development for all members of the community.

2.5.3 Road Map to Implement Global Action Programme (GAP) on ESD

At the UNESCO World Conference on ESD in 2014, UNESCO also proposed the Roadmap for Implementing the Global Action Programme on Education for Sustainable Development (GAP). For the purpose of enabling strategic focus and fostering stakeholder commitment, the Road map has identified five priority action areas of GAP to advance the ESD agenda as follows (UNESCO 2014c):

- i) Advancing policy - Mainstream ESD into both education and sustainable development policies, to create an enabling environment for ESD and to bring about systemic change
- ii) Transforming learning and training environments- Integrate sustainability principles into education and training settings
- iii) Building capacities of educators and trainers- Increase the capacities of educators and trainers to more effectively deliver ESD
- iv) Empowering and mobilizing youth- Multiply ESD actions among youth
- v) Accelerating sustainable solutions at local level- At community level, scale up ESD programmes and multi-stakeholder ESD networks

The roadmap is indicating actions, main stakeholders, expected outcomes and examples according to each five priority action areas of the GAP. It recommended that ESD should be scaled up in all levels and areas to accelerate progress towards sustainable development beyond DESD through the collaborations and networks by involving multi-stakeholders and respective sectors (Table 2.2). As a proponent of DESD, Japan is also expected to demonstrate the specific direction that its post-2015 efforts in these areas will take, and to engage in active communication at the international level. In promoting ESD, it is essential to involve a wide range of actors, such as educators, NGOs, businesses, and young people, not only government.

Table 2.2 Structure and Implementation of Global Action Programme

Priority Action Area	Actions	Main Stakeholders & Missions	Expected outcomes & Examples
Policy support : Advancing policy	ESD into international and national policies on education and sustainable development: - The Ministries of Education around the globe have integrates ESD into curricula and national quality standards, and developing relevant indicator frameworks that establish standards for learning outcomes. - ESD needs to be seen as an important contributor to educational quality, and included in national education system measures of quality. - National and international strategies dealing with the social, economic, and environmental dimensions of sustainable development, ranging from disaster management plans to low carbon development strategies, should include ESD as a means of implementation. - ESD should also become a systematic part of bilateral and multilateral development cooperation frameworks.	Policymakers in both the education and the sustainable development sectors: - Stakeholders in education - They need to set out policies and agendas to integrate ESD into various processes and structures of the sector. - They need to allocate and to mobilize resources to translate these policies into actions, especially building necessary capacity at national and sub-national levels. - Policymakers working in sustainability challenges - They are invited to recognize and to adopt ESD to tackle these issues. - They can invest their efforts in supporting inter-ministerial and multi-stakeholder coordination and collaboration, where education is an integral part of discussions on sustainable development. - Civil society organizations- community groups, NGOs, associations, unions, and foundations - They can urge governments to take the necessary actions, or they can pursue their own initiatives to complement the actions of the public sector, bridging the gap between policy and practice. - Inter-governmental bodies, agencies and institutions - They should integrate ESD into their agendas and mandates on sustainability. They should also encourage their Member States to do their part in efforts at country level.	- Outcomes ESD integrated into national, regional and international policy frameworks, plans, strategies, programs and processes related to education and to sustainable development. - Examples - National governments include ESD in national quality standards and indicator frameworks that establish standards for learning outcomes. - National governments, development banks, international NGOs, and UN agencies include ESD in global agreements on sustainable development
Whole-institution approach: Transforming learning and training environment	- Institutions develop a vision and a plan to implement ESD in the dedicated learning and training environment, in partnership with the broader community. - Institutional leaders are prompted to take a holistic view of ESD, focused not only on transferring content about sustainable development, but also on participating in sustainable development practices, including taking actions to reduce the institution's ecological footprint. - Collaboration between the learning and training institution and the host community is important.	Leaders and the managers of all types of learning and training institutions: - School principals, directors of Technical and Vocational Education and Training (TVET) centers - Presidents of universities and community colleges as well as those of private companies - Community leaders, parents, learners and trainees are important partners for these main stakeholders.	- Outcomes Sustainability plans or strategies could be implemented by schools and other training institutions, and public and private sector organizations. - Examples - Schools develop a school sustainability plan in partnership with the broader community - Universities incorporate sustainability into campus operations, governance, policy and administration
Educators: Building capacities of educators and trainers	- ESD should be integrated into pre-service and in-service teacher education. - ESD should be also integrated into training for early childhood, primary and secondary schools and TVET institutions. - At post-secondary level, higher education institutions can also	- Educators and trainers who deliver ESD to learners and trainees. - Educators and trainers working in education and training institutions for teachers and trainers - Training personnel or managers of human resources working in public or private organizations, civil society, and	Outcomes ESD integrated into pre-service and in-service teacher education programs, and the capacity of education and training institutions for teachers and trainers enhanced;

	integrate ESD into faculty training, to improve the ability of the faculty to teach sustainability issues and to conduct and supervise related research. Sustainability lens is introduced to the professional development programs for educators, trainers and staff members of various private institutions.	other institutions - They must be given opportunities to acquire the skills and knowledge they need to design and deliver education and training programs for their staff based on ESD principles. 4. Faculties of colleges and universities, especially professors of business, journalism, public policy, development studies, international relations or other relevant specialties - They play a vital role in making professionals in these areas aware of sustainability issues, and ultimately in guiding their decision-making processes to support sustainable development.	- Training certification and accreditation standards aligned with the ESD concept, and ESD incorporated into TVET training programs - The professional ESD workshops for faculty 2. Examples - Teacher education institutions deliver pre-service and in-service training on ESD - National TVET agencies build the capacity of TVET teachers and trainers to address ESD
Youth: Empowering and mobilizing youth	- Providing young people with opportunities to harness the enormous benefits of information and communication technologies including social media, not only for learning, but also for networking. - Promising approaches include e-learning on ESD and on-line platforms where young people can share their own ideas and actions on sustainable consumption and sustainable lifestyles. - Mass mobilization of youth towards sustainable development requires empowering youth with information on the impacts of their daily choices and actions, while tapping into their creativity and determination to find workable and innovative solutions and alternatives.	Youth between 15 and 24 years old who are the largest group of more than one billion to make the transition to adulthood. 1. Youth, including activists and leaders, are both beneficiaries and drivers of this Priority Action Area. 2. Youth-focused and youth-led organizations as well as institutions that serve youth in the public and private sectors, ranging from mass media and faith-based organizations to local and national governments.	1. Outcomes - More quality e-learning opportunities for youth - Youth participating in and contributing to ESD advocacy, policy development and implementation at local, national and international levels - More Youth-led ESD activities 2. Examples - Public-private partnerships develop free smart phone apps that provide information on ESD and sustainable lifestyles. - Youth organizations build a global coalition for youth on sustainable lifestyles.
Local Community Accelerating sustainable solutions at local level	- Strengthening multi-stakeholder networks at local level, and improving the quality of local platforms for learning and cooperation. - Mobilizing many new stakeholders to involve as large a stakeholder population as possible. - Local authorities and local leaders are called upon to increase and strengthen learning opportunities for the community through formal, non-formal, and informal venues. - Empowering and increasing the capacity of civil society as critical agents of change. - These concerned members and stakeholders will develop measures and mechanisms to resolve the sustainable challenges facing their communities.	1. Public authorities such as governors and mayors 2. Local education stakeholders such as school board members and the leaders of education institutions (ex. school principals, presidents of universities) 3. Managers of private companies 4. Civil society representatives, NGOs, associations and groups for the disadvantaged and the marginalized as well as individuals 5. Local media - It has an important role to play in mobilizing communities and disseminating information and knowledge 6. The private sector - It has critical role to play in developing locally-based sustainable enterprises	1. Outcomes - The integration of ESD programs and ESD perspectives into the planning and decision-making processes of the community. - The number of multi-stakeholder networks at local level should be increased and their networks be expanded through involving a wider range of stakeholders. 2. Examples - Local authorities set up local ESD centers - The local business sector integrates ESD in corporate social responsibility activities

Main data from “UNESCO Roadmap for Implementation the Global Action Programme on Education for Sustainable Development” (2014), Analyzed by author

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Chapter 3 Essence of Disaster Education

Abstract: Through the experiences of huge disasters such as mega-earthquakes, super-typhoons, heavy floods and volcanic eruptions, the public awareness for disaster risk reduction (DRR) is gaining more importance under the recognition of “Disasters, many of which are exacerbated by climate change and increasing in frequency and intensity, significantly impede progress towards sustainable society”. Education takes a crucial role to realize disaster risk reduction by accelerating the progress of society toward disaster resilience as well as increasing awareness and developing proper knowledge and skills among individuals. At global level, the Hyogo Framework for Action (HFA) has emphasized the role of knowledge and education, and highlighted formal and non-formal education and awareness-raising as important components for disaster education, along with other global educational initiatives such as Education for All (EFA) contributing to Millennium Development Goals (MDGs) and Education for Sustainable Development (ESD). In order to promote disaster education effectively, it is important to incorporate DRR components into school curriculum and non-formal learning program, developing disaster education curriculum/program by various approaches to fit each situation, and creating tools and methods for its promotion. In Japan, some cities and schools have been promoting advanced disaster education developing a systematic curriculum and linking with community and local government based on the lessons learned from past tragic disasters. Ten years after the HFA, “Sendai Framework for Disaster Risk Reduction” was launched at the World Conference on Disaster Risk Reduction in 2015 and it enhances disaster education to achieve DRR, disaster preparedness and response, and “Build Back Better”.

3.1 Evolution of Disaster Education Concept

3.1.1 Concept of Disaster Education

Although its expressions are different, “Disaster Education”, “Disaster Risk Education” or “Disaster Prevention Education” means “Disaster Risk Reduction (DRR) Education”. As the role of education in disaster risk reduction, it is widely acknowledged that education takes a crucial role in reducing disasters and achieving human security in the

attempt to achieve sustainable development. Previous experiences have shown positive effects of education in disaster risk management. For instance, children who have been taught about the phenomenon of disasters and how to react to those situations have proved to be able to respond promptly and appropriately, thereby warning others and protecting themselves during times of emergencies, like the 10 years girl who saved over 100 people's lives by warning tsunami with the knowledge acquired at school during Indian Ocean Tsunami in 2004. The significant public education efforts of disaster education have started in many countries since International Decade of Natural Disaster Reduction (IDNDR) in the 1990s. "Public awareness" and "Education for Disaster Risk Education" are gaining importance and they have been widely advocated. The Hyogo Framework for Action (HFA) 2005-2015 emphasizes the role of "Knowledge and Education" and highlights formal and non-formal education and awareness-raising as important components for disaster risk reduction in the "priority for action 3". Disaster education aims to accelerate the progress of society toward disaster resilience at the same time, increase awareness and develop proper knowledge and skills among individuals (Shaw, Shiwaku & Takeuchi, 2011).

The activities and program or curriculum of disaster education should be interdisciplinary, holistic and practical approach, making the best use of indigenous knowledge, information and experiences which have been sustained over generations as valuable lessons from past disasters in each community or area, as well as results of academic researches and expertise of specialists. The disaster education is more successful through experience-based and action-oriented learning. United Nations International Strategy for Disaster Reduction (UNISDR) System Thematic Cluster/Platform on Knowledge and Education argued "Education for Disaster Risk Reduction is an interactive process of mutual learning among people and institutions. It encompasses far more than formal education at schools and universities, and involves the recognition and use of traditional wisdom and local knowledge for perception from natural hazard" (UNISDR, 2005a).

Petal (2009) suggested the mission of Disaster Risk Reduction (DRR) education, both for children and for adults, in all walks of life should serve to;

- (i) Convey an understanding of natural and environment conditions and the human actions and inaction that lead to disaster, to stimulate change in individual and group behavior.
- (ii) Motivate advocacy and raise expectation of social policy to reduce these threats.

It was also emphasized that disaster education should not be merely teaching “natural hazard” or organizing “campaigns” for risk awareness but should be guiding people toward the discovery of their own solution by their own power.

With regard to formal education, it is widely acknowledged that the school takes an important role in raising awareness among students, teachers, and parents (Shaw & Kobayashi 2001). The importance of disaster education at school is increasing because of the following reasons;

- (i) Children are one of the most vulnerable sections of the society during a disaster.
- (ii) They represent the future.
- (iii) School serves as a community’s central location for meetings and group activities.
- (iv) The efforts of school education can be transferred to parents and community.

In this context, the school is regarded to play a crucial role in raising awareness among students, teachers and parents as well as within local community. In the 2006-2007, “Disaster Risk Education Begins at School” campaign, United Nations International Strategy for Disaster Reduction (UNISDR), some of lessons learnt from the experience of the campaign is as follows (Shiwaku, 2009);

- (i) Education is a process for effective disaster reduction.
- (ii) Knowledge, perception, comprehension and actions are the four important steps.
- (iii) Schools and formal education play an important role in knowledge development.
- (iv) Family-, community-, and self-education are important for comprehension of knowledge and implementation of risk reduction actions.
- (v) Holistic education includes actions at local level as well as its policy integration.

However, in this campaign, UNISDR not only attempted to highlight the importance of integrating disaster risk reduction into formal school, but also emphasized the importance of community participation for the purpose of achieving sustainability within the community (UNISDR, 2006). Although school education may provide individual disaster knowledge, it is insufficient to either raise preparedness or motivate the individual to take actions on disaster risk reduction activities. Education is vital, as is the sharing of experiences within and among communities (UNISDR, 2007a). Therefore, disaster education should be implemented in not only formal education but also non-formal and in-formal education based on each local community, linking with

parents, community members and outside sectors such as local institutions, local government and NGO/NPOs.

The goal of developing “Disaster-resilient communities” is widely understood to depend heavily on the success of disaster education, and the integration of both formal and non-formal/in-formal education through school is one way of ensuring that these messages reach every family and community so that the learning can be sustained into the future generation (Petal 2008).

3.1.2 International Initiatives related to Disaster Education

3.1.2.1 Education for ALL (EFA) and Disaster Education

The International initiatives those are related to disaster education can be categorized as “Education for All (EFA), “Education for Sustainable Development (ESD)” and “Hyogo Framework of Action (HFA)”. Therefore, disaster education should be promoted from the perspectives of EFA, ESD and HFA all those are initiatives in education at global level.

The Education for All (EFA) movement is a global commitment to provide quality basic education for all children, youth and adults. The movement was launched at the “World Conference on Education for All” in 1990 by UNESCO, UNDP, UNFPA, UNICEF and the World Bank. Participants endorsed an 'expanded vision of learning' and pledged to universalize primary education and massively reduce illiteracy by the end of the decade. Ten years later, at the World Education Forum in Dakar, Senegal in 2000, with many countries far from having reached this goal, the international community affirmed their commitment to achieving Education for All (EFA) by the year 2015 as the Dakar Framework for Action. They identified and agreed six key education goals which aim to meet the learning needs of all children, youth and adults by 2015 as follows (UNESCO 2000):

- (i) Expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children.
- (ii) Ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to, and complete, free and compulsory primary education of good quality.

- (iii) Ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life-skills programmes.
- (iv) Achieving a 50 per cent improvement in levels of adult literacy by 2015, especially for women, and equitable access to basic and continuing education for all adults.
- (v) Eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality.
- (vi) Improving all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills.

Disaster education is one of essential life-skills program which fosters the ability for disaster risk reduction to vulnerable children, people and communities, so that it can be regard as a part of EFA achievement.

3.1.2.2 Millennium Development Goals (MDGs) and Disaster Education

These EFA goals also contribute to the global pursuit of the eight “Millennium Development Goals (MDGs)” adopted by 189 countries and world’s leading development institutions in 2000. There are 193 countries currently and at least 23 international organizations committed to help achieve the Millennium Development Goals by 2015. MDGs proposed eight goals and each goal has specific targets (21 targets in total) along with measurable health indicators and economic indicators for each target (60 indicators in total) (UN 2015). Eight MDGs are:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality rates
5. Improve maternal health
6. Combat HIV/AIDS, malaria, and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

Two MDGs (Goal 2 & 3) relate specifically to education, but none of the eight MDGs can be achieved without sustained investment in education. Education gives the skills and knowledge to improve health, livelihoods and promote sound environmental practices (UNESCO 2015). It can be pointed out that disaster education is an important component and can contribute to the achievement of these MDGs.

Therefore, disaster education should be implemented in the context of achievement of “Education for All” and “Millennium Developing Goals”.

3.1.2.3 Education for Sustainable Development (ESD) and Disaster Education

As discussed chapter 2, “Education for Sustainable Development (ESD)” advocated by United Nations, of which lead agency is UNESCO, aims to help people develop the attitudes, skills and knowledge required to make decisions for their own benefit and one of others, now and in the future, and to act upon these decisions. ESD seeks to empower people of all ages to assume responsibility for creating a sustainable future. The four major thrusts of ESD as identified in Chapter 36 of Agenda 21 are;

- (i) Developing public understanding and awareness
- (ii) Access to quality basic education
- (iii) Reorienting existing education to ESD
- (iv) Providing training program for all sectors

In December 2002, the UN General Assembly adopted the resolution of “UN Decade of Education for Sustainable Development (DESD)”, spanning from 2005 to 2014. The primary aim is to encourage governments to consider the inclusion of measures to implement the DESD in their respective education systems and national development plans with four key objectives:

- (i) Facilitating networking and collaboration among stakeholders in ESD
- (ii) Fostering greater quality of teaching and learning of environmental topics
- (iii) Supporting countries in achieving their MDGs through ESD efforts
- (iv) Providing countries with new opportunities and tools to reform education

UNESCO is designated to lead the Decade and seeks to integrate the principles, values and practices of sustainable development into all aspects of education and learning, in order to address the social, economic, cultural and environmental problems faced in 21st century. Implementation focused on the following seven building blocks; (i) advocacy

and vision-building, (ii) consultation and ownership, (iii) partnership and networks, (iv) capacity-building and training, (v) research and innovation, (vi) information and communication technologies, and (vii) monitoring and evaluation (UNESCO 2005).

Disaster education has to seek for sustainable community, society and future by developing the capacity of people, communities and nations for disaster risk reduction through their promotion and practice. In addition, not only the concept but also methodology and strategy of disaster education have similarity or commonality with those of ESD. Therefore, disaster education is going with the same stream as ESD, and it should be promoted as an important approach and component of ESD to achieve sustainable development. It is crucial to make the best use of the synergy between ESD and disaster education, and it leads to enrich the learning and practice and to broaden the perspective of disaster education.

Hyogo Framework for Action (HFA) was endorsed by the UN General Assembly in the Resolution following the 2005 World Disaster Reduction Conference held in Kobe, Hyogo, Japan. The HFA is a 10-year plan from 2005 to 2015 to make the world safer from natural hazards, which title is “Building the resilience of nations and communities to disasters”. It should be more discussed in the following section (3.2).

3.2 Methodology of Disaster Education

3.2.1 Framework of Disaster Education

According to the Chapter 36 of Agenda 21 of Rio Declaration on “Promoting Education, Public Awareness and Training”, it was stated that “while basic education provides the underpinning for any environment and development education, the latter need to be incorporated as an essential part of learning” (UN 1992). “Both formal and non-formal education is indispensable to change people’s attitudes so that they have the capacity to access and address their sustainable development concerns,” suggesting the synergetic effect resulting from the combination of the various types of education. Disaster education should be promoted for the pursuit of sustainable development based on environmental education, human security and human rights including United Nations Convention of the Right of Child. Therefore, disaster education also must be implemented through the combination and synergy among formal, non-formal and informal education.

In disaster education, the power and simplicity of experiences learned and preserved in individuals and communities is very important. There exists a practical intelligence, different from school intelligence that matters more in real life (Resnick 1987). To either raise preparedness or motivate the individual to take actions on disaster risk reduction activities, education is vital, as is the sharing of experience within and among the communities (UNISDR 2007a). In addition to classroom lecture, supplementation of non-formal, experience-based and action-oriented learning activities, with the incorporation of indigenous knowledge and community participation, is seen to enhance the awareness and preparedness within individuals as well as the community, and is widely advocated in disaster education. Sharma (2008) pointed out that while teaching-based approaches are dependent on the content developed by academicians, learning approach is based on people finding out things from the environment or local sources; hence the learning approach catalyzes the learning process that remains dependent on the local environment and encourages cross-learning through sharing of stories, facts and cultural approaches. The local sources and information, also known as indigenous knowledge, evolved over generations in the community are time tested in the local context, and thus are seen to be able to sustain for generations.

On the other hand, Shaw and Kobayashi (2001) emphasized that the school plays an important role in raising awareness among students, teachers and parents. UNISDR conducted a campaign based on observation that children are among the most vulnerable population group during disaster and that disaster risk reduction empowers children and helps build greater awareness of the issue in communities (UNISDR 2006). However, almost all the countries or regions in the world have no separated or special curriculum for disaster education in elementary, middle and high school. Usually, school education is divided into curricular and extra-curricular activities, so that disaster education in school should be conducted as part of both curricular and extra-curricular activities according to each school curriculum in order to increase the hours spent on disaster education. If it is possible, the school is able to conduct systematic and effective disaster education depending on school level and characteristics of the regions, considering developing stage of students and aims of subjects or field of school curriculum. And the practice of disaster education at school became more sustainable and developing as formal education supported by each community and government. How to develop the curriculum and construct the promotion system of disaster education at school will be discussed at next part.

3.2.2 Curriculum Development of Disaster Education

Disaster risk reduction is interdisciplinary subject and it has links to other issues such as environment, development and human security. The link between environment and disaster is prominent in the area where natural and social issues merge such as rural area which depends on agriculture and natural resources for their livelihood. These issues are linked with the overall concept of human security (Shaw 2006). Also, climate change impacts can be regarded as the missing link between environment and disaster. Climate change adaptation (CCA) and disaster risk reduction (DRR), through broadly understood to be linked in some ways, should be taken as a holistically linked complementary set of actions that require collaborative and coordinated action by all concerned stakeholders (Shaw, Mallick & Takeuchi 2011). Therefore, the disaster education curriculum is needed to consider these linkages and it should be developed and implemented by interdisciplinary approach.

In this context, curriculum development of disaster education is able to learn a lot from the concept and method of curriculum development for ESD. Burton (2006) pointed out the ingredients for effectively incorporating ESD into teaching and learning practice as follows;

- (i) Full integration of ESD into the curriculum with continuity (i.e., not one-off or final year option module, not a three years project that ends in a report)
- (ii) Student-centered activities and assessments that reward critical thinking and reflective learning, (ex. use of problem-based learning, projects, case studies, portfolios, field studies)
- (iii) Trans-disciplinary teaching, with modules that are taught by staff from a range of disciplines and encourage contact between students from different subject areas
- (iv) Teaching that emphasizes that ESD is an ongoing process, i.e., part of lifelong learning journey where answers are not hard and fast

These interdisciplinary and integrated learning approaches of ESD are also important to realize “Deep Learning”. Deep learning is a key strategy by which the students extract meaning and understanding from course materials and experiences (Warburton 2003). Because of range and interconnectedness of environmental, social and economic issues, and importance of interdisciplinary thinking and holistic insight, deep learning is relevant in the context of ESD as well as disaster education. Thus, realizing that one

should cross boundaries to solve problems could be one of the most important elements in their education (Fortuin & Bush, 2010).

Moreover, Shaw et al. (2011) pointed out guiding principle of higher education in disaster risk reduction as follows (Shaw, Mallick & Takeuchi 2011);

- (i) **Inclusive Curriculum;** The curriculum structure needs to address issues at a general level that are inclusive of all for a well-rounded foundation to proceed to specific issues
- (ii) **Theoretical Focus;** The curriculum will focus on imparting education primary in the field of DRR with climate change adaptation, DRR/prevention/mitigation as important components
- (iii) **Field Orientation;** The curriculum will not only focus on theoretical knowledge but the faculty and students would undertake research on disaster-related issues with exposure to real-life situations to assess vulnerabilities, mitigation and preparedness measure
- (iv) **Multidisciplinary Approach;** Disaster preparedness and management are Multidisciplinary in nature and various subjects contribute to the field of disaster management
- (v) **Skill Enhancement;** The curriculum will focus on producing trained manpower, and the training should be based on experiences learned from the previous case studies according to market demand

These Principles are fit not only for higher education but also for elementary, middle and high school education. Especially, integrated approach, experience-based learning and inquiry-based learning are very active at elementary school, rather than high school and university. In Japan, MEXT set aside a time for integrated study period, it's called "Sougotekina Gakushu no Jikan", in the Course of Study of elementary, Junior and senior high school since its renewal in 2002 (Oikawa 2014).

In the development of disaster education curriculum in formal education, Petal (2008) pointed out the approaches of; (i) Curriculum integration, (ii) Extracurricular integration, (iii) Curriculum infusion, and (iv) Stand-alone course (Table 3.1).

Analyzing the strategies or methods of curriculum development and the situations of implementation on disaster education at schools, especially in Japan, it can be pointed out the characteristics and challenges on each approach to disaster education as follows;

- (i) Curriculum integration approach is to develop and integrate the learning units or modules for disaster education by making the best use of other subject's chapters and modules which focused on or related to disaster risk reduction. In Japanese case, integrated study period plays a key role for developing and integrating disaster education units and also for setting a part of times for its learning.
- (ii) Extracurricular integration approach is usually project-based or action-oriented learning such as campaigns and projects with local governments and NGO/NPOs. The target and goal of this approach is very clear, so that students get more motivated for implementation and it's effective to raise public awareness. On the other hand, the program is not so systematic and difficult to link to school curriculum.
- (iii) Curriculum infusion approach is based on existing subjects or field of school curriculum to infuse DRR components into units, modules and activities of subjects. According to this approach, disaster education can be promoted as a part of activities of each subject through the school curriculum. However, it has to iron out the differences or similarities of the goals or targets between each subject and disaster education. In this case, it is usually regarded that the priority of existing subjects is superior to disaster education.
- (iv) Stand-alone course is very rare case in formal education. In Japan, several high schools, which have established after Hanshin Awaji Earthquake (Maiko High School in Hyogo) and East Japan Earthquake and Tsunami (Shiogama High School in Miyagi), have special courses of disaster education as formal subject.

Education for Sustainable Development (ESD) also introduces these approaches in developing learning programs in order to integrate environmental, economic and social issues into school curriculum. As discussed above, ESD as well as disaster education is interdisciplinary learning. But both of them have no special subject usually, so they need to establish integrated learning for their implementation. It is expected to develop the curriculum for disaster education at each school and school level utilizing these approaches, and to implement disaster education practices through all aspects of school curriculum (Oikawa 2015).

Table 3.1 Convergence of Disaster Education Curriculum into Formal Education

Approach	Detail of the approach
Curriculum integration	• Make use of specially developed units, modules, or chapters concerning on disaster risk reduction. • Designed to fit into specific course curricula, grade level, and duration • Teachers training is necessary to development competence and efficacy
Extra-curriculum integration	• Campaigns with local governments, which could also help increase public awareness.
Curriculum infusion	• A more comprehensive approach that distributed disaster risk reduction content throughout the curriculum, using lessons, readings, and activities, enriching the existing curriculum. • Require high-level policy guidance, resource, collaboration between curriculum specialists and disaster risk reduction experts in developing and evaluating the curriculum. • Full curriculum adoption may take 5-10 years
Stand-alone course	• Specialized course curricula focused on disaster risk reduction

Source: Petal (2008)

3.2.3 Tools and Methods of Disaster Education

Mulayasari et al. (2011) suggested that the disaster education tools can be considered base on the following;

- (i) Mode of education (i.e., formal, non-formal, informal education),
- (ii) Type of tool (i.e., printed, non-printed, etc.),
- (iii) Type of study (lecture, experience, discussion, etc.),
- (iv) Purpose (inquiry/investigation, discussion/sharing, presentation/dissemination, etc.),
- (v) Targeted people or user (students, teacher, parents, residents, etc.).

In the learning of disaster education, learners or teachers should select and combine the tools considering points above, and make good use of them (Table 3.2).

Table 3.2 Overview of Disaster Education Tools and Methods

By Categories		Tools
Learning Process	through Lecture	Printed materials (textbooks, comics, booklets, leaflets, handbooks, posters, working books)
	through Experience	- Town watching - Interviews - Visit to museums - Disaster drills
	through Experience	Workshop tools (actions oriented planning)
Approaches in education formats	In formal education	- Curriculum integration - Extra-curricular integration - Curriculum infusion - Broad range of course - Stand-alone courses - Curriculum resource materials
	In informal education	- Dissemination of written materials - Cultural and performing arts - After-school “safety clubs,” scouting badges, and project activities - Projects that bring students into contact with local community, local government, and community-service-oriented clubs - Competitions, awards, and commendations - Parents and local community involvement - Participation of community partners - Disaster drills

[Source: Mulyasari, Takeuchi & Shaw (2011)]

In Disaster education, experience-based learning is very important. As one of them, “Town Watching” is a very effective method and activity in disaster education. “Town watching”, which is a particularly technique used in community or neighborhood planning in order for residents to recognize problems as a group and put forward solution together, had been extended to dealing with disaster and safety related to physical issues such as safe or unsafe place and evacuation routes (Yoshida 2007). Town watching is supposed to be initiated by students in elementary and junior high school and facilitated by teachers, parents, municipal employees, community workers and volunteer (Shaw & Takeuchi 2009b). The objectives of town watching are:

- (i) Knowing current situation of the area,
- (ii) Increasing children's and adults' awareness of disaster prevention,
- (iii) Cultivating children's comprehensive skills and abilities of information collection
- (iv) Telling the experience of disaster victims,
- (v) Pointing out regional problems and suggesting solutions
- (vi) Establishing cooperation system whenever disaster occurs
- (vii) Local residents preparing for disasters with raised awareness of disasters prevention
- (viii) Becoming a trigger for children to be important leaders in disaster prevention in the region

In addition, establishing school-based system of mutual help becomes another objective of town watching through these activities (Mulyasari, Takeuchi & Shaw, 2011). This method of town watching can be also broadened to region or community within watershed as regional/community watching, by connecting neighboring areas such as mountain area (mountain watching) plan area (town watching) and coastal area (coastal watching) (Fig. 3.1).

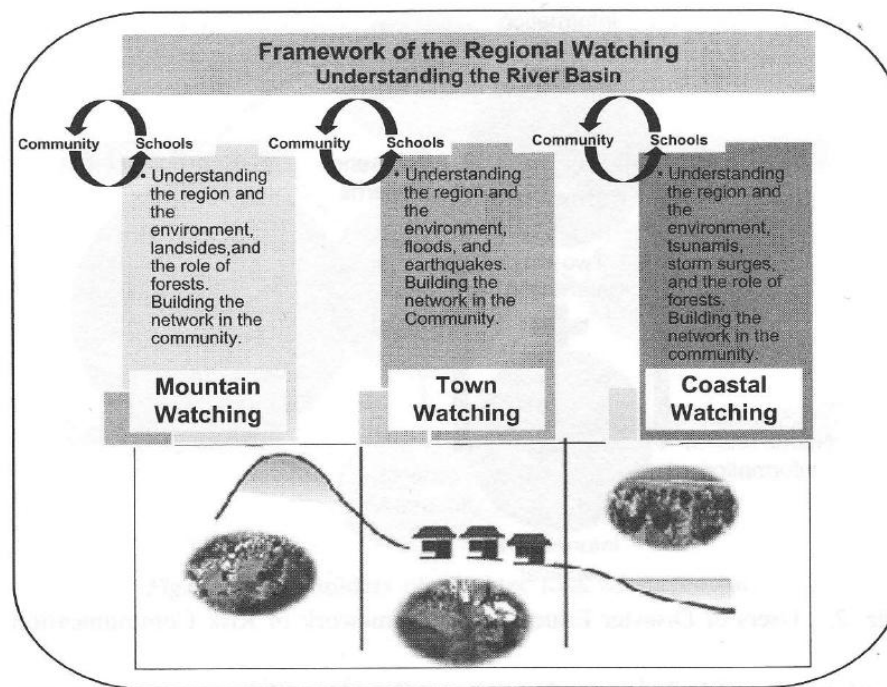


Fig. 3.1 Regional/Community Watching Context
[Source: Mulyasari, Takeuchi & Shaw 2011]

Town watching can also be used as a tool to measure the impact of disaster education (before and after activity). A questionnaire survey was conducted before and after the implementation of the activity and results showed changes in the consciousness in (a) hazard, (b) physical, (c) damage in the infrastructure, and (d) impact on people. And it was also reported that change were also in the damage perception among the individuals (Mulyasari, Takeuchi & Shaw, 2011).

Along with town watching, production of community maps has been proven to be a successful tool in developing an efficient way to increase community awareness. Denis Wood (1994) suggested in his publication that what is communicated with maps reflects one's relationship to the territory one inhabits. Maps are also a way of communicating with the environment that can be stimulating, emotionally linking and context-aware. A map can be produced in a participatory way where member of the community including children contribute with the information and ideas, and this creates a "sense of inclusion". Thus, the map becomes an excellent tool both as an educational aid to enhance awareness and as a public participation tool that helps unite the community (Talero 2004).

As a part of experience-based learning, disaster prevention drill, especially, evacuation drill and the camp focused on DRR often takes place in not only Japan but also other countries. The camp include various activities such as town watching, DRR mapping, interactive session, making action plan, outdoor activities, contest, quiz, poster-making, documentary, dance & song performance, drama, and hearing of experience and indigenous knowledge of disaster prevention from resource persons in the community.

The concept map is also useful not only for students' learning but also for teachers' training in disaster education. The resulting concept map shows the teacher the extent of the knowledge that students possess. In the concept map, students can describe words or topics if they understand the relationship with other words or topics. Through the concept map, teachers can measure the amount of knowledge and image or concept of disaster management that students have (Shiwaku & Fernandez 2011a).

In addition, Internet is useful to facilitate the sharing good practices around the world. Trained teachers or community leaders can find various kinds of helpful information on the Internet, and hopefully they will actually utilize them. But also, collecting information on good practices is important to provide diverse kinds of information on Internet that can be applied in different situations and context. The roles of Internet (website) in order to make disaster education more effective are as follows (Shiwaku & Fernandez 2011);

- a) Sharing information in order to learn from others,
- b) Providing information to promote implementation of disaster risk reduction and disaster education activities,
- c) Collecting information useful to information users.

Following the adoption of Hyogo Framework for Action (HFA) in 2005, various materials of disaster education in the form of booklets, handbooks, textbooks, posters, activities, games, and practices were developed (UNISDR 2006). These tools have an important function in communicating the disaster education to the public via formal, non-formal, and informal education which may take place at school, at home, and/or within the community. The tool for each type of learning process, such as learning process through lecture, experience and presentation, differ from each other (Fig. 3.2).

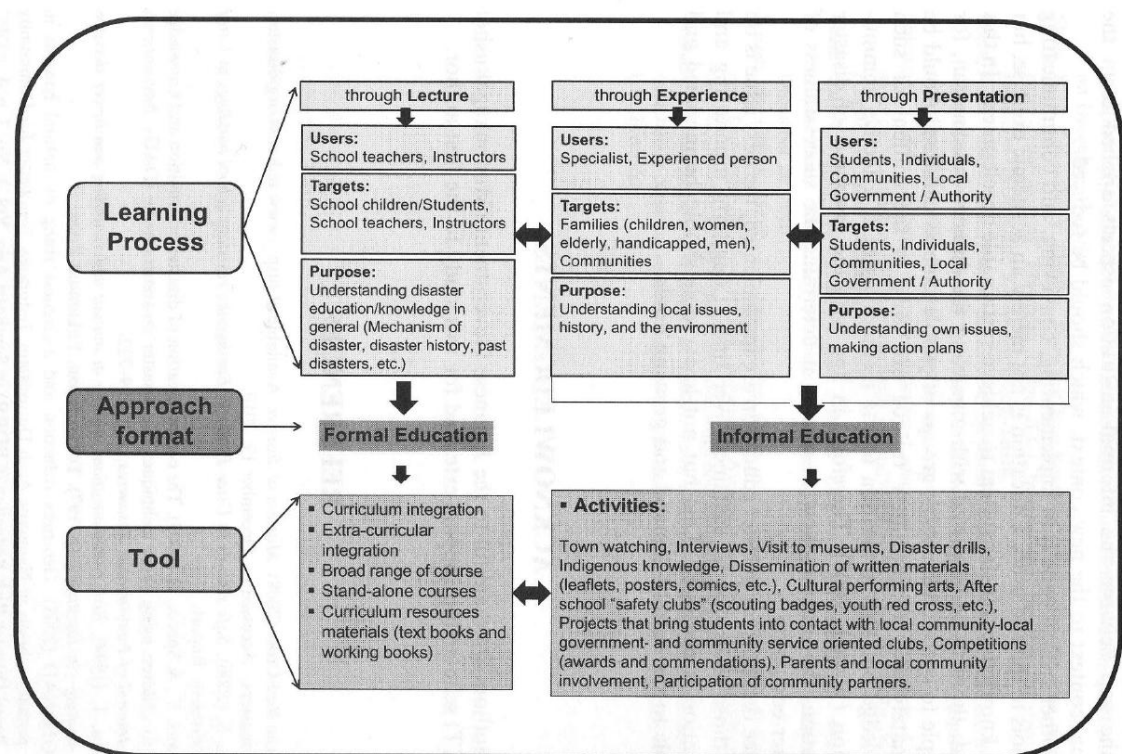


Fig. 3.2 Comprehensive Learning System and Its Tools for Disaster Education

[Source: Mulyasari, Takeuchi & Shaw 2011]

Toward the development and implementation of tools for disaster education, it should be customize to the local context considering (a) the physical-environmental difference, (b) the social-cultural value difference, and (c) the gap between the informal institution aspects applied from the original context to the new context. Moreover, the

tools should be also modified and flexible to the current demand and growing needs. In line with the essentials of disaster education, the tools on how to convey it determine the successfulness of disaster education (Mulyasari, Takeuchi & Shaw 2011).

3.3 Hyogo Framework for Action (HFA) and Disaster Education

3.3.1 Outline of Hyogo Framework for Action

The second World Conference on Disaster Reduction (WCDR) was held from 18 to 22 January 2005 in Kobe City, Hyogo, Japan, and adopted the Framework for Action 2005-2015, which is called “Hyogo Framework for Action (HFA): Building the Resilience of Nations and Communities to Disasters”. The Conference provided a unique opportunity to promote a strategic and systematic approach to reducing vulnerabilities and risks to hazards. It underscored the need for, and identified ways of, building the resilience of nations and communities to disasters (UNISDR 2005b). The World Conference on Disaster Reduction (WCDR) was convened by the resolution of the General Assembly in December 2003, with five specific objectives;

- (a) To conclude and report on the review of the Yokohama Strategy and its Plan of Action, with a view to updating the guiding framework on disaster reduction for the twenty-first century;
- (b) To identify specific activities aimed at ensuring the implementation of relevant provisions of the Johannesburg Plan of Implementation of the World Summit on Sustainable Development on vulnerability, risk assessment and disaster management;
- (c) To share good practices and lessons learned to further disaster reduction within the context of attaining sustainable development, and to identify gaps and challenges;
- (d) To increase awareness of the importance of disaster reduction policies, thereby facilitating and promoting the implementation of those policies;
- (e) To increase the reliability and availability of appropriate disaster-related information to the public and disaster management agencies in all regions, as set out in relevant provisions of the Johannesburg Plan of Implementation.

The Conference also resolves to adopt the following strategic goals:

- (a) The more effective integration of disaster risk considerations into sustainable

development policies, planning and programming at all levels, with a special emphasis on disaster prevention, mitigation, preparedness and vulnerability reduction;

- (b) The development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level, that can systematically contribute to building resilience⁷ to hazards;
- (c) The systematic incorporation of risk reduction approaches into the design and implementation of emergency preparedness, response and recovery programmes in the reconstruction of affected communities.

The Hyogo Framework for Action (HFA), which is the final report of the World Conference on Disaster Reduction (WCDR), consists of three sections; i) WCDR: Objectives, expected outcome and strategic goals, ii) Priorities for action 2005-2015, iii) Implementation and follow-up, following “Challenges posed by disasters” and “The Yokohama Strategy: lessons learned and gaps identified” as preamble. In the description of “The Yokohama Strategy: lessons learned and gaps identified”, it is pointed out specific gaps and challenges are identified in the following five main areas;

- (a) Governance: organizational, legal and policy frameworks;
- (b) Risk identification, assessment, monitoring and early warning;
- (c) Knowledge management and education;
- (d) Reducing underlying risk factors;
- (e) Preparedness for effective response and recovery.

Considering these key areas for developing a relevant framework for action for the decade 2005–2015, and based on objectives, expected outcome and strategic goals of the World Conference on Disaster Reduction (WCDR), the conference has adopted the following five priorities for action 2005–2015;

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.
2. Identify, assess and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
4. Reduce the underlying risk factors.

5. Strengthen disaster preparedness for effective response at all levels.

3.3.2 Education in Hyogo Framework for Action

The Hyogo Framework for Action (HFA) 2005-2015 adopted by WCDR emphasizes the role of formal and non-formal education and awareness-raising as important components for disaster risk reduction. The priority for action 3 of the HFA insists the importance of education for DRR as “Use knowledge, innovation and education to build a culture of safety and resilience at all levels”. Under the priority for action 3, UNISDR addressed emphasis of integrating disaster risk reduction into education through the campaign of “Disaster Risk Reduction Begins at School in 2006-2007”. UNISDR not only highlighted the importance of education for disaster risk reduction into formal education, but also emphasized the importance of community participation in order to achieve sustainability within the community at the same time (UNISDR 2006). Additionally, the campaign also promote safe construction and retrofitting of school buildings to withstand natural hazards, because school buildings could also serve as temporary shelters for community flowing disasters. Therefore, the safety of school buildings is important to ensure the safety of students as well as continuation of education at post-disasters (UNISDR 2006). In the case of East Japan Earthquake and Tsunami in 2011, amount of schools in affected area functioned as shelters accepting many students and evacuees in each community, and they protected and kept their lives for a while following the disaster until temporary houses were built in other places such as parks and school yards.

Shiwaku suggested lessons learnt from the experiences of the campaign as follows: (i) education is a process or method for effective disaster risk reduction; (ii) knowledge, perception, comprehension, and actions are four important steps; (iii) schools and formal education play an important role in knowledge development; (iv) family-, community-, and self- education are important for comprehension of knowledge and implementing risk reduction actions; and (v) holistic education includes actions at the local level, as well as its policy integration (Shiwaku 2007).

Moreover, an integrated approach is necessary to ensure disaster risk reduction is incorporated into not only the school but also into the education sector as a whole. The approach should not only consider education curricula and safe school buildings but also address legislative measure such as having formal guidelines for implementation and funding, proper warning systems and risk assessments, training of qualified professionals, promoting community involvement, as well as measure taken to prepare

community in responding to disaster (Gwee et al. 2011). According to the document of “Words into Action: A Guideline for implementing the Hyogo Framework” by UNISDR, as useful strategies for implementing the HFA, UNISDR suggested 22 tasks which are organized to help address and guide the implementation of the HFA’s five priorities for action (ISDR 2007b). Out of the 22 tasks, 16 tasks were identified and modified to suit the education sector, and they are considered as “Education in Hyogo Framework for Action (E-HFA)” (Gwee et al. 2011). The 16 tasks identified should be performed at all levels including national, local, community and school, in order to achieve sustainable improvement (Table 3.3). At the national level, the Ministry of Education (MOE, or MEXT in Japan) would a play key role in performing the tasks. On the other hand, at local and community level, it would be local education department (board of education) and community members. And at school level, the teachers and students should take important roles for implementation.

Table 3.3 Proposed 16 Tasks Relevant to Education Sector

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

[Source: Disaster Education Policy: Current and Future in Disaster Education (GWEE, 2011)]

As to suggested activities for respective tasks of each priority of HFA, in HFA 1, the four key focuses are suggested; (i) Systematic coordination, (ii) Multi-stakeholder dialogue, (iii) Institutional basis, and (iv) Allocation of resources. HFA 2 focuses on (i) Risk assessment and (ii) Strengthen early warning through effective communication. In terms of HFA 3 that focuses on disaster education itself, key areas are as follows: (i) Public awareness program, (ii) Incorporating disaster risk reduction into the education curricula, (iii) Training and Learning at community level, and (iv) Dissemination of disaster risk reduction information. HFA 4 focuses on (i) Understanding of ecosystem, environment and natural resources, (ii) Disaster risk reduction in land-use planning, (iii) Strengthen building safety and protection of facility and (iv) Disaster recovery planning. At last, HFA 5 emphasizes (i) Enhancing disaster preparedness capacities and (ii) Assessing disaster response preparedness capacities and strengthens planning.

3.4 Disaster Education in Japan and its Evolution

3.4.1 Framework of Disaster Education in Japan

Disaster education in Japan is divided into three types. First one is disaster education as formal education at school. It is usually promoted as a part of subjects or integrated study (Sougotekina-gakushu-no-jikan) based on school curriculum, and school events such as evacuation drill. The second one is as non-formal education, which is organized disaster prevention activity and drill conducted by local government, fire department or community learning center (Kominkan), and some of which would be organized through the collaboration among these sectors in community. And the third one is as informal education. It is disaster education by parents, family members and community member or association at home or in the community, which includes inheriting experiences, lessons and indigenous knowledge from past disasters such as tradition or folklore.

School education plays an important role in raising awareness among students, teachers and parents. UNISDR also conducted campaign based on the observation that children are among most vulnerable population group during disaster (UNISDR 2007a). School education hours can be divided into curricular and extra-curricular. Almost all the schools in Japan, there are no separated or special curriculum for disaster education in elementary and high school. So that school disaster education should be conducted as part of both curricular and extra-curricular activities in order to increase the hours spent on disaster education and to sustain disaster education. In many cases, extra-curricular

activities can provide more hours to disaster education Also in Japan.

According to mid-term report of Ministry of Education, Culture, Sports, Science and Technology-Japan (MEXT) in 2007, disaster education should achieve the following four abilities (MEXT 2007);

- (i) Ability to take action in disaster preparedness and mitigation by knowing local disasters and characteristics of residential area and acquiring disaster prevention technologies
- (ii) Ability to protect oneself from natural disaster and cope with post-disaster life if one suffer from disaster
- (iii) Ability to rehabilitate disaster-affected areas and to reconstruct secure and safety society
- (iv) Ability to voluntary help other people and area to be safe

After the Great East Japan Earthquake and Tsunami, based on the experience and lessons of the disaster, MEXT indicates the goal of disaster education as follows (MEXT 2013):

- (i) Having a better understanding of the current situation, the causes and disaster mitigation of natural disasters, enable appropriate decision-making and action selection based on precise thinking and judgment against disaster to face current and future.
- (ii) Understanding and predicting the risks which is due to the occurrence of earthquakes and typhoons enable to take actions to ensure their safety and daily preparedness.
- (iii) Respecting the life of oneself and others, and recognizing the importance of creating a safe and secure society, enable to participate collaboratively and contribute to the safety activities of the school and home and community.

3.4.2 School-centered Community Building for DRR and Recovery in Japan

Under the situation of East Japan Earthquake and Tsunami (EJET) on 11 March 2011, MEXT sent a notification to 15 prefectures and one city of EJET affected regions to suggest the concept of “School-centered community building” for disaster recovery in order to promote building resilient community for DRR and recovery. The concept

has three pillars: i) Ensuring safety and security of schools, ii) Provision to improve DRR and eco-friendly features and iii) Combining schools with other public facilities such as community learning center and social welfare facilities to make school the center for community interaction. Effective implementation of this concept in recovering schools, which are normally considered as core of society, is expected to facilitate the overall recovery process in the affected regions. As Fig. 3.3 shows, at national level, MEXT, Ministry of Agriculture, Forestry and Fisheries (MAFF) and Ministry of Land, Infrastructure, Transport and Tourism (MLIT) as well as board of education (BOE) and related city government departments are mandated to work together in providing comprehensive support in building school-centered communities (MEXT 2012).

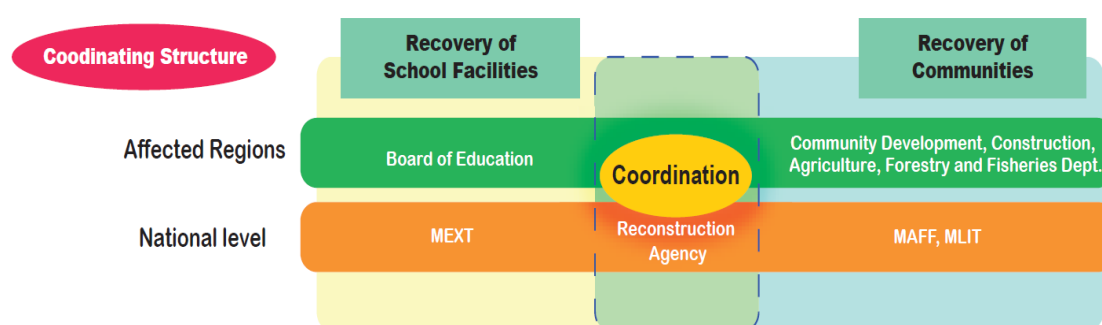


Fig. 3.3 Structure for Implementation of School-centered Community Building

[Source: MEXT 2012]

Among the three pillars of School-centered community building, making school multifunctional facilities will provide opportunities for not only to be used as educational facilities, but also to be as hubs for community integration in which the whole community, including people with no children, will be able to look over their children and provide an environment to learn from each other (Fig. 3.4). As for DRR, the new school facilities can become a place where people can seek for safety and security during emergencies and during normal times, used for disaster education and activities (MEXT 2012).

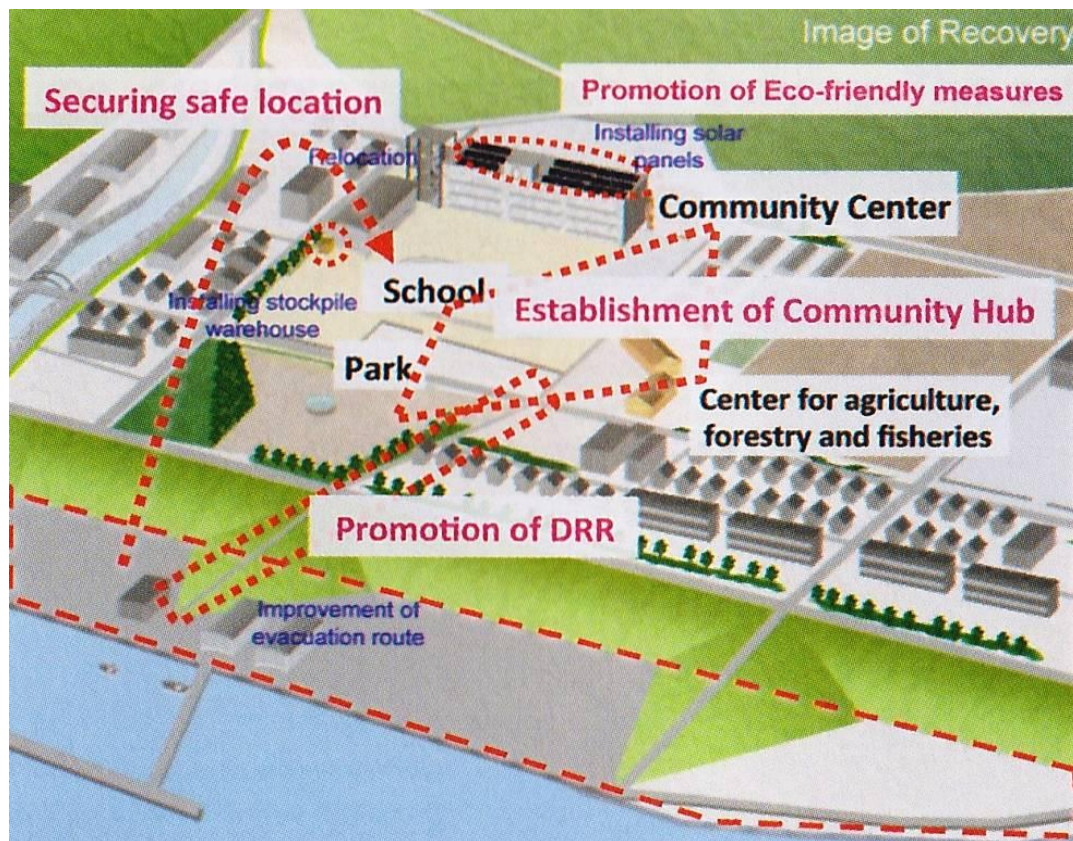


Fig. 3.4 Image of School-centered Community Building

[Source: MEXT (2012)]

3.4.3 Practices of Disaster Education in Japan

With regard to the practice and implementation of disaster education in Japan, there are three examples of disaster education to be indicated as good practices of curricular disaster education, extra-curricular disaster education and disaster education for the recovery from East Japan Earthquake and Tsunami (EJET). First case is the disaster education of Saijo City in Ehime Prefecture which is conducted by city government in extra-curricular mainly. Second case is the curricular disaster education of Maiko High School in Hyogo Prefecture, which has advanced stand alone course for disaster education for the first time in Japan. Lastly, the case of Kamaishi City in Iwate Prefecture which suffered serious damages of East Japan Earthquake and Tsunami in 2011, has been improving their disaster education after EJAT.

3.4.3.1 Disaster Education in Extra-Curricular: Case of Saijo City

Saijo City of Ehime Prefecture in Japan has been promoting advanced disaster education based on the experience of typhoon disaster in 2004. Saijo City has the population of 116,455 (Nov. 2004) with land area of 509 km² after three towns were incorporated to the city in 2004. The geography can be characterized as having a narrow plain area (consisting 30 % of the total), sandwiched by mountain range and shoreline. In 2004, six typhoons that landed in Shikoku Island triggered record rainfalls causing damage to 2,772 public facilities and 29 deaths in the prefecture in which five deaths were in Saijo City. After the typhoon disaster in 2014, Saijo has revised its DRR Planning with the following four concepts with guidance from Kyoto University.

- (i) Make citizens the main actors of DRR; Make every citizens self-conscious that they are the main actors in DRR
- (ii) Build mechanism to save the most vulnerable people; Build mechanism so that no vulnerable group exists in the city
- (iii) Share regional DRR culture; Share DRR culture throughout the city extensively
- (iv) Deliver message to next generation to build disaster resilient society; Train young leaders with DRR capacity

With the above, Saijo City has started implementation of “12-years-old Education Project” from 2006. The project aims to build a community centered DRR culture by training young leaders with social skills and DRR capacity through acquirement of DRR knowledge. Although 12 years old (6th grade) students are in the vulnerable group, they are capable to think and make decisions by themselves, therefore has been as suitable target to start disaster education. For implementation, the Working Committee (consisting of faculty of each school) in coordination with Disaster Management Division of the city government and Ministry of Land, Infrastructure, Transport and Tourism (MILT), Fire Department, NTT (Nippon Telegraph and Telephone Corporation) on needed basis implements the project (Fig. 3.5).

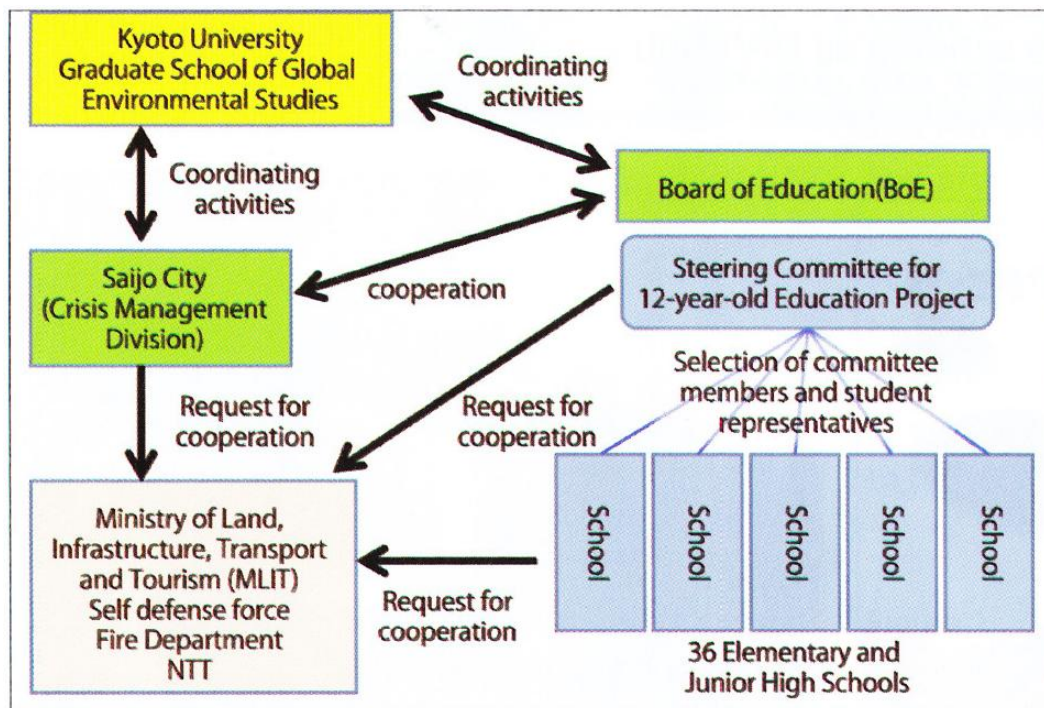


Fig. 3.5 Implementation Structure of 12-years-old Education Project

[Source: Saijo City 2012]

The main annual events of the project are the leader's training and the DRR Summit. For the DRR Summit about a total of 60 students (6th grade) from 26 elementary schools participate to decide on what topics they would like to study on DRR. In the DRR camp (leaders' training), conducted during summer vacation, the students acquire DRR knowledge, skill and conduct through such activities as earthquake simulation vehicle exercise, first-aid class, exercise pertaining to emergency provisions, Disaster Imagination Game (DIG) and town watching to know the safe and dangerous area around their schools and school zones. The leaders who received the training then decide which activities will be implementable at school. The example of the activities which were conducted at schools so far is as follows: Making suggestions for better evacuation from the dangers earthquake and tsunami, Town watching of school zones and Proposing emergency supplies that can be bought at 100 yen shops. Even adults are able to refer to the many ideas that were recommended from the DRR activities by the students (Saijo City 2012).

3.4.3.2 Disaster Education in Curricular: Case of Maiko High School

Maiko High School which is one of public high school in Hyogo Prefecture established “Environment and Disaster Mitigation Course” in 2002 based on the lessons from Hanshin-Awaji Earthquake. This course is the first of its kind at the high school level in the world, which focuses on disaster risk management. According to Maiko High School, the goal of disaster education is equip citizens with disaster mitigation literacy (Maiko High School 2002). Disaster mitigation literacy consists of three factors: fundamental knowledge and fundamental skills to cope with disaster and a strong will to contribute to society. The purpose of the course is to have students think of how they live and exist in a symbiotic society by utilizing the lessons learned from the Great Hanshin-Awaji Earthquake disaster. The course gives the students the disaster mitigation education concerning both the natural environment and the social environment. The abilities that the course required students to develop are fundamental knowledge, comprehensive ability and interest. The fundamental concepts of the disaster mitigation education are the following:

1. The disaster mitigation education is based on the lessons from the Great Hanshin-Awaji Earthquake. It also makes the students think of the importance of life, cultivates the students’ capacity against disasters, and bring up human beings who can contribute to the society.
2. The students are expected to understand deeply the various environments (the natural environment and social environment) by learning the mechanism of natural phenomena and the relationship between disasters and human society.
3. Maiko High School cooperates with universities, research institutes and relevant organizations. The students’ understanding of the environment and disaster mitigations is deepened through experiential learning. To raise the students’ attitude to “Think Globally, Act Locally” is one of the main goals. The school aims to foster students who can take action independently.

According to the education curriculum of the “Environment and Disaster Mitigation Course” in 2002 (Table 3.4), the subjects in the course are divided into three types: (i) General subjects, (ii) Special subjects integrated into general subjects, and (iii) Special subjects with a new education concept concerning disaster mitigation. About one-third of the units are used for the special subjects those were established as disaster education subjects (Shiwaku 2004).

Table 3.4 Education Curriculum of the Environment and Disaster Mitigation Course of Maiko High School (2002)

Credit	1st Year	2nd Year			3rd Year					
1	Japanese 1	Japanese 2			Japanese 3					
2										
3										
4										
5	Contemporary Society	Geography A	World History B		World History A	World History B				
6	Mathematics 1	Mathematics 2	Choose two subjects Mathematics 2 Japanese Classics 1 Reading		Mathematics 3	Mathematics 2	Japanese Classics 1			
7					Mathematics B		Geography A			
8		Chemistry 1B	Chemistry 1A		Chemistry 1B	Reading	Workshop			
9		Physics 1B		Biology 1B				Biology 1A		
10	Health Education	Physical Education			Physics 1B	Biology 1B	Computer B			
11	Physical Education				Physics 2	Japanese Classics	Choices α			
12	Domestic Technology				Music/Art/Japanese Calligraphy			Physical Education		
13	English									
14	Computer A	English			Activity in Disaster Mitigation II					
15								Human Beings & Society, Social, Welfare, Volunteerism, and Mental		
16	Environment and Science	Disasters & Human Beings		Long Home Room						
17	Disasters & Human Beings I	Natural Environment & DM I	Social Environment & DM II				Natural Environment & DM II	Social Environment & DM II		
18		Activity in Disaster Mitigation I			Long Home Room					
19		Long Home Room								
20	Long Home Room									

Highlighted in Gray are the newly established disaster education subjects,

[Source: Shiwaku (2011)]

The credit means the number of school hours that are used in the subjects per week. In case of the first grade students, “Computer A” and “Environment and Science” are advanced subjects for disaster management. The “Environment and Disaster Mitigation Course” modified such subjects into special subjects. “Disaster and Human Beings 1” is the subject with a new concept that cannot be covered by regular education curriculum, which is a distinguishing subject of the course (Shiwaku and Fernandez 2011).

Many lessons from Maiko High School’ practice could be pointed out as the characteristic points on disaster education. To promote the lesson of the course of Maiko, not only schools but also other institution or stakeholders need to make an effort. Disaster education should meet local issues such as local environment, hazard and disaster risk, so that it should be promoted in local context. A standard program/curriculum is effective to some extent, but capacity building of teachers

including management ability should be enhanced in order to make education more effective (Shiwaku, Shaw, Kandel, Surya & Dixit 2006). The roles or efforts of each stakeholder to be needed are as follows (Shiwaku and Fernandez 2011b):

- (i) As governmental principle, government such as a board of education instructs schools to develop their own curriculum for disaster education through implementation and the process can be a part of teacher's training.
- (ii) Schools should utilize both curricular and extra-curricular education, exploring how disaster education can be integrated into existing regular school curriculum. As for extra-curricular disaster education, practical learning should be emphasized.
- (iii) NGOs and research institutes play important role to provide special knowledge on disaster management to schools.
- (iv) Community-based organizations are also useful to bridge schools and special organizations and institutions in order to communicate school needs to such organizations
- (v) Related organization/institutions should be also be involved to promote school disaster education.

3.4.3.3 Disaster Education based on Lessons of EJET: Case of Kamaishi City

In Kamaishi City, Iwate Prefecture, Previous disaster education efforts included cooperation between schools and local communities, such as identification of evacuation shelters with parents on class visit days. In addition, schools, in cooperation with town associations and School Guard Volunteers consisting of community members, have nourished beliefs for school children and parents that children will be evacuated to safety when disaster occurs and family members or parents will come to pick them up after the disaster. Evacuation drills have been performed and handover training has been offered to parents after school (handover of students to parents until safety has been confirmed is prohibited). Junior high school students have learned about "Disaster response and Volunteer opportunities" in their ethics class, and they have been also learning practical disaster education in cooperation with local authorities through participating in DRR volunteer activities.

As to the approach in disaster education, Kamaishi City Board of Education made "Guideline of tsunami disaster prevention education" as one of the Disaster Prevention Education Support Project 2008-2009 by MEXT. According to this guideline, disaster management system has been developed in Kamaishi City for all school children and their parents based on the themes below, under the thought of how protect the "safety of children" through the cooperation among school, parents and local authorities.

Theme 1: Improvement of DRR technology related teaching materials

Theme 2: Development and enforcement of the training program for school teachers

Theme 3: Development and Implementation of practical disaster education program

Theme 4: Implementation of innovative initiative in disaster response with local context

Using these themes, Kamaishi should foster the culture of “Everyone who live in Kamaishi City must prepare for tsunamis”, and aims for citizens to develop skills to protect themselves and help each other.

After the East Japan Earthquake and Tsunami (EJET), based on the lessons learned from EJET, Kamaishi has been promoting “Education for Creative Reconstruction to Survive Future Disasters” in the context of “Life Education” since 2011. Kamaishi City Board of Education aims to teach respecting others and all forms of life by reinforcing safety education (traffic rules, safe practice in daily life, and disaster response) and at the same time, eradicate issues such as bullying. This safety education and associated school security plan, along with crisis control manual have been developed in cooperation with relevant organizations. Furthermore, schools and local government make sure that people do not get satisfied just by developing plans and manuals, but to look into the practicality of “who” and “how” these will be utilized in the most effective way.

To ensure the effectiveness and continuity of practical disaster education beyond EJET, DRR perspectives must be incorporated into existing curriculum. In addition, DRR drill and education activities should not be confined to schools alone and plans should be shared with the relevant authorities, Kamaishi City is currently in the process of creating new DRR materials, developing plans based on the Guideline for Tsunami Disaster Prevention Education with teachers, students and local residents. Moreover, a more global and creative approaches to disaster education are considered necessary to maintain the awareness of disasters and DRR in the future (Kamaishi City 2012).

3.5 Disaster Recovery and Challenges

People in Japan have been experienced various disasters – earthquake, tsunami, typhoon, flood, mudflow, landslide and so on - from the past more frequently rather than other countries. Therefore Japanese people including government, institution and education sectors have been learning the knowledge as lessons for disaster risk reduction and post

disaster recovery from the past disasters.

Before East Japan Earthquake and Tsunami in 2011, one of huge disaster in Japan is Hanshin-Awaji Earthquake which occurred in 1995. It gave many lessons to the institutions and schools in affected area of East Japan Earthquake and Tsunami. Some part of situations of Hanshin-Awaji Earthquake is similar to those 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 response to disaster and promote educational recovery at post disaster such as checking students' safeties, management of shelters with communities, restarting school lessons and taking care of students' psychological aspects. Moreover, they also suggested how to improve disaster risk management and disaster education. As a lesson from Hanshin- Awaji Earthquake, Kobe City Board of Education (BOE) established text book of disaster education that is named "Let's carry happiness over (Shiawase-Hakobou)". 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 (Morimoto and Tahara 2012). These are completely same as concepts of people and institutions in other affected area.

On the other hand, Okushiri Tsunami Disaster in Hokkaido which occurred in 1993 also gave many suggestions to other affected area especially in Tohoku. The disaster in Okushiri was caused by tsunami mainly, so that the characteristics and situations of disaster are same as East Japan Earthquake and Tsunami. Recovery process of Okushiri Town has been done with three major strategies, the first is "Reconstructing Lives", the second is "Building DRR Town", and the last is "Enforcing Industry". They established "Disaster Recovery Foundation" and they built many resilient infrastructures against tsunami using the foundation. They also established Tsunami Memorial Park to memorize the experience and lessons of this tsunami disaster, and they tried to hand them down to posterity. With regard to disaster education, Okushiri Town Board of Education (Okushiri BOE) established Disaster Education Promotion Committee and it made DRR manual for teachers and students based on Self-help. It disseminated the manual to whole schools in town and they are performing evacuation drill repeatedly with whole residents' participation. Moreover, Okushiri BOE developed Practical Guideline for disaster education, so that each school put DRR lesson into their school curriculum and performs systematically from elementary school to high schools in collaboration with community members (Hokkaido Educational Research Center 2012).

Commonalities of DRR and DRM at recovery processes of both Hanshin-Awaji Earthquake and Okushiri Tsunami cases are practical action and response at local level, linkage with community and collaboration with diverse sectors locally and globally.

Other city, institutions and schools in Japan are able to learn many informative lessons from not only two experiences of disaster but also the experiences of other disaster affected areas including East Japan Earthquake and Tsunami in Tohoku area and it's also possible to introduce these lessons to their disaster education effectively (Oikawa 2013).

3.6 New Trend of Disaster Education

3.6.1 Sendai Declaration of World Conference on DRR 2015

In March of 2015, four years later from Great East Japan Earthquake and twenty years anniversary from Hanshin-Awaji Earthquake, the third United Nations “World Conference on Disaster Risk Reduction (WCDRR)” was held in Sendai City of Miyagi Prefecture in Japan, which is in affected area of Great East Japan Earthquake and Tsunami in March 2011. At the end of this conference, “Sendai Declaration” was adopted by the heads of state and government, ministers and delegates participating in the conference and also “Sendai Framework for Disaster Risk Reduction 2015-2030” was launched to enhance the efforts to strengthen disaster risk reduction as the follow-up to “Hyogo Frame Work for Action (HFA) 2005-2015”.

The Sendai Declaration states four points as follows (UNISDR 2015a);

- (i) Declare the determination to enhance the efforts to strengthen disaster risk reduction to reduce disaster losses of lives and assets worldwide, recognizing the increasing impact of increasing impact of disasters and their complexity in many parts of the world.
- (ii) It adopts the “Sendai Framework for Disaster Risk Reduction 2015-2030” to be strongly committed to its implementation as the guide to enhance our efforts for the future, based on valuing the important role played by the “Hyogo Framework for Action 2005-2015” having completed the assessment and review of and considered the experience gained under its implementation past ten years.
- (iii) It calls all stakeholders to action, aware that the realization of the new framework depends on our unceasing and tireless collective efforts to make the world safer from the risk of disasters in the decades to come for the benefit of the present and

future generations.

- (iv) It thanks the people and the Government hosting the Third WCDRR and to Japan for its commitment to advancing disaster risk reduction in the global development agenda.

The declaration requires all states to implement “Sendai Framework for Disaster Risk Reduction” as the new framework for global DRR action.

3.6.2 Sendai Framework for Disaster Risk Reduction as follow-up to HFA

Sendai Framework for Disaster Risk Reduction consists of six sections; i) Preamble, ii) Expected outcome and goal, iii) Guiding principles, iv) Priorities for action, v) Role of stakeholders, and vi) International cooperation and global partnership. As a distinctive feature of the third framework, concrete global targets are set in the section of “Expected outcome and goal” to support the assessment of global progress in achieving the outcome and goal of this framework (UNISDR 2015b). The seven global targets are:

- (a) Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015
- (b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015.
- (c) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.
- (d) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.
- (e) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.
- (f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030.
- (g) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.

The Sendai Framework is also urging all states to implement four Priorities for Actions which were identified through WCDRR. The priority for action as follows:

Priority 1. Understanding disaster risk

Policies and practices for disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment.

Priority 2. Strengthening disaster risk governance to manage disaster risk

Disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk.

Priority 3. Investing in disaster risk reduction for resilience

Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment.

Priority 4. Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction

The steady growth of disaster risk, including the increase of people and assets exposure, combined with the lessons learned from past disasters, indicates the need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate disaster risk reduction in response preparedness and that ensure capacities are in place for effective response and recovery at all levels.

The third point of the framework is enhancing “Build Back Better” in recovery as well as disaster preparedness for effective response. This new concept of “Build Back Better” is similar to “Sustainable Development” in the context of post-disaster recovery, rehabilitation and reconstruction. The framework emphasizes to use post-disaster recovery and reconstruction to “Build Back Better” supported by strengthened modalities of international cooperation, setting as Priority for action 4; “Enhancing disaster preparedness for effective response and to Build Back Better in recovery, rehabilitation and reconstruction”.

3.6.3 Linkage of Sendai Framework with Disaster Education

The Sendai Framework for Disaster Risk Reduction includes and emphasizes the importance of education for disaster risk reduction, recovery and reconstruction to “Build Back Better” in each section and Priority for Action. As Priorities for action 1 of “Understanding disaster risk” and Priority 4 of “Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction”, disaster risk reduction and its management should be based on an understanding of disaster risk in all its dimensions. Therefore, education including learning, training and research would take a key role for not only disaster risk reduction, but also reconstruction and building resilience, through the implementation of the Sendai Framework (Table 3.5).

In the Priority 1 “Understanding disaster risk”, at national and local levels, the Framework is emphasizing the importance to promote the incorporation of disaster risk knowledge, including disaster prevention, mitigation, preparedness, response, recovery and rehabilitation, in formal and non-formal education, also in civic education at all levels, as well as in professional education and training. And it also enhance to promote national strategies to strengthen public education and awareness in disaster risk reduction, including disaster risk information and knowledge, through campaigns, social media and community mobilization, taking specific audiences and their needs into account. At global and regional levels, the Framework enhances to develop effective global and regional campaigns as instruments for public awareness and education, building on the existing ones to promote a culture of disaster prevention, resilience and responsible citizenship, generate understanding of disaster risk, support mutual learning and share experiences.

In the Priority 2 “Strengthening disaster risk governance to manage disaster risk”, at national and local levels, the Framework enhances relevant mechanisms and initiatives for disaster risk transparency, which may include financial incentives, public awareness-raising and training initiatives, reporting requirements and legal and administrative measures, while it also promotes mutual learning and exchange of good practices and information through voluntary and self-initiated peer reviews among interested states at global and regional levels.

In the Priority 4 “Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction”, it is emphasized to promote regular disaster preparedness, response and recovery exercises, including evacuation drills, training and the establishment of area-based support systems, and

develop guidance for preparedness for disaster reconstruction, including by learning from the recovery and reconstruction programs over the decade since the adoption of the Hyogo Framework for Action, and exchanging experiences, knowledge and lessons learned at national and local levels. And at global and regional levels, it is also emphasized to enhance international mechanisms, such as the International Recovery Platform, for the sharing of experience and learning among countries and all relevant stakeholders.

In addition, the importance of research and introducing its expertise is emphasized in the Framework as a critical instrument for disaster risk reduction and reconstruction. The Priority 1 “Understanding disaster risk” enhances the scientific and technical work on disaster risk reduction and its mobilization through the coordination of existing networks and scientific research institutions at all levels and all regions in order to: i) promote scientific research of disaster risk patterns, causes and effects, and ii) identify research and technology gaps and iii) set recommendations for research priority areas in disaster risk reduction, and also iv) use post-disaster reviews as opportunities to enhance learning and public policy. On the other hand, in Priority 3 “Investing in disaster risk reduction for resilience”, it will be facilitated to promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help reduce disaster risk at global and regional level (UNISDR 2015b).

Thus, “Education”, including learning, training and research, would be the bridge toward disaster risk reduction, building resilient society and the “Build Back Better” at local, national and global level, which is the significance role of disaster education in the Sendai Framework for Disaster Risk Reduction.

Table 3.5 Disaster Education in Sendai Framework for Disaster Risk Reduction

Section of Framework	Disaster Education, Learning, Training & Research
I. Preamble	The Hyogo Framework for Action: lessons learned, gaps identified and future challenges 3. International mechanisms for strategic advice, coordination and partnership development for disaster risk reduction have been instrumental in the development of policies and strategies and the <u>advancement of knowledge and mutual learning</u>. 7. There is a need for the public and private sectors and civil society organizations, as well as <u>academia and scientific and research institutions</u>, to work more closely together and to create opportunities for collaboration 14. There is a need to address existing challenges and prepare for future ones by focusing on investing in the economic, social, health, <u>cultural and educational resilience of persons, communities and countries</u> and in the environment, also through <u>technology and research</u>

II. Expected outcome and goal	17. Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, <u>educational</u>, environmental, technological, political and institutional <u>measures that prevent and reduce hazard exposure and vulnerability to disaster</u> <u>17-(d) Reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.</u>
III. Guiding principles	19-(k) In the post-disaster recovery, rehabilitation and reconstruction phase, it is critical to prevent the creation of and to reduce disaster risk by “Building Back Better” and increasing <u>public education and awareness of disaster risk</u>
IV. Priorities for action	Priority 1. Understanding disaster risk National and local levels 24-(d) Evaluate, record, share and publicly account for disaster losses and understand the economic, social, health, <u>education</u>, environmental and cultural heritage <u>impacts</u> in the context of event-specific hazard-exposure and vulnerability information 24-(g) <u>Build the knowledge of government officials at all levels, civil society, communities and volunteers, as well as the private sector, through sharing experiences, lessons learned, good practices and training and education on disaster risk reduction, including the use of existing training and education mechanisms and peer learning</u> 24-(i) <u>Promote the incorporation of disaster risk knowledge, including disaster prevention, mitigation, preparedness, response, recovery and rehabilitation, in formal and non-formal education, as well as in civic education at all levels, as well as in professional education and training</u> 24-(k) Promote investments in innovation and technology development in <u>long-term, multi-hazard and solution-driven research in disaster risk management</u> to address gaps, obstacles, interdependencies and social, economic, <u>educational</u> and environmental <u>challenges</u> and disaster risks 24-(m) Promote national strategies to <u>strengthen public education and awareness in disaster risk reduction</u>, including disaster risk information and knowledge, through campaigns, social media and community mobilization, taking into account specific audiences and their needs Global and regional levels 25-(f) <u>Develop effective global and regional campaigns as instruments for public awareness and education, building on the existing ones to promote a culture of disaster prevention, resilience and responsible citizenship, generate understanding of disaster risk, support mutual learning, share experiences.</u> 25-(g) <u>Enhance the scientific and technical work on disaster risk reduction and its mobilization through the coordination of existing networks and scientific research institutions at all levels and all regions in order to: promote scientific research of disaster risk patterns, causes and effects; identify research and technology gaps and set recommendations for research priority areas in disaster risk reduction; use post-disaster reviews as opportunities to enhance learning and public policy</u> 25-(i) Enhance access to and support for innovation and technology as well as <u>in long-term, multi-hazard and solution-driven research</u> and development in disaster risk management Priority 2. Strengthening disaster risk governance to manage disaster risk National and local levels 27-(a)-(iii) Enhance relevant mechanisms and initiatives for disaster risk transparency, which may include financial incentives, <u>public awareness-raising and training initiatives</u>, reporting requirements and legal and administrative measures Global and regional levels 28-(e) <u>Promote mutual learning and exchange of good practices and information through, inter-alia, voluntary</u>

	and self-initiated peer reviews among interested states Priority 3. Investing in disaster risk reduction for resilience National and local levels 30-(i) Enhance the resilience of national health systems, including by <u>developing the capacity of health workers in understanding disaster risk and applying and implementing disaster risk reduction approaches in health work; promoting and enhancing the training capacities in the field of disaster medicine; and supporting and training community health groups in disaster risk reduction approaches in health programmes</u> Global and regional levels 31-(c) <u>Promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help reduce disaster risk</u> Priority 4. Enhancing disaster preparedness for effective response and to “Build Back Better” National and local levels 33-(c) <u>Promote the resilience of new and existing critical infrastructure, including water, transportation and telecommunications infrastructure, educational facilities, hospitals and other health facilities</u> 33-(h) <u>Promote regular disaster preparedness, response and recovery exercises, including evacuation drills, training and the establishment of area-based support systems, with a view to ensuring rapid and effective response to disasters and related displacement</u> 33-(k) <u>Develop guidance for preparedness for disaster reconstruction, including by learning from the recovery and reconstruction programmes over the decade since the adoption of the Hyogo Framework for Action, and exchanging experiences, knowledge and lessons learned</u> Global and regional levels 34-(d) <u>Enhance international mechanisms, such as the International Recovery Platform, for the sharing of experience and learning among countries and all relevant stakeholders</u>
V. Role of stakeholders	36-(a) Civil society, volunteers, organized voluntary work organizations and community-based organizations to <u>contribute to and support public awareness, a culture of prevention and education on disaster risk</u> 36-(a)-(ii) Children and youth are agents of change and should be given the space and modalities to contribute to disaster risk reduction, <u>in accordance with legislation, national practice and educational curricula</u> 36-(b) <u>Academia, scientific and research entities and networks to: focus on the disaster risk factors and scenarios, including emerging disaster risks, in the medium and long term; increase research for regional, national and local application</u> 36-(c) Business, professional associations and private sector financial institutions, to <u>engage in awareness-raising and training for their employees and customers; engage in and support research and innovation as well as technological development for disaster risk management</u> 36-(d) Media to stimulate a culture of prevention and strong community involvement in <u>sustained public education campaigns</u> and public consultations at all levels of society, in accordance with national practices
VI. International cooperation and global partnership	General considerations 40. In addressing economic disparity and <u>disparity in technological innovation and research capacity among countries it is crucial to enhance technology transfer involving a process of enabling and facilitating flows of skill, knowledge, ideas, know-how and technology from developed to developing countries in the implementation of the present framework</u> Means of implementation 47-(c) <u>Promote the use and expansion of thematic platforms of cooperation such as global technology pools and</u>

	<u>global systems to share know-how, innovation and research</u> and to ensure access to technology and information in disaster risk reduction Support from international organizations 48-(c) UNISDR to support the implementation, follow-up and review of this framework through reinforcing a culture of prevention in relevant stakeholders, through supporting <u>development of standards by experts and technical organizations, advocacy initiatives, and dissemination of disaster risk information, policies and practices</u> , as well as <u>providing education and training on disaster risk reduction</u> 48-(i) The United Cities and Local Governments organization and other relevant bodies of local governments to continue supporting cooperation and <u>mutual learning among local governments for disaster risk reduction and the implementation of this framework</u>
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Main data from “Sendai Framework for Disaster Risk Reduction” (2015), Analyzed by author
Underlines are related descriptions to topics of education, training and research

3.6.4 Synergy of Sendai Framework with Education for Sustainable Development

3.6.4.1 Sendai Framework for DRR emphasizes Sustainable Development

With regard to the synergy between disaster risk reduction (DRR) and sustainable development (SD), states which participated in WCDRR reiterated their commitment to disaster risk reduction and the building of resilience to disasters to be addressed with a renewed sense of urgency in the context of sustainable development during the WCDRR, based on the lessons learned, gaps identified and future challenges from “The Hyogo Framework for Action”. And, it is recalled that the outcome of the UN Conference on Sustainable Development 2012, “The Future We Want”, which called for disaster risk reduction and building of resilience to disasters to be addressed with a renewed sense of urgency in the context of sustainable development and poverty eradication and to be integrated at all levels. The Sendai Framework for Disaster Risk Reduction also states that effective disaster risk management contributes to sustainable development and that disaster risk reduction is essential to achieve sustainable development, under the recognition of “Disasters, many of which are exacerbated by climate change and increasing in frequency and intensity, significantly impede progress towards sustainable development” and “Ten years after the Hyogo Framework for Action, disasters still continue to undermine efforts to achieve sustainable development” (UNISDR 2015b). Therefore, the framework is affirming that the development, strengthening and implementation of relevant policies, plans, practices and mechanisms need to aim at coherence across sustainable development and growth, food security, health and safety, climate change and variability, environmental management and disaster risk reduction agendas at its Guiding Principles (Table 8.2).

3.6.4.2 Sendai Framework for DRR enhances cooperation and Partnership

On the other hand, the Sendai Framework for Disaster Risk Reduction identifies modalities of cooperation based on commitments to implement a post-2015 framework for disaster risk reduction. Based on lessons learned, gaps identified and future challenges from The Hyogo Framework for Action, the Sendai framework analyzes at preamble;

- (i) International mechanisms for strategic advice, coordination and partnership development for disaster risk reduction, such as the Global Platform for Disaster Risk Reduction and the regional platforms for disaster risk reduction, as well as other relevant international and regional forums for cooperation have been instrumental in the development of policies and strategies and the advancement of knowledge and mutual learning (UNISDR 2015b):
- (ii) There is a need for the public and private sectors and civil society organizations, as well as academia and scientific and research institutions, to work more closely together and to create opportunities for collaboration
- (iii) International, regional, subregional and transboundary cooperation remains pivotal in supporting the efforts of States, their national and local authorities as well as communities and businesses to reduce disaster risk
- (iv) To complement national action and capacity, there is a need to enhance international cooperation between developed and developing countries and between States and international organization.

According to this review of Hyogo Framework for Action, the Sendai Framework for DRR also further enhances to establish various kinds of global and national cooperation, partnerships and platforms for its implementation (Table 3.6).

In the Sendai Framework for Disaster Risk Reduction, disaster risk reduction, recovery and reconstruction process which is called as “Build Back Better”, and building resilience should be recognized and renewed in the context of sustainable development, and it is emphasized that disaster risk reduction is essential to achieve sustainable development. To realize it effectively, it should be also implemented with the view to establish diverse cooperation and partnerships by states, institutions, organizations, NGO/NPO and multi-stakeholders at local and national as well as global and regional level. The concept and approach which links these aspects and implementations is Education for Sustainable Development (ESD). That is the synergy concept of ESD and DRR in the Sendai Framework for Disaster Risk Reduction.

Table 3.6 Cooperation in Sendai Framework for Disaster Risk Reduction

Level	Type of Cooperation, Collaboration and Partnership
International Cooperation	• Enhance international cooperation between developed and developing countries and between States and international organizations to complement national action and capacity. • Enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030. • Each State has the primary responsibility to prevent and reduce disaster risk, including through international, regional, subregional, transboundary and bilateral cooperation. • Engage in the Global Platform for Disaster Risk Reduction, the regional and sub-regional platforms for disaster risk reduction and the thematic platforms in order to forge partnerships • Promote the development and strengthening of disaster risk transfer and sharing mechanisms and instruments in close cooperation with partners in the international community, business, international financial institutions and other relevant stakeholders • Promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help reduce disaster risk • North-South cooperation, complemented by South-South and triangular cooperation, has proven to be key to reducing disaster risk • Promote the use and expansion of thematic platforms of cooperation such as global technology pools and global systems to share know-how, innovation and research and to ensure access to technology and information in DRR
National & Local level Cooperation	• Enhance collaboration among people at the local level to disseminate disaster risk information through the involvement of community-based organizations and non-governmental organizations • Establish and strengthen government coordination forums composed of relevant stakeholders at national and local levels, such as national and local platforms for disaster risk reduction • Civil society, volunteers, organized voluntary work organizations and community-based organizations to participate, in collaboration with public institutions, to provide specific knowledge and pragmatic guidance
Multi-stakeholder Platform	• Promote and improve dialogue and cooperation among scientific and technological communities, other relevant stakeholders and policymakers in order to facilitate a science-policy interface for effective decision-making in disaster risk management. • Promote common efforts in partnership with the scientific and technological community, academia and the private sector to establish, disseminate and share good practices internationally • Promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help reduce disaster risk • Enhance cooperation between health authorities and other relevant stakeholders to strengthen country capacity for disaster risk management for health • Promote the cooperation of diverse institutions, multiple authorities and related stakeholders at all levels in view of the complex and costly nature of post-disaster reconstruction • Promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help reduce disaster risk

3.7 Key findings

A) Education contributes to Disaster Risk Reduction and Recovery

Through the evolution of disaster education, it is identified that “Education” takes a crucial role in reducing disaster risks and achieving human security and recovery in the attempt to achieve sustainable development. The Hyogo Framework for Action (HFA) 2005-2015 emphasized the role of “Knowledge and Education” and highlights formal and non-formal education and awareness-raising as important components for disaster risk reduction. Disaster education aims to accelerate the progress of society toward disaster resilience at the same time, increase awareness and develop proper knowledge and skills among individual.

The mission of disaster education is to convey an understanding of natural and environment conditions and the human actions and inaction that lead to disaster, to stimulate change in individual and group behavior, and to motivate advocacy and raise expectation of social policy to reduce these threats. Disaster education should not be merely teaching “natural hazard” or organizing “campaigns” for risk awareness but should be guiding people toward the discovery of their own solution by their own power.

B) Holistic and Interdisciplinary Approach to Disaster Education

The activities and program/curriculum of disaster education should be interdisciplinary, holistic and practical approach, making the best use of indigenous knowledge, information and experiences which have been sustained over generations as valuable lessons from past disasters in each community or area, as well as results of academic researches and expertise of specialists. The disaster education is more successful through experience-based and action-oriented learning. “Disaster Education” is also an interactive process of mutual learning among people and institutions. It encompasses far more than formal education at schools and universities, and involves the recognition and the use of traditional wisdom and local knowledge for perception from natural hazard.

C) School plays a key role of Disaster Education

As lessons learned from the campaign by UNISDR, Education is a process for effective disaster reduction and knowledge, perception, comprehension and actions are the four important steps. Thus, schools and formal education play an important role in knowledge development. On the other hand, Family-, community-, and self-education

are important for comprehension of knowledge and implementation of risk reduction actions. This holistic education includes actions at local level as well as its policy integration

The importance of disaster education at school is the following reasons: i) Children are one of the most vulnerable sections of the society during a disaster, ii) They represent the future, iii) School serves as a community's central location for meetings and group activities, and iv) The efforts of school education can be transferred to parents and community.

D) Involving Community and Multi-stakeholder in Disaster Education

Disaster Education emphasizes the importance of community participation for the purpose of achieving sustainability within the community. School education is insufficient to either raise preparedness or motivate the individual to take actions on disaster risk reduction activities. Education is vital, as is the sharing of experiences within and among communities. Disaster education should be implemented in not only formal education but also non-formal and in-formal education based on each local community, linking with parents, community members and outside sectors such as local institutions, local government and NGO/NPOs. The goal of developing "Disaster-resilient communities" is widely understood to depend heavily on the success of disaster education. The integration of both formal and non-formal/in-formal education through school is one way of ensuring that these messages reach every family and community so that the learning can be sustained into the future generation.

E) Convergence of Disaster Education to International Initiatives

Disaster education is one of essential life-skills program which fosters the ability for disaster risk reduction to vulnerable children, people and communities, so that it can be regard as a part of Education for All (EFA) achievement. In this context, disaster education is also an important component and can contribute to the achievement of the Millennium Development Goals (MDGs).

Moreover, disaster education has to seek for sustainable community, society and future by developing the capacity of people, communities and nations for disaster risk reduction through their promotion and practice. Thus, it should be promoted as an important approach and component of ESD to achieve sustainable development. Not only the concept but also methodology and strategy of disaster education have similarity or commonality with those of ESD. So, it is crucial to make the best use of the synergy

between ESD and disaster education, and it leads to enrich the learning and practice and to broaden the perspective of disaster education.

F) Incorporating Disaster Risk Reduction into Education

(a) Approaches to Incorporate Disaster Risk Reduction into Education

Disaster education should be promoted for the pursuit of sustainable development based on environmental education, human security and human rights. Therefore, disaster education also must be implemented through the combination and synergy among formal, non-formal and informal education. In addition to classroom lecture, supplementation of non-formal, experience-based and action-oriented learning activities, with the incorporation of indigenous knowledge and community participation, is seen to enhance the awareness and preparedness within individuals as well as the community. The local sources and information, also known as indigenous knowledge, evolved over generations in the community are time tested in the local context, and thus are seen to be able to sustain for generations.

The school plays an important role in raising awareness among students, teachers and parents. Children are among the most vulnerable population group during disaster and disaster risk reduction empowers children and helps build greater awareness of the issue in communities. School education is divided into curricular and extra-curricular activities, so that disaster education in school should be conducted as part of both curricular and extra-curricular activities according to each school curriculum in order to increase the hours spent on disaster education. The school is able to conduct systematic and effective disaster education depend on school level and characteristics of the regions, considering developing stage of students and aims of subjects of field of school curriculum.

(b) Curriculum Development to Incorporate Disaster Risk Reduction into Education

Disaster risk reduction (DRR) is interdisciplinary subject and it has links to other issues such as environment, development and human security, so that DRR should be taken as a holistically linked complementary set of actions that require collaborative and coordinated action by all concerned stakeholders. Therefore, the disaster education curriculum is needed to consider these linkages and it should be developed and implemented by interdisciplinary approach. In this context, curriculum development of disaster education is able to learn a lot from the concept and method of curriculum development for ESD. The ingredients for effectively incorporating DRR into teaching

and learning practice based on the lessons of ESD are: i) Full integration of ESD into the curriculum with continuity, ii) Student-centered activities and assessments that reward critical thinking and reflective learning, iii) Trans-disciplinary teaching, with modules that are taught by staff from a range of disciplines and encourage contact between students from different subject areas, and iv) Teaching that emphasizes an ongoing process.

Guiding principles in disaster risk reduction are; i) Inclusive Curriculum which needs to address issues at a general level that are inclusive of all for a well-rounded foundation to proceed to specific issues, ii) Theoretical Focus on the basic concepts and theories of DRR, climate change adaptation, global warming and scientific understanding of various type of disaster, iii) Field Orientation which exposes students to real- life situations to assess vulnerability, mitigation, and preparedness measure to help them bridge the theories with the practice, iv) Multidisciplinary Approach which provides a vast field of research and coordination and also increases the need of understanding the subject as a whole, and v) Skill Enhancement which plays an important role in minimizing the losses caused by the disaster through better preparation and management. Moreover, as the approaches to the development of disaster education curriculum in formal education, it could be indentified: i) Curriculum integration approach which is to develop and integrate the learning units or modules for disaster education by making the best use of other subject's chapters and modules which focused on or related to disaster risk reduction, ii) Extracurricular integration approach which is usually project-based or action-oriented learning, ii) Curriculum infusion approach which is based on existing subjects or field of school curriculum to infuse DRR components into units, modules and activities of subjects, and iv) Stand-alone course which is to make specialized curriculum for disaster education.

(c) Effective Tools and Methods for Disaster Education Promotion

Creating tools and methods of disaster education is very effective and important for its promotion. In the process of developing tools and methods, it should be considered: i) Mode of education; formal, non-formal and informal education, ii) Type of tool; printed or non-printed etc., iii) Type of study; lecture, experience, discussion etc., iv) Purpose of study; inquiry / investigation, discussion / sharing, presentation / dissemination, etc., and v) Targeted people or user; students, teacher, parents, residents, etc.

As one of representative tools for disaster education, “Town Watching” is a very effective method and activity in disaster education. Town watching is supposed to be initiated by students and facilitated by teachers, parents, municipal employees,

community workers and volunteer. Along with town watching, production of community maps has been proven to be a successful tool in developing an efficient way to increase community awareness. This map creates a “sense of inclusion”. Thus, it becomes an excellent tool both as an educational aid to enhance awareness and as a public participation tool that helps unite the community. The concept map is also useful not only for students’ learning but also for teachers’ training in disaster education. Through the concept map, teachers can measure the amount of knowledge and image or concept of disaster management that students have.

As a part of experience-based learning, disaster prevention drill, especially, evacuation drill and the camp focused on DRR often takes place in disaster education. In addition, Internet is useful to facilitate the sharing good practices around the world. Trained teachers or community leaders can find various kinds of helpful information on the Internet for preparedness for, response to and recovery from disaster.

Toward the development and implementation of tools for disaster education, it should be customize to the local context considering: (a) the physical-environmental difference, (b) the social-cultural value difference, and (c) the gap between the informal institution aspects applied from the original context to the new context.

G) Disaster Education in Hyogo Framework for Action

The Hyogo Framework for Action 2005-2015 (HFA) adopted by second World Conference Disaster Reduction held in Kobe, Hyogo is the following five priorities for action 2005-2015:

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.
2. Identify, assess and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
4. Reduce the underlying risk factors.
5. Strengthen disaster preparedness for effective response at all levels.

HFA emphasizes the role of formal and non-formal education and awareness-raising as important components for disaster risk reduction. The priority for action 3 of the HFA insists the importance of education for DRR as “Use knowledge, innovation and education to build a culture of safety and resilience at all levels”. Under the priority for action 3, UNISDR addressed emphasis of integrating disaster risk reduction into formal

education through the campaign. However, UNISDR not only highlighted the importance of disaster education into formal education, but also emphasized the importance of community participation in order to achieve sustainability within the community at the same time.

According to the Guideline for implementing the Hyogo Framework by UNISDR, UNISDR suggested 22 tasks which are organized to help address and guide the implementation of the HFA's five priorities for action. Out of the 22 tasks, 16 tasks were identified and modified to suit the education sector, and they are considered as "Education in Hyogo Framework for Action (E-HFA)". The 16 tasks identified should be performed at all levels including national, local, community and school, in order to achieve sustainable improvement.

H) Disaster Education in Japan moving forward

In Japan, disaster education is divided into three types: i) as formal education at school which is usually promoted as a part of subjects or integrated study based on school curriculum and school events such as evacuation drill, ii) as non-formal education which is organized disaster prevention activity and drill conducted by local sector such as city government, fire department or community learning center and so on, and iii) as informal education which is disaster education by parents, family members and community member or association at home or in the community in daily life.

According to the MEXT's mid-term report, disaster education should achieve the following four abilities: i) Ability to take action in disaster preparedness and mitigation, ii) Ability to protect oneself from natural disaster and cope with post-disaster life, iii) Ability to rehabilitate disaster-affected areas and to reconstruct secure and safety society, and iv) Ability to voluntary help other people and area to be safe. After the Great East Japan Earthquake and Tsunami, based on the experience and lessons of the disaster, MEXT indicates the goal of disaster education: i) Having a better understanding of the current situation, the causes and disaster mitigation of natural disasters, ii) Understanding and predicting the risks which is due to the occurrence of earthquakes and typhoons, and iii) Respecting the life of oneself and others, and recognizing the importance of creating a safe and secure society. Under the situation and lessons of East Japan Earthquake and Tsunami (EJET) on 11 March 2011, MEXT has also launched the concept of "School-centered community building" for disaster recovery in order to promote building resilient community for DRR and recovery. The concept has three pillars: i) Ensuring safety and security of schools, ii) Provision to improve DRR and

eco-friendly features and iii) Combining schools with other public facilities to make school the center for community interaction.

With regard to the practice and implementation of disaster education in Japan, it can be identified some good practices of curricular disaster education, extra-curricular disaster education and disaster education for the recovery, based on the lessons from sufferings of Mega-disaster such as Hanshin-Awaji Earthquake, strong typhoons and East Japan Earthquake and Tsunami. Saijo City of Ehime Prefecture in Japan has been promoting extra-curricular advanced disaster education based on the experience of typhoon disaster in 2004. Saijo City has started implementation of “12-years-old Education Project” from 2006. The project aims to build a community centered DRR culture by training young leaders with social skills and DRR capacity through acquirement of DRR knowledge. The main annual events of the project are the leader’s training and the DRR Summit. On the other hand, Maiko High School in Hyogo Prefecture established “Environment and Disaster Mitigation Course” in 2002 which focuses on disaster risk management based on the lessons from Hanshin-Awaji Earthquake. According to the education curriculum of the “Environment and Disaster Mitigation Course”, the subjects in the course are divided into three types: i) General subjects, ii) Special subjects integrated into general subjects, and iii) Special subjects with a new education concept concerning disaster mitigation. This practice is advanced curriculum-based disaster education not only in Japan but also in the world. Lastly, Kamaishi City in Iwate Prefecture, which is famous for “Kamaishi Miracle”, has been promoting disaster education efforts included cooperation between schools and local communities, such as identification of evacuation shelters with parents on class visit days. Kamaishi City Board of Education made “Guideline of tsunami disaster prevention education” in 2009, and according to this guideline, disaster management system has been developed in Kamaishi City for all school children and their parents under the thought of how protect the “safety of children” through the cooperation among school, parents and local authorities. After the EJET, based on the lessons learned, Kamaishi has been promoting “Education for Creative Reconstruction to Survive Future Disasters” in the context of “Life Education” since 2011.

I) Sharing Lessons and Challenges contributing to Disaster Recovery

Under the recognition of that disaster is getting intensely and frequently because of climate change around the world, people including government, institution and education sectors have been learning the knowledge as lessons for disaster risk reduction and post disaster recovery from the past disasters. In Japanese case,

Hanshin-Awaji Earthquake which occurred in 1995 gave many lessons to the institutions and schools in affected area of East Japan Earthquake and Tsunami in 2011. As a lesson from Hanshin- Awaji Earthquake, Kobe City Board of Education (BOE) established text book of disaster education. It is emphasized that the importance of life, collaboration, appreciation, bonds of family and volunteer. This part of situations of Hanshin-Awaji Earthquake is similar to those of Tohoku area, so that their experiences and method are very useful for the people and institutions in Tohoku region.

On the other hand, Okushiri Tsunami Disaster in Hokkaido which occurred in 1993 also gave many suggestions to other affected area especially in Tohoku. The disaster in Okushiri was caused by tsunami mainly, so that the characteristics and situations of disaster are same as East Japan Earthquake and Tsunami. Okushiri Town Board of Education (Okushiri BOE) established Disaster Education Promotion Committee and it made DRR manual for teachers and students based on Self-help. Moreover, Okushiri BOE developed Practical Guideline for disaster education, so that each school put DRR lesson into their school curriculum and performs systematically from elementary school to high schools in collaboration with community members.

Commonalities of DRR and DRM at recovery processes of both Hanshin-Awaji Earthquake and Okushiri Tsunami cases are practical action and response at local level, linkage with community and collaboration with diverse sectors locally and globally. Other city, institutions and schools in Japan are able to learn many informative lessons from not only two experiences of disaster but also the experiences of other disaster affected areas including EJET.

J) Sendai Framework for DRR: Future Perspective of Disaster Education

At the third United Nations “World Conference on Disaster Risk Reduction (WCDRR)” held in Sendai City in March of 2015, “Sendai Declaration” was adopted and “Sendai Framework for Disaster Risk Reduction 2015-2030” was launched to enhance the efforts to strengthen disaster risk reduction as the follow-up to “Hyogo Frame Work for Action (HFA) 2005-2015”. As a distinctive feature of the third framework, firstly, seven concrete global targets are set to support the assessment of global progress in achieving the outcome and goal of this framework. Secondly, the Sendai Framework is also urging all states to implement four Priorities for Actions which were identified through WCDRR. The priority for action is:

Priority 1. Understanding disaster risk

Priority 2. Strengthening disaster risk governance to manage disaster risk

Priority 3. Investing in disaster risk reduction for resilience

Priority 4. Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction

The third point of the framework is enhancing “Build Back Better” in recovery as well as disaster preparedness for effective response. This new concept of “Build Back Better” is similar to “Sustainable Development” in the context of post-disaster recovery, rehabilitation and reconstruction.

The Sendai Framework for Disaster Risk Reduction includes and emphasizes the importance of education for disaster risk reduction, recovery and reconstruction to “Build Back Better” in each section and Priority for Action. As Priorities for action 1 and Priority 4, disaster risk reduction and its management should be based on an understanding of disaster risk in all its dimensions. In addition, each priority for action includes and emphasizes disaster education at national and local levels as well as global and regional levels (Table 3.5). For example, in the Priority 1 “Understanding disaster risk”, the it is emphasized to promote the incorporation of disaster risk knowledge in formal and non-formal education, also in civic education at all levels, as well as in professional education and training at national and local levels. In the Priority 2 “Strengthening disaster risk governance to manage disaster risk”, the framework also promotes mutual learning and exchange of good practices and information through voluntary and self-initiated peer reviews among interested states at global and regional levels. In addition, In the Priority 4 “Enhancing disaster preparedness for effective response and to “Build Back Better”, it is emphasized to promote regular disaster preparedness, response and recovery exercises, including evacuation drills, training and the establishment of area-based support systems, and develop guidance for preparedness for disaster reconstruction. Furthermore, the importance of research and introducing its expertise is emphasized in the Framework as a critical instrument for disaster risk reduction and reconstruction.

Thus, “Education”, including learning, training and research, would be the bridge toward disaster risk reduction, building resilient society and the “Build Back Better”

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Part 2 Case Study of Kesennuma City

Chapter 4 East Japan Earthquake and Tsunami and its Impacts on Education Sectors

Abstract: East Japan Earthquake and Tsunami (EJET) was the largest disaster on its scale, extent and intensity among the disaster which Japan has been experienced so far. Its impact on education sectors was enormous on various aspects. However, the impacts warrant an in-depth examination of lessons learned from the disaster in order to achieve well-rounded disaster education for the disaster risk reduction of future disaster and the recovery from EJET. Geographical condition determines the feature of disaster such as tsunami. Through the observation of the damage of EJET, it can be categorized two types of tsunami disaster, which is Sanriku Coast area and Sendai Plain area. On the other hand, Damage level to educational governance also determines the recovery process of education sectors. This chapter analyzes the characteristics of tsunami disaster which made contrast between those two areas and cases, with observing selected case of education sectors in both. Finally, it will be discussed how to promote disaster education including evacuation and disaster recovery according to different situation of the disaster and recovery as key lessons from EJET, considering governance issues, school education and community involvement.

4.1 Earthquake and Tsunami and its Damages

4.1.1 Overview of East Japan Earthquake and Tsunami

At 2:46 p.m. on Friday March 11th, 2011, the massive earthquake of magnitude 9.0 on the Richter scale occurred in Pacific Ocean in front of East Japan. It is the worst and the largest in Japan's meteorological records. The earthquake caused a huge tsunami which happened once per millennium following the earthquake. The huge tsunami hit the Pacific coastline of northeastern Japan, especially, Tohoku Region (Oikawa 2012). Japan Meteorological Agency named this earthquake "The 2011 off the Pacific coast of Tohoku Earthquake". After that, the round-robin cabinet meeting of April 1st decided its name as "the Great East Japan Earthquake" (MILT 2011).

On 11 March 2011, at 14:46, "The 2011 off the Pacific coast of Tohoku Earthquake" of magnitude 9.0 occurred off shore at Sanriku, 130km east-southeast of

the Oshika Peninsula in Miyagi Prefecture. This was the largest earthquake observed in Japan's history. Seismic intensity level was measured as 7 (maximum) in Kurihara City where is the northern area of Miyagi Prefecture (Table 4.1). The seismic ground motion was observed in a wide area in Japan from Hokkaido to Kyushu, and was felt most acutely in East Japan (CAO 2011). Especially, a widespread area experienced destructive shakings, including the prefectures of Miyagi, Fukushima, Ibaraki, and Tochigi (Fig. 4.1). It was the fourth mega earthquake known to date: other three were the Chile earthquake in 1960, the Alaska earthquake in 1964 and the Sumatra earthquake in 2004.

Table 4.1 Summary of Great East Japan Earthquake (East Japan Earthquake and Tsunami)

Date and Time:	11 March 2011 14:46 JST (05:46 UTC)					
Magnitude:	9.0 (the largest earthquake recorded in Japan)					
Hypocenter:	38° 6.2' N, 142° 51.6' E (130km ESE off Oshika Peninsula) Depth 24km					
Mechanism:	Reverse fault type with WNW-ESE compressional axis (by CMT analysis)					
Earthquake Early Warning:	Issued 8.6 seconds after the detection of the first P-wave at the nearest seismic station					
JMA Seismic Intensity:	7 (Max)	Kurihara City of Miyagi Prefecture				
	6+	28 cities and towns in Miyagi, Fukushima, Ibaraki, and Tochigi Prefectures				
	6- or weaker	Observed nationwide from Hokkaido to Kyushu				
Tsunami Warnings and Advisories:	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 15:30 JST (06:30 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
Observed Tsunami:	9.3m or higher at Soma (Fukushima Pref.), 8.6m or higher at Ishinomaki (Miyagi Pref.), etc					

[Source: Japan Meteorological Agency 2011]

The earthquake generated a massive tsunami. Three minutes after the outbreak of the massive earthquake, Japan Meteorological Agency (JMA) announced the warning of a huge tsunami on the Pacific coast in Iwate, Miyagi, and Fukushima. Until the evening of March 13, the JMA continued to announce warnings in coastal areas of the country. The tsunami caused by the massive earthquake surged onto coasts in wide areas, from Hokkaido to Okinawa, centering along the Pacific coast along regions of Hokkaido, Tohoku and Kanto (MILT 2011). The first tsunami wave of this earthquake reached the

Japanese mainland 20 minutes after the earthquake and affected a 2,000km stretched of Japanese Pacific coast. Large tsunami waves were observed all over Japan.

The tsunami hit the prefectures of Iwate, Miyagi and Fukushima at different times, with closest occurring about 15 to 25 minutes from the time of the earthquake and farthest occurring approximately one hour after the earthquake. On an average, there was 30-40 minutes time lag between earthquake and the arrival of the tsunami. The height of tsunami was also different depend on the place owing to the distance from the epicenter and geographical conditions. According to Japan Meteorological Agency (JMA), the highest height of tsunami in the Great East Japan Earthquake which they could observe was 9.3m in Souma City, Fukushima prefecture. However, taking the trace of tsunami into considering, they estimated that the 16.7m of tsunami had attacked to Ofunato City in Iwate prefecture (Fig 4.2). Furthermore, at peninsula in Ofunato City, it was reported by researching group that the tsunami went up to the height of 40.1m, which is the highest record of tsunami observed in Japan's historical records (TTJS 2011).

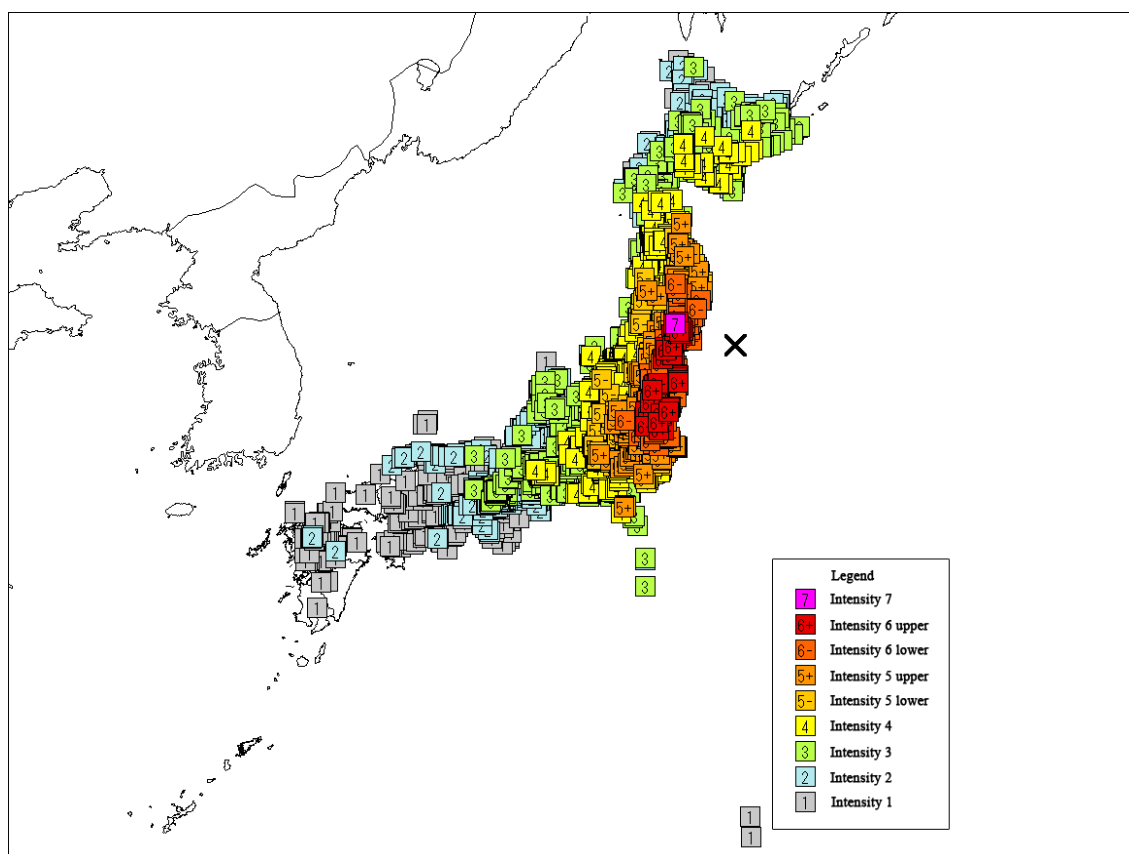


Fig. 4.1 Seismic Intensity Map of East Japan Earthquake and Tsunami
[Source: Japan Meteorological Agency]

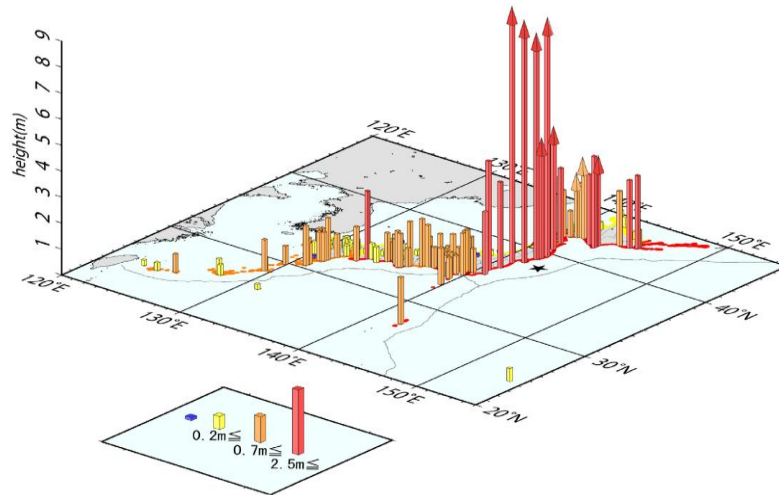


Fig. 4.2 Observation of Tsunami in East Japan Earthquake and Tsunami
[Source: Japan Meteorological Agency]

4.1.2 Damage of East Japan Earthquake and Tsunami

This disaster of earthquake and tsunami caused terrible and widespread damages of many aspects such as personal sufferings, social, economic, environmental and cultural damages in Pacific coast line area of eastern Japan such as Tohoku and Kanto region (Fig. 4.3). According to Fire and Disaster Management Agency (FDMA) in Japan, about 19,000 people were killed, the number of missing persons is more than 2,600 and more than 6,000 people are injured by the earthquake and tsunami. In addition, more than 127,000 houses were completely collapsed, and more than 1 million houses suffered the partial collapse of their building by earthquake and tsunami as well as the fires which occurred following both (FDMA 2014). This huge and catastrophic damage spread over 22 prefectures in Japan (Table 4.2).



Fig. 4.3 Damages by Massive Tsunami caused by Great East Japan Earthquake
left: Miyako City in Iwate prefecture, right: Minami Sanriku Town in Miyagi prefecture,
[Sources: Miyako City, Iwate (left)]

Table 4.2 Damage Impact of East Japan Earthquake and Tsunami

Prefecture	Casualty			Housing damage					Fire
	Dead	Missing	Injured	Total collapsed	Half collapsed	Partial Collapsed	Inundation above floor level	Inundation under floor level	
Hokkaido	1	0	3	0	4	7	329	545	4
Aomori	3	1	110	308	701	1,005	0	0	11
Iwate	5,115	1,132	211	19,107	6,609	18,827	0	6	33
Miyagi	10,496	1,271	4,145	82,992	155,122	224,158	0	7,796	137
Akita	0	0	11	0	0	5	0	0	1
Yamagata	3	0	45	0	14	1,249	0	0	2
Fukushima	3,352	226	183	21,224	73,764	161,139	1,061	338	38
Ibaraki	65	1	712	2,628	24,355	186,423	1,799	779	31
Saitama	1	0	104	24	199	16,567	0	0	12
Chiba	22	2	256	801	10,131	54,988	157	731	18
Tokyo	7	0	117	16	203	6,225	0	0	35
Kanagawa	4	0	137	0	41	459	0	0	6
Niigata	0	0	3	0	0	17	0	0	0
Yamanashi	0	0	2	0	0	4	0	0	0
Nagano	0	0	1	0	0	0	0	0	0
Shizuoka	0	0	3	0	0	13	0	5	0
Mie	0	0	1	0	0	0	2	0	0
Osaka	0	0	1	0	0	0	0	0	0
Tokushima	0	0	0	0	0	0	2	9	0
Kochi	0	0	1	0	0	0	2	8	0
Total	19,074	2,633	6,219	127,361	273,268	762,277	3,352	10,217	330

As of Sep. 1st, 2014 [Source: Fire and Disaster Management Agency, Modified by author]

The number of deaths is over three times of that of the Greater Hanshin-Awaji Earthquake. However the main cause of death at East Japan earthquake was different from one of Hanshin-Awaji. Over 90% of dead persons in Iwate, Miyagi and Fukushima prefectures were drowning by tsunami (Fig. 4.4 left). On the other hand, people who are more than 60 years old account for 63% of the dead persons (Fig. 4.4 right).

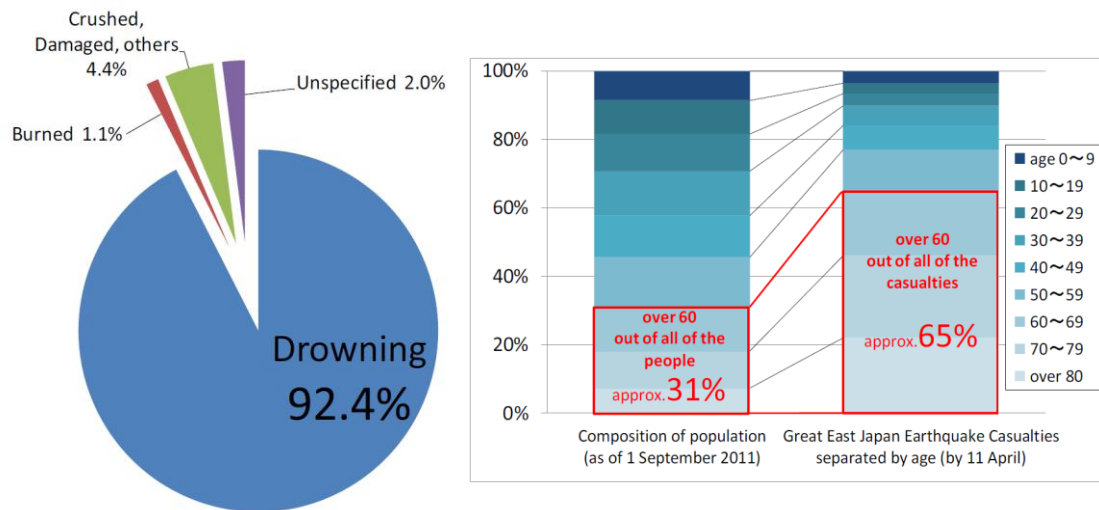


Fig. 4.4 Cause and Population by age of Death in East Japan Earthquake and Tsunami (As of 2011 in Iwate, Miyagi and Fukushima Prefecture), Left: Cause of Death in EJAT, Right: Comparison of the number of casualties and the area population by age in EJET [Source: Cabinet Office, Government of Japan]

Moreover, this number of 19,000 deaths includes 3,089 dead people who didn't die because of direct impact of the disaster such as earthquake, tsunami and fire. They had lost their lives related to the disaster after the evacuation, for example, getting ill or getting it worse because of bad condition of sanitation and foods in shelters, the stress or psychological problem because of changing the situations of living environment, and the problems of human relations and economics caused by the disaster. Especially, the elder persons are very vulnerable in these critical situations, so that the aged people (over 65) occupied approximately 90% of whole disaster related death (Table 4.3). Although they had survived this massive disaster for the time being, they had lost their lives after the disaster owing to health and psychological troubles caused by the disaster. That is very typical and serious problem in the disaster of East Japan Earthquake and Tsunami comparing with other disasters in Japan. This is one reason why it takes so long time for recovery and reconstruction from the disaster as the damage is so widespread and catastrophic.

Analyzing the characteristics of tsunami damage with regard to regional situations, it can be categorized as two cases because of geographical conditions of regions. One is "Plain area" which is along coastline in south of Miyagi and Fukushima prefecture, mainly Sendai Plain located in south part of Miyagi Prefecture. Another is "Sanriku area" which is saw-toothed coast line, it is called rias coast line areas, ranging from

north of Iwate prefecture to mid-Miyagi prefecture. Those two areas are divided by Oshika Peninsula which is a part of Ishinomaki City and close to epicenter of “The 2011 off the Pacific coast of Tohoku Earthquake”.

Table 4.3 Disaster Related Death after East Japan Earthquake and Tsunami

Prefecture	Total	According to Age		
		Under 20	21 to 65	Over 65
Iwate	441	1	54	386
Miyagi	889	1	111	777
Yamagata	2	0	1	1
Fukushima	1,704	0	154	1,550
Ibaraki	41	2	6	33
Saitama	1	0	1	0
Chiba	4	0	1	3
Tokyo	1	1	0	0
Kanagawa	3	0	1	2
Nagano	3	0	0	3
Total	3089	5	329	2,755

As of 31 March, 2014 [Source: Reconstruction Agency]

Comparing the number of victims (dead and missing people) and flooded area, Fig. 4.5 shows the contrast between Plain area and Sanriku area. South of Miyagi and Fukushima prefecture, there are broad plain along the coast line, so that inundated area by tsunami was widespread (Shaw and Takeuchi, 2012). In Sendai plain which is one of the biggest and best agricultural regions in Japan, tsunami also inundated a wide area, extending about 5km from the coastline of Sendai Plain until stopped by high way (Fig. 4.6 left). Tidal waves ran up along rivers such as the Natori River and the Abukuma River, and changed the water level of Kitakami River at the point of 49km away from its estuary (MILT 2011).

On the other hand, although the flood area of each city in Sanriku area is not so wide, many cities in Sanriku area have higher numbers of dead and missing people than Plain area. Especially, Rikuzentakata City, Otsuchi Town, Kamaishi City in Iwate prefecture and Kesennuma City in Miyagi prefecture had more than one thousand victims by tsunami and there is also several city and town those had from 500 to 1,000

victims in Sanriku area. Because, the tsunami wave is getting higher when it go into the deep bay from the ocean, so that many cities and towns in Sanriku area have attacked by big tsunami and suffered seriously. Fig. 4.2 also shows the evidence of this incident as data. This is the reason why the wave caused by earthquake is called “Tsu-nami”, which means “Bay Wave” (Fig. 4.6 right).

Ishinomaki City of Miyagi prefecture was the most seriously damaged city in tsunami affected area of East Japan Earthquake and Tsunami. Ishinomaki City consist of both Plain area and Sanriku area because the city is located in the boarder of Sanriku area and Plain area and it had a municipal merger with one city and six town in 2005, so that the city had both damages of Plain area and Sanriku area. The number of dead and missing is 3,971 people (as of April, 2017) and the inundated area is 73km².

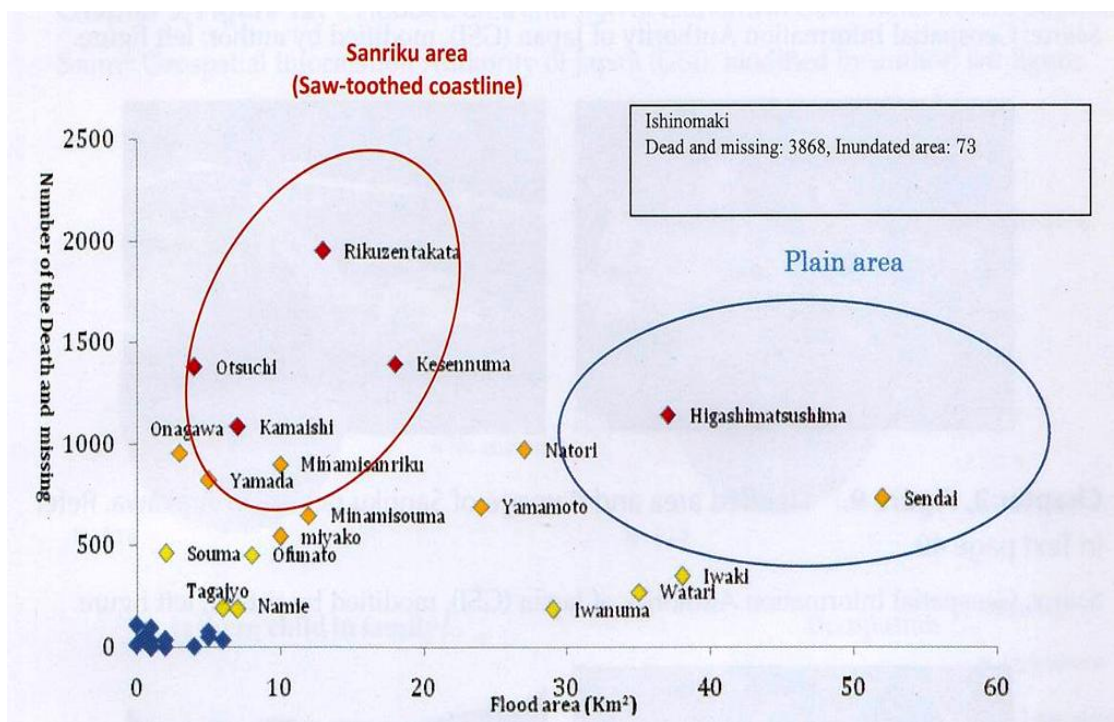


Fig. 4.5 Tsunami Inundated Area and Number of Dead and Missing in Each City
[Source: Government of Japan], Modified by Suda 2012



Fig. 4.6 Photos of Tsunami Hitting
 Left: Pain area (Sendai City in Miyagi), Right: Sanriku area (Miyako City in Iwate),
 [Source: Left; Sendai City Fire Department, Right; National Geographic]

The peak of number of evacuees reached to 470,000 people on March 14th 2011, which was a three days later of the East Japan Earthquake and Tsunami. This number exceeds one of the Greater Hanshin-Awaji Earthquake and the Chuetsu (Mid Niigata) Earthquake. Especially in three affected prefectures, Iwate, Miyagi and Fukushima prefecture, the impacts of tsunami were so severe and the damages were so catastrophic that a large number of evacuees gathered to the many shelters around the affected areas, which number amounted to 400,000 people that occupied 85 % of whole evacuees in Japan then. Many of whom still remain temporary housings (Fig. 4.7)

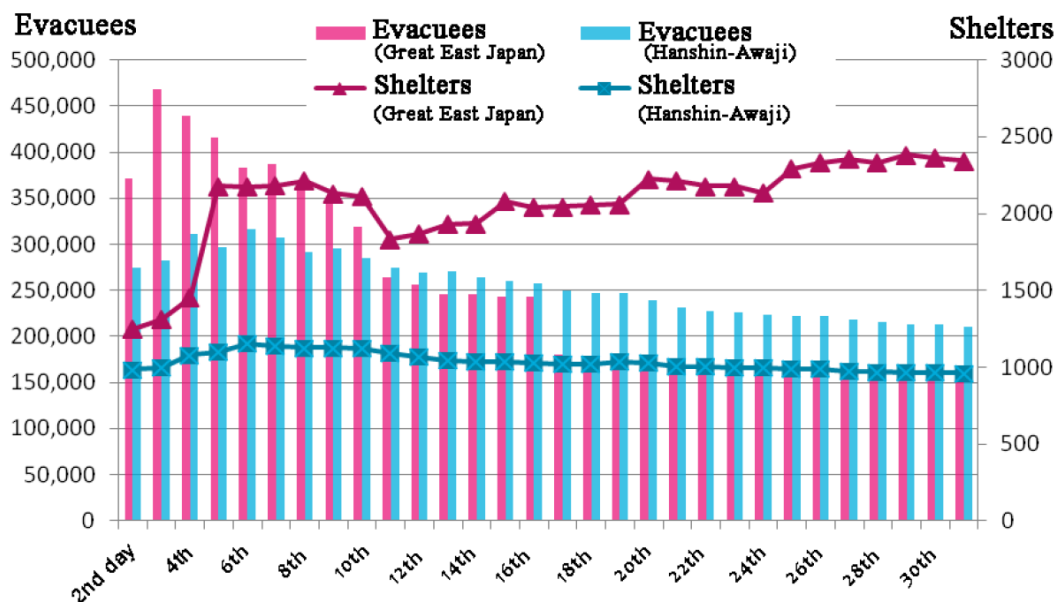


Fig. 4.7 Trend of the Number of Evacuees in the Great East Japan Earthquake (Compared to the Great Hanshin-Awaji Earthquake), Note: The values recognizable at that moment.
 [Source: MLIT based on materials of National Police Agency and Hyogo Prefecture]

Thus, the disaster of East Japan Earthquake and Tsunami provided: i) Massive earthquake of magnitude 9.0 which is the maximum scale ever observed in the country, ii) Severe damage caused by tsunami and the widespread devastated area, and iii) Greatest number of casualties since World War II, so that it is the Unprecedented Disaster in Japan.

4.2 Impact of East Japan Earthquake and Tsunami on Education Sector

4.2.1 Overview of Schools Damage in East Japan Earthquake and Tsunami

In the East Japan Earthquake and Tsunami, the education sector experienced massive damage, along with other sectors such as housing, infrastructure, energy and civil society. According to the report (on Sep. 14th, 2012) of Ministry of Education, Culture, Sports, Science and Technology, Educational Institutions and schools in tsunami affected area also suffered serious damages of not only facilities but also students and staffs (MEXT 2012a). 12,150 educational institutions in 24 prefectures including 7,988 schools (76 national schools, 6,484 municipal schools and 1,428 private schools) 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 (Table 4.4).

Table 4.4 Number of Casualties in Education Sectors in EJET

Prefecture	National School		Public/Municipal School		Private School		Non-formal Education		Others		Total	
	Dead	Injured	Dead	Injured	Dead	Injured	Dead	Injured	Dead	Injured	Dead	Injured
Iwate	1	0	84	15	21	18	4	2	0	0	110	35
Miyagi	8	2	348	27	104	14	0	1	0	0	460	44
Fukushima	1	0	75	6	11	9	0	2	0	0	87	17
Ibaraki	0	0	0	10	0	0	0	4	0	0	0	14
Tochigi	0	0	0	37	0	4	0	0	0	0	0	41
Gunma	0	0	0	10	0	4	0	0	0	0	0	14
Saitama	0	2	0	6	0	2	0	0	0	0	0	10
Chiba	0	1	0	0	0	3	0	1	0	1	0	6
Tokyo	0	5	0	0	2	68	0	1	0	0	2	74
Kanagawa	0	0	0	2	0	3	0	0	0	0	0	5
Niigata	0	0	0	2	0	0	0	0	0	0	0	2
Total	10	10	507	115	138	125	4	11	0	1	659	262

As of September 13, 2011 [Source: MEXT 2011] Modified by author

MEXT reported school damages of East Japan Earthquake and Tsunami about 3,127 schools in Iwate, Miyagi and Fukushima prefecture in January, 2012 (MEXT 2012b). According to the report named “Investigation of School Response in Disaster of Great East Japan Earthquake”, approximately, 80% of schools in those three prefectures suffered damages of schools buildings including gymnasium, and 70% of schools had damages of equipments in classrooms. In addition, school yards of about 40% schools were damaged by earthquake. Especially, the percentage of high school damages is higher than other school such as elementary and junior high school (Fig. 4.8). On the other hand, 131 schools in three prefectures were hit by tsunami in total. And 69 schools in despite of which were not in tsunami flooded area of hazard map, were also attached by tsunami and its rate is almost half (46.3%) of tsunami affected schools (Fig. 4.9). Among the schools that were affected by the tsunami, over 50% schools’ buildings and 20% schools’ land were inundated by tsunami.

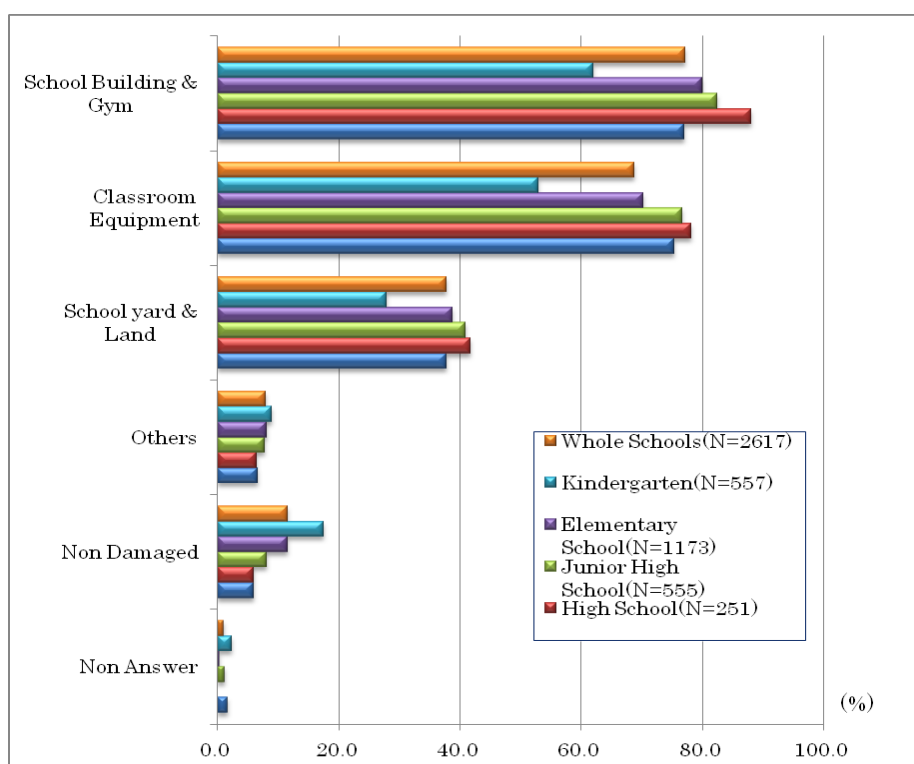


Fig. 4.8 Material Damage of Schools by East Japan Earthquake and Tsunami
[Source :MEXT 2012] Modified by author

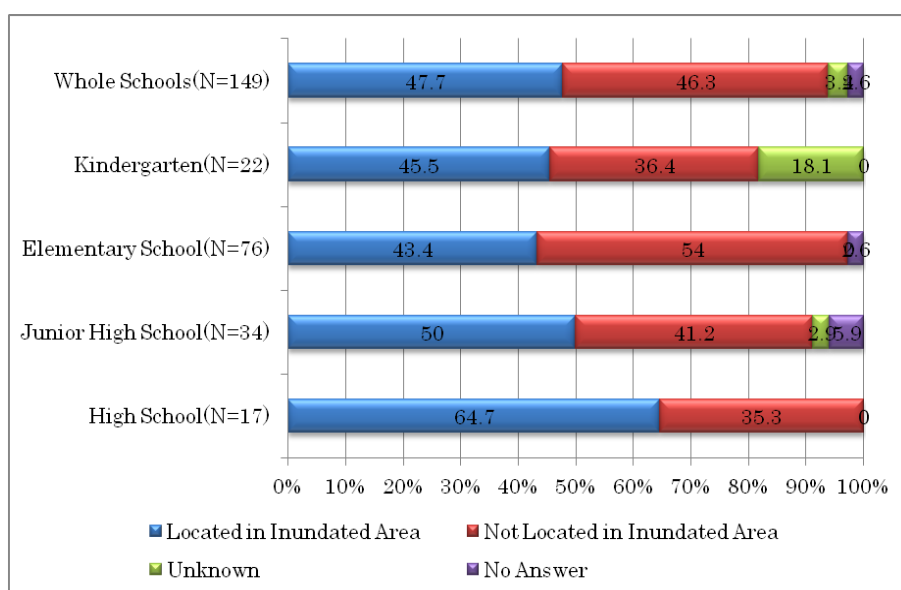


Fig. 4.9 Tsunami affected School was Located in Inundated Area of Hazard Map

[Source :MEXT 2012] Modified by author

Note: Target of the survey is 149 schools among the schools those were located in tsunami inundation areas of hazard Map or those were inundated by tsunami in EJAT actually.

Moreover, 113 schools, those correspond to 75% of tsunami affected schools, had students at schools when tsunami hit (Fig. 4.10). Especially, at 87% of elementary schools, students were staying at the time of disaster occurring, so that teachers could conduct students' evacuation at schools then. 70% of Junior high schools also had students on that day. March 11th, 2011, on which the EJET occurred, was around the graduation ceremony of junior high schools, so that third grade students of some junior high schools were out of schools on that day. The percentage of high schools is half of high schools, which is less than one of elementary and junior high school. The third graders had graduated from schools and some students remained at schools for the lessons and club activities. They took evacuation depends on their locations and situations. 35% schools evacuated to upper floors and roofs. 32% schools evacuated to high land near the schools, and 31% schools escaped to evacuation place which were designed in advance of the disaster. The route of evacuations schools took were selected depend on their situations (Fig. 4.11).

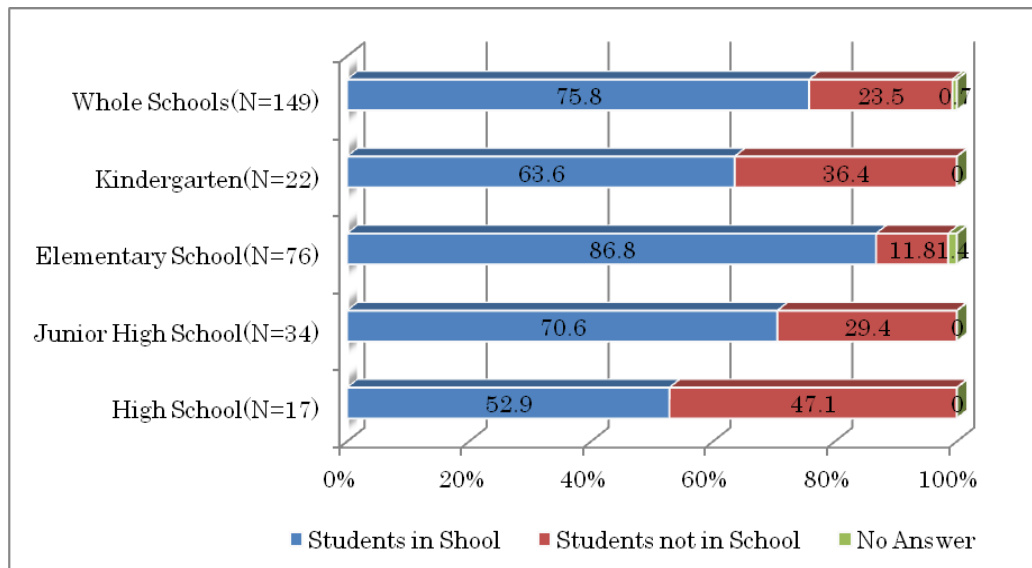


Fig. 4.10 Students are in School or not when Tsunami attacked

[Source :MEXT 2012] Modified by author

Note: Target of the survey is 149 schools among the schools those were located in tsunami inundation areas of hazard Map or those were inundated by tsunami in EJAT actually.

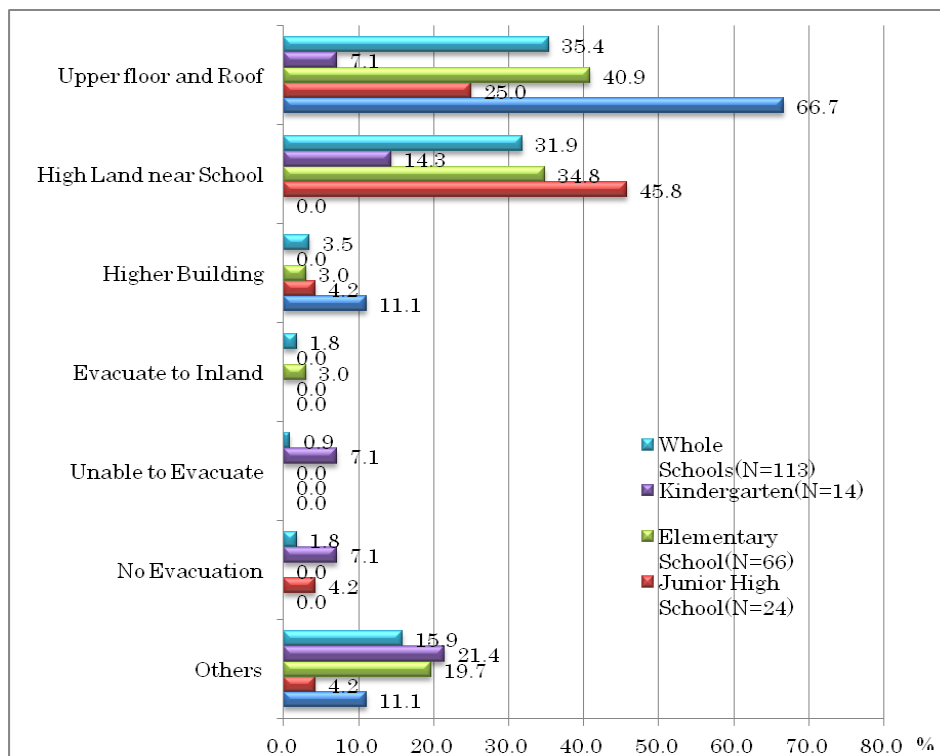


Fig. 4.11 Evacuation Action of Schools from Tsunami

[Source :MEXT 2012] Modified by author, Note: Target of the survey is 113 schools which had students at the time of disaster occurring among the schools those were located in tsunami inundation areas of hazard Map or those were inundated by tsunami in EJAT actually.

MEXT classified the school damage level into these types. Fig. 4.12 shows the breakdown of school number of damage levels 1-3. 202 schools belong to damage of Level 1, indicating total destruction by serious damage which makes the continued use of the school impossible, so that it requires rebuilding or large-scale restoration works. 764 schools of Level 2 signified heavy damage, which necessitates restoration work. 5,023 schools of Level 3 signified minor damage, which requires small-scale restoration work, mostly non-structural (MEXT 2011a). 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, Miyagi Prefecture is one of the few schools where the students and teachers died in the school 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 education, etc. (Takeuchi & Shaw 2012).

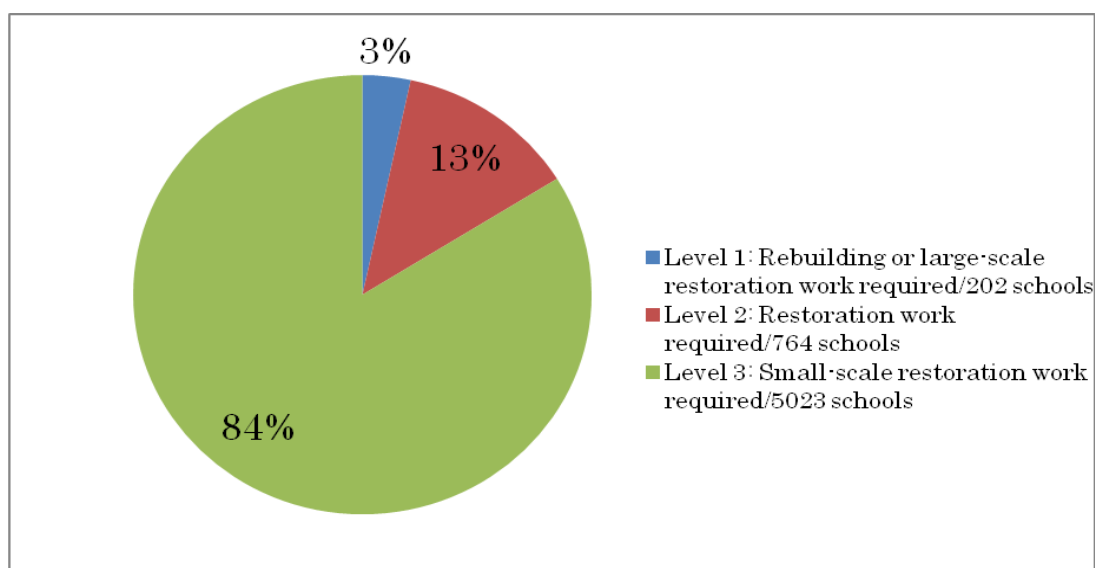
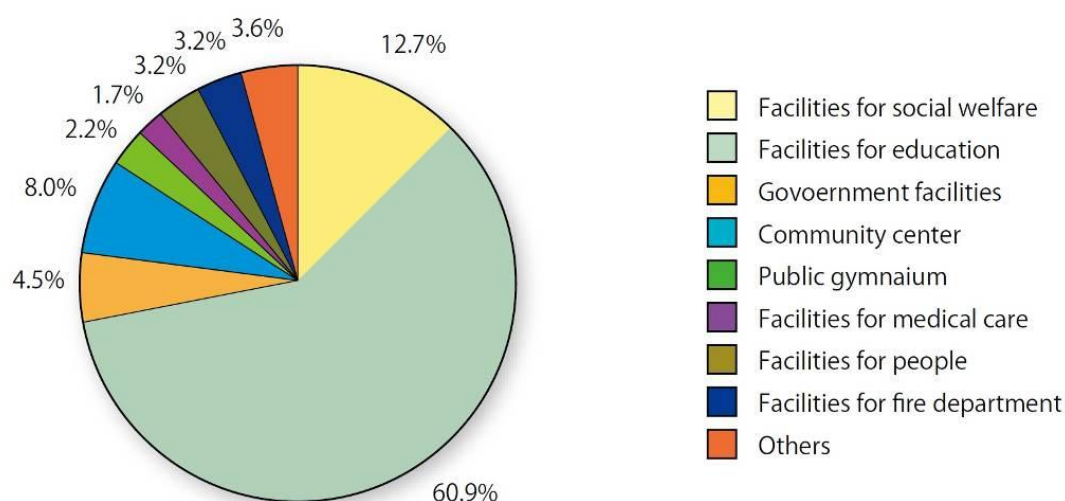


Fig. 4.12 Number and Level of Damaged Schools by EJET

[Source: MEXT 2011]

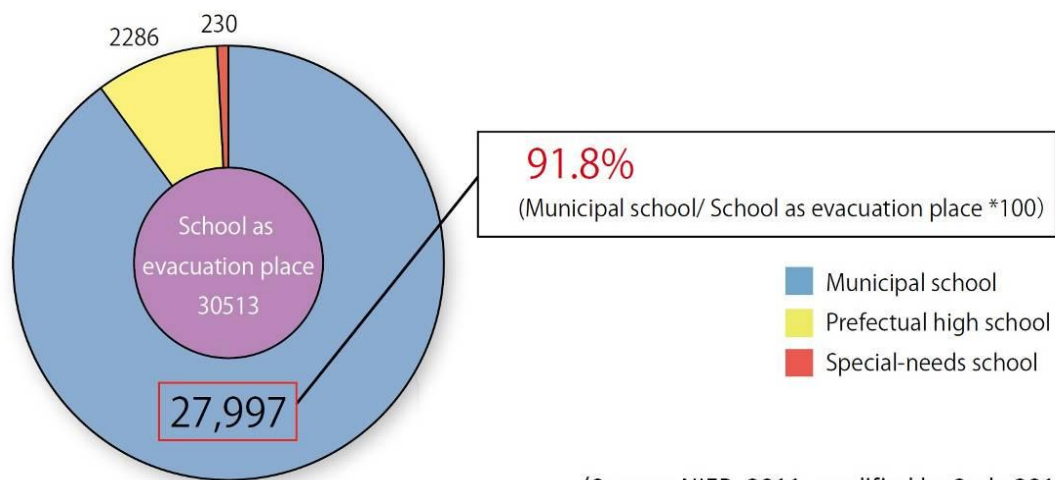
In addition, after the East Japan Earthquake and Tsunami (EJET), as many people in affected area evacuated to the schools and educational facilities such as Kominkan (Community learning Center) and Gym.

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 (Fig. 4.13). 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 (Fig. 4.14). Most of the elementary and junior high schools are administered by municipalities in Japan. Hence, it can be seen that public elementary and junior high schools are primarily used as evacuation sites. Shaw & Takeuchi pointed out 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 (Shaw & Takeuchi 2012b).



(Source: NIER, 2008, modified by Suda 2012)

Fig. 4.13 Public Facilities used in Disaster Prevention



(Source: NIER, 2011, modified by Suda 2012)

Fig. 4.14 Number of Schools used as Evacuation Places

At the disaster of EJET, most educational facilities 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 (Fig. 4.15). On March 17th, 2011, 622 schools managed the shelter in the gym or class room at its peak at as Emergency Proposal of MEXT says (MEXT 2011b). And last shelter in school was closed in November 2011 which is 8 months later from disaster happened (Fig. 4.16).

Schools were used as shelters for a long time, so that many schools had to make coexistence of educational activities and evacuation life for a while. It was reported that there are lots of obstacles of both school and residents such as moving evacuees to other place, changing the utilization of school building, etc. to restart the school lessons. In addition, there are many schools which school yards were used for building temporary housings. This has made difficult for student to learn physical education and enjoy club activities at schools even now in spite of three years have passed since EJET. These issues were pointed out also in the case of Great Hanshin-Awaji Earthquake. However, based on the lessons of EJET, the necessary to take measure considering coexistence of educational activities and evacuation life was proven in order to examine the modalities of school facilities as shelters (MEXT 2014).



Fig. 4.15 Evacuation Place and Shelter of Schools

Left: Upper floor of Arahama Elementary School in Sendai City, Right: Gym of Koharagi Junior High School in Kesennuma City

[Source: Left; Sendai City Board of Education, Right; Kesennuma City Board of Education]

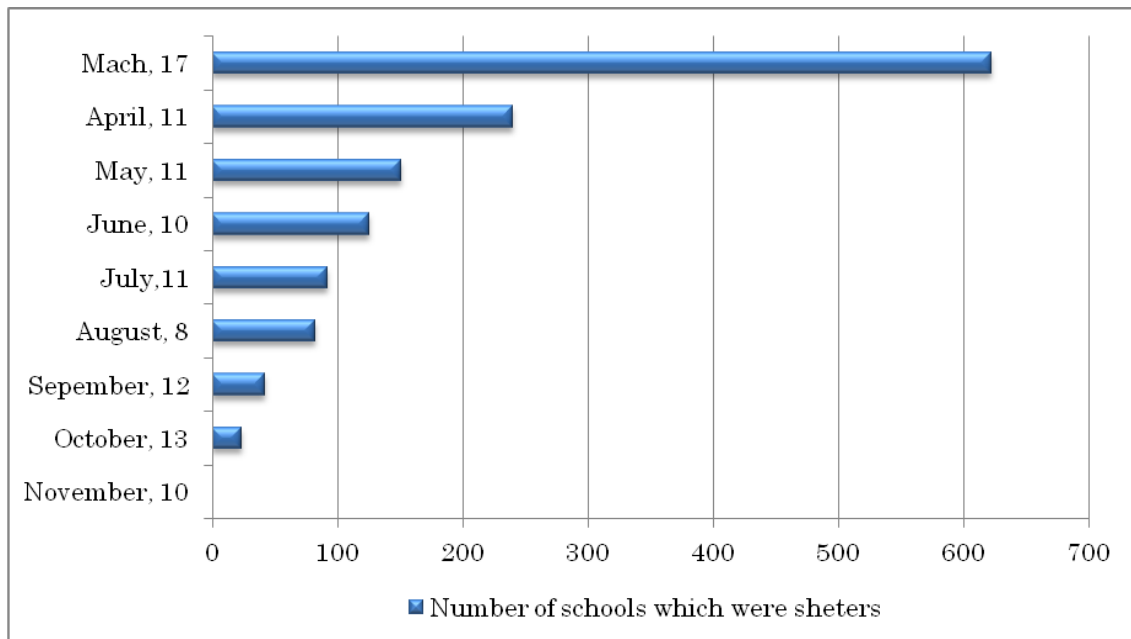


Fig. 4.16 Number of Schools which had Shelters during EJET

Modified by author based on Press Releases of MEXT

4.2.2 Contrast of School Damage between Sanriku Coast and Sendai Plain

After the East Japan Earthquake and Tsunami (EJET), Education, Culture, Sports, Science and Technology Ministry (MEXT) has established a “Working Group for Building Disaster Resilient School Facilities”, and conducted investigation on the existence of damage caused by tsunami, targeting the municipal schools (582 schools)

which are located in coastal areas of three affected prefectures (Iwate, Miyagi and Fukushima), and it focused on the site conditions of each school such as altitude and distance from the coast line (MEXT 2014). Fig. 4.17 shows the relation between the altitude & the distance from the coast line and the existence of damage of 332 schools which are located in the area where the altitude is 50m below and within 6km distance from the coast among 582 targeted schools. According to the relation between height and distance from the coast line, it can be identified to categorize two groups as follows:

- A) In rias coast which is complex coast line and can be seen in Iwate and north-east of Miyagi prefecture, tsunami went up to high land, so that there are many damaged school by tsunami in spite of high altitude. (Pink group indicated as A in figure)
- B) As typified by Sendai Plain, in flat area, there are not so many things that block tsunami, so the schools which are far from ocean were also hit by tsunami going upstream in rivers (Orange group indicated as B in figure).

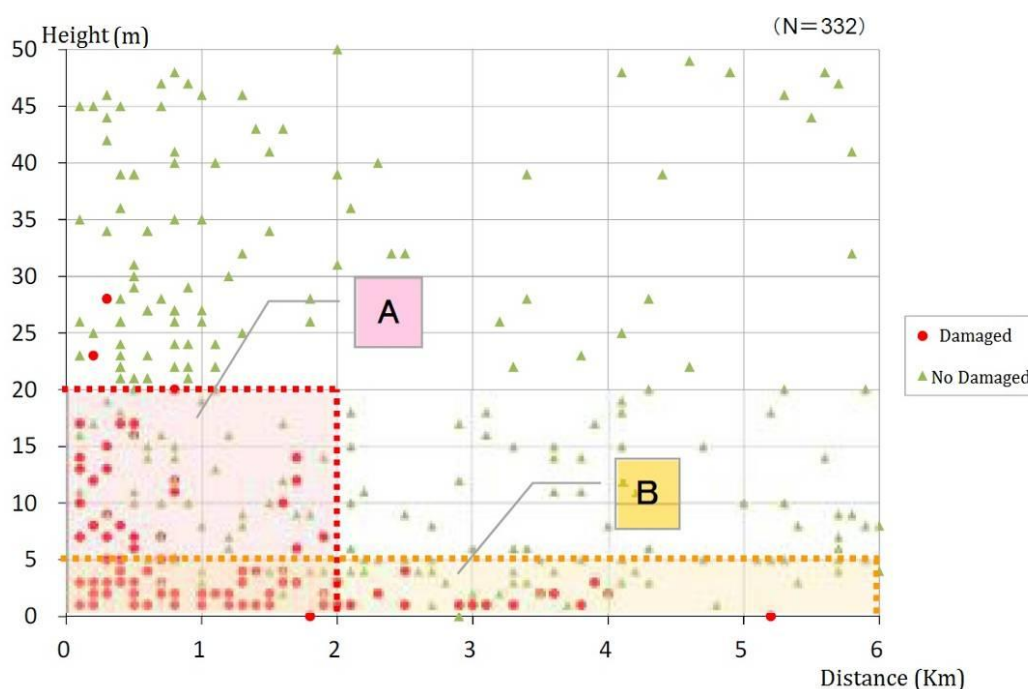


Fig. 4.17 Relation between Altitude and Distance from coast line of School
 Note: Municipal School in Affected Prefecture (Iwate, Miyagi and Fukushima) [Source: MEXT]

As a result, it is proven that schools need to identify their altitude, distance from the coast, and geographic condition surrounding schools for tsunami disaster risk reduction.

4.2.2.1 School Damage in Sanriku Coast – Case of Kamaishi City

(a) Damage Background

East Japan Earthquake and Tsunami (EJET) have brought the following damages to Kamaishi City: 1,143 death and missing persons (as of April 2015), 10,266 evacuees (estimated maximum). Damage to 4,616 houses, 4 kindergarten facilities (1 completely collapsed), 9 elementary schools (2 completely collapsed: Unosumai and Toni Elementary School, 7 partially collapsed), 5 Junior high schools (2 completely collapsed: Kamaishi Higashi and Toni Junior High School, 2 partially collapsed) (Fig. 4.18). In Unosumai district, the tsunami reached the third floor of the school building. 3,164 temporary housing units are still in use in the city (as of April 2014). Currently, city office has professed the plan of decreasing temporary housings to 1,545 by first half of 2017.

(b) Impact on Education

With regard to impact on education, resumption of schools faced difficulties because of the damage to both elementary and junior high schools. However, Kamaishi City Board of Education (BOE) arranged for the students of damaged schools to attend other schools. In addition, BOE made decision not to construct temporary housing facilities on the school yards so that students will be able to use them for physical education and club activities. Currently, students go to school by route school bus.

(c) Issues related to Students and Teachers

More than 1,000 people are reported dead or missing in the city, including 8 students and 5 teachers, as result of EJET. Although the result of the school DRR program in Kamaishi City proved to be effective up to a certain level, as voluntary evacuation of school children was witnessed during EJET, the city aims to further strengthen the local DRR system to make use of the lessons learned from the EJET. Teacher must be share disaster education materials with each other, prepared on the basis of the Guidelines for Tsunami Disaster Education. Existing documents and manuals will be revised with creativity, incorporated with global DRR trends to maintain DRR awareness community (Kamaishi BOE 2012).



Fig. 4.18 Damage of Tsunami and Evacuations at Kamaishi Higashi Junior High School
 Left: The School hit by Tsunami, Right: Evacuation with Community Member
 [Source: Cabinet Office, Government of Japan]

(d) Case1: Evacuation of Toni Elementary School in Kamaishi City

Toni Elementary School was established in 1982 and it 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 the school was built 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 massive 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.



Fig. 4.19 Damaged Toni Elementary School and its Surrounding
 [Source: Kyoto University]

The school was heavily damaged by the tsunami, which reached up to the 3rd floor of the school building (Fig. 4.19). Consequently, the school's facilities could not be used to resume classes, and temporary space was granted by Heita Elemental School. After five months after the disaster, Kamaishi City Board of Education made a plan to merge Toni elementary School with Toni Junior High School (referred to in a later case study) and other public community facilities. The school principal agreed to this plan, but was worried about differences that existed between the elementary school and Junior high school, such as differences in class lengths, as well as requirements of different levels of safety measures for elementary school and Junior high school. The Toni Elementary School is currently operating in a temporary school facility built in the Toni JHS premise (Shaw and Takeuchi 2012b).

The key lesson of this case is to conduct students' evacuation higher and higher immediately with quick and appropriate judgment of principal considering higher disaster risk. It can be said that this awareness for disaster risk reduction could protect students' lives.

(e) Case2: Evacuation of Toni Junior High School in Kamaishi City

Unlike its elementary school counterpart, Toni JHS was located on high ground, and thus was not directly affected by tsunami (Fig. 4.20). However, the building was quite old, so that the school 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, so that they had to depend on the locally-available resources for some time. Schooling resumed one month after the disaster, beginning with graduation and entrance 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 school yard.

One of the key lessons was the proper judgment of the school principal, who had to take different responsibilities which are focused on disaster risk knowledge and

management, apart from the usual education programs (Takeuchi & Shaw 2012).



Fig. 4.20 Toni Junior High School (left) and its Surrounding (right)
[Source: Kyoto University]

4.2.2.2 School Damage in Sendai Plain

Sendai City is the capital of Miyagi prefecture that has population of over one million and is the center of transportation and economics such as industry, commerce and information. In east of the city, immense flat land, it is named “Sendai Plain, spreads from the end of mountain area (Ohu Maintains) to Pacific Ocean, which land is used as urban area, industry area, and mainly agriculture area such as rice field. Therefore, at East Japan Earthquake and Tsunami in March 2011, tsunami went up to inland, maximally 5km far from the seashore and devastated plain area along coast line widely (Fig. 4.21). Owing to this terrible disaster, 997 persons, including disaster related dead persons, lost their lives and 28 persons are still missing (as of February 2015).

According to the report of Sendai City (Sendai City 2012), all of 197 schools in Sendai City were affected by East Japan Earthquake and Tsunami. Among these, 22 schools (13 elementary schools, and 9 Junior high schools) received serious damages by earthquake and tsunami. During this disaster, 17 students including high school students lost their precious lives in Sendai City (MEXT 2012a). In particular, Nakano Elementary School, Arahama Elementary School and Higashi Rokugo Elementary School those were located in Sendai Plain closing to coast line, were inundated and collapsed by tsunami, so that students of those schools move to other school buildings to restart the school lessons after their evacuations (Fig. 4.22). However, Nakano Elementary School is planning to be closed in March 2016. On the other hand, it has been decided that Arahama Elementary School will merge with Shichigo Elementary

School in April 2016, and Higashi Rokugo Elementary School will merge with Rokugo Elementary School in April 2017 also.

With regard to school's damage and evacuation in Sendai Plain area, tow typical cases of schools are identified. One is Arahama Elementary School which was inundated and surrounded by tsunami, so that students and teachers had to take evacuation immediately. And another is Higashi Miyagino Elementary School which is far from coast and river, so that the school didn't receive the damages by tsunami. But, the school accepted students and residents after the disaster.



Fig. 4.21 Tsunami Damages of Sendai Plain

Left: 3 days after the tsunami, Right: 5 months after the tsunami [Source: Sendai City]

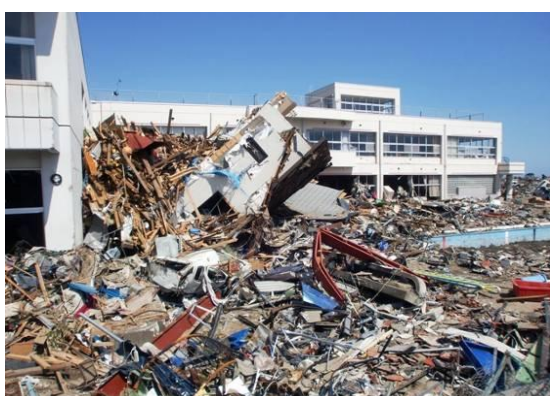


Fig. 4.22 School Damages in Sendai Plain

Left: Nakano Elementary School damaged by tsunami, Right: Shelter at Gym of Tsutsujigaoka Elementary School, [Source: Sendai City]

(a) Case3: Evacuation of Arahama Elementary School in Sendai City

Arahama Elementary School is a municipal school in Sendai City. This school is located in the Sendai Plain, within 200 meters from the coastline. Sendai plain is immense flat area, so that 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 land in this region is very flat and all other safe evacuation place is far from this residential area, so that Arahama Elementary School is the highest building and it is the only place to evacuate.

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 grade students were on their way back to their homes, while other students were taking classes in the school building. The school building is four stories with a flat rooftop. Immediately after the earthquake, since school broadcasting became a power outage and was not available, the principal has instructed the evacuation using the loudspeaker. Children evacuated to the fourth floor, local residents to the third floor, and those who bedridden took evacuation to the second floor of the school building, followed by around 233 people from the local community. Homeroom teacher cared their students, and other teachers and faculties accepted local residents who evacuated to school.

The tsunami came at around 15:55 and is running up Arahama region 70 minutes later after the earthquake. The head of tsunami is running up the agricultural waterway. The shape of tsunami and the way of approach is not entering parallel to the land, because coastal forests along with other buildings acted as obstacle which changes the speed and force of tsunami (Koganezawa 2014). The big waves came past the bare land retaining its force and attacked school building. The tsunami reached up to the 2nd floor of school building and surrounded the school (Fig 4.23). But, no one in the school building was injured, thanks to quick and systematic evacuation. Around 16:30, the teacher distributed foods, water, and blankets that had been stockpiled on the third floor of the school building to the evacuees.

At around 17:30, the first helicopter arrived at school and started rescuing the students from the roof by helicopter. At 5 am on next day (12th), the rescue of the

children has been completed and then local residents and faculty have been rescued in the order until 18:00 on that day.

Currently, Arahama ES has is temporarily relocated to Higashi Miyagino Elementary School. After the decision to move from the education board of Sendai City, the school received support materials from the government, NGO/NPOs, and others sources to make 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 (Takeuchi and Shaw 2012).

As key lessons of this case, some points could be identified. Firstly, in the location which has no high ground and high-rise buildings in the vicinity, the school had set up an emergency evacuation place on the roof and upper floors of the four-storey school building. Secondly, School has set up a warehouse which stockpile water, foods, assembling type toilet, blankets, etc. on the third floor of the school building. In fact, these stockpiles were very useful for evacuees in the disaster of EJET. Thirdly, School had been carrying out tsunami disaster drill jointly with local residents on a daily basis. Before the EJET, the school had implemented the evacuation drill for children to evacuate to the fourth floor assuming the tsunami disaster, and also had carried out the evacuation drill for local residents to evacuate to more than three floor building. These experience and learning were utilized in smooth and systematic evacuation effectively even though real situation of EJET.

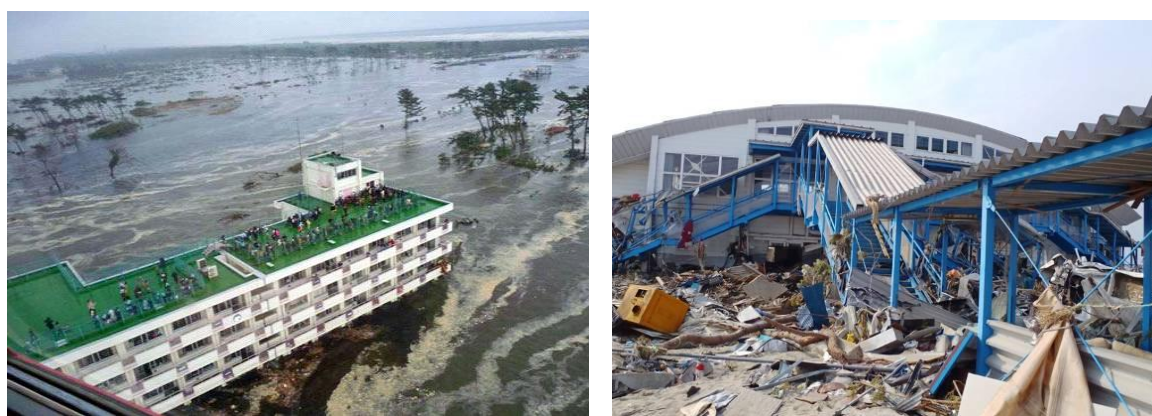


Fig. 4.23 Damage by Tsunami and Evacuation at Arahama Elementary School,
Left: Students and Residents evacuated to the Roof, Right: Damage of Gym by Tsunami
[Source: Sendai City]

(b) Case4: Higashi Miyagino Elementary School accepting affected School

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 school. 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 Elementary School. Therefore, it was like two different schools in one large building (Shaw and Takeuchi 2012b). Currently, the exchange between Higashi Miyagino Elementary School and Arahama Elementary School is progressing at student level as well teacher level. Both schools are promoting joint events and assembly, and teachers of both schools also share teaching materials and teacher training.

4.3 Educational Governance and Educational Recovery

4.3.1 Recovery Process in Education Sector

Based on these damages of the disaster of East Japan Earthquake and Tsunami, educational institutions such as school and board of education had to response to recovery process of schools education. Its responses should be performed from their perspectives of missions and roles depend on the phases of recovery process and needs of schools. MEXT categorizes recovery process to restart school education into four phases from two functions as the shelter and the school on their report of “Emergency Proposal for Preparation of school facilities based on the Great East Japan Earthquake” (MEXT 2011b) as follows:

1. Rescue and Evacuation Period—from disaster happened to evacuation
2. Securing Lives Period—for a few days after the evacuation
3. Making Livings Period—for a few weeks after Securing Lives Period
4. Restarting School function Period—after restarting the school education

In case of the schools in Sanriku coast and Sendai Plain, 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 education sector in tsunami affected area. So it should be categorized recovery process of education sector into the following five stages (Table 4.5).

Table 4.5 Main Responses of Educational Sectors according to phase and stages

Stages of Responses	Situation and Mission	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 Support to self-manage	Set up shelters in schools Check students' 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, Environmental & Economical Supports	Psychological supports Settle school education
Further Response to reconstruct future	Preparation for future disaster and recovery	Record experiences Establish diverse links	Improve DRM, DRR & ESD for creative recovery

[Source: Oikawa 2014]

1. Emergency Response to manage crisis—after the disaster immediately
2. Short-term Response to sustain lives—set up and manage the shelters
3. Mid-term Response to school restarts—until school restart after set up shelter
4. Long-term Response to recover education—recover and settle school education
5. Further Response to reconstruct future—response to next disaster and future

Therefore, the response of the board of education and schools should be done according to these phases and stages. After the East Japan Earthquake and Tsunami, various responses of educational sectors have been implemented according to these steps adjusting and customizing as situations of community, characteristics of disaster and speed of recovery in each affected area (Oikawa 2014a).

4.3.2 Case Study of Damage to Educational Governance and Educational Recovery

The education sectors such as schools and board of education in affected area, which suffered massive tsunami of EJET, were not able to avoid having educational interruption due to severe damages. Many of schools located in the coastline of Pacific Ocean of Tohoku region especially Iwate, Miyagi and Fukushima Prefectures, were hit by tsunami and their school building and equipments were collapsed. Some of them were impossible to be reuse and some need be reconstructed large-scale repairs. On the other hand, some of educational governances such as Rekuzentakata City Board of Education (BOE) in Iwate Prefecture and Minami Sanriku Town BOE in Miyagi Prefecture were also affected by tsunami disaster seriously. In this case, the BOE had casualties and physical sufferings, so that it became difficult to maintain the function as educational governance to sustain and recover the education. Therefore, it took long time for those affected educational sectors to restart education for new academic year. Almost all the tsunami damaged schools in the affected cities and towns of three prefectures could restart school lessons between April 20 and 27, which was more than one month interruption after EJET. The latest case stated new school year after May 10th, which was two months later from EJET (Table 4.6).

Table 4.6 Date of Restarting School Lessons in Tsunami affected Area after EJET

Prefecture	City or Town	Opening Ceremony in AY 2011	Entrance Ceremony in AY 2011
Iwate	Miyako City	April 25	April 25 – 26
	Otsuchi Town	April 20	April 25
	Kamaishi City	April 21 – 26	April 23 – 27
	Ofunato City	April 20 – 21	April 21 – 22
	Rikuzentakata City	April 20	April 21 – 23
Miyagi	Kesennuma City	April 21	April 22
	Minamisanriku Town	May 10 – 11	May 11 – 12
	Ishinomaki City	April 21	April 22
	Higashimatsushima City	April 21	April 21
	Sendai City	April 11 – 21	April 11 – 22
	Natori City	April 21	April 21 – 22
	Iwanuma City	April 21	April 21
	Yamamoto Town	April 25	April 26
Fukushima	Mimamishima City	April 22	April 22
	Iwaki City	April 6	April 6

Note: The table is modified by Author from the information of Iwate Prefectural Board of Education (2012), each city and town board of education, and Kokushikan University & JASEA (2012)

According to the damage level of local educational governance, the recovery of education sector indicates different processes and aspects, so it could be identified the linkage between educational governance and recovery. Through the observation on some cases of damage to educational governances in tsunami affected area, it would be analyzed how the damage level of educational governance is concerned with recovery process of education sector.

4.3.2.1 Case of Otsuchi Town Board of Education in Iwate

Otsuchi Town has five elementary schools and two junior high schools. The town is divided into two districts of Kirikiri Junior High School and Otsuchi Junior High School and the district of Otsuchi Junior High School suffered serious damage by tsunami. Almost all the city facilities including city office were devastated by massive tsunami and many city executives including the mayor died, so that governance of the town fell into breakdown all at once. The board of education was only public facility which remained after the disaster, so that it became the disaster countermeasure office of Otsuchi Town. Therefore, the board of education lost their function as educational governance temporally and could not direct the schools after the disaster immediately. So principal of each school had to make decision to conduct evacuation actions and manage shelters. The board of education did their best to reopen the school education based on the lesson which restarting school is the most important for educational recovery, and the superintendent decided that Opening Ceremony of new school year (AY) should be on April 20th 2011 and Entrance Ceremony should take place on April 25th 2011 all at once in Otsuchi Town consulting with supervisors of the board of education (Kokushikan University & JASEA 2012).

However, the available schools for the lessons, which are not affected by tsunami, were just two schools: one is Kirikiri Elementary School and another is Kirikiri Junior High School. Three elementary schools (Ando, Akasaki, and Otsuchikita Elementary School) moved and restarted school lesson at part of Kirikiri Elementary School. Otsuchi Elementary School used the social education facility of prefecture for restarting school lesson instead of damaged school building. On the other hand, Otsuchi Junior High School was divided into groups. First and second grade students moved to Kirikiri Junior High School and third grade students move to Prefectural Otsuchi High School, so they had to restart their school lessons on April 20th 2011 separately (Iwate Prefectural BOE 2012).

4.3.2.2 Case of Rekuzentakata City Board of Education in Iwate

Rekuzentakata City had nine elementary schools and six junior high schools, 15 schools in total at the time of EJET. One elementary school (Kesen Elementary School), four junior high schools (Kesen, Hirota, Otomo and Yonesaki Junior High School) had serious damages by tsunami and all of those schools could not be reused for school lessons. Rekuzentakata City Board of Education (BOE) also suffered catastrophic damage. Building of BOE was completely collapsed by tsunami and the superintendent and 13 staff of BOE lost their lives. Therefore, the function of BOE as educational governance fell into breakdown after the disaster immediately. Rekuzentakata BOE was not able to contact with schools in the city and also could not direct their instruction to each school for a while, so each school in the city had to response to the difficult situations of disaster including management of shelters at schools according to the decision making by the principal of each school. Under these disruptions of educational governance, Rekuzentakata BOE sought the help of Iwate Prefecture Board of Education because of the shortage of man power by the disaster in order to promote educational recovery. Prefectural BOE dispatched 6 supervisors from the branch offices inland such as Ichinoseki and Hanamaki City in Iwate. They looked around schools including affected schools above and surveyed if each school could reopen or not (Kokushikan University & JASEA 2012).

Surviving staff of BOE and school principals tackled on reopening school supported by supervisors and staff from prefectural BOE and volunteers. Kesen Elementary School restarted the lesson at the building of Osabe Elementary School on April 20th 2011. Four affected junior high schools also reopen the school using the part of other school buildings: On April 20th 2011, Kesen Junior High School restarted at former Yahagi Junior High School which closed in March 2011, Hirota Junior High School restarted at Hirota Elementary School, and Yonesaki Junior High School restarted at Yonesaki Elementary School, and on April 22nd 2011, Otomo Junior High School restarted at Otomo Elementary School (Iwate Prefectural BOE 2012).

4.3.2.3 Case of Minamisanriku Town Board of Education in Miyagi

Minamisanriku Town is one of the most affected areas in East Japan Earthquake and Tsunami (EJET). Residential areas in flat land of the town were devastated by tsunami. Minamisanriku Town had five elementary schools and three junior high schools at the time of East Japan Earthquake and Tsunami. Although schools in Minamisanriku Town, except Togura Elementary School, were basically located on high land based on the

lessons from past tsunami disasters, two elementary schools (Togura ES and Natari ES) and one junior high school (Togura JHS) suffered serious damage by massive tsunami.

Regarding to the damage of the governance, the Minamisanriku Town Office including the Disaster Management Center suffered catastrophic damage by massive tsunami, and a lot of officials who stayed at office lost their lives (Fig. 4.3 right). Also, the building of Minamisanriku Town Board of Education was located in low and flat land near Shizugawa Bay, so that it was hit by tsunami and collapsed completely although the offices were on second and third floors of the building. The superintendent along with other officials of Minamisanriku BOE had fallen victims to disaster. The function of educational governance of Minamisanriku Town was collapsed due to this tragic disaster. Therefore, each school principal had to play the role of education recovery at each school and community. Especially, the Principal Association of Minamisanriku Town Municipal Schools took the key role of educational recovery such as conducting evacuation and management of shelter as well as negotiating with town government, the board of education of other city and prefecture for evacuation and restart of affected schools in Minamisanriku.

According to the direct interview to Mr. S. Sugawara who was the leader (chair person) of Principal Association of Minamisanriku and the principal of Shizugawa Junior High School (JHS) at the time of EJET, he was engaged on conducting management of shelters at Shizugawa JHS after the disaster. Because Shizugawa JHS is located on the high land in the center of the town and it has also large gym and wide school yard, the school became the center for evacuation place and the base or hub of acceptance support materials from governments, Self-Defense Force and volunteers. On the other hand, Mr. Sugawara accompanied with surviving director of Minamisanriku BOE visited Tome City Board of Education (BOE) and negotiated to evacuate Togura ES and Togura JHS students and teachers to other school building in Tome City. Whole Togura district including both schools suffered very catastrophic damage, so that students and parents needed to evacuate to safety place and building after the tsunami disaster immediately. As Tome City is the west next to Minamisanriku Town and it is located inland as the boarder of Kitakami Mountains, the city was not affected by tsunami. Tome BOE accepted their appeal and agreed that students, parents and teachers of Togura ES and JHS evacuated to Toyoma Junior High School in Tome City temporarily, so they could evacuate to the facility of Toyoma JHS between March 11th and 13th, 2011 and stayed for over one month. Tome BOE also afforded the facility of former Zennouji Elementary School to the students of Togura ES and JHS for school restart, so they moved there on April 18th from Tome JHS. AS former Zennouji ES is

three floors building, Togura ES used first and second floors and Togura JHS used third floor together. They were learning there far from their community for almost one year. The two schools and students could return to Minamisanriku Town in April 2012 which is more than one year after the EJET, however, they could not return to their own school. Togura ES moved to the first floor of Shizugawa ES and students are learning there for four years (as of 2015), while Togura JHS moved to the facility of Shizugawa JHS and it was merged into Shizugawa JHS in April 2014. Minamisanriku BOE is planning to reconstruct the school building of Togura ES replacing to high land in 2015, so they can return to their own school after the construction completed.

Natari Elementary School also suffered serious damage by tsunami which needs large-scale repairs so that students could not use their school building for a while after the EJET. Therefore the students of Natari ES moved to the next school - Isatoma Elementary School and learned there for two and half years using the facility of Isatoma ES. The reconstruction of Natari ES was completed in 2013 and students were able to return to their own school on 8th of November 2013.

Under the circumstance of educational governance and processes of education recovery, Minamisanriku BOE was able to reopen the school of the town all at once including city office Togura ES and JHS in Tome City on May 10th 2011 after the Golden Week, which was the latest date of school restarting in affected area of EJET. Thus, educational recovery of Minamisanriku Town had long way and complicated processes due to the collapse of educational governance caused by huge damage to it.

4.3.2.4 Case of Iwaki City Board of Education in Fukushima

Iwaki City has 74 elementary school and 44 junior high schools, 118 schools in total in the wide range of city area. In the EJET, four schools (two elementary and two junior high schools) were affected by tsunami. In addition, because of the incident of Fukushima Daiichi Nuclear Power Plant, three schools which are located within 30 km far from the power plant had to evacuate to safety places also.

On the other hand, as Iwaki City Board of Education (BOE) did not suffer the damage of the disaster directly, BOE could maintain the function of educational governance for educational recovery from the EJET. BOE collected the information of damage situations of each school, safety of students and teachers, and evacuees in the shelters of educational facilities. BOE also implemented security check of all school facilities to secure and repair the damages of earthquake and tsunami for school restart. Under the measure to educational recovery, Iwaki BOE decided that all elementary and junior high schools including seven affected schools in the city should restart school

lessons on April 6th 2011, which is very earlier than other schools in affected area of EJET. In order to achieve this, BOE organized and implemented “Joint Entrance & Opening Ceremony” for all affected schools, gathering students at Iwaki Culture Center on April 6th 2011.

As other mission of Iwaki BOE toward educational recovery, they had to accept transfer and evacuating students who evacuated from the affected area of nuclear incident in Fukushima such as Futaba Town and Naraha Town. The number of transfer students was 770 students at elementary schools and 568 students at junior high schools (as of August 25th 2011), also the number of evacuating students who come to schools from other cities and towns was 622 students at elementary schools and 103 students at junior high schools (as of August 1st 2011), as a result, the number of students increased from April immediately after the EJET (Kokushikan University & JASEA 2012). That is different characteristics and mission of educational governance compared with other board of education in tsunami affected areas.

4.3.3 Damage Level to Educational Governance and Educational Recovery

Comparing the damage level to educational governance and educational recovery through the observation of some case of educational governance such as the board of education (BOE), the BOEs which suffered high level damage took long time to achieve educational recovery like Minamisanriku Town. In contrast, BOEs which were not damaged directly could restart school education earlier like Iwaki City.

The BOE such as Minamisanriku Town and Rekuzentakata City, which suffered very high level damage by tsunami, had some serious problems of governance for educational recovery. Firstly, both BOE of Minamisanriku and Rekuzentakata lost the superintendent who is key persons to make the decision on governance issues directly to initiate the recovery of education sector. Leadership of the superintendent is very important to promote educational governance, especially in emergency situation such as disaster. Secondly, both of BOEs also lost officials who were specialists on educational governance, so that BOE faced the shortage of manpower for educational recovery. Thirdly, the facilities of BOE were collapsed or occupied as other function and fell into unavailable situation due to massive disaster.

In addition, not only in high level damaged BOE but also in low level damaged BOE which did not suffered the damage directly (Low level) such as Iwaki City, some schools in their cities or towns suffered serious damage by tsunami, and they could not reuse the buildings or needed large-scale repairs, so that BOE had to move the students

of affected schools to other schools or facilities until the reconstruction or repairs of the school buildings would be completed. These difficulties of educational governance were reasons why damaged BOEs took so long time for the resume of education sector, especially high level damaged BOE such as Minamisanriku Town. Under these critical situations, each BOE in affected area took the educational governance measures according to its damage levels in order to overcome these difficulties and accelerate educational recovery (Table 4.7).

Table 4.7 Damage level to Educational Governance and Recovery of Education Sectors

Damage Level	Board of Education	Main Actors	Measure to recovery	Date of School Restarting
Very High Level: Facility was collapsed. Superintendent and many staff lost lives.	Minamisanriku Town Board of Education	Principals (Principal Association) Official of BOE	•Get Support of other city's BOE to accept affected schools students to their school facilities •Move affected schools to other schools in the town	May 10 th 2011
Very High Level: Facility was collapsed. Superintendent and many staff lost lives.	Rekuzentakata City Board of Education	Supervisors and Officials of BOE Supervisors from Other BOE	•Get Supports of man power from prefectural and other cities' BOE •Move affected schools to other schools and facility	April 20 th 2011
High Level: BOE was not damaged but it became disaster countermeasure office.	Otsuchi Town Board of Education	Superintendent Supervisors Official of BOE Principals	•Each Principal conducted evacuation and shelter •Move affected schools to other schools and facility	April 20 th 2011
Low Level: BOE was not damaged directly	Iwaki City Board of Education	Superintendent Supervisors Official of BOE	•Organize Joint Entrance & Opening Ceremony for affect schools •Accept students of nuclear incident affected area	April 6 th 2011

Note: The table is analyzed by Author from the information of Kokushikan University & JASEA (2012) and direct interview to Chairperson of Principal Association of Minamisanriku Town Municipal Schools

Analyzing the linkage and relation between damage level to educational governance and educational recovery based on the lessons from the experiences of BOEs in affected area of EJET, the critical measure of educational governance could be identified for educational recovery in the aftermath of East Japan Earthquake and Tsunami (EJET).

(a) Principal takes Key Role of Educational Governance in Critical Situation

In the high level damaged case of Minamisanriku Town and Rekuzentakata City which lost superintendents by tsunami and the function of educational governance was

collapsed, the school principals should take key roles instead of superintendent or BOE in this difficult situation. In the each case of BOE in tsunami affected area, the principal of each school make the decision of conducting evacuation and shelters of their school to protect students and residents. Also, as the case of Minamisanriku Town, the leadership of principal initiated other schools' evacuation and school restart, and also contributed to educational recovery process of whole town.

(b) Support of Manpower from Prefectural and other BOE is Helpful

In the case of BOEs which lost officials by disaster and faced the shortage of manpower for educational recovery, manpower support from prefectural BOE and other cities' BOE inland was very helpful as a case of Rekuzentakata City. BOE officials have specialties on educational governance, so that they play important roles of educational recovery from disaster. To get this support, each BOE in affected area establishes linkage and partnership with prefectural BOE and other cities' BOEs preparing for the disaster.

(c) Partnership with other BOE should be formed to evacuate Students to Safe Place

As Togura district in Minamisanriku Town which was devastated by tsunami, there was the case that BOE had to determine to evacuate all students and whole schools to safe place such as schools or facilities in other city inland. This supports was very crucial for affected schools and BOE to protect students and resume the school education. In this case, as a mission of educational governance, affected BOE have to negotiate with other city's BOE to accept students of affected school to the facilities of them. To achieve this, it is necessary for affected BOE to build a good relationship with other city's BOE from daily time.

(d) Moving affected Schools to Other Schools is Maid Measure to Rebuild Education

In many case of affected area, it can be observed that BOE moved or merged serious damaged schools to other schools or facilities which are available to evacuate and restart school lesson. This measure was important and main governance measure of BOE in affected area to promote educational recovery and rebuild school education in the aftermath of EJET. In the promotion of this measure, BOE needs to consider the damage level of affected schools, prospect the transition of number of children, and consult with parents and residents.

(e) Joint Events for affected Schools organized by BOE is Driving Force to Recovery

In the case of low level damage to educational governance such as Iwaki City, BOE maintained governance function and took a key role of educational recovery. Especially, Joint Entrance and Opening Ceremony for affected school at culture center, which was organized by Iwaki BOE, was one of effective measure as the driving force for educational recovery.

(f) Acceptance of Students from other affected area is the Mission of governance

In the case of Iwaki BOE which suffered low level damage, accepting transfer students and evacuating students from other affected area such as nuclear incident area was one of the important missions of educational governance. The schools and students in some affected areas which were devastated by tsunami like Minamisanriku and affected by nuclear power plant incident in Hamadori Area of Fukushima, had to evacuate to wide range of area beyond city or prefectural boarder. In this situation, the partnership and collaboration between affected BOE and non-affected BOE as well as high level damaged BOE and low level damaged BOE are very important to promote disaster recovery in education sector. That is the Mutual-help of educational governance for educational recovery from the disaster.

4.4 Key Lesson and Challenges

East Japan Earthquake and Tsunami (EJET) was the largest disaster on its scale, extent and intensity among the disaster which Japan has been experienced so far. Its impact on education sectors was enormous on various aspects and it cannot be resolved and recovered yet. However, the impacts warrant an in-depth examination of lessons learned from the disaster in order to achieve the disaster risk reduction of future disaster and the recovery from EJET. 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 four issues: i) Natural and geographical conditions, ii) Governance issues, iii) School management and education, and iv) Community involvement as follows:

4.4.1 Natural and Geographical Conditions

4.4.1.1 Geographical Condition –Contrast of Sanriku (Rias) coast and Sendai Plain

Geographical condition determines the feature of disaster such as tsunami. Through the observation of the damage of EJET, it can be categorized two types of tsunami disaster. The characteristics of tsunami disaster made contrast between Sanriku Coast and Sendai Plain. In Sanriku Coast which has complex coast line called “Rias Coast Line”, tsunami gets higher because of a lot of deep bays and go up to high land (recorded maximum 40m in EJET), so that big and strong tsunami attacked schools in Sanriku coast area. In this reason, students and teachers need to evacuate school to higher and higher place immediately, especially, at the schools which are built on low land beside the ocean, to stay at school after the earthquake and tsunami warnings is very dangerous as the case of Okawa Elementary School in Ishinomaki City. Thus, in Sanriku area, rapid evacuation action is very crucial for risk reduction of tsunami disaster.

On the other hand, in plain area such as Sendai Plain, tsunami doesn't get so high but go up river and low land to deep inland (recorded maximum 5km from coast line) and inundates vast area of plain, so that the schools located in such area are surrounded by tsunami. In addition, it is difficult to find out the high land and facilities or buildings as evacuation place in school's neighborhood. In this context, at schools located in plain area, it could be an option that students and teacher evacuate to upper floor or roof of their school buildings like the case of Arahama Elementary School.

4.4.1.2 Altitude and Distance from coast line should be considered for Evacuation

Location of school building is a crucial issue. According to the survey of MEXT, it can be find out that there is a close relationship between altitude and distance from the coast line with regard to school location and risk of tsunami disaster. It is identified two categories as analyzed above. One is the schools which had many damages by tsunami in spite of high altitude in Sanriku area, and another is the school which received damages by tsunami going upstream in rivers and flat land in spite of the distance from the ocean. Therefore, altitude and distance from the ocean is quite important for evacuation from tsunami. Especially, schools in Sanriku area have disaster risk of tsunami even if the school is located on high land, so that teacher and students have consider the “Altitude” of school land primarily in order to take appropriate evacuation routes and places for disaster preparedness. On the other hand, the schools in plain area have disaster risk of tsunami even if the school has definite distance from coast line, so

that teachers and students in such schools should recognize the risk of tsunami based on the lesson learned from EJET and utilize it to improve their evacuation manual and drill, and disaster education for the preparation for next coming disaster.

4.4.2 Governance Issue

4.4.2.1 Governance Correspond to Recovery Process in Education Sector

Governance, such as the board of education (BOE) takes a significant role to the progress of educational recovery and reconstruction in education sector. Physically, BOE make up and implement the plan of rebuild building and facilities of affected school. Logistically, BOE tends to supply the manpower for educational recovery and psychological supports to affected students and parents. And, instructionally, some BOEs are promoting the new concept of disaster education and recovery education from the lesson of EJET with developing the curricula and teaching method.

Through the analyzing the linkage and relation between damage level to educational governance and educational recovery based on the observation of some case of educational governance in tsunami affected areas, the critical measure of educational governance could be identified for educational recovery in the aftermath of EJET.

(a) Principal takes Key Role of Educational Governance in Critical Situation

In the high level damaged case of BOE which lost superintendents by tsunami and the function of educational governance was collapsed, the school principals should take key role of making the decision such as conducting evacuation and shelters to protect students and residents instead of superintendent or BOE. Moreover, the leadership of principal initiated other schools' evacuation and school restart, and contributed to educational recovery process of whole city.

(b) Support of Manpower from Prefectural and other BOE is Helpful

In the case of BOEs which lost officials by disaster and faced the shortage of manpower for educational recovery, the manpower support from prefectural BOE and other cities' BOE was very helpful. To get this support, BOEs in affected area needs to establish partnership with prefectural BOE and other BOEs inland preparing for the disaster.

(c) Partnership with other BOE should be formed to evacuate Students to Safe Place

In affected area devastated by tsunami, BOE had to determine to evacuate all whole school students to the safe place in other city inland. This supports was very crucial for affected schools and BOE to protect students and resume the school education. To achieve this, it is necessary for affected BOE to build a good relationship with other city's BOE from daily time.

(d) Moving affected Schools to Other Schools is Maid Measure to Rebuild Education

In many affected area, BOE had to move or merge serious damaged schools to other schools or facilities which are available to evacuate and restart school. This measure was important and main governance measure of affected BOE to rebuild school education in the aftermath of EJET. In the process of the measure, BOE needs to consider the damage level of school, prospect the transition of number of children, and consult with parents and residents.

(e) Joint Events for affected Schools organized by BOE is Driving Force to Recovery

In the case of low level damaged area, as BOE maintained governance function and took a key role of educational recovery, to organize joint events for affected schools is effective measure as the driving force for educational recovery.

(f) Acceptance of Students from other affected area is the Mission of governance

In low level damaged area, accepting transfer students from other affected area such as nuclear incident area was one of the important missions of educational governance. The schools and students in some affected areas had to evacuate to wide range of area beyond city boarder. In this situation, the partnership and collaboration between affected BOE and non-affected BOE as well as high level damaged BOE and low level damaged BOE are very important to promote disaster recovery in education sector.

4.4.2.2 Challenge of Educational Governance for Recovery

In the situation of low birthrate and longevity, and depopulation of affected area of EJET, governments have many kinds of obstacles and challenges to accelerate the recovery from EJET. It is influencing on the educational governance. In tsunami affected area, some of affected schools have been closed by student decreasing because of the disaster of the EJET so far, and some schools will be closed in a few years by

damage of the disaster. Second case is to merge affected school with another school which has no damages like several schools in affected areas. And third case is to combine elementary school and Junior high school in same district like Toni Elementary School and Toni Junior High School in Kamaishi City. As a result, the disaster of EJET accelerates the merge of schools in disaster affected area, so that many of communities in affected area are losing their schools as a center of community. It is a challenge for educational and community recovery.

4.4.3 Improving School Management and Education

(a) School functioned as shelter and center for recovery

During the disaster, the schools were functioning as a shelter for not only students and teacher but also community residents. 622 schools managed the shelter in the gym or class room at its peak. And last shelter in school was closed 8 months later from disaster happened. The schools contributed to evacuation of local residents and recovery of community. While schools were used as evacuation center, people from local communities remained in school for long time. 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. In this context, schools need additional facilities to manage shelters such as shower, kitchen and toilet for evacuees, and stockpile warehouse. Stockpile warehouse should be set upper floors to avoid inundation by tsunami or flood based on the lessons of EJET.

(b) Teacher's Literacy (Capacity) for DRR: Knowledge, Judgment, Skill – training

Observing cases of schools damages and evacuations, many cases can be found that the judgment of principals and teachers rescued the lives of students and local residents. It can be said that knowledge, skills and ability they acquired through experiences and trainings, produce appropriate judgment and action. In emergency situation of disaster, teachers play key roles as specialists for conducting evacuation action and communicating with students, community members and experts of disaster management sectors such as fire department. Especially, school principal has privilege for disaster management and decision making for disaster risk reduction at school such as conducting students' evacuation and setting the shelter in the school. Therefore, it is very crucial for principals and teachers to raise awareness and foster the ability and skill for disaster risk reduction through trainings.

(c) Effectiveness of Disaster Education:

As exemplified in the school of Kamaishi and Arahama Elementary School 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. Some of schools and the board of education are trying to improve disaster education based on the lessons learned from EJET. To achieve this, they also try to develop the curriculum of the education for disaster risk reduction and recovery as well as the disaster prevention manual renewing evacuation route and place. Especially, several BOEs in affected area such as Kesennuma City venture to incorporate disaster education to school curriculum in order to promote disaster education effectively and continuously in formal education, utilizing various resources in the region (Oikawa 2014b). MEXT also set object of disaster education and renewed guideline based on the lessons of EJET for the promotion and dissemination of disaster education.

4.4.4 Community Involvement and Multi-stakeholder

4.4.4.1 Community Involvement for Disaster Risk Reduction

When the disaster of East Japan Earthquake and Tsunami (EJET) occurred, it was seen that students took evacuation with local residents in many place in Tohoku. On observing selected case of schools, both of schools in Kamaishi and schools Sendai conducted evacuation actions collaborating with local residents and faculties of government and disaster management sectors. Sometime, students supported elders and children, on other hand, community member protected students' lives with appropriate advice and instruction. After the disaster of EJET, linkage and collaboration between school and community is progressing in many regions and cities, and joint evacuation drill and disaster class are performing at many schools and communities as voluntary initiatives.

4.4.4.2 New role of school and multi-stakeholder dialogue:

As disaster prevention practices are implemented involving community and its activity is getting higher, Multi-stakeholder network or platform is forming in order to promote disaster education and activities effectively. To promote disaster education as community based education, platform for multi-stakeholder dialogue is necessary.

On the other hand, in the changing demographic condition in local community, schools are expected to play increasing role in the community as a community facility, as it is called that “The school is a ship floating on the community”. Therefore, the reconstruction of the school building and education recovery needs interactions with a diversity of stakeholders, including community members.

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Chapter 5 ESD Promotion of Kesennuma City: Framework and Practices

Abstract: This chapter will analyze the framework and practice of ESD promotion in Kesennuma City. Since the latter half of the 20th century, Kesennuma City has made the most of its abundant nature to promote special activities with the aim of creating a sustainable society. In addition, since 2002 the city has developed and implemented a systematic, community-based ESD program that centers on school education in collaboration with specialized agencies such as universities, overseas schools and organizations. These efforts and innovative challenges have played a leading role in pioneering ESD in Japan. In June 2005, the Greater Sendai area including Kesennuma City was designated by the United Nations University as one of Regional Centres of Expertise (RCE) on the UN Decade of ESD (DESD). Since 2008, under the leadership of Kesennuma City Board of Education, schools in Kesennuma City has been becoming members of UNESCO Associated Schools (ASPnet School) with the aim of further improving the quality of ESD practice. And all elementary schools and junior high schools along with some kindergartens and senior high schools in Kesennuma have been acknowledged as ASPnet Schools and have promoted characteristic ESD practice based on their communities and resources. However, Kesennuma City suffered unprecedented damage from the East Japan Earthquake and Tsunami that occurred in March 2011. Even so, the city aims for sustainable reconstruction and is working to foster human resources that can create and revitalize the region based on the fundamental principles of ESD by enhancing disaster risk reduction and reconstruction.

5.1 Overview of Kesennuma City

5.1.1 Demography and Topography of Kesennuma City

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 67,179, householders of 26,142 and a population density of 201.49 persons/km² (as of April 30, 2015), the city are the center of the Minami-Sanriku area which has a population of approximately 90,000 (Table 5.1).

However, because of East Japan Earthquake and Tsunami which occurred on March 11, 2011, the population of more than 6,000 people decreased in a several years (Table 5.2).

Table 5.1 Demography of Kesennuma City

Name	Kesennuma City
Prefecture	Miyagi Prefecture in Japan
Gross Area	333.41 Km ² (Kesennuma district:184,39 Km ² , Karakuwa district: 42,32 Km ² Motoyoshi district:106,7 Km ²)
Location	North latitude: 38°44'23" - 39°00'10, East Longitude:141°23'55" - 141°40'31"
Population	Total: 67,179 people, Male: 32,656, Female: 34,523 (as of April. 2015)
Householders	26,142 holders (as of April. 2015)
Temperature	Average: 10.7°C, Maximum: 33.9°C, Minimum: - 9.2°C (as of 2013)
Precipitation	Annual: 1271.5 mm, Maximum: 434.0mm, Minimum:10.0mm (as of 2013)
Schools	Elementary: 17, Junior High School: 12, High school: 5 (as of 2013)

[Source: Kesennuma City] Modified by author

Table 5.2 Transition of Population caused by East Japan Earthquake and Tsunami

Classification	Before EJET 28-Feb-11	After EJET 31-Mar-14	Transition
Population	74,247	67,951	-6,296
Male	35,950	33,001	-2,949
Female	38,297	34,950	-3,347
Householders	26,601	25,846	-755

[Source: Kesennuma City] Modified by author

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 known as a “Rias coast line”. In the background stand mountains beginning with the 760 meter Mt. Ohmori from which the Ohkawa River, Omoze River, Shishiori River and other small size rivers to mid size rivers flow into the Kesennuma Bay (Fig. 5.1). It has long been one of the leading fishing ports in Japan. Fish 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 fin (Oikawa et al. 2007).



Fig. 5.1 Landscape of Kesennuma City: Kesennuma Bay (2008)

5.1.2 Historical Perspective of City and Characteristics

The region also has traditional performing arts and local heritages. There is a cultural landscape of taking care of nature and living creatures. It is also a precious region that supports food production towards the creation of a sustainable society. Utilizing rich nature and culture, Kesennuma City has been promoting various activities toward sustainable regional society. Under the slogan of “Forests is sweetheart of ocean”, oyster farmers have been planting trees to preserve the forest on the mountains of

upstream river more than 20 years, involving people in Kesennuma and other region. In 2002, Kesennuma city established “Slow Food Kesennuma Association” and drafted “Kesennuma Slow Food Declaration”, which aims to protect the produces, culture and environment in region while passing on real food taste to future generations.

Within city limits, there are 4 prefectural high schools, one private high school, 13 middle schools and 18 elementary schools (as of 2014) and there are no universities in Kesennuma City. The city, primarily through the board of education, is working earnestly to raise the level of education. On other hand, fishing industry which main industry in Kesennuma, have been declining since end of 20th century because of exhaustion of marine resources, falling of fish prices and rising of oil price. So people, especially younger people are getting difficult to get jobs within Kesennuma City. Therefore, students go to universities and business companies in urban area after graduation of high school in Kesennuma City. As a result, in addition of decreasing of birthrate of children, Kesennuma City is getting the aging society year by year, which is one of the key issues for sustainability of the city.

5.2 ESD in Kesennuma and its Key Features, Lessons

In 2005, when the “Decade of Education for Sustainable Development (DESD)” was launched by United Nations, United Nation University designated Greater Sendai as a Regional Center of Expertise (RCE) to promote ESD at world level (UNU IAS 2005). Then, Greater Sendai RCE became one of seven RCEs in the world and that consisted of Sendai City, Kesennuma City and Tjiri-town (Ohsaki City), and then Shiroishi-Shichigashuku area also participated in the RCE in 2008 (MUE 2009).

According to acknowledgement of “Regional Centres of Expertise (RCE)” as a part of Greater Sendai RCE, Kesennuma City Board of Education and schools have developed in-depth programs to implement a unique environmental learning-based “Education for Sustainable Development” (ESD) in partnership with local professional knowledge-providing organizations such as universities, local industries and government, NPO/NGO, Media sectors and so on. Using the local knowledge-base network, they are promoting locally based ESD focused on International Environmental Education Programs mainly (Oikawa 2011).

Kesennuma ESD/RCE has been developing and expanding based on the flowing five steps, initiated by Omose Elementary School and Kesennuma City Board of Education (Oikawa 2014a).

5.2.1 Forming Elementary, Junior High and High School Partnerships

Since 2002, in Kesennuma City, Omoso Elementary School has participated in the Master Teacher Program (MTP) of the Japan Fulbright Memorial Fund administered by Japan-U.S. Educational Commission. In this program, the school developed a pair project at each grade level under the theme, “Water Environments and Effects on Human Life”. These projects were conducted jointly with Lincoln Elementary School, Wisconsin, the United States, and implemented as exchange-based international environmental learning. Following the success of Omoso Elementary School’s practice, Omoso Junior High and Kesennuma High Schools joined the Master Teacher Program (MTP) in 2005, and began their partnership programs with Callisburg Elementary, Junior High and High Schools in Texas, the United States, to engage in international environmental education programs. Teachers from both regions visited each other and also have international exchanges over the internet. This joint opportunity provides an ESD anchoring environmental education from a global perspective. This partnership has enabled to conduct a systematic development and practice of elementary to high school level as ESD programs targeting abilities and competences to foster through the learning style and approach according to school level (Fig. 5.2).

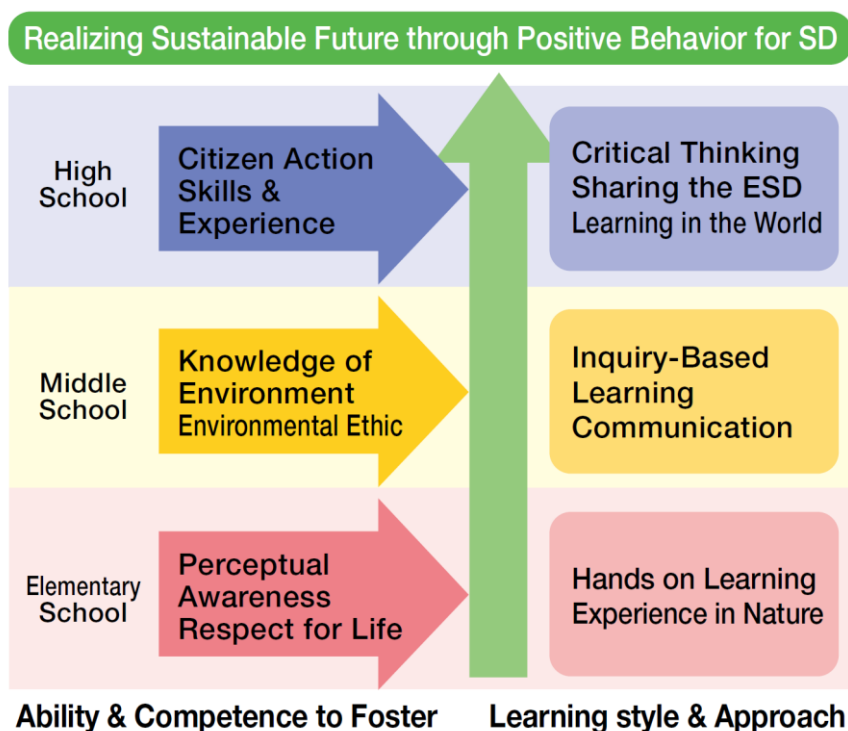


Fig. 5.2 Systematic ESD from Primary to High School in Kesennuma City
[Source: Mobius for Sustainability 2002-2009(Oikawa 2009)]

5.2.2 Hosting the Kesennuma Round-table Conference for ESD Promotion

In 2006, the Kesennuma Round-table Conference for the promotion of ESD was held to share the practices of ESD practice in Kesennuma City based on each region and ESD programs with all other elementary and junior high schools and high schools in Kesennuma as well as multi-stakeholder and sectors in region. This forum grew out of the “Project Partnership Meeting” hosted by Omoso Elementary School jointly with local universities and organizations as well as partner schools in the U.S. The meeting, held since 2002, aims to promote and improve ESD practice. In this forum, participants had lectures and discussions on ESD to plan future programs and motivate the practitioners while sharing knowledge and experience with peers guided by ESD experts from universities, institutions and ministries. The conference has been sustained beyond DESD as a multi-stakeholder platform of ESD in Kesennuma region (Fig. 5.3).



Fig. 5.3 Kesennuma ESD/RCE Round-table Conference 2014

5.2.3 Establishment of Kesennuma RCE Promotion Committee

In June, 2005, the United Nations University designated Greater Sendai region including Kesennuma City as its Regional Centres of Expertise (RCE) to implement the UN-Decade of Education for Sustainable Development (DESD). To promote ESD/RCE in Kesennuma, under the leadership of Kesennuma Board of Education, Kesennuma City tried to organize “Kesennuma ESD/RCE Promotion Committee” by forging

dynamic partnership with Miyagi University of Education, other local specialized knowledge institutions, local government, and local industry organizations. This should allow the schools and activists of ESD to benefit from distinctive local resources and the expertise offered by these partner institutions.

In November 2006, Kesennuma City established “Kesennuma RCE Promotion Committee” to further promote ESD as a model region of the world. This committee consists of 28 organizations that play central roles in local ESD promotion, including schools, businesses, nonprofit organizations, museums, local governments as well as media organizations (Table 5.3). These organizations are the leading actors in environmental education, international education, food education and disaster risk reduction education etc. Each organization has shared its own action plans for the partnership with local schools and nonprofit organizations.

Table 5.3 Constituent of Kesennuma ESD/RCE Promotion Committee, as of 2009

Specialized knowledge Institutes	Local Government (Public Sector)	Local Industry & Press Organizations	NPO and Volunteer	Educational Organizations
Miyagi University of Education Kesennuma City Library Rias Ark Museum of Art Miyagi Architect Association	Miyagi Prefectural Kesennuma Civil Engineering Office Environmental and Health Division, Kesennuma City Planning and Policy Division, Kesennuma City Kesennuma City Board of Education	Kesennuma Office of Tohoku Electric Power Co., Inc. Kesennuma Chamber of Commerce Sanriku-Shinpo Newspaper Kahoku-Shinpo News paper	Kesennuma UNESCO Association “Slow Food” Kesennuma Association Kesennuma Nature School “I Love Oshima” Oshima Experience Station Kesennuma Butterfly Association “Forest as Sweetheart of Ocean” Research Group for Teaching Materials in Region	Omose Elementary School Hashikami Elementary School Shishiori Elementary School Nakai Elementary School Omose Junior High School Shishiori Junior High School Kesennuma High School Kesennuma West High School

[Source: Mobius for Sustainability 2002-2009 (Oikawa 2009)]

5.2.4 Training and Dissemination for ESD Promotion

In Kesennuma, Omose Elementary and Junior High Schools as well as Kesennuma High School, in partnership with Kesennuma City Board of Education (Kesennuma BOE) played a significant role in providing training to teachers engaged in ESD focused on environmental education. As of 2005, Miyagi University of Education joined this partnership, and began environmental education-related “Satellite Training Seminar,” “Science Workshop,” and “Friendship Project” with Kesennuma BOE. Kesennuma BOE has also started many kinds of workshops and symposiums for the promotion of ESD since 2006. The City of Kesennuma has hosted approximate more than 100

teachers and school administrators from China, South Korea and USA since 2008 through “Korea/China Educator Invitation Program” of the Asia-Pacific Cultural Centre for UNESCO (ACCU) and “ESD Japan-US Teacher Exchange Program” of the Fulbright Japan. Similarly, teachers of Kesennuma also visited these countries to deepen mutual educational exchanges. In February 2009, Kesennuma City hosted “UNESCO Associated Schools International Forum on ESD in Kesennuma 2009” where teachers and educational experts from China, South Korea and Japan were invited. Even then Kesennuma City suffered serious damages by East Japan Earthquake and Tsunami of March, 2011, Kesennuma held “National Research Seminar for Environment Education” in November, 2011 and “UNESCO School Regional Exchange Conference” in January, 2012, inviting educators from not all over Japan but also foreign country such as USA and Korea. Through a variety of these information sharing programs, it was shared that ESD activities were carried out under an organic partnership in inside and outside of Kesennuma and deepened their friendship, and it will be continued to strive for spreading ESD programs beyond the school and region.

5.2.5 Vertical, Horizontal and Lateral Links for Whole City Promotion

In Kesennuma, the City Board of Education took initiatives to establish three kinds of linkages and partnerships for promoting ESD throughout region (Fig. 5 4).

The first is a “Vertical Links” among elementary, junior and senior high schools and further universities based on systematic ESD program. The second is a “Horizontal Links” with other schools through the UNESCO Associated School Project Network (ASPnet) and other programs such as projects or programs of Ministry of Education (MEXT), Ministry of Environment, UNESCO and OECD. And the third is “Lateral Links” with other non-formal and informal organizations in the community such as local governments, nonprofit and nongovernmental organizations (NPOs/NGOs), industries and professional organizations through Kesennuma ESD/RCE Promotion Committee. This structure was built up in Kesennuma City for the first time in the world, advised and supported by United Nation University, so that the structure was adopted as the concept and structure of RCE. Kesennuma is now trying to disseminate their good practices as “Kesennuma ESD Model” to the world through World Conference on ESD, RCE and ASPnet programs (Interministerial Meeting on DESD, 2014).

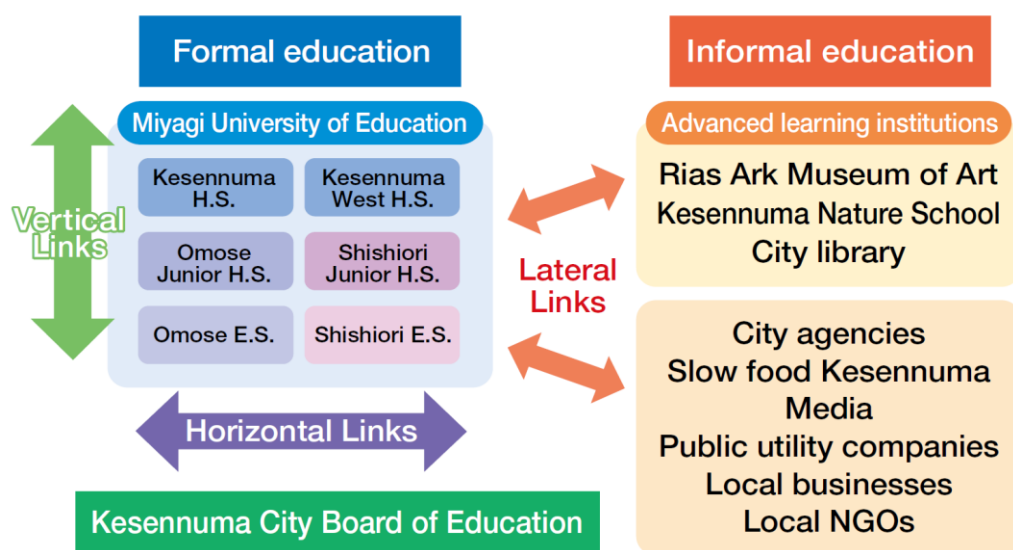


Fig. 5.4 Structure of Kesennuma ESD/RCE Promotion
 [Source: Mobius for Sustainability 2002-2009 (Oikawa 2009)]

5.3 ESD of Schools in Kesennuma

5.3.1 Schools need to promote ESD linking with Outside Organizations

There was an on-going reform in school education in Japan. In keeping up with a changing society, the government has recognized the need to train students to be rich in heart and become able to contribute to sustainable society, acquire the basic skills for educating themselves, and cultivate their "Zest for Living". The Renewal Course of Study, in effect April 2011, still requires schools to set aside time for integrated studies and promote ESD through subjects and integrated studies at each school level. In order for schools to realize and reap the benefits of these reforms, it is essential that teachers go beyond the school walls, establish links with community and professional organizations and institutions, and promote educational activities with the support of a broader partnership framework. In particular, with ESD programs through the approach of environmental education and international understanding education, schools devise and implement their own original learning programs, creating and realizing distinct, unique educational activities. By involving universities and other professional organizations in this process, teachers can apply the latest expert knowledge, techniques, data, information, and research findings to their teaching and

curriculum in pursuit of more in-depth and comprehensive learning programs of ESD. When all parties form linkages, collaborate to create and implement learning programs, and cultivate these relationships, teachers realize learning programs tailored to the individual learning styles and educational needs of each child, expanding possibilities and opening doors for students and education. Building this new education networks meets the needs of their future (Oikawa 2014).

5.3.2 Strategies and Process for Promoting ESD in Kesennuma City

In Kesennuma, the schools have been promoting ESD through development and practice of ESD programs utilizing rich natural environment, cultural heritages, and regional issues from the following perspectives (Oikawa and Mikami 2010). In the case of Omoso Elementary School which is the pilot school of ESD in Kesennuma City, it could be analyzed how to develop the strategies and process for promoting ESD in formal education. The ESD practice of Omoso Elementary School is very innovative and systematic on curriculum development, promotion system and partnership for collaboration or exchange. It has been leading ESD practice of not only schools in Kesennuma City but also schools of other region in Japan and other countries.

5.3.2.1 Strategy 1: Development of community-based systematical “Inquiry- based Learning Program”

Utilizing rich nature and considering problems in region, the schools should foster students’ perceptual awareness and interests based on hands-on experience, and develop and implement systematic inquiry-based ESD program according to grade level. Omoso Elementary School (Omoso ES) in Kesennuma has developed and implemented what it calls a “global inquiry-based environmental education program” across the entire school grades (1st through 6th grade) since 2002. Kesennuma City is the perfect place to learn about nature and the environment. Kesennuma city is situated on a saw-toothed coastline area within the National Park. Rivers flow from the green Mountains through the city to Bay. It is surrounded by forests, rivers and ocean all of which are interconnected by water. Thus, it was agreed by staff and partner schools in the United States that the environmental learning theme should be on water. At Omoso ES, Integrated Studies Period was centered on the development and implementation of ESD programs and projects. Omoso ES expanded the curriculum to incorporate previous education for international understanding, environmental education and information

education curricula to the ESD project. It was aimed to build a comprehensive education program, which embraces the environmental education project, international understanding activities, food education, and information education and so on. It is the approach to create ESD curricula at Omore E.S.

5.3.2.2 Strategy 2: Forming partnerships with local communities, universities and professional organizations that serve as a knowledge base

For promoting ESD based on region and community, schools in Kesennuma cooperating with Kesennuma City Board of Education (Kesennuma BOE) have been making the linkage with outside institution such as university, museum, nature center, nonprofit organization, industry, as well as local government, and schools developed ESD program reaping the benefits of their expertise.

For the purpose of making up ESD program, schools in Kesennuma such as Omore Elementary School (Omore ES) established linkages with specialists in environmental issues and education, beginning with Miyagi University of Education, to seek support for new program. Starting this project, Kesennuma BOE and Miyagi University of Education formally promote the development and growth of the linkage between Environmental Education Center (EEC) of Miyagi University of Education and Omore ES. In order to launch this project, Omore ES had instructors from EEC of the Miyagi University of Education, Sendai City Science Museum, and Shizugawa Nature Center, and they participate in each grade project of Omore ES. Omore ES also had many volunteers from the municipal governments, industrial companies, nature schools, and volunteer organizations in the community cooperated in the project. Specialists offered advice and support from their respective fields of expertise. They supported teachers in all aspects of the projects, providing information and technological support and granted the school access to a wide range of resources, information, and materials. Their resources, as a result, helped Omore ES engage in sophisticated and effective research and learning in ESD focused on inquiry based global environmental education project.

Along with other specialized institutions, local governments, and local industry organizations, Miyagi University of Education provided guidance on the development of the ESD programs at Omore ES, assisted the implementation of the program, and delegated guest teachers to Omore ES. Since the ESD program of Omore ES has been developed by forging dynamic partnerships with local civil society, learning processes of individual students at Omore ES are closely linked to regional development processes.

5.3.2.3 Strategy 3: *Fostering the global perspectives through “Joint-Learning” with schools in other regions and abroad*

ESD collaboration was done with schools abroad and communities, and mutual understanding of culture and environment on global perspectives through sharing their activities and results of learning was promoted. In 2002, Omoso ES participated in the Japan Fulbright Memorial Fund (JFMF) Master Teacher Program (MTP) and carried out ESD based on environmental education projects. Omoso ES formed a partnership with Lincoln Elementary School in Madison, Wisconsin, from 2002 to 2004, and with Callisburg Elementary school in Texas from 2005 to 2006. Under the Master Teacher Program of the Japan Fulbright Memorial Fund, Japan-U.S. Educational Commission, and Omoso and American schools engaged in joint environmental projects. The collaboration was based on the theme of “USA and Japan (Kesennuma) water environments and their effect on human life”. Each grade level decided on the theme for their project, created a pair project, interacted via the internet and engaged in joint learning activities. Through interactions based on the learning, the similarities and differences between two environments was compared by students in both side of Kesennuma and USA. The pair projects of each grade were planed based on the common theme and different characteristics between Kesennuma City and cities in USA. (Fig. 5.5)



Fig. 5.5 ESD Joint-learning between Omoso ES and American School
[Source: Mobius for Sustainability 2002-2009 (Oikawa 2009)]

5.3.2.4 Strategy 4: Promoting ESD through UNESCO Associated School Project Network (ASPnet)

Under the leadership of Kesennuma BOE, 20 Elementary, 10 Junior High, 2 Senior High Schools and 1 kindergarten in Kesennuma have been certificated as UNESCO Associated Schools by the UNESCO headquarters in Paris, France. This made Kesennuma the city that had a largest number of UNESCO Associated Schools (as of December 2011). The recognized UNESCO Associated Schools in Kesennuma further expand ESD activities using local resources and characteristics. Also, through the UNESCO Associated School Project Network (ASPnet), Kesennuma City strives further to promote ESD with domestic and international partnerships. In 2014, all of elementary schools (Table 5.4) and junior high schools (Table 5.5) along with 2 high schools (Table 5.6) and 2 kindergartens (Table 5.7) in Kesennuma City have been acknowledged as UNESCO Associated Schools and they are promoting characteristic ESD practice based on their communities. However, after the East Japan Earthquake and Tsunami in 2011, five UNESCO Associated Schools (four elementary schools and one junior high school) in Kesennuma have been merged with other schools because of disaster damage and declining birthrate on the other hand.

Table 5.4 List of UNESCO Associated Schools in Kesennuma and ESD Focuses: Elementary School



List of ESD Practices Themes **Elementary Schools**

	School Name (ASP Status)	Themes for This Fiscal Year ◇Outline of Good Practices	Main ESD Area
1	Kesennuma Elementary School (ASPnet school)	Life in the seaside town of Kesennuma ◇Fishing industry-based environmental education, food education, disaster-preparedness, and welfare programs	Understanding of Local Community, Environment, Industry, Disaster Preparedness, Food Education, Welfare
2	Kujo Elementary School (ASPnet school)	Let's look at this town, and extend the circle of people. ◇Through cultivation activities carried out at the "learning garden" and "school farm", children experience a "dialogue with nature" (1st and 2nd grades), and through this as well as activities investigating the environment, topography, facilities and industries around them, children deepen their understanding of the region's special features.	Understanding of Local Community, Environment
3	Shishiori Elementary School (ASPnet school)	Learning about our hometown of Shishiori ◇The children take part in interaction with overseas students twice a year under the themes of local traditions, natural environment, and individual plan learning that are pursued in the integrated studies and life environment studies periods.	International Understanding, Environment, Career Education
4	Urashima Elementary School (ASPnet school)	ESD learning emphasizing knowing about issues, examining them and putting the knowledge to good use while utilizing the special characteristics of the community ◇Through experiencing activities related to how to protect life in the face of natural disasters, as well as understanding and experiencing industry in the recovering local community, sentiments of acting and living with the rest of the people in the community are nurtured in children.	Disaster Preparedness/ Safety, Understanding of Local Community, Food Education
5	Hakusan Elementary School (ASPnet school)	Handing down local traditions and devices for activities to learn about the environment and disaster prevention ◇Through joint-education provided by the Hakusan Elementary School District Collaborative Schools Promotion Council, children learned how to play Uchibayashi Hakusan drums and displayed their skills at school sports days and other events.	Understanding of Local Community, Environment, Disaster Preparedness
6	Matsuiwa Elementary School (ASPnet school)	Learning how to build a society and a future where people live in harmony with others ◇Maximizing the specific characteristics of the school district--which includes a coastal area (which since the Edo period has been devoted to aquaculture), an urban and commercial area, and an area extending to the hills where numerous cultural and welfare facilities are located--the ESD program approaches all subjects within the syllabus in a cross-cutting and comprehensive way.	Environment, Local Community, Welfare
7	Mizunashi Elementary School (ASPnet school)	Understand, Study, and Communicate hometown information ◇In order to nurture in children a spirit and attitude of loving their hometown, they create flower beds together with members of local seniors clubs, experience pottery expression with local potters, learn traditional Hata Kagura music and dance, and cultivate rice in the local area.	Understanding of Local Community

8	Shinjo Elementary School (ASPnet school)	Encounter the local environment, find interesting things, investigate them	Understanding of Local Community, Welfare
		◇With business offices and homes being built in areas where earthquake damage was minor, an annual plan was formulated based on "local community" and "welfare" themes in order to take advantage of the natural and social environments.	
9	Tsukidate Elementary School (ASPnet school)	Fostering children who love Yase, their hometown, and learn with enthusiasm	Understanding of Local Community
		◇We aim to encourage students to learn about the positive aspects of their hometown of Yase through experiential activities in which they interact with local people. From this knowledge students can identify problems, initiate action to solve those problems, and then use their own words to communicate information.	
10	Ochiai Elementary School (ASPnet school)	Cultivation and environmental conservation activities of Ochiai Elementary School with its abundant nature	Environment
		◇Utilizing the rich nature of the Ochiai district, located between mountains, students carry out cultivation and nature conservation activities in flower beds, and through these activities acquire attitudes of desiring to protect the abundant natural environment that surrounds them.	
11	Hashikami Elementary School (ASPnet school)	Nurturing Students to Look at Their Local Area and Devise a Sustainable Future for It Through Food	Food Education
		◇Based on the "Hashikami Elementary School Slow Food Declaration" issued in 2002, students identify issues related to food and study these issues systematically. Within these studies, students develop the ability to make proposals for ways of living and visions for the district in the future.	
12	Oshima Elementary School (ASPnet school)	Let's take a close look at Oshima and think of what we can do.	Environment
		◇Due to the earthquake disaster, instead of studying the island's natural environment surrounded by the sea, studies focused on activities to invigorate island residents; promote yuzu (Japanese citron), a local speciality; pizza-making and buckwheat noodle-making for inviting guests; and various other subjects.	
13	Omoso Elementary School (ASPnet school)	Teaching to improve students' ability to think for themselves and to express themselves: Teaching Life Environment Studies and Period for Integrated Studies with a focus on writing activities	Environment, Energy, Disaster Preparedness
		◇In addition to the environmental studies program with the theme of the "waterside environment" that the school has developed and implemented since 2002, a disaster preparedness program based on "self-help" and "mutual-help" was also implemented.	
14	Karakuwa Elementary School (ASPnet school)	Promotion of environmental education focusing on hands-on activities with oyster farming to experience the richness of the Karakuwa ocean	Environment
		◇Oyster farming activities begun in 2004 were resumed after being temporarily discontinued due to the earthquake disaster. Rafts for oyster farming were made for the children and we were able to resume activities that enable students to experience the richness of the ocean.	
15	Nakai Elementary School (ASPnet school)	To nurture children for life in the future while looking closely at our hometown	Environment, International Understanding, Understanding of Local Community
		◇With the help of local residents, students carry out experiential activities such as observing local nature, growing vegetables, and making konjac jelly from the konnyaku plant. Furthermore, in the Hometown Study Group, students undertake not only ocean-related activities but also disaster-preparedness studies.	
16	Koharagi Elementary School (ASPnet school)	Our hometown Koharagi – look at the present, think about the future	Understanding of Local Community
		◇In place of the planned ocean field studies, which could not be carried out due to the catastrophic damage caused by the earthquake disaster, students deepened their learning with regard to (1) the local community's diverse natural environment and culture; and (2) activities aimed at recovery.	

17	Tsuya Elementary School (ASPhet school)	Fostering children who look at Tsuya, learn about the community and build a new future for their hometown – linking people and nature towards tomorrow	Understanding of Local Community
		◇Through cultivation of sweet potatoes, investigating the Tsuya region, learning about the natural environment, rice cultivation, bean cultivation, and other production activities, as well as through making Tsuya lunchboxes that feature local products, children provide both inside and outside of the school with information about the wonderfulness of Tsuya.	
18	Magome Elementary School (ASPhet school)	Living in our home town of Magome – Magome kids learning from people, nature and community	Environment, Understanding of Local Community
		◇Students learn about the relationship and connection between the natural assets such as the Magome River and forests that are representative of the Magome District, historical buildings, traditional performing arts, and history by exploring Magome.	
19	Koizumi Elementary School (under application)	Fostering children who can look at the way they live while being involved with local nature and people	Environment, Welfare
		◇Based on the area's specific characteristics of being blessed with natural assets such as the sea, mountains and rivers, a thriving fishing industry and agriculture, and a large number of welfare facilities, through experiential activities the program aims to foster children who are capable of examining the way they live their own lives.	
20	Ohya Elementary School (ASPhet school)	Nurturing children who look at their community, and find out about and try to express its good points	Understanding of Local Community, Disaster Preparedness, Environment, Welfare, Local Cultural Heritage
		◇Centering on the perspectives of local nature, industry, culture, and welfare, etc., students examine and explore the area, pursuing activities that express the district's good points and following a cross-cutting approach with related coursework subjects and fields.	

[Source: “Kesennuma ESD Joint Research Report (Kesennuma BOE et al 2013)]

Table 5.5 List of UNESCO Associated Schools in Kesennuma and ESD Focuses: Junior High School



List of ESD Practices Themes **Junior High Schools**

	School Name (ASP Status)	Themes for This Fiscal Year ◇Outline of Good Practices	Main ESD Area
1	Kesennuma Junior High School (ASPnet school)	Let's think about how Kesennuma will be in 10 years' time! ◇Aiming towards the reconstruction of Kesennuma, which sustained enormous damage in the Great East Japan Earthquake, we have junior high school students image "Kesennuma in 10 years' time" and think about what they themselves can do to realize that future image based on a pillar of "Disaster Preparedness Education", with students learning about "Self-Help", "Mutual-Help", and "Public-Help".	Disaster Preparedness
2	Shishiori Junior High School (ASPnet school)	Nurturing students who contribute to local reconstruction: through surveys of the local environment ◇We aim to raise awareness of hometown environmental protection, nurturing students who desire to protect the natural environment remaining in Shishiori after the earthquake disaster and contribute to the restoration of the natural environment destroyed by the earthquake and tsunami.	Environment
3	Matsuiwa Junior High School (ASPnet school)	Creating a welfare hometown: mutual assistance for better living ◇Experiential and investigational activities are being carried out under the theme "Creating a Welfare Hometown" with the aim of nurturing future leaders in creating a society where all people can live happily.	Welfare
4	Hashikami Junior High School (ASPnet school)	We are disaster prevention warriors of the future: through learning about 'self-help', 'mutual-help', and 'public-help' as well as the importance of 'bonds' ◇The ESD perspective of awareness of relationships with others, with society, and with nature is being incorporated into the disaster prevention education carried out within the school's periods for integrated studies.	Disaster Preparedness
5	Oshima Junior High School (ASPnet school)	Environmental education related to scallop farming ◇During periods for integrated studies, in relation to scallop farming, students surveyed familiar marine organisms; and thought about the ways they are involved with the local community, society, and the environment; and prepared and performed plays or skits on environmental themes.	Environment
6	Jonan Junior High School (ASPnet school)	Let's become people who can support Kesennuma in the future: through environment, disaster preparedness, and coexistence ◇1st, 2nd, and 3rd grades learned under the separate themes of "Environment", "Disaster-preparedness", and "Living Together", respectively. For overall structure, program content comprised learning about disaster-preparedness based on environment-related studies, as well as about the importance of relationships between people and nurturing attitudes that enable students to live harmoniously with other people.	Environment, Disaster Preparedness, Living Together
7	Omoze Junior High School (ASPnet school)	Sports as culture ◇Sporting activities for use as ESD teaching materials were developed with the cooperation of the Toin University of Yokohama and general community sports club NEO. Use of "The Meaningfulness of Sports as Culture" and other junior high school physical education theories was examined.	Understanding of Local Community, Welfare
8	Niitsuki Junior High School (ASPnet school)	Learning how to live: the past, present, and future ◇Students learn about Tatara iron-making, which was a thriving industry in the Niitsuki District in 1st Grade, undertake work experience in 2nd Grade, and visit companies as well as undertake "volunteer experience" in 3rd Grade, thinking about their own way of living based on their 3 years of ESD studies.	Understanding of Local Community

9	Karakuwa Junior High School (ASPnet school)	Let's think about our energy in 2050: energy studies in which we learn about love for our hometown, dreams and aspirations, and learning with a positive attitude, and communicate our thoughts	Environment, Energy
		◇We encourage students to correctly understand energy, including nuclear power, and then think, communicate, and make recommendations about how energy should be supplied and used in their hometown of Karakuwa in the year 2050.	
10	Koharagi Junior High School (ASPnet school)	Promoting food education through production, processing, and consumption	Food Education
		◇Centered on guidance provided during lunchtime and in coordination with related coursework guidance as well as student council activities, students undertake studies that enable them to understand the importance of food as well as make efforts to maintain and improve their own health. The program also nurtures in students an attitude of desiring to use local products and pass on food culture.	
11	Tsuya Junior High School (ASPnet school)	Interacting with local community members through 'local surveys' and activities to carry on the traditional art of 'mitake drums'	Understanding of Local Community
		◇Students investigate the characteristics of this region through which runs a local highway following the Tsuya River that has generated culture as a transportation route. Students also undertake activities to learn and pass on the traditional drum-playing art of the Shimokawachi District known as "Mitake Drums".	
12	Koizumi Junior High School (ASPnet school)	Cooperating with the region Participation in society by junior high school students through activities and questions "What kind of initiatives for disaster prevention and safety are needed in the Koizumi area?"	Disaster Preparedness
		◇In response to the question "Answer about what activities can junior high school students carry out towards initiatives for disaster prevention and safety needed in the Koizumi area?" studies were pursued as follows: draft plan, implementation, review, and deepening.	
13	Ohya Junior High School (ASPnet school)	Knowing your hometown, loving your hometown and nurturing a spirit to create your hometown through the Ohya Hummingbird Project (environmental conservation)	Environment
		◇In a school district blessed with a rias coast and rich mountains, we are continuing to implement the "Hummingbird Project" through which environmental conservation education is carried out via initiatives such as Countermeasures for Pine Wilt (mountains), Rocky-shore Denudation Survey (ocean), and Winter-flooded Rice-fields (rice-fields).	

[Source: "Kesennuma ESD Joint Research Report (Kesennuma BOE et al 2013)]

Table 5.6 List of UNESCO Associated Schools in Kesennuma and ESD Focuses: High School

List of ESD Practices Themes High Schools			
	School Name (ASP Status)	Themes for This Fiscal Year ◇Outline of Good Practices	Main ESD Area
1	Kesennuma High School (ASPnet school)	Towards International Understanding and Understanding of Local Community "Developing Human Resources for Our Hometown, Kesennuma" ◇We aimed to nurture in students a desire to correctly understand the local environment and proactively learn about the environment. Furthermore, through international exchange via videophone students are able to come to understand different cultures and widen their perspectives.	Environment, International Understanding
2	Kesennuma Nishi High School (ASPnet school)	Test of New ESD Education Practices after the Great East Japan Earthquake "Thinking about Kesennuma's Natural Environment through Astronomical Observations: Deepening Community Exchange through Space Watching" ◇Through astronomical observations, we aimed to deepen students' understanding of Kesennuma's characteristics and climate, foster exchange with the community, and contribute to ESD. Furthermore, we aimed to encourage friendship and build mutual trust through visits to and exchange with welfare facilities.	Environment, Welfare, Community Exchange

[Source: "Kesennuma ESD Joint Research Report (Kesennuma BOE et al 2013)]

Table 5.7 List of UNESCO Associated Schools in Kesennuma and Its ESD Focuses: Kindergarten

List of ESD Practices Themes Kindergarten			
	School Name (ASP Status)	Themes for This Fiscal Year ◇Outline of Good Practices	Main ESD Area
1	Karakuwa Kindergarten (Under application)	Karakuwa is the best – Let's discover Karakuwa's diverse nature, warm-hearted people and nice places ◇We used the rich environment as a teaching material to enable the children to appreciate how good the district is and pass down this understanding to future generations. We also aimed to nurture the children's communication skills to enable them to experience the fun, kindness, and gratefulness involved in linking up with other.	Environment
2	Matsubatake Kindergarten	Let's encounter the variety of the natural world and the warmth of the local people ◇The aim was to foster among the children communication and a sense of life's importance and kindness, through experiences using the local natural assets and encounters with other people in the community where the children live.	Environment, Understanding of Local Community
3	Ohya Kindergarten	Let's foster lively Ohya children! ◇Through winter-flooded rice field activities the children are able to get plenty of exercise while encountering a familiar natural environment, deepening their will to explore as they make discoveries and become aware of things.	Environment, Food Education, Kindergarten/ Elementary School collaboration
4	Magome Kindergarten (ASPnet school)	Magome kids who value the richness of nature, people and life ◇Under the themes of "Living", "Eating", and "Existing", we aimed to foster children who will realize what is good about their district through cultivation activities and interaction with the community, as well as realize the value of carrying on and handing these down to future generations.	Food Education, Understanding of Local Community, Disaster Preparedness
5	Tsuya Kindergarten	Towards the fostering of infants who tolerate each other and grow up together – through interaction activities between kindergartens, nurseries and elementary schools ◇Through exchange activities between the kindergarten, nursery, and elementary schools, we aimed to encourage children to acquire lifestyle customs and social rules while playing, play with and enjoy conversation with children of the same age and other ages, and carry out experiential activities with groups of children of different ages.	Understanding of Local Community, Kindergarten/ Nursery/Elementary School collaboration

[Source: "Kesennuma ESD Joint Research Report (Kesennuma BOE et al 2013)]

5.3.2.5 Strategy 5: *Promoting Global Education for Better Communicative Skills*

In addition to normal English activities, Omoso Elementary School developed special English activities linking with the joint project with American schools such as video conferencing, so that Kesennuma BOE is promoting the global study to foster their motivation to communicate and develop international awareness through the collaboration with other schools abroad. In academic year (AY) 2005, three elementary schools were designated as “Elementary School English Education Promotion Program” schools by Miyagi Prefectural Board of Education, in an aim to “train students who are actively engaged in communication in English” while providing English activities and international education. As of AY 2006, Kesennuma BOE established a partnership program in the Shishiori area with the Research Center for Education in International Understanding, Miyagi University of Education. In the program, students are acquiring better communicative skills in English through international exchange with foreign students as well as internet teleconferencing with students in the USA. In addition, the Ministry of Education (MEXT) has assigned Nakai Elementary School as a school for “Programs for English Activities and International Education at Elementary Schools” in 2007. The school got assistance from people in the local community, parents and guest teachers (Fig. 5.6). In Japan, a foreign language activity has been formally introduced to 5th and 6th grade at elementary schools since 2011. To prepare for it, Kesennuma BOE and schools were engaged in providing learning opportunities to improve rich international perspectives as well as communicative attitudes from an early age.



Fig. 5.6 International Education for Better Communicative Skills
[Source: Nakai Elementary School]

On the other hand, Kesennuma High School, since 2003, has been promoting international exchange through language study programs in Australia for its students as well as hosting students from Australia, and sister cities such as Zhoushan, China. Furthermore, since 2007, the City Board of Education has extended invitations for educators and school administrators from China and South Korea to participate in a variety of exchange programs and international forums sharing best practices in ESD.

5.3.2.6 Strategy 6: Expansion of ESD to Gain Knowledge of Local Experts

ESD activities of Kesennuma City are spreading throughout the schools in the city under the leadership of Kesennuma BOE as well as Kesennuma ESD/RCR Promotion Committee while making the most out of local characters and resources as follows:

(a) ESD under the Theme of “Slow Food”

Kesennuma has traditionally been a leading region to promote food education utilizing local fishing and agricultural industries. In 2003, the City declared Kesennuma a “Slow Food City” in statement aiming to create a community of rich food variety. Based on this statement, each school in the city is engaged in learning about lives surrounding food in the local community so that the students could acquire skills to live in a healthy way in the future. At Hashikami Elementary School, students find their own themes surrounding food from first to sixth graders trying to solve challenges pertaining to their life and environment. Through this activity, students are expected to find the importance of food and lives surrounding food as well as the relationship between food and health (Fig. 5.7).



Fig. 5.7 Slow Food Activity
[Source: Hashikami Elementary School]

(b) ESD to prepare for immediate local necessity, “Disaster Preparedness”

Kesennuma City is located in the Rias coast line where Tsunami tidal waves have hit many times and caused tremendous fatalities in the region. It was estimated by experts that Kesennuma was highly likely to have a strong earthquake and Tsunami hitting the region in the near future before East Japan Earthquake and Tsunami. Therefore, preparing for the next disaster was one of the most important and immediate challenges. Hence, schools in Kesennuma such as Urashima Elementary and Hashikami Junior High School were in partnership with the local community, City government’s Emergency Management Department and Tohoku University to provide “Disaster Risk Reduction (DRR) Education”. Hashikami Junior High School invites former victims of Tsunamis for lecture and students make maps for evacuation. The school also implements emergency drills so that the students acquire skills to survive in emergency situations through the concepts of a cycle of disaster preparedness “Self-Help”, “Mutual-Help” and “Public-Help” (Oikawa 2014b).

(c) ESD under the theme of “local heritage” such as local tradition and culture

In Kesennuma, traditional industries that grew in the rich mountainous and coastal environment still exist throughout the region. Schools utilize this “local heritage” in school education to encourage students to learn about and develop pride and love toward their hometown. Tsukidate Elementary School, for example, provides students with opportunities to learn about local traditions such as folk dancing (Fig. 5.8), charcoal burning, sericulture as well as soba noodle cooking. These activities are supported by people in the local community. Hakusan Elementary School, which was merged with Shishiori Elementary School in 2015, also taught students Taiko (Drums) instructed by local musicians, and students play the drums in a variety of events.



Fig. 5.8 Local Heritage Education: Dear Dance
[Source: Tsukidate Elementary School]

5.4 Case Study: Development of ESD at Omoso Elementary School

Omoso Elementary School (Omoso ES) has developed and implemented what it calls a “global inquiry-based environmental education program” across the entire school grades (1st through 6th grade) since 2002. Also in 2002, Omoso ES participated in the Fulbright Memorial Fund Master Teacher Program (MTP) and carried out ESD focused on environmental education projects. At Omoso ES, it centered Integrated Studies Period (Sougotekina-Gakushu-no-Jikan) on the development and implementation of MTP. Omoso ES tried to expand the ESD curriculum by incorporating previous environmental education, international understanding and information education to the MTP project. Omoso ES aimed to build a comprehensive global inquiry-based environmental education program, which embraces the environmental education project, international understanding activities and information education. It is the approach to create ESD curricula at Omoso ES (Oikawa 2009).

5.4.1 Theme of International Joint ESD Project

Omoso ES also formed a partnership with Lincoln Elementary School in Wisconsin, USA from 2002 to 2004, and with Callisburg Elementary School in Texas from 2005 to 2006. Under the Master Teacher Program of the Japan Fulbright Memorial Fund, Japan-U.S. Educational Commission, Omoso and American schools engaged in joint environmental projects. It based the collaboration on U.S. and Japan (Kesennuma) water environments and their effect on human life. Each grade level decided on the theme for their project, created a pair project, interacted via the Internet and engaged in joint learning activities.

Omoso is the perfect place to learn about nature and the environment. Kesennuma City, Omoso ES's home, is situated on a rias or saw-toothed coastline area within the National Park. Rivers flow from the green Mountains through the city to Bay. It is surrounded by forests, rivers and ocean, all interconnected by water. Thus, they agreed with partner schools in the United States to center the environmental learning on water. According to this discussion, they set the theme of international Joint ESD project as ***“Interaction in Water Environments and Effects on Human Life: A Study Omoso and American School’s Students”***. Through interactions based on learning focused on the theme, students compared the similarities and differences between their two environments. Its pair project on each grade was decided based on common characteristics of environment and culture (Fig. 5.9)

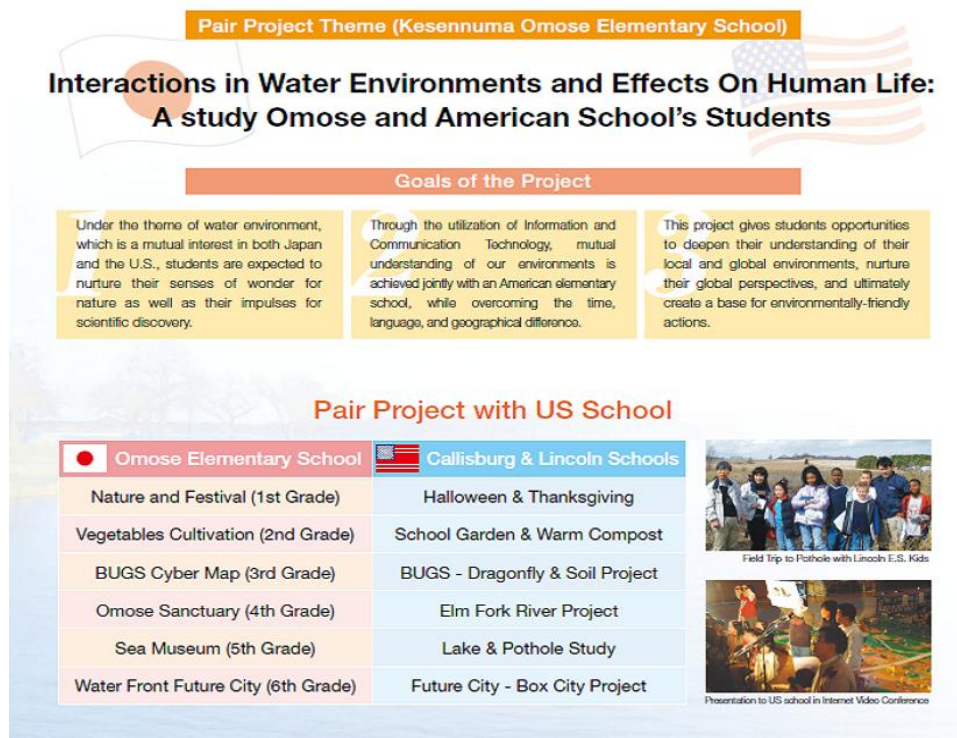


Fig. 5.9 International ESD Joint Project between Omoso ES and American School
[Source: Mobius for Sustainability 2002-2009 (Oikawa 2009)]

5.4.2 Project Goals

This hands-on, experience-based and inquiry-based learning is an eye-opening experience for students who hunger for knowledge and discovery. Through web-based interactions, students develop a mutual understanding about each other's environments. This in turn develops their understanding of the earth's systems and opens up their eyes to the global world. Based on this concept, Omoso ES indicated three points as project goals below:

- Under the theme of water environment, which is a mutual interest in both Japan and the USA, students are expected to nurture their senses of wonder for nature as well as their impulses for scientific discovery.
- Through the utilization of Information and Communication Technology, mutual understanding of both environments is achieved jointly with an American elementary school, while overcoming the time, language, and geographical difference.
- This project gives students opportunities to deepen their understanding of their

local and global environments, nurture their global perspectives, and ultimately create a base for environmentally-friendly actions.

5.4.3 Structure of ESD Implementation among Diverse Sectors

This project began with Miyagi University of Education (MUE) supporting education research activities of Omose ES in Kesennuma City. Funds for this support came from MUE and MUE external funds as well as external funds brought in by Omose ES. A Japan Fulbright Memorial Foundation (JMFM) contribution was particularly important for international exchange between Omose ES and American counterparts. MUE, Sendai City Science Museum, Shizugawa Nature Center and other social education facilities contributed personnel and intellectual resources for the project. Information necessary for implementing lessons was provided with the cooperation of local organizations including the Little International Embassy of Kesennuma City, Kesennuma UNESCO Association, Northern Miyagi Prefecture Tuna Fishermen's Association, Hashikami Fisheries Co-operative Associations, among others.

Educational practice, teacher training, and site accommodations were provided by MUE, Sendai City Science Museum, Shizugawa Nature Center, Rias Ark Museum of Art, etc. Thus, Omose ES established the linkages and partnerships among diverse sectors and actors, and their project is sustained by supports of them (Fig. 5.10).

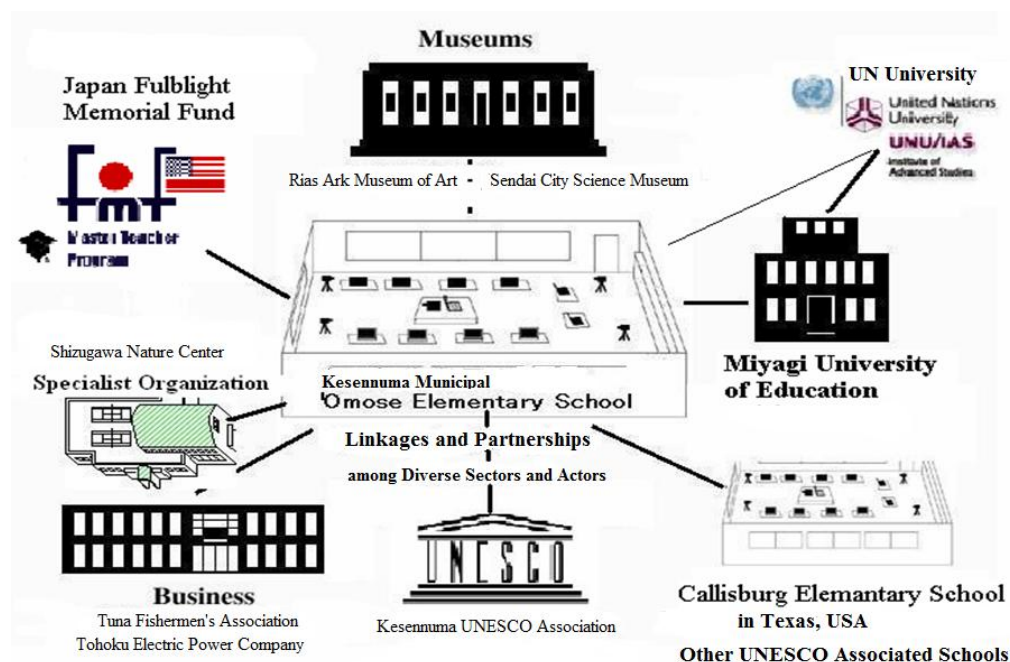


Fig. 5.10 ESD Linkages and Partnerships of Omose ES among Diverse Sectors
[Source: Oikawa 2011]

5.4.4 Omoso Elementary School Program Content

Starting in 2002, Omoso Elementary School has implemented a Japan-America collaborative environmental education program that utilized the abundant shoreline environment in a theme about humans and their livelihoods. This global environmental education project aims to polish the sensitivity and intellect necessary for children to be rich and strong as they survive the environmental age. It is the 21st century's new perspective education focused on environment which is called "Global Inquiry-Based Environmental Education Program." This is the origin of ESD of Kesennuma City

5.4.4.1 Viewpoints in the Creation of Inquiry-Based EE Program

Utilizing the accumulated results of research and network connections, Omoso Elementary School has established and implemented research with the following five viewpoints in order to create this new inquiry-based environmental education program.

- Development of local Inquiry-Based ESD Program
- Implement Global Collaboration with American elementary school
- Construct a Knowledge Creating Web with community, universities and experts
- Achieve Total Physical Presence utilizing Information and Communication Technologies (ICT)
- Foster Global Communication

On the basis of the five viewpoints above, Omoso ES has developed and implemented a whole school systematic program that integrates yearlong themes for each grade level that consider children's developmental stages in relationship to appropriate sensitivity, knowledge and ability, and reaps the benefits of the community as a field of study and its educational resources.

5.4.4.2 Outline of Omoso Elementary School ESD Learning Program

After being selected as a Fulbright Memorial Fund Master Teacher Program (MTP) recipient in 2002, Omoso Elementary School took the opportunity to begin developing and implementing ESD programs that were based on global environmental education through collaboration with an American elementary school. In this joint America-Japan environmental learning project, Omoso ES attempted to develop a systematic learning program informed by both local and global viewpoints across grades one through six in

order to implement this international exchange-type environmental learning throughout the school. At the outset of this challenge there was no precedent to such a program; it was the original and creative challenge of Omore Elementary School. In the same year that the project launched, a systematic global environmental education program was developed for grades one through six (Oikawa 2011).

(a) 1st grade - Nature and Festival Project

First graders experienced human cultures, traditions and other aspects of life through games in nature, festivals and other events; the project develops as pupils in America and Japan exchange information and shares the similarities about nature and festivals. Pupils experience traditional Japanese events like Tanabata (Star Festival) and eating pumpkin on the winter solstice. They also invited community members from other countries to teach them about how to celebrate Halloween and a Philippine festival. Pupils realize the relationships between nature and human life by enjoying themselves and playing. Pupils also challenge themselves to make soil improvements with leftover vegetables by creating warm compost (Fig. 5.11 left top).

(b) 2nd grade - Vegetable Cultivation Project

Second graders grow various types of vegetables in the schoolyard. Through this process they feel the vegetables' growth, wonder and mysteriousness; they cook traditional vegetable recipes with their harvest; and the activities foster a sense of gratitude for the bounties of nature. Additionally, pupils share information about vegetable varieties and recipes, they compare their food environments and food cultures, and the activities offer them a chance to encounter new cultures. This entire process is shared with elementary school children in America via television conferencing (Fig. 5.11 left middle).

(c) 3rd grade - Bugs Project

Third graders observe and survey insects then create an environment map. In doing so, they come to understand the insects' diversity and seasonal changes, which they then share and compare with a counterpart in America via the Internet. First, pupils go out into the field to the Omore River and pond. With support of a local insect expert, pupils observe and survey shoreline insects (mainly dragonflies), and investigate types of species and their distribution. As pupils summarize their findings in observation journals and on maps, they grasp the concepts of biological diversity and seasonal

change. Pupils engage in a hands-on investigation about what type of environment is good for dragonflies to live in. The results of this entire process are then summarized and uploaded in a cyber map that is used to compare and share with an American elementary school's Bugs Project (Fig. 5.11 left bottom).

(d) 4th grade - Omoze Sanctuary Project

Fourth graders experientially explore food chains, connections between living organisms and the conditions necessary to preserve a rich environment by cultivating small fish (gobiidae family). First, pupils put their eyes to the water and survey native species in the nearby Omoze River. They gather some of the fish and create a Miniature Omoze Aquarium. Through continual observation as pupils cultivate the fish, they seek out optimum conditions for these fish to survive, such as: correct water temperature, space and living quarters, dissolved oxygen, and food. With the help of fish and aquatic microorganism specialists, pupils learn about the aquatic organisms and insects that fish feed on and observe an even more microscopic world. This makes pupils realize the connections between aquatic organisms and their food chains. They are able to look at the environment of Omoze River in light of a very important perspective for maintaining a rich water environment while having an experiential, problem-solving exploration. After organizing their discoveries and realizations, pupils create the Omoze Sanctuary. They recognize the ecosystems and richness of the river and develop a sense of stewardship for them (Fig. 5.11 left top).

(e) 5th grade - Sea Museum Project

Through a series of experiential activities, fifth graders inquire about the connections amongst marine organisms and between the forests and the ocean, while also thinking about the relationship between the ocean environment and human life. First, pupils go out to the local beach where they realize the diversity of coastal areas by observing organisms along the seashore. Thereafter, pupils heighten their awareness about marine ecosystems when they experience making herbarium specimens from seaweed and listen to a talk about the linkages between organisms within the realm of the sea. In September, in an activity called “Healthy Forests Store Water and Cultivate Ocean Life via Rivers,” pupils recognize the connections between forests and oceans when they observe and go stream climbing in a beech forest with guidance from a plant expert at Mt. Kurikoma. Again in the fall, pupils tour local key industries that are staged in the sea: deep-sea tuna fishing and oyster farming. As pupils realize how human life

(industry) and the ocean are connected, they also realize the importance of protecting it and the depth of the relationship between humans and the ocean's environment when they gain the viewpoint of "food" through a Parent/Child Tuna Cooking Class in which they taste the treasures of the sea (Fig. 5.11 left middle).

(f) 6th grade - Future City Project

Sixth graders work on a future-oriented project in which they contemplate how to connect city, forest, river and ocean and how to create the city's future in a way that coexists with the environment. First, pupils carry out a field study and conduct a questionnaire in order to understand good things about the region's environment, as well as its problems. They also work with a water quality specialist to conduct a scientific Omoze River Water Quality Survey. By creating a story about changes in water that the eye cannot see, pupils realize the current conditions of the shoreline environment as well as the causal relationship to their own daily lives. Also, in collaboration with the Energy Conservation Center and Tohoku-Electric Power, pupils learn how energy is generated in a lesson with a model and by going on a tour of a power plant. They set up energy conservation monitors and study the relationship between their own lives and energy supply, and deepen their thoughts about co-existing with the environment from an energy perspective. Based on what they learn and after integrating ideas and advice from various experts in the fields of environment, health, industry, etc., pupils reexamine their own lifestyles in a sustainable future and articulate their model future city in a diorama (Fig. 5.11 left bottom).

Thus, Omoze Elementary School established systematic inquiry-based ESD learning program of each grade and also the curriculum throughout all grade levels based on regional environment issues and international corporations with US schools through MTP Project. To develop and implements this innovative program and curriculum, Omoze ES ventured to form the linkages and partnerships with specialized institutions such as university, science museum, art museum, nature center as well as local sectors and resources such as fisherman's association, electronic company, architect association in Kesennuma City, etc. This ESD program and network of Omoze ES became an advanced model of ESD promotion in formal education not only in Japan but also in other country at the begging of UN-Decade of ESD. Many of schools and the board of education in Japan and other country, which tried to promote ESD, introduced and adopted the methods or strategies of Omoze ES: curriculum development, utilizing local resources, establishing the partnerships with divers sectors in region.



Fig. 5.11 ESD Project of Omose Elementary School

Left top; 1st grade - Nature and Festival Project, Left middle; 2nd grade - Vegetable Cultivation Project, Left bottom; 3rd grade - Bugs Project, Right top; 4th grade - Omose Sanctuary Project, Right middle; 5th grade - Sea Museum Project, Right bottom; 6th grade - Future City Project [Source: Omose Elementary School]

5.4.5 Strategies for ESD Program Development and Collaboration

5.4.5.1 Method and Process for Developing Systematic ESD Program

At the beginning of MTP project with Lincoln Elementary School in Wisconsin USA, Omose Elementary School tackled on the ESD program development focused on

environment issue and international exchange. The school tried to develop systematic program or curriculum of entire grade level from first grade to sixth grade taking advantage of previous education practices and supports by specialists and community members. The methods and process which accelerate systematic ESD program development are as follows (Oikawa et al. 2007).

(a) Program Development Utilizing Contents of Previous Activities

In 2002 the first step in creating the systematic ESD program for grades one through six was to reexamine material and content related to the environment, international understanding, etc. in individual subject or other cross curricular units and to restructure the yearlong program for each grade level. Since being designated a foreign language education research development school by the Ministry of Education in 1994, the school had broadened its research from English education to education for international understanding within which it also gradually began integrating learning about the environment, welfare and human rights in light of the "period for integrated studies" which began with the 2002 New Course of Study. The first phase of program development was to make the most of existing curricula. Emphasizing "environment" and "global," the school examined each grade's developmental stage and coordination with other grade levels while reexamining curricula content and the overall story. Then teachers reformulated the materials, objectives and content for each grade level to develop the global environmental education ESD program.

(b) Discovering New Community Material for Creating Systematic Program

When creating the systematic learning program for all grade levels, all former activities were restructured and placed into the new program, but this alone was not sufficient. Some grades required that teachers find new materials, set a new theme and develop the learning program. Others required major additions or changes in content. At that point, the schools lead researcher suggested new learning materials, themes, concepts and program structure based on the developmental stage and interests of pupils at each grade level and the overall systematic integration of all grades. The researcher and classroom teachers held numerous meetings after school to discuss program development. At this time, the lead researcher shared with teachers of all grade levels how each grade level fit into the systematic approach, what the educational objects and concepts are, and what qualities and skills are targeted. On the other hand, teachers shared their opinions and discussed challenges with the researcher based on their experiences teaching the

children directly. Improvements were made through this process and a refined program proposal was created.

(c) University and Specialist Knowledge Introduced for Quality Improvement

As described above, first drafts for the program were created through ongoing discussion between teachers at each grade level and the school's lead researcher. However, when teachers created programs for each grade level, teachers were setback. Teachers could not envision the details and concrete progression of activities because teachers' conceptions of their environmental materials (plants, insects, seaweed, water quality, forests, and community development) were either too vague or insufficient.

It was at this point that Omore Elementary School recruited MUE-EEC, Sendai City Science Museum, Shizugawa Nature Center and other specialist organizations to provide leadership and support for program development. For each of the environmental materials for each grade level, Omore Elementary School made requests to specialists to host trainings or have teachers visit with them. Teachers were trained with direct guidance in specialized knowledge and skills related to their materials. This process enabled teachers to envision how to present materials in a way that heightens children's interests and that deepens their thoughts. This led to a significant improvement in the quality of the program.

(d) Program Systematization: Learning from Wisconsin's Environment Education

When developing its systematic program, Omore Elementary School learned from and referred to the State of Wisconsin progressive environmental education curricula, its concepts, planning methodology and case studies, in attempts to refine its own program. In the United States, Wisconsin is known for its emphasis on environmental education as well as its progressive environmental education programs and excellent facilities. The Wisconsin Department of Public Instruction (DPI) publishes "*A Guide to Curriculum Planning in Environmental Education*". This publication outlines comprehensive goals and the qualities and skills to be fostered, as well as what types of materials should be used, content and methodology. Teachers utilize the guide to create environmental education curriculum at each school. That is to say, there is a system in place to implement comprehensive environmental education that aligns with grade level and stages of development that is based on state level guidelines.

Teachers from Omore Elementary School visited Wisconsin to learn its approach to environmental education. When they visited Lincoln Elementary School to observe its

environmental education activities, they also went on an environmental learning field trip, observed cross curricular environmental learning, and studied Wisconsin University's cutting edge environmental education learning materials. After returning back to Japan, when teachers continued to develop and improve the Omore program, their experiences were helpful to refer to methods for experiential learning and conducting investigations, as well as how to weave together a cross curricular course of study. Omore Elementary School set out to develop its own first through sixth grade comprehensive learning program while referring to the State of Wisconsin's environmental education curriculum planning system.

5.4.5.2 Method and Process for Structuring Collaboration with Multi-stakeholder

One other unique characteristic of Omore Elementary School's ESD is the broad collaboration system that makes up the knowledge base which supports its activities. This system is highly regarded both nationally and internationally for the various levels of organizations, from very local to international agencies, and for the depth and diversity of its resources. At a global level, the United Nations University, whose mission it is to promote ESD, has evaluated and introduced this system as a model for other communities. The Japanese National Commission for UNESCO has also included this collaboration system as part of "Major examples of efforts and activities in Japan" in its proposal to UNESCO *Regarding the Further Promotion of the UN Decade of Education for Sustainable Development* which was reported to 193 member countries and adopted by the UNESCO General Assembly.

(a) Starting Collaboration from individual to grade level collaboration

This collaboration system did not start and was not organized as the ESD supporting knowledge base that it has become. Rather, the first step was back in the late 1990s when individual teachers or sometimes an entire grade reached out for support from outside resources and organizations to supplement subjects or cross-curricular learning (education for international understanding, environmental education, social welfare education, etc.) that teachers and the school could not cover thoroughly. However, the school gradually recognized the educational impact and these collaborations spread from individual teachers to entire grade levels and even passed on to the next grade level. In other words, one-on-one "individual" collaborations became "shared collaborations".

(b) Beginning of Organized Collaboration: ESD collaboration with MUE

In April 2002, after returning from Lincoln Elementary School in Wisconsin, teachers became keenly aware that specialized support was needed to develop the program in Kesennuma City. When the global environmental education program began teachers wasted no time in requesting for support from MUE.

As Omoso ES created the structure for the collaboration with MUE, the school progressed with the basic principle that collaborations should be between organizations rather than individuals, which was a suggestion from the university. Project leader of Omoso ES (Oikawa) immediately consulted with the Omoso Elementary School principal and the president of the Kesennuma City Board of Education, and had Omoso Elementary School form collaboration with MUE-EEC (Environment Research Center) and the Kesennuma City Board of Education. The relationship progressed smoothly. In the first year, four to five instructors from the MUE-EEC Environment Research Group participated in Omoso Elementary School projects; by the second and third years, 10 instructors were involved in participating and supporting Omoso Elementary School activities. Specialists were invited to instruct teachers at trainings and participate in project meetings as well as to meet directly with pupils in class at appropriate times to impart their specialized knowledge.

As this went on, Omoso Elementary School continued to strive to make these assets and the privilege of collaborating with the Environment Research Group not only their own but to open the way for other teachers in other schools. As a result, collaboration with MUE extended to include the entire city and subject areas beyond environmental education. In March 2006, the collaboration had developed into an official relationship when MUE and the Kesennuma City Board of Education signed the “*Collaboration and Cooperation Memorandum of Understanding*” (Mikami and Oikawa 2012).

(c) Constructing Knowledge Base: Project Collaboration Promotion Committee

Our collaboration with MUE began in 2002 but Omoso ES integrated all of the global environmental education based ESD collaborators (community, university and specialized organization) by forming the Project Collaboration Promotion Committee. This aimed to further enhance projects by promoting information exchange between the community and specialized organizations. The committee was formed from 29 individuals and 20 organizations, representing industry, NPOs local government, specialized organizations and educational organizations. Its goal is to contribute to the

development of the community's environmental education and ESD. The establishment of this committee led to the creation of a knowledge base which allows community and specialized organizations to take advantage of their resources and Omoso Elementary School has developed a systematic and continuous support structure for its projects. This system has been recognized as a leading whole community ESD collaboration model by the Ministry of Education, Culture, Sports, Science & Technology (MEXT) in Japan as well as internationally by organizations such as UNESCO.

5.4.6 Project Evaluation

5.4.6.1 Impact on Teachers as a Group

(a) All Faculty Participate in Creating School System

The first people to change through this program were the teachers. At the beginning of the project, not all Omoso Elementary School (Omoso ES) teachers were highly motivated and proactively trying to participate. On the contrary, a majority of teachers were not. Their primary reasons were things such as: "There is no need to go out of one's way to do something that is not in the textbook." "I'm already busy. With another unnecessary thing, I'll be way too busy." "I don't know what to do because there is no precedent." "This will be impossible for teachers that don't speak English to work with American schools." "Why don't you do the project with administrative staff and the lead researcher?" At this point Omoso ES implemented several strategies to advance the project with the participation and teamwork of all faculties.

First, Omoso ES confirmed that this project was something that should be tackled by the entire school and created a system for all faculties to be a part of the program. This enabled all faculties to share project goals and an understanding of issues. Collaborations with American elementary schools would be implemented as pair projects for each grade level. Omoso ES decided all grade levels would exchange with American counterparts via television conferences. By doing so, teachers from all grade levels could clarify the direction and content of activities and increase their stake as a central player in the project.

On the other hand, the lead researcher steered the project by meeting with teachers from each grade level to make suggestions about materials, themes and general structure. After repeated debate, teachers gradually began to see the prospect of the program. As they began to see the potential, teachers' motivation to act greatly increased. This

process is partially the development of Omore ES's systematic program, but it is also a system designed to have full faculty participation.

(b) Increased Motivation due to Specialist Support

The second strategy was to obtain support from specialists in the development and implementation of programs at each grade level. Because teachers went to hear specialists' lectures and received instruction for preliminary surveys and experiments prior to implementing the program, they heightened their understanding and awareness for the environment and gained ideas about how to proceed with the program. More than anything, as teachers progressed with their learning throughout the program, just like their pupils, many of them made new realizations, gained new perspectives, reaffirmed the importance of environmental education and ESD and increased their own motivation for the activities. For some teachers, the scales fell from their eyes and their eyes shone brighter than even their students'.

(c) Hosting Public Research Meetings

In order to promote the project to the community as well as articulate and publicize the results of each grade level and the entire Omore ES project, Omore ES hosted four Global Environmental Education Public Research Group Meetings. The truth is this was an enormous pressure on teachers but they all worked together and diligently implemented their daily activities with each grade level and each teacher embracing a sense of nervousness. This Public Research Group Meeting started out very local as collaboration with MUE, but when the group was designated by the prefectural board of education, it became much more international with participants coming from the United Nations University (UNU) and with meetings held jointly with UNESCO's International Seminar. Lecturers have attended from the Central Council for Education, the Ministry of Education, Culture, Sports, Science & Technology, UNESCO and UNU. What started out as public meetings for one school has turned into quite the international event. What supported this success is the unmistakably the teachers of Omore ES.

5.4.6.2 Impact on Students

(a) Sense of Wonder towards Nature and Life

The first thing that can be noted about children's transformation through this project is their heightened interest in nature and the environment. Each grade level program

emphasized experiential activities; many activities that had direct and real contact with real living creatures were integrated. For Omore ES children that have grown up playing in a virtual world with video games, televisions, comics etc., they could not appreciate wonderful nature even though it was in their immediate surroundings. However, through playing in nature and discovery learning at each grade level, children were amazed with a “Sense of Wonder” towards nature and their interest was piqued. The number of children playing in the rivers and fields and raising insects and other organisms at home has increased since the start of this program. Teachers have also heard from parents and guardians that there has been an increase in conversations at home about nature, the environment and living creatures.

Along with heightened interest has come an increased ability to observe nature. As children draw insects and fish, or make models out of clay, the abstract dragonfly or fish can be articulated in fine detail. The numbers of children that can create detailed artwork so fine that you can tell seeds apart have increased. Specialists were surprised but the level of improvement is objectively clear when comparing Omore ES's excellent levels of achievement for observation skills--in the *Comprehensive Academic Achievement Diagnostic Test - Environmental Education Edition* (developed by Omore ES)--to other schools.

(b) Increased Intellectual Curiosity and Perceptual Awareness

In learning activities at all grade levels children have indicated a vigorous thirst for knowledge and intellectual curiosity based on a rich perceptual awareness for nature and the environment. This is evident in comments: "I want to learn more about this." "Why is this the way it is? I want to learn more." Some pupils that came to be called "professor dragonfly" or "professor fish" gained abundant knowledge through observation and study. Others discovered the most indiscreet changes (that even the teacher didn't notice) and began formulating and presenting the reasons why. Children began to learn, think and problem-solve on their own. This is exactly what the Ministry of Education is aiming for in its period for integrated studies and complements *Ikiru Chikara* (Zest for living). This also coincides with the direction of ESD.

(c) Compassion and Conscientiousness towards Nature and Life

These learning activities were not just smooth sailing for children and teachers. There were failures followed by numerous trials and errors. There were even situations in which life was lost while raising living organisms. At times like these, when children

experience the fragility and irreversibility of life face to face, they realize how irreplaceable life is. Making the most of this lesson, children challenged themselves to raise and observe their chosen creature at home or school and to seek advice from experts and consult with their friends to find solutions.

Children gain compassion and conscientiousness towards life (environmental ethics) through such experiences and they learn to have a multifaceted and balanced perception and relationship with nature as they develop.

5.4.6.3 Impact on Parents, Community Members and Collaborators

(a) Impact on Parents

Since the understanding and cooperation of parents and guardians is so essential for the promotion of this program, initially Omore ES proactively sent out information about the school's global environmental education efforts via class letters and through parent/guardian meetings. Parents were invited to visit the classroom to see their children's activities during research lessons, an Omore festival was held and they were welcome to participate in Public Research Group Meetings. Additionally, guardians were given questionnaires to evaluate different aspects of the project at the end of the school year. Parent cooperation and willingness to participate increased through these types of efforts and dissemination of information. They now support a variety of Omore ES experiential activities as school volunteers for field trips, helping prepare for and support experiential learning activities, etc.

The cooperation and participation of guardians in each grade level projects really brings out how wonderful these activities are as well as their significance; parents can converse with their children about their project; direct and indirect ripple effects also have parents and children out on weekends participating in nature experiences. Based on questionnaires and comments made at research group meetings, it is clear that guardians highly value Omore ES's global environmental education ESD activities, they are proud of them, and they would like for them to continue.

(b) Impact on Community Members

Omore ES's global environmental education ESD is implemented with the support of and in collaboration with various human resources and organizations in the community. The individuals and organizations that have supported the Omore ES program highly merit its value and are positive about cooperating and supporting its activities, sometime more so than the school or teachers. Amongst them are many that felt joy and pride in

being able to participate in the Omoso ES project. Under such favorable circumstances, the program acted as a centripetal force in creating a local knowledge base, fostering resource collaboration in the community and in invigorating each of the various activities. The program also created a base for the ESD Learning System and ESD Learning Space.

(c) Impact on Higher Educational Institutions as Counterpart

As mentioned previously, MUE made many efforts leading up to the full support of remote Kesennuma City. Until reaching this point, EEC debated about how to support Omoso ES and the significance and value in doing so. Now their experimental achievements are beginning to add up. The university learned that what they need to be most careful about when promoting ESD or collaboration in the community is maintaining the "give and take" relationship between supporters and the supported. Particularly common between higher learning institutions and schools is a sense of arrogance in their support on the part of graduate students or researchers. Supporters can't forget that they too can learn from schools and children and enjoy themselves through their assistance. Support is not achieved if one party services the other and demands gratitude in return. When doing community outreach, higher learning institutions need to be keenly aware that the instant they run down a self serving path, the thread holding their collaboration together will be cut.

Furthermore, the success of Kesennuma City and MUE entering into a collaboration agreement was the foundation for MUE developing collaboration agreements with five cities in Miyagi Prefecture.

5.4.6.4 Social Impact

Omoso ES activities have created various kinds of impact on the local community.

(a) Collaborating with International Organizations and ESD Regional Center

Having developed an environmental theme pair project together with an American elementary school through the Master Teacher Program (MTP) and carried out a joint learning project, the Japan Fulbright Memorial Fund (JFMF) reported both partner schools' activities as good practices. The knowledge base of Omoso ES and collaboration system matched particularly well with the "Global Knowledge Creating Web" that the JFMF was advocating, and actively promoted as a model program to participating schools in both Japan and America. As an acknowledgment of these

achievements, Kesennuma elementary, middle and high schools have been selected together for MTP for three years in a row starting in 2005. It has also taken on the important role of promoting ESD in the region.

UNU, which had been promoting the UN Decade of Education for Sustainable Development (DESD) since 2005, paid close attention to Omore's systematic, global ESD activities and the knowledge bases. It has also deployed experts to offer advice and support the continuation, development and promotion of Omore ES programs and collaboration system. In June 2005 when the UNU designated global Regional Centres of Expertise (RCE) to advance DESD, Omore activities were highly regarded and Kesennuma City became a part of the potential region for the Greater Sendai RCE.

Following these events, in 2006 the Kesennuma City Board of Education founded the Kesennuma ESD/RCE Promotion Committee in order to further the advancement of ESD throughout the entire city. With Omore ES Project Promotion Committee as a base, the Kesennuma ESD/RCE Promotion Committee was comprised of 25 groups including schools, NPOs, specialized organizations, government, media, etc. This committee has become the nucleus of promoting ESD in the Kesennuma region. Member groups share information about activities as well as host satellite training, workshops and an enlarged citywide version of Omore ES project meetings. They are implementing the community's ESD outreach and improving the instruction quality of faculty.

In Kesennuma, Omore Elementary School has been promoting ESD based on a three dimensional collaboration system that is made up of a "vertical link" (the systematic activities of Omore ES elementary, middle and high schools), a "horizontal link" that spreads the activities to other schools, and a "lateral link" that the community's knowledge base supports.

(b) Possibility of Community Collaboration with Overseas Partners

The progressive Omore ES global environmental education ESD activities are having a ripple effect overseas as well. Inspired by Kesennuma's global environmental education ESD program and collaboration system, MTP pair partners Callisburg Elementary, Middle and High Schools introduced the program's methods and systems starting in 2005. They particularly recognized the importance of ESD and the need to promote ESD so they used the Omore ES case as a model to implement in their own community. They are currently moving forward with the creation of a network, including several northern Texas universities and research institutions, and are building a system to promote ESD. In a conservative region, in an area of Texas that is rather flat towards environmental education and ESD, this program was revolutionary. Now, several

colleges and organizations are participating and the program is spreading into the community. In 2007, Callisburg became part of the second RCE designated in the United States, the Greater North Central Texas RCE.

In the future, there is a possibility that Kesennuma will no longer collaborate with Texas on a school to school level through MTP, but that the relationship will mature into collaboration on a regional level through RCEs. There is also a movement initiated by the city board of education to actively promote ESD at the school level by participating in the UNESCO School Network (ASPnet). Currently, 34 city schools (18 elementary, 12 middle, 2 high schools, and 2 kindergartens) have been already acknowledged as UNESCO School (ASP), and 2 schools are in the process of applying. This is how environmental education started at one small school is developing into community-wide ESD.

5.4.6.5 Project Sustainability and Development

The activities in Kesennuma and the seeds of Omore ES have begun to sprout in various ways throughout the region. Collaboration in environmental education has progressed to middle schools and then on to high schools. Horizontal linkages have been made within the community and the school can now put on elementary, middle and high school science presentations. A "Science Workshop in Kesennuma" was held for teacher training.

Starting in 2005, there was much progress in the relationship with MUE. What started out as a relationship with just one school has become a collaboration between MUE and Kesennuma City and there are "satellite trainings" for citizens and faculty, "science workshops" for teachers and a "friendship program" for neighborhood children. In 2007 a Japanese National Commission for UNESCO publication highlighted the public environmental education "satellite trainings" as a leading ESD model curriculum in Japan. The same year the publication was submitted to the general assembly of UNESCO. This satellite project had gone beyond environmental education and is expanding to cover science and mathematics education.

5.4.6.6 Significance of Omore ES Project as ESD

The Omore ES project is based in environmental education and integrates education for international understanding, food education, social welfare education and is supported by information and communication technology (ICT) and English education (global communication). The Omore ES model is a rare multi-disciplinary approach to

education. The project has also developed and been implemented utilizing local materials at the same time pupils go beyond their countries' borders to share and compare studies with pupils in other countries. It truly is a program that embodies the saying, "Think Globally, Act Locally."

Through various experiences and inquiry based activities, children reexamined local nature, the environment and society; they recognized the value of these things as well as their challenges from both local and global perspectives; and they learned the need to conserve and to problem-solve. That is, the program provides a place for children to deepen their understanding about sustainability in the community they live in and on earth, the planet they live on. The program did not just impact children. For the many guardians, community members and organization members, the program provided an opportunity to think about the sustainability of their community and the earth. More specifically, the value of the Omoze ES project is its expression of the importance of ESD learning and its direction--start with public education at the nucleus, establish an inclusive ESD learning system (including guardians, community, organizations, etc.) and involve the entire community or even the world.

5.5 Achievements and Future Perspective of Kesennuma ESD

5.5.1 Characteristics of Kesennuma ESD

At the end of United Nations Decade of Sustainable Development (UNDESD), Japanese Government (Interministerial Meeting on the "United Nations Decade of Sustainable Development") published "Japan Repot 2005-2014" for the purpose of disseminating the achievement of Japanese ESD practice at the World Conference on ESD which was held in Nagoya and Okayama City, Japan in November 2014. In this report, Oikawa as an author described the practice of ESD in Kesennuma City as a good practice in Japan and analyzed its characteristics and achievements of based on the observation of its practices and evidences (Kesennuma BOE and MUE 2014).

According to the observations of ESD practice in Kesennuma City, it can be categorized as six characteristics as follows:

- i) Development of unique ESD based on multiple approaches that address issues and merits in the region and schools
- ii) Construction of a system by various actors to promote ESD through participation and collaboration that is centered on the Regional Centres of Expertise (RCE)

- iii) Development and practice of hands-on/inquiry-based ESD curriculum in schools through UNESCO Associated Schools
- iv) Improved quality of ESD that leverages specialized knowledge and skills through collaboration with the community and specialized agencies, such as universities
- v) Promotion of ESD that fosters international perspectives through collaboration/cooperation with overseas schools and international organizations
- vi) Promotion of disaster risk reduction/reconstruction education based on the principles of ESD with an eye toward recovering from the East Japan Earthquake and Tsunami

5.5.2 Achievements of Kesennuma ESD

Based on the ESD characteristics above, the following achievements can be indicated in ESD promotion of Kesennuma City.

(a) Interdisciplinary Approach in the Local Context

The strengths and problems in the region and schools have been addressed to develop unique and interdisciplinary ESD programs, such as food education and environmental education that utilizes the nature of Rias coast, international education as an international fishing city, regional heritage education that passes on ancient traditions, and energy education that builds a sustainable society. The city has developed a variety of endeavors and has worked hard to improve the quality of ESD practices.

(b) Partnership by Multi-stakeholder Approach based on Community

As the model of Greater Sendai RCE for that is designated by the United Nations University, Kesennuma City has built a collaborative system centering on the Kesennuma ESD/RCE Promotion Committee in which various sectors and stakeholders participate, including schools, regional residents, governments, museums, industrial groups, and media in order to promote community-based ESD.

(c) Development of Hand-on and Inquiry-based ESD Learning Program

Kesennuma City was the first in Japan to join UNESCO Associated Schools activity as a city involved (34 schools and kindergartens as of 2014), and has striven to spread and promote ESD in school education. Each school has developed and practiced hands-on,

inquiry-based ESD curriculum of high quality, and actively shared those practices with the rest of Japan and other countries.

(d) Linkage with Higher Education for drawing Expertise

In 2006, Kesennuma City entered into a collaborative agreement with Miyagi University of Education and has jointly practiced, researched, and shared ESD. Later, this system developed into the Interuniversity Network Supporting the UNESCO Associated Schools Project Network (ASPUnivNet) proposed by Miyagi University of Education. After the earthquake, ties were also made with Kyoto University, Ochanomizu University, and the University of Tokyo, and efforts were made to pioneer new fields of education, such as disaster risk reduction. The city has endeavored to improve the quality of education toward reconstruction.

(e) Collaboration with International Institution for Broadening Perspective

In the process of advancing ESD, joint studies with overseas organizations have been conducted that utilize programs such as the Fulbright Japan and ACCU, and teacher training and international forums have been developed. In addition, ties have been made with UNESCO, the United Nations University, and OECD to implement joint projects in an effort to foster international perspectives in children and teachers.

(f) ESD contributing Disaster Risk Reduction and Recovery

As evidence of the ESD carried out to date at Kesennuma, the lives of many people were saved even in the midst of the calamity of the Great East Japan Earthquake through the abilities of children, teachers, and local residents, and great contributions were made to the subsequent recovery of schools and communities.

It can be said that these achievements above are the evidence of more than ten years ESD Practice in Kesennuma City.

5.5.3 Future Perspective and Challenge of Kesennuma ESD

However, Kesennuma City was catastrophically impacted by the huge tsunami caused by the East Japan Earthquake and Tsunami. Based on this tragic experience and the lessons learned from the disaster, new directions for recovery have been added to the ESD practiced to date, such as disaster risk reduction, securing the safety of people, the environment, economy, and community revitalization. The significance of ESD has

become increasingly important. On the other hand, the lives of many people were saved even in the midst of the calamity of the East Japan Earthquake and Tsunami by the abilities of children, teachers, and local residents fostered through ESD and Community linkage. And ESD contributed to the subsequent recovery of schools and communities, which can be pointed out that it is the evidence of the ESD carried out to date at Kesennuma City (Oikawa 2014c).

From now on, through the process of working toward reconstruction, the city will make the most of the lessons learned from the disaster and strive to establish the following basic principles of ESD:

- i) Disaster risk reduction education that fosters abilities for self-help and mutual-help collaborating with the community,
- ii) Environmental education that aims for harmony with nature,
- iii) Regional heritage education that passes on hometown traditions and culture,
- iv) International education that exceeds borders and shares learning,
- v) Recovery education that builds the future.

With the goal of enhancing that education and recovering from the disaster, the city will work to foster human resources who can tackle the creation and reconstruction of the region.

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Chapter 6 School Damages and Recovery Process in Kesennuma and the Key Lessons

Abstract: After the massive disaster of East Japan Earthquake and Tsunami on March 11, 2011, education sectors such as schools and board of education (BOE) in tsunami-affected area faced many issues and challenges immediately and continuously. This chapter analyzes how educational sectors have been implementing the responses to the disaster and recover process of schools and education from the disaster of East Japan 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 disaster impacts on schools and the examples of a few specific urgent measures of Kesennuma BOE after the disaster, the chapter 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.

6.1 School Damages of Kesennuma

6.1.1 Damage of Kesennuma City by East Japan Earthquake and Tsunami

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 reached very high level of shaking continued for five minutes or more less. 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 devastated in no time (Fig. 6.1).

Especially, northern part of the city area, that is Shishiori district, was burning more than 10 days by terrible fire because of oil and gas tanks catching fire after the tsunami. Then those areas were devastated. 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. 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 (Table 6.1). The tsunami and fire has done 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 affected 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 6.1). These are unprecedented case in Kesennuma.



Fig. 6.1 Damage Photos of Kesennuma

Left top; Fire in Shishiori, Left bottom; Street hit by tsunami Right top; Damaged ship transported inland, Right bottom; Burning boat in Kesennuma Port

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 (Oikawa 2013).

Table 6.1 Damage of Kesennuma City by East Japan Earthquake and Tsunami

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

6.1.2 Damage of Schools in Kesennuma

Almost all the schools in Kesennuma were isolated and unaided by the disaster. Tsunami intercepted all of information, traffic, and materials and 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 prepared for the earthquake and tsunami, which will be anticipated in the near future so far, and each school decided upon the disaster prevention manual, and schools have also implemented the evacuation drill in each school many times repeatedly, assuming various disaster situations. However, the scale of this earthquake disaster exceeded our assumption and a manual by far. It was certainly an “unprecedented” case. And the disaster risk management was 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 our deep regret that over ten students’ precious

lives were lost among the students who were absent on that day, who left school earlier than usual and who has come back home from school before tsunami invaded to the schools. In addition, 65 students in Kesennuma lost their parent by this disaster and two teachers of elementary schools of Kesennuma were killed by tsunami at home or on the way to school (Oikawa 2013) (Table 6.2).



Fig. 6.2 Damage Photos of Schools in Kesennuma

Left top; Damaged Schools in Kesennuma City (*Red Zone*: Tsunami affected area, Tsunami Damaged Schools: *star*; High, *diamond*; Middle, *circle*; Low, Earthquake Damaged Schools: *triangle*). Right top; Kesennuma Koyo High School, Left bottom; Minami- Kesennuma Elementary School, Right bottom; Shishiori Elementary School

After the massive earthquake of M9.0, the tsunami reached three elementary schools, one junior high school, one high school and one kindergarten in Kesennuma City. Amongst these, Minami Kesennuma Elementary School, Shishiori Elementary School, Kesennuma Koyo High School, Ohya Kindergarten were collapsed by tsunami. As for

Hashikami Elementary School and Karakuwa Kindergarten, they were seriously collapsed by earthquake (Fig. 6.2a, b). Eighteen schools located on the coastline functioned as shelters after the tsunami, while five elementary schools and junior high schools were used as posts of the Self-Defense Force, police and fire brigade. The gymnasiums of four Elementary Schools were used as mortuaries (Table 6.2).

Table 6.2 Damage of Schools in Kesennuma City by Earthquake and Tsunami

Area	Category of damage	Actual number	Proportions (%)
Casualty	Victims of students(total)	13 students	0.2
	Kindergartner	1 child	
	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	
	Victims of teachers	2 persons	
Damage of facilities	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		
	Junior high school	1 schools	7.7
	Ohya J.H.S ^a		
	Kindergarten	2 schools	33.3
	Ohya kindergarten ^a		
	Karakuwa kindergarten ^b		
	School that had shelter, garrison of self-defense, firehouse, and mortuary	22 schools	64.7
	Facilities used as shelter	16 schools	47.1
	(Including classroom)	(9 schools)	(26.5)
	Facilities used as mortuary	4 schools	11.8
	Schools that have temporary houses in school yard (houses)	14 schools (1,143 houses)	41.2
	Elementary school (houses)	6 schools (143 houses)	28.5
	Junior high school (houses)	11 schools (1,000 houses)	84.6

^aDamage by tsunami

^bDamage by earthquake

As of October 2012

6.2 Selected Cases of School Damages

In Kesennuma City, as described above, three elementary schools, one junior high school, one high school and one kindergarten were hit by tsunami. All of them took evacuations to protect students' lives according to their situations such as geographical conditions and scale of damage. Three typical cases of schools are selected and described how their school responses to evacuation, shelter management and recovery process of schools were implemented (Kesennuma BOE et al 2012).

6.2.1 Case 1: Minami-Kesennuma Elementary School

The school, located on a riverside, was hit by tsunami, which completely collapsed the first floor. 600 students, teachers and residents evacuated to the third floor and after spending one night, the Self-Defense Force finally rescued them. The school restarted its educational activities in April 2011, using part of Kesennuma Elementary School and eventually merged with Kesennuma Elementary School in April 2012.

When the earthquake hit the school during lesson 6 at 2:46 p.m., from 3rd grade to 6th grade students who were studying in class room, escaped to school yard. First and second grade students had left school. Principle ordered teachers to take 1st and 2nd grade students back to the school. Teachers gathered other 90 % students and kept them in school yard. School handed the parents some students whom parents came to school to take. According to the information of 6 m tsunami coming to Kesennuma from bousai musen, the principle decided that he ordered to let all of students and staff refuge to second floor of school building. The assumption of Miyagi-ken Oki Earthquake is 2 m tsunami, so manual set the evacuation place of the school and stock at gym. 600 people including 350 students, 120 local residents, 80 kids and staff escaped to central school building. Other residents also escaped to east school building.

When tsunami attacked school at 3:36, tsunami came to the school yard from the Okawa River beyond dike (Fig. 6.3a). Tsunami came up to second floor of the school, so principle directed all evacuees to move from second floor to third floor and kept the rote to the roof (Fig. 6.3b). Teachers took off the curtains and gave to students instead of blankets, and students wore them. All evacuees stayed cold night without water and foods. Staff and residents brought stock at gym to the school building for evacuees although water still covered school yard and passage to gym in early morning. Evacuees could receive supports of drinks or foods from restraint and convenience store in neighborhood. Evacuation to K-Wave (City Gymnasium) by Jeep of Self-Defense

started at 3:00 p.m. next day. All evacuees of the school could move to K-Wave completely by 5:00 p.m.

In regard to the process of restarting and recovery school, first and difficult mission of school is safety check of missing students whom School handed to parents before tsunami coming and who took refuge to the shelter. And then according to direction of Kesennuma City Board of Education, teachers moved the function of school to Kujo Elementary School on 14th. The school took place the graduation and school-end ceremony at Jonan Junior High School on 23rd of March, but one student was still missing then. On April 1st the school moved to east part of Kesennuma Elementary School's building supported by staff of Kesennuma ES, parents, and volunteers. On April 21st, the school restarted with 223 students, which was estimated at 350 students before the disaster (Fig. 6.3c). On the same day, the death of missing students was confirmed. She is only victim of the school by disaster. The students studied at Kesennuma Elementary School together for one academic year. Kesennuma City and City Board of Education decided that Minami-Kesennuma Elementary School should merge with Kesennuma Elementary School as soon as possible, considering students' environment of learning after consulting with parents repeatedly. At last, Minami-Kesennuma Elementary School was merged with Kesennuma Elementary School on April 1st, 2012, and they started new academic year as new school.



Fig. 6.3 Damage of Minami-Kesennuma Elementary School
(a) School Building hit by Tsunami, (b) Staff Room destroyed by Tsunami, (c) First grade Students studying at other school

6.2.2 Case 2: Shishiori Elementary School

Although this school is located 2 km away from Kesennuma Bay, the tsunami carried the waves up the river and caused devastating damage to the 1st floor. At this time, the teachers instructed evacuation to 145 students and parents. They moved to 5 different places for evacuation, eventually reaching a temple on a high ground and stayed there

for 3 nights. The school activities resumed using the 2nd and 3rd floors. Construction of the 1st floor was completed at the end of August in 2012.

This school is located in the north of city along Shishiori River and 1.5 km far from bay area. The school has never been hit by tsunami yet. The new school building was established 3 month before the disaster. When earthquake hit at 2:46 pm, 1st grade had left school before the earthquake because of 4 lessons. And 2nd to 6th grade students were studying in the school. Principle directed the staff to take whole students in the school to the school yard.

When tsunami attacked school at 3:36, tsunami came up the river from Kesennuma Bay and attacked the school beyond the dike. Tsunami came into 1st floor at 140 cm level and washed away everything in classrooms and staff room of first floor. The gym under construction (Almost finished) also inundated by tsunami (Fig. 6.4a, b).

Staff and parents who came for their students took 5 steps refuges under teacher's instruction as flows.

- At first, students and staff escaped to school yard.
- Secondly, they moved to hill beside of the school and handed some students to parents. Other students, staff and parents were 145 in total,
- Thirdly, they moved to temporary office near the hill, but the space was not enough for all of evacuees to stay.
- Fourthly, they moved to the temple, that is located 1 km from the school. But they could not be accepted in the temple.
- Lastly, 145 people move to next temple where 1 km far from last temple. They stayed 3 nights, and handed students to their parents safely.

In regard to the process to restarting and recovery school, safety check of students was very difficult because the means of communication such as telephone, mobile phone and internet were unavailable by earthquake and tsunami, and transportations were also unavailable as teachers' cars were washed away and almost of roads were covered with rubble by tsunami and fire. 5 students were missing after school handed them to parents. The death of 4 students was confirmed by April 2012, but one is still missing. The number of victims is worst in the school in Kesennuma City. Second is cleaning up school building. Tsunami left mud which thickness is 10 cm and lots of rubble at first floor. Staff tried to take it away to restart the school getting supports of parents, residents and staff of other school which was not affected by earthquake and tsunami. Information from school to students and parents was also difficult. Teachers

walked around shelters and shops to display information such as school events and to get information of students' safety. The school also had to grasp students' changes to other school because of disaster. After the disaster, 54 students of 356 moved to other school because their houses or their parents' job were lost.



Fig. 6.4 Damage of Shishiori Elementary School
(a) Hallway in front of Principal Room, (b) Staff Room destroyed by Tsunami, (c) School Garden Recovery Project with Volunteers of Bank

The school could restart on 21st of April 2011 using 2nd and 3rd floor. On 5th of September 2011, gym was reconstructed. And in August 2012, reconstruction of 1st floor was completed, so students are studying in whole school building now. This school also received many supports from volunteers NPO/NGOs, companies, and institution in Japan and all over the world. BOE also supported this school through introducing donations and scholarships as well as opportunities encouraging students like concerts and sports events (Fig. 6. 4c).

6.2.3 Case 3: Hashikami Junior High School

This School is very famous for being a pilot school of Disaster Risk Reduction (DRR) Education in Kesennuma. But a couple of students of this school lost their lives by tsunami on the previous day of graduation.

The school building didn't receive significant damages by the tsunami because the school is located on highland and far from the sea. However, at the time of evacuation, more than 2,000 evacuees gathered to the school for safety, making it function as a shelter for the whole community. Residents, teachers and students who had experienced disaster education/training managed the shelter by themselves.

As this School is pilot school of Disaster Education in Kesennuma, it functioned as a shelter in this Disaster. More than 2000 evacuees gather to this school then. Community member, Teachers and Students as volunteer managed the shelter

collaborating each other (Fig. 6.5a). Especially, students contributed to restoration of the community in the shelter, taking advantage of disaster education. Some students tried to help distribution of cooked rice and blankets to evacuees. Some students helped cleaning up toilets getting water from school pool because of stopping water. Some school students took care of old persons who took refuge to the shelter, with chatting and massaging (Fig. 6.5b).

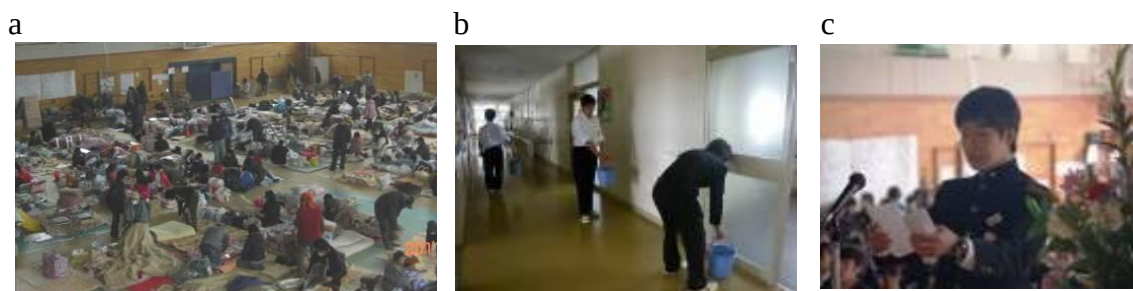


Fig. 6.5 Shelter at Hashikami Junior High School
(a) Shelter in the gym of Hashikami Junior High School, (b) Students cleaning up toilets,
(c) Graduation ceremony with evacuees in gym

One week later after the earthquake and tsunami, this school held graduation ceremony with many evacuees in gym (Fig. 6.5c). The address of representative student encouraged not only students and teacher but also evacuees and residents in gym as well as people in Kesennuma and tsunami affected area.

6.3 School Response to EJET: Survey of Schools in Kesennuma

Based on serious damages and tragic experience of East Japan Earthquake and Tsunami, Kesennuma City Board of Education (Kesennuma BOE) tried to survey disaster impacts on schools and schools' respond to the huge disaster in order improve disaster risk management (DRM) and disaster risk reduction (DRR) as well as disaster education at not only each school but also whole city level. Kesennuma BOE promoted this survey through the research of Kesennuma Educational Researching Group (Kesennuma-shi Kyoiku-Kenkyu-in) which consists of teachers who are selected by BOE from municipal schools in Kesennuma. Kesennuma Educational Researching Group has over 40 years history and they have been researching latest educational issues such as ESD so far. Thus, Kesennuma BOE decided to promote its research focused on DRR and disaster education based on the lessons learned from East Japan Earthquake and Tsunami. Author (Oikawa) conducted Kesennuma Educational Researching Group to

promote this survey as a supervisor of Kesennuma BOE and disseminated the results to not only the city or schools in Kesennuma, but also other regions in collaboration with Ministry of Environment (KERG 2012).

6.3.1 Framework of Survey

This survey is questionnaire survey of municipal kindergartens, elementary schools and junior high schools in Kesennuma City.

6.3.1.1 Objectives of Survey

The survey has two objectives below:

- i) Analyze the situations of the school in the recovery process from East Japan Earthquake and Tsunami (EJET) immediately through the observation of the evacuation actions of kindergartener and students as well as the responses of faculties on the day of EJET occurring.
- ii) Analyze the efforts of disaster education at schools and the consciousness of school faculties for disaster risk reduction.

6.3.1.2 Contents of Survey

The survey has two target groups; one is the school principals, and another is individual teachers, so that it has two types of questionnaires. The contents of two questionnaires are as follows:

(a) Questionnaire survey of schools (principals)

- i) Disaster prevention system related to the earthquake and tsunami before the East Japan Earthquake and Tsunami.
- ii) Situation of students and kindergarteners at the time of earthquake disaster and the evacuation.
- iii) Status of handing over students and kindergarteners to parents, and the safety confirmation of them.
- iv) Modalities of the school as a center of disaster risk reduction.
- v) Renewal and improvement of disaster prevention system.
- vi) Impact of East Japan Earthquake and Tsunami on the educational activities.

vii) Disaster education

(b) Questionnaire survey of teachers

- i) Previous situation before the East Japan Earthquake and Tsunami.
- ii) Situation at the time of the East Japan Earthquake and Tsunami occurring.
- iii) Response to the largest aftershock of April 7, 2011.
- iv) Situation after school reopening.

6.3.1.3 Method of Survey

(a) Target group of survey

Questionnaire of Schools (principals) targeted all municipal kindergartens (6 kindergartens), elementary schools (21 schools) and junior high schools (13schools) 40 schools/kindergartens in total. On the other hand, questionnaire of individual teachers targeted four teachers per each school and three teachers per each kindergarten, which is correspond to 16 kindergarten teachers, 81 elementary school teachers and 51 junior high school teachers, 148 teachers in total.

(b) Date of survey

Questionnaire was delivered to schools and teachers on January 19, 2012 and collected on January 26, 2012 via Kesennuma BOE.

6.3.2 Disaster Awareness and Preparedness of Schools before EJET

Kesennuma BOE has experienced tsunami disaster almost once per 30 years so far such as Meiji Sanriku- Tsunami, Showa-Sanriku Tsunami and Chile Earthquake Tsunami, so that tsunami evacuation drills have been conducted by emergency division of city office frequently. Therefore, residents' in Kesennuma have higher awareness of tsunami disaster rather than other area in Japan (Shirahata 2013).

However, according to the questionnaire survey of school principals in Kesennuma, Just 35 % schools of Kesennuma set evacuation places assuming tsunami disaster on the school disaster risk reduction (DRR) plan (Gakkou Bousai Keikaku) before East Japan Earthquake and Tsunami (EJET), although some schools those are located in mountain area, have no concerns of tsunami inundation. Moreover, 25% schools out of 35% schools did not set evacuation places assuming the tsunami of EJET scale, so that only

10 % schools of Kesennuma could secure the evacuation places on their School DRR Plans. Conversely, 35% schools did not assume tsunami disaster when they decided their evacuation places including all of kindergartens (Fig 6.6). Also, two schools of these schools were designated by the city as shelter for residents in spite of buildings beside rivers, by reason why school is far from coast line (KERG 2012).

Therefore, it is critical that schools in Kesennuma should be decide to set safety evacuation places and shelters taking the situations of damage and the tsunami inundated areas of EJET as well as the tsunami running up the river into consideration for the future.

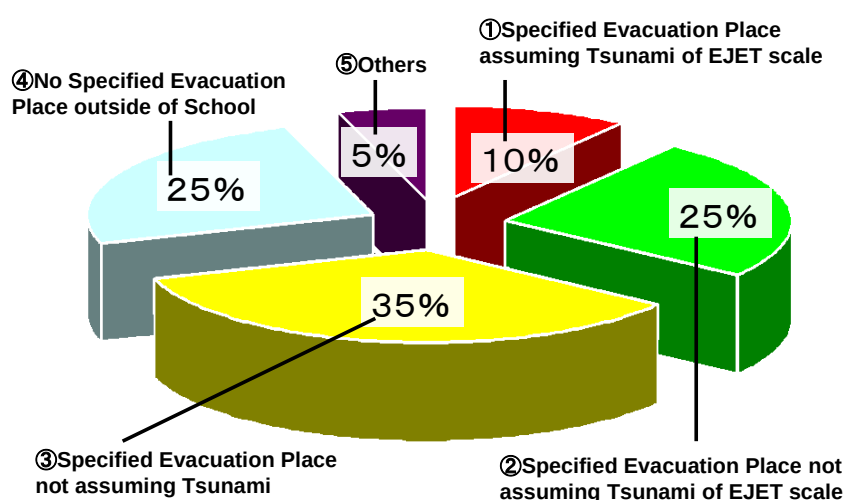


Fig. 6.6 Percentage of Specified Evacuation Place with assuming the Tsunami Damage
[Source: Kesennuma BOE 2012] modified by Author

According to the questionnaire survey of individual teachers, with Regard to teachers' disaster awareness before EJET, almost all the teachers (90.2%) had understood the DRR plan of their own schools (Fig 6.7 left). And over 90% teachers in Kesennuma had been promoting daily education activities, considering and assuming the response to disaster when it would occur. This high awareness of teachers in Kesennuma achieved that schools have not lost any lives of students under the control of teachers in spite of massive disaster of EJET in 2011 (Fig 6.7 right).

However, there is room for improvement of teachers' awareness to disaster. Because teachers who had sufficiently understood the DRR plan were less than a quarter of teachers (23.8%) in Kesennuma before EJET (Fig 6.7 left). And also less than a half of teachers (40.7%) didn't have sufficient disaster awareness while they were promoting daily education at school (Fig 6.7 right). Thus, through the tragic experience

of EJET, teachers in Kesennuma are reaffirming the significances of disaster awareness and understanding of DRR plans. So that they are trying to improve their systems, plans and raise awareness for disaster risk reduction not to repeat tragedy of disaster. Especially, disaster awareness of teachers has been rising up drastically. Teachers who have sufficient disaster awareness on daily lesson are up from 40% to 70% (Fig 6.8).

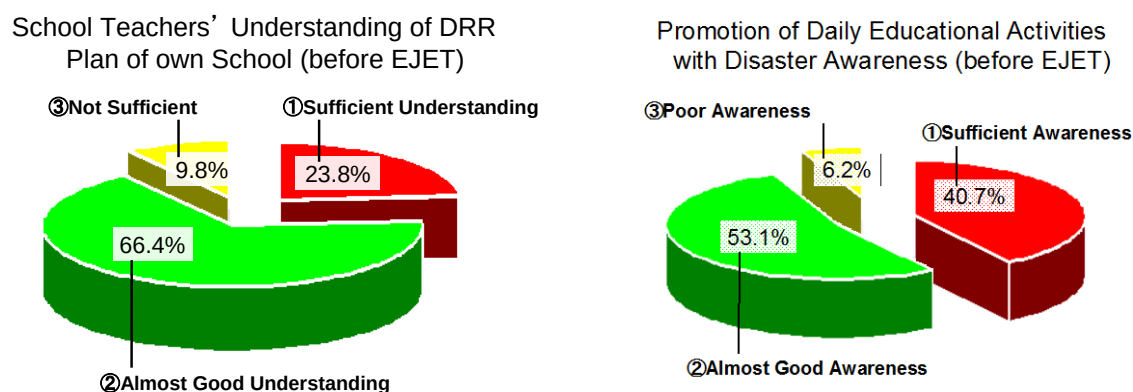


Fig. 6.7 Teachers' Understanding of DRR Plan and Disaster Awareness before EJET
Left: Teachers' Understanding of DRR Plan of own School (before EJET), Right: Promotion of Daily Lessons with Awareness for Disaster Response [Source: Kesennuma BOE 2012], Modified by Author

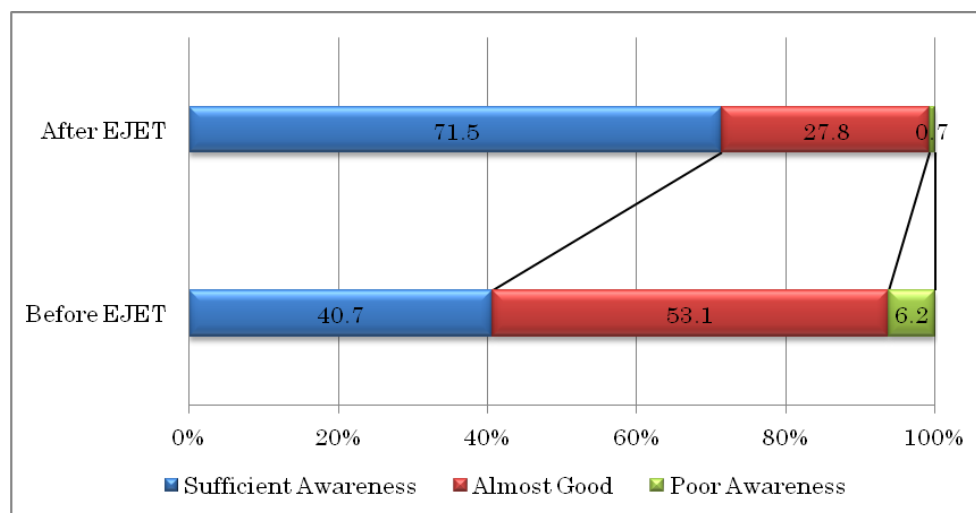


Fig. 6.8 Transition of Disaster Awareness of Teachers on Daily Lesson
[Source: Kesennuma BOE 2012] Modified by Author

6.3.3 Immediate Response of Schools to the Disaster of EJET

When the East Japan Earthquake and Tsunami (EJET) occurred, immediately, schools and teacher had to respond to emergency situation to protect students and residents such as conducting evacuation, checking students' safety, setting up the shelter and handing

over students to parents, etc. These school responses to disaster in Kesennuma City can be analyzed based on the data of questionnaire survey.

Fig. 6.9 shows where students in Kesennuma were when the EJET occurred according to school level. As the disaster occurred at 2:46 PM, on Friday, 11th of March, almost all the schools were still in class at that time, so that most students stayed at school. At elementary schools, most of student was taking lesson at class room, but lower grade (first or second grade) of some schools had left school after just finishing their lessons and on the way home, so that teachers went to pick them up to school again. At junior high schools, as the day was the day before graduation ceremony of all junior high schools in Kesennuma, third grade students at junior high school had already gone back home for preparing next day, so that over 30 % students were out of school, on the other hand many of lower grade students were preparing for ceremony at gym. As of Kindergarten, kids were in many situations such as field trip, on the school bus, preparing for going home and afternoon nap (Fig 6.9). In total, 88.6 % students were under the control of teacher at school or outside school, and 11.4 % students are out of school. This made it possible that teachers conducted students' evacuation. Most students (83.3%) could evacuate to safe place completely by 16:00 (Fig 6.10). It is 90 minutes later from earthquake occurring and about 45minits tsunami reached.

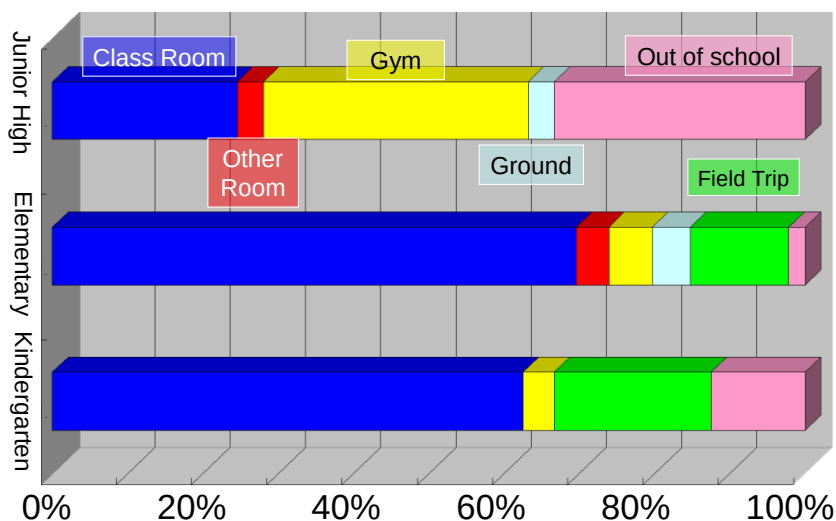


Fig. 6.9 Whereabouts of students at the time of EJET occurring
[Source: Kesennuma BOE 2012] Modified by Author

However, the situations are different depend on school level and grade level, so that evacuation action conducted by teachers and students is also different in many situations. Based on this experience, it will be necessary that evacuation drills should be

conducted in various conditions combining place, time and activities, and that practical DRR plans and manuals should be formulated. Also assuming the case of disaster suffering outside school, it is crucial that disaster education should be improved to foster the ability of protecting themselves by taking evacuation action proactively.

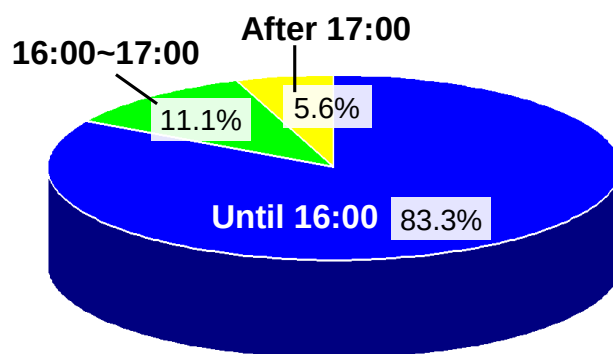


Fig. 6.10 Time when Students could evacuate to Safe Place under the Control of Teachers
[Source: Kesennuma BOE 2012] modified by Author

In addition, the handing over students to parents was critical issues of disaster risk management (DRM) and response of schools during EJET. In Kesennuma City, any schools did not lose the students' lives under their control, but a few schools have lost precious lives of some students after the handing the students to parents and family members. According to the questionnaire survey of schools in Kesennuma, 37.8% schools had started to hand over students to parents immediately and 10% schools handed over students after tsunami warning issued. This means almost a half of schools in Kesennuma started handing over students before tsunami coming (Fig 6.11). It is the big problem of disaster management of the schools. Because of this judgment, the most tragic case is that students suffered tsunami disaster and lost their lives on the way home with families.

On the other hand, about half of schools were careful to hand over students and made students stay at shelter of school or evacuation place for a while in spite of parents' requirements of getting students back. As the reasons of this judgment, the survey indicates: 50% principals of those schools assumed tsunami would inundate their school districts and 43% principals had confidence that the school was most safety place for evacuations. Therefore, these schools, under the judgment of principals, made students stay at school or evacuation places with their families for a while, and handed over them to families after checking and giving instruction of safety manners. 12.5% schools

handed over them after sun set and 10% schools have done next day of tsunami (Fig 6.12). Moreover, because of handing over students before tsunami inundated, it was the very hard for schools to check the safety of those handed students after the evacuation. Since students evacuated with families around the spreading area beyond the school district and city area to escape the massive tsunami, it was very hard for teachers to identify whereabouts or shelters of students by their own. This is the reason why it took so long time to complete the safety check of those students (Fig 6.13).

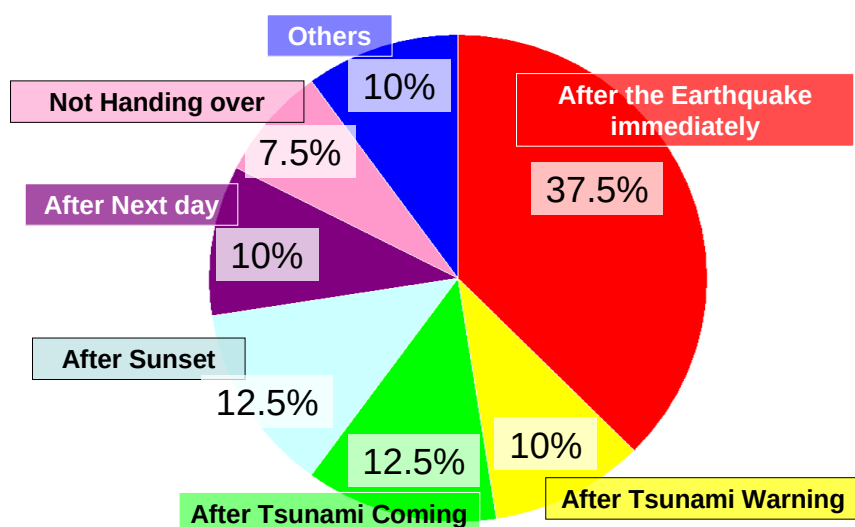


Fig. 6.11 Timing when the school started to hand over students to parent
[Source: Kesennuma BOE 2012] modified by Author

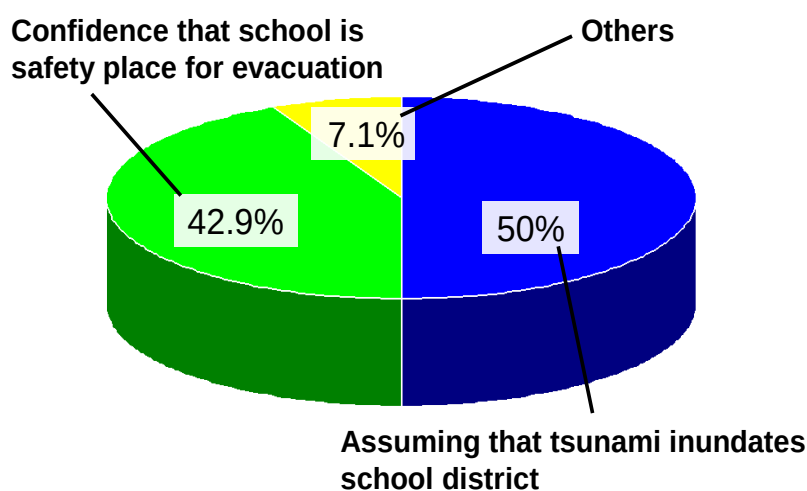


Fig. 6.12 Reason why Schools were careful to hand over Students
[Source: Kesennuma BOE 2012] Modified by Author

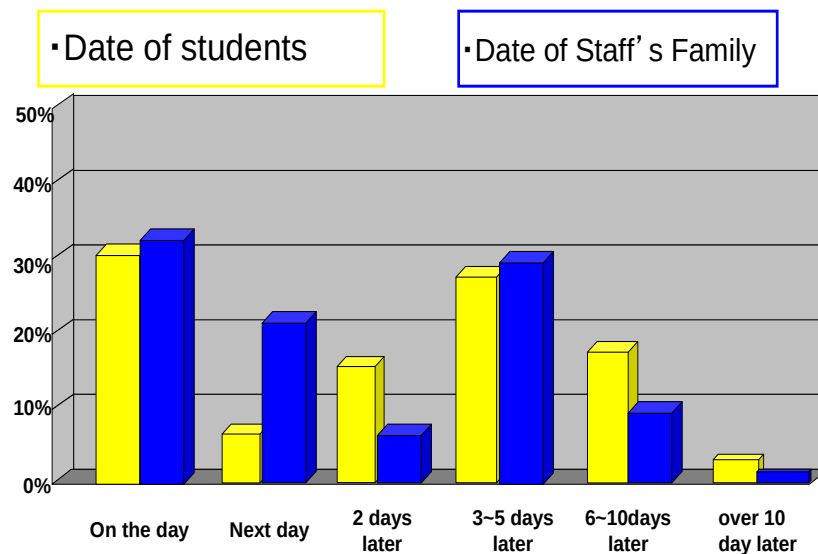


Fig. 6.13 Timing when Security Check was finalized
 [Source: Kesennuma BOE 2012] Modified by Author

Timing of handing over students was very difficult judgment as schools response and DRM, because parents have parental authorities, so if parents or family members require passing over students, teachers could not reject their requirement basically. This experience is one of key lessons from EJET. Based on the lessons, each school has improved DDR plans which should include the manual of handing over students with describing the timing and methods.

6.3.4 School Response to Educational Recovery Process from the EJET

In the midst of the East Japan Earthquake and Tsunami (EJET), immediately, almost all the school became the shelters to accept the students and residents from not only community but also other region. Although over 60% schools in Kesennuma were designated as evacuation places (shelters) by city office. Actually, most of school functioned as shelters and base of rescue agencies. There were some cases that more than thousands of people gathered to schools such as Hashikami Junior High School. However, a half of the schools which were designated as shelters did not have stockpiles for evacuees and the stockpiles at schools which had that were not sufficient for mega-disaster like EJET. Fig 6.14 shows the stockpiles at schools: as main goods, blankets, dried foods (bread and rice), and first-aid kits and so on (Fig. 6.14). The survey indicates there is linkage between the stockpiles at schools and the teachers' consciousness of shelter (Kesennuma BOE 2012).

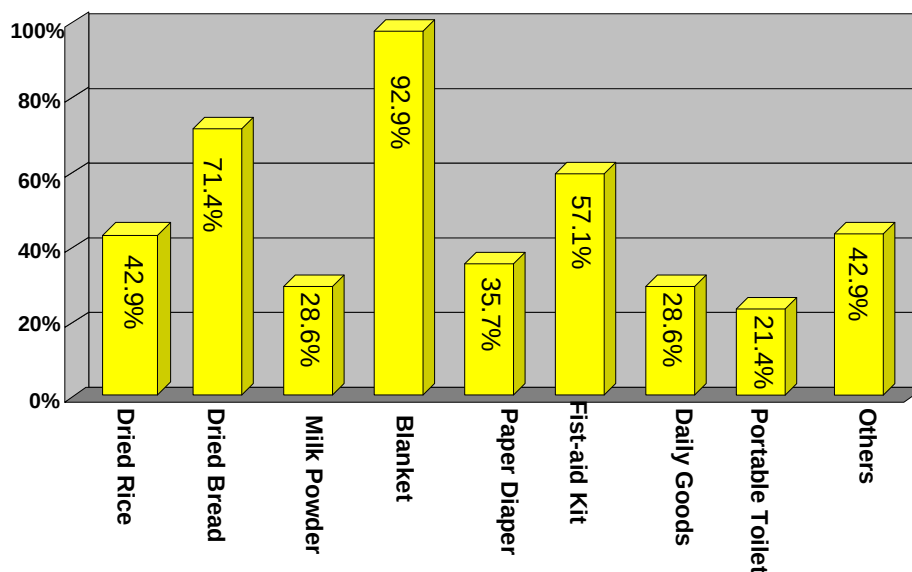


Fig. 6.14 Stockpiles at Schools before EJET
[Source: Kesennuma BOE 2012] Modified by Author

After the EJET immediately, school teachers engaged in setting up the shelters and first phase of shelter management conducted by principals. They contributed to recovery process. But they had many challenges and obstacles, and they were changing depend on phases of recovery process (Fig 6.15).

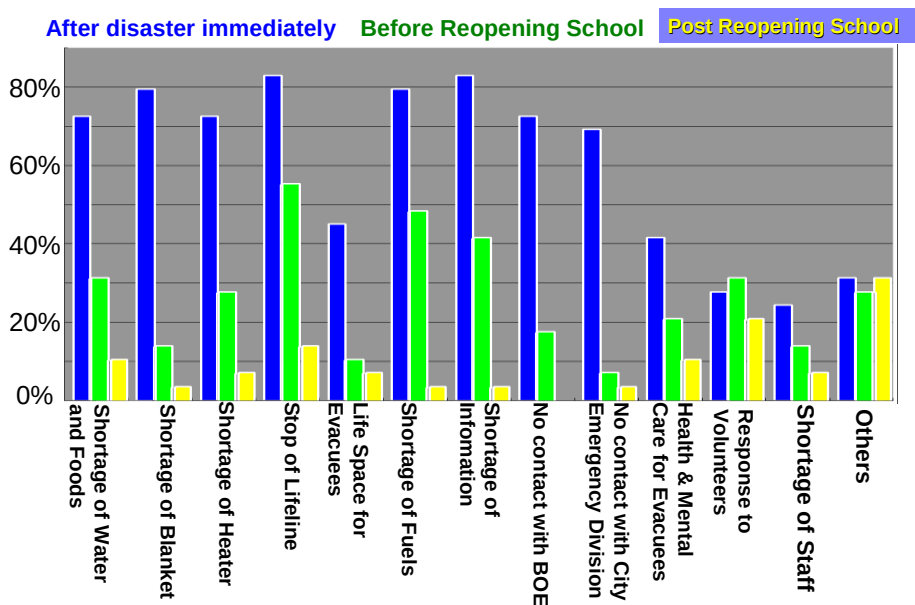


Fig. 6.15 Obstacles on Shelter Management at School
[Source: Kesennuma BOE 2012] Modified by Author

At first phase after the tsunami disaster immediately, shortages of blankets, fuels, foods and information, and non-available lifelines were serious problems for managing shelters. As recovery was progress, these percentages wad decreasing. In contrast, at the phase of post reopening schools, the response to volunteer and health and psychological supports for evacuee were getting main issues of shelter management at school comparatively.

On the other hand, the schools in Kesennuma did their best to restart school lesson supported by Kesennuma BOE, although shelters and bases of emergency institutions still remained at schools. However, they had many obstacles to reopen their schools as follows (Fig 6.16):

- (i) Problem concerning facilities such as damaged facilities and not available water,
- (ii) Problem concerning evacuees such as school building occupied by shelters and temporary housings,
- (iii) Shortage of learning materials and equipments
- (iv) Problem concerning transportation of students and teachers,
- (v) Providing school lunch.

These are critical issues caused by the disaster of EJET and should be solved in order to restart school lesson and recovery school education. Each School tackled on these matters collaborating with BOE, local community, and each other.

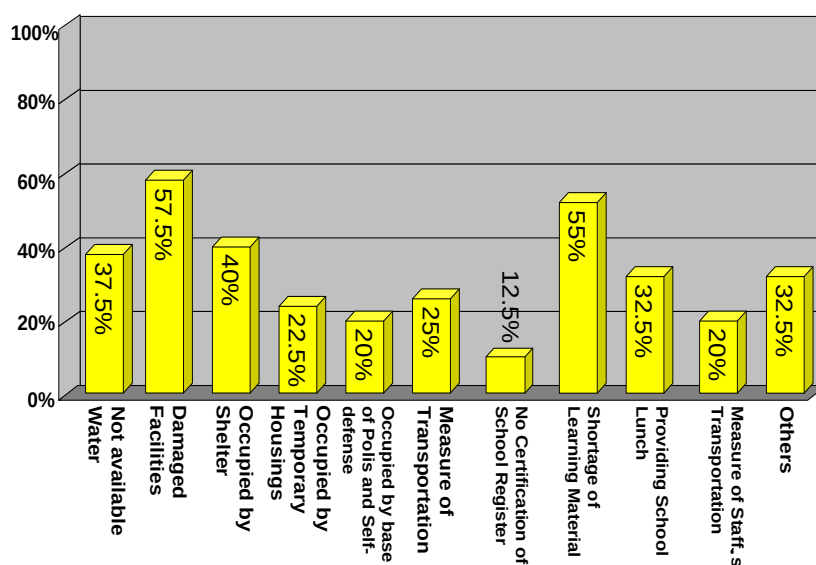


Fig. 6.16 Obstacles for Reopening School Education
[Source: Kesennuma BOE 2012] Modified by Author

To overcome these issues and restart school lessons for students as soon as possible, teachers at each school had done dedicated efforts in the aftermath of EJET (Fig 6.17).

- (i) Strengthening the linkage with outside institution; board of education, community, volunteer and NPO/NGO.
- (ii) Improving curriculum to adjust the situation of damage and restriction.
- (iii) Borrowing facilities and equipments of other school for educational activities.

Especially, many schools tried to establish and enhance the linkage with diverse sectors such as government (BOE), community, NGO/NPO, volunteer group. Schools in Kesennuma have been promoting ESD establishing collaboration with these sectors, so that the schools recognized merits and methods of collaboration with outside sectors through ESD promotion. Thus, each school and teachers made the best use of these experiences and methods for establishing collaborative linkage and support system in order to solve the many difficulties caused by disaster toward educational recovery process (Oikawa 2014).

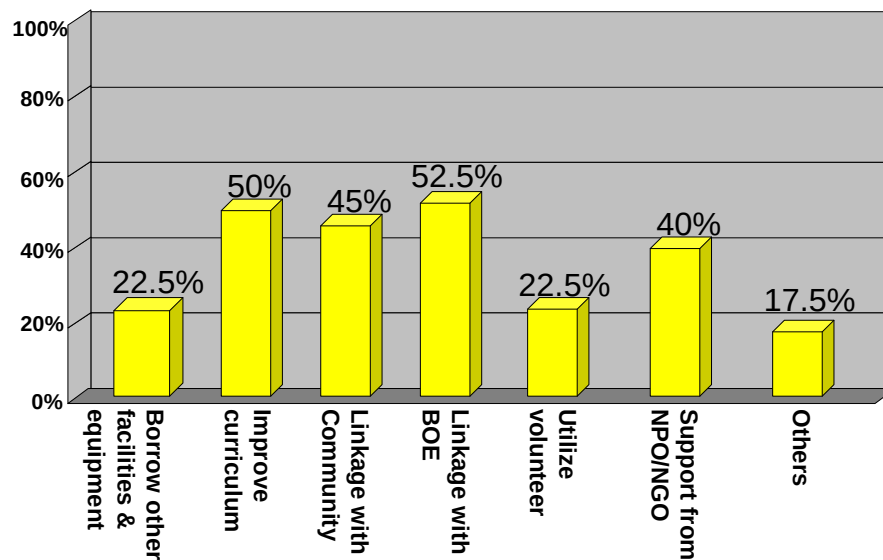


Fig. 6.17 Efforts for Reopening School
[Source: Kesennuma BOE 2012] Modified by Author

With regard to DRR and DRM of school on the recovery process, all of schools have renewed DRR plans and manuals, and also improved disaster education programs and activities based on the lessons of EJET. According to DRR plan and disaster

education program, the schools are trying to enhance the disaster prevention drill quantitatively and qualitatively, assuming damage of EJET scale (Fig 6.18).

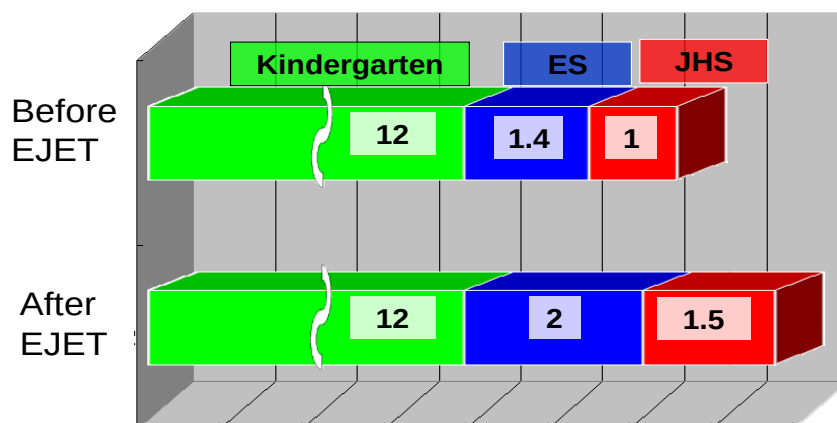


Fig. 6.18 Transition of Evacuation Drill before and after EJET
Note: Average Number of Evacuation Drill per year [Source: Kesennuma BOE 2012]

6.4 Institutional Response in Education Sector

After the East Japan Earthquake and Tsunami, so many people in affected area evacuated to the schools and educational institutions such as Kominkan (Community learning Center) and Gym. 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 at as Emergency Report of MEXT says (MEXT 2011). And last shelter in school was closed in November, 2011 which is eight months later from disaster happened. Based on these tragic damages of the disaster of East Japan Earthquake and Tsunami, Educational Institutions such as board of education 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. MEXT categorizes recovery process to restart school education into four phases from two functions as the shelter and the school on their report of “Emergency Proposal for Preparation of school facilities based on Great East Japan Earthquake” as follows (MEXT 2011):

1. Rescue and Evacuation Period—From disaster happened to evacuation
2. Securing Lives Period—For a few days after the evacuation

3. Making Livings Period—For a few weeks after Securing Lives Period
4. Restarting School function Period—After restarting the school education

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 categorized recovery process of school educational into five stages as follows (Table 6.3):

1. Emergency Response to manage crisis—after the disaster immediately
2. Short-term Response to sustain lives—set up and manage the shelters
3. Mid-term Response to school restarts—until school restart after set up shelter
4. Long-term Response to recover education—recover and settle schools
5. Further Response to reconstruct future—response to next disaster and future

Therefore, the response of the board of education and schools should be done according to these phases and stages. It will be described in this paper how main responses of educational institutions in Kesennuma City have been implementing so far after East Japan Earthquake and Tsunami (Oikawa 2013).

Table 6.3 Main Response of Educational Governance according to Phase and Stage in Kesennuma

Stages of Responses	Situation and Mission	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 Support to self-manage	Set up shelters in schools Check students' 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, Environmental & Economical Supports	Psychological supports Settle school education
Further Response to reconstruct future	Preparation for future disaster and recovery	Record experiences Establish diverse links	Improve DRM, DRR & ESD for creative recovery

[Source: Oikawa 2014]

Emergency and short-term response such as taking evacuation and setting up & managing shelter, have been includes and described in “Selected case of school damage” above already, so that Mid-term, Long-term and Further response should be analyzed in the following sections.

6.4.1 Mid-term Response 1 - “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 of schools in Kesennuma City were also devastated by the earthquake and tsunami. 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 houses were built in school yards and parks not only in Kesennuma City but also in Ichinoseki City in Iwate prefecture and students moved to the temporary houses from shelters with their family. This also made difficult for students to go to their own schools (Table 6.4).

Table 6.4 Number of Evacuate Students in Kesennuma City after EJET

Living place	School level	April 15th, 2011	October 1st, 2011	April 1st, 2012	October 1st, 2012
Shelters	Elementary	288	1 (0)	0	0
	Junior high	198	4 (2)	0	0
	Total	476	5 (2)	0	0
Relatives and 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)
Temporally houses	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 and 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)

Made from research of students living place by Kesennuma BOE

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

Therefore, Kesennuma City Board of Education had to provide students transportations from shelters to schools in order to restart the schools. This matter was indispensable condition to recover the schools education in Kesennuma City. Kesennuma City Board of Education tried to secure new school buses systems which could link shelters and temporally houses 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 routes between shelters and school were unavailable by tsunami cutting. In addition, the city office and board of education could not afford budget for new school bus running. 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 the school restarting, Kesennuma BOE was able to get the agreement 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.

After that, Kesennuma BOE has been trying to increase and adjust the routes according to the situation of students’ moving and living places by 2013(Table 6.5). This school bus system is still functioning as important transportations for students who go to their school beyond school district even in 2015.

Table 6.5 Number of Students using Emergency School Bus and Living Place in Kesennuma City

As of July 2013

Living place	Own house		Relatives’ house		Rental housing		Temporary housing		Total
School district	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside	
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

Data from Kesennuma City Board of Education, Analyzed by Author

6.4.2 Mid-term Response 2: “Resupplying School Lunch beyond Earthquake and Tsunami”

To restart schools and to recover education, supplying school lunch was very important immediately after the disaster of earthquake and tsunami. 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. But it was crucial that BOE restarted school lunch as soon as possible for recovery of school education.

6.4.2.1 Outline of School Lunch in Kesennuma before the Disaster

Kesennuma City used to have 3 types of school lunch system in Kesennuma 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 (Niituski Junior High Schools and Oshima Junior High Schools) in Kesennuma area, as well as all elementary schools and junior high schools in Motoyoshi Town area. Second type is semi-full supply school lunch (Hoshoku-Kyusyoku) in 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 themselves from their home. Third system is milk school lunch (Milk-Kyushoku) of junior high schools in Kesennuma City area excepting Niitsuki and Oshima Junior High School. This provides just mill to students, so students at schools of the system have to bring lunch (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. (Table 6.6.a) Coexistence of these different systems made difficult and complicated restoration of the school lunch system in Kesennuma from the disaster of East Japan Earthquake and Tsunami. These systems

lasted until Central School Lunch Center (Chuo Kyushoku Center) established in Oct 1st. 2011. (Table 6.6.b)

Table 6.6 Outline of School Lunch in Kesennuma City

a. May 1st, 2010 (before the Disaster)

Type of System	School Level	Number of school	Number of Students
Full Supply	E.S.	18	3,483
	J.H.S	5	535
	Total	23	4,018
Semi-Supply	E.S.	3	320
	J.H.S	2	226
	Total	5	546
Just Milk	E.S.	0	0
	J.H.S	6	1,492
	Total	6	1,492
Total	E.S.	21	3,803
	J.H.S	13	2,253
	Total	34	6,056



b. Oct. 1st, 2011 (after the Disaster)

Type of System	School Level	Number of school	Number of Students
Full Supply	E.S.	18	3,177
	J.H.S	11	1,920
	Total	29	5,097
Semi-Supply	E.S.	3	302
	J.H.S	2	205
	Total	5	507
Just Milk	E.S.	0	0
	J.H.S	0	0
	Total	0	0
Total	E.S.	21	3,479
	J.H.S	13	2,125
	Total	34	5,604

[Source: Report of Administration Council of School Lunch in Kesennuma City, 2012]

6.4.2.2 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 the staff of school lunch center 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 center had many challenges to restart then, and every staff of each center said 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 damaged, and many problems and obstacles occurred at each center as flows. Therefore, the situations of each center were very difficult at that time, so that it was impossible to provide full supply school lunch to each school then. 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.

1. A couple of school lunch center functioned had to take a role as center of distributing boiled rice to evacuees in shelters.
2. So staff of lunch center also had to be engaged in that mission, but not in cooking school lunch.
3. It is difficult to get materials for cooking such as vegetables, meats, fishes, rice and milk because transportation and distribution system stopped.
4. Some school lunch centers had troubles in cooking machine and other facilities by earthquake.
5. Some trucks which carry school lunch to schools were washed away by tsunami.
6. Some School lunch centers were used as bases to store provision for evacuees.
7. Sanitary conditions in some lunch centers were poor, because evacuees used the lunch centers to distribute boiled rice and they entered the center with their shoes on.

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 of each school lunch center, all of school lunch center in Kesennuma City could supply school lunches to each schools 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, 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 Oshima and Motoyoshi School Lunch Center those could not use water line then. These were remarkable achievements of each school lunch center in Kesennuma City (Table 6.7).

Table 6.7 Recovery Process of School Lunch Centers in Kesennuma City after EJET

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.Schools	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.Schools 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		

As of 2011

However, problem 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 a staple food to school. Some of these students could not bring lunches or rice because the condition of their lives and cooking were not so good for evacuation to shelters and relatives. 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 (shidashi-bento) to students at school of milk school lunch who could not bring lunch, and also providing rice to some students at school of semi-school lunch who could not bring rice, utilizing National Disaster Relief Law and Study Support System of Kesennuma City communicating with federal and prefectural governments.

6.4.2.3 Establishing Kesennuma Central School Lunch Center

After the disaster of East Japan Earthquake and Tsunami, all of public constructions of Kesennuma City were stopped to cope with many emergency situations first. The construction of Kesennuma Central School Lunch Center which Kesennuma City Board of Education was promoting had also been stopped for a while. But City office and

board of education gave priorities to establish new school lunch center in order to improve the situations of students' school lunches as soon as possible, so that BOE restart the construction of Central School Lunch Center.

Table 6.8 Structure of Kesennuma Central School Lunch Center

Capacity of cooking of school lunches		3,000 meals per a day
Number of schools and school lunches to supply	Elementary school	9 schools (1,350 meals)
	Junior high school	6 schools (1,350 meals)
	Total	15 schools (2,700 meals)
Number of staff and employees	Office workers	6 persons
	Cooking workers	30 persons (commissioned)
System of cooking sector		Commissioned to private sector
Type of cooking		Dry cooking (no wet)

Data from Kesennuma City Board of Education, Analyzed by Author

Finally, Kesennuma Central School Center established on October 1st, 2011. And it worked to provide 2,700 full supply school lunches to 15 schools (9 elementary schools and 6 junior high schools). By the establishment of Kesennuma Central School Lunch Center, Kesennuma City Board of Education also could solve the problem of “milk school lunch”. Central School Lunch Center started to provide full supply school lunch to 6 junior high schools those used to be milk school lunch supply (Table 6.8).

As a result, all of school lunches of Kesennuma city became full supply or semi-supply school lunch. The establishment of Central School Lunch Center contributed to recovery of school lunch supplying system in Kesennuma City highly.

6.4.3 Long-term Response 1: “Economical Supports for Students and Parents”

As described above, over 80% citizens in Kesennuma City lost their jobs by the damage of 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 have been very hard to seek for new jobs because of most factories and business offices, more than 80% in Kesennuma City, were devastated by tsunami and not reconstructed yet. (Table 6.9) It was very serious problem not only for students' economical situations but also for school education in Kesennuma City.

Table 6.9 Condition of Job Offers in Kesennuma City after EJET

Month/year	Number of people seeking jobs (a)	Number of unemployment insurance (b)	People without insurance (a)–(b)	Job offers (c)	Ratio of job offers (c)/(a)
February/2011	1,778			1,019	0.57
March	1,761			923	0.52
April	4,410	1,006	3,404	838	0.19
May	6,169	5,079	1,090	1,069	0.17
June	6,325	5,511	814	1,836	0.29
July	5,417	5,008	409	1,799	0.33
August	4,835	4,660	175	1,800	0.37
September	4,627	4,210	417	1,775	0.38
October	4,321	3,760	561	1,703	0.39
November	4,355	3,523	832	1,886	0.43
December	4,287	3,335	952	1,858	0.43
January/2012	4,131	3,056	1,075	1,929	0.47
February	4,042	2,843	1,199	2,229	0.55
March	4,041	2,636	1,405	2,542	0.63
April	3,820	2,289	1,531	2,291	0.60
May	3,424	2,055	1,369	2,228	0.65
June	3,119	1,769	1,350	2,222	0.71

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

6.4.3.1 Expanding Public Support System for Educational Expense

After the Disaster of East Japan Earthquake and Tsunami, 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 in order to aid the students and parents who were affected by the disaster. This system covers expenses of learning materials, goods to go to school and school lunch. 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. 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 under 10% before the earthquake and tsunami. The serious situation has never been experienced in Kesennuma City so far (Table 6.10).

Table 6.10 Economical Supports for Students affected by EJET

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 and goods Expense of school lunch
Grant for orphans by disaster	Disaster orphans	63 students ^a	Lump-sum payment: 100,000 yen Payment per month: 20,000 yen (until graduation of high school)
Grant for disaster affected students	Affected students	632 students ^a	Payment per month: 20,000 yen for 3 years

^aNumber of disaster affected students of elementary and junior high schools of Kesennuma City in 2011

6.4.3.2 New Grants for Students affected by Disaster

On the other hand, Kesennuma Board of Education ventured to establish new grants 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.

One of grants is for orphaned students by East Japan Earthquake and Tsunami. This grant covers 100,000yen 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 grant is organized by National Federation for UNESCO and the budget was donated by city bank (Table 6.10).

Another grant is for students whose parents had 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 had serious damages by this disaster. This grant covers 20,000yen per month for three years. 632 students of Kesennuma City were selected as recipients of this grant. This grant was also organized by NEUAJ and it was donated by software company, men's suits company and NPO. Both of grants were very helpful for family budget of tsunami affected families, such as expense of learning materials, excursion, club activities and so on (Table 6.10).

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 (Table 6.11).

Table 6.11 Damage of Recipients of “Scholarship for Disaster affected Students” by EJET

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%

AS of Dec. 2011

6.4.4 Long-term Response 2 - “Making Substitute School Yard for School Activities”

After the earthquake and tsunami, a large number of temporary houses 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 houses 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 houses. These are reason why Kesennuma city government had to decide to build the temporary houses at school yards of elementary and junior high school of Kesennuma City. Beyond half of schools in Kesennuma provided their school yards to build the temporary houses.

Especially, almost all the school yards of junior high schools were occupied by temporary houses for evacuees (Table 6.12).

Table 6.12 Temporary Housing at School Yard of Schools in Kesennuma

School level	Number of schools	Percentage in total schools (%)	Number of temporary houses	Percentage in total temporary houses (%)
Elementary school	7	35	143	4.1
Junior high school	11	85	1,000	28.5
Total	18	55	1,143	32.6

Note: Elementary and Junior High Schools in Kesennuma, As of October 2012

The school which provided school yards for temporary houses 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 houses. 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 the school yard 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 school yards.

As a result, BOE was able to borrow lands from communities and to get financial support of NPO, so that BOE could made 3 substitute school yards beside Oya Elementary and Junior High School as well as Shishiori Junior High School.

6.4.5 Further Response 1 - “Constructing Electricity Power & Water Resources”

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 devices 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 and to manage the shelter at each school.

Learning from this experience and lesson, Kesennuma City Board of Education decided to construct emergency electronic and water supply system at schools those are used as shelters in disaster for the purpose of preparing next disasters in future. 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. 6.19). And Supporting from German City, Kesennuma BOE could set portable solar panels at other 11 schools in 2011 as emergency electronic resource and daily using outside. So, all of schools in Kesennuma City have solar panels as emergency electronic supply.

In addition, Kesennuma BOE is planning to set solar panels with storage battery at five 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.



Fig. 6.19 The well with solar panel of Kesennuma Elementary School

6.4.6 Further Response 2 - Improving Disaster 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 (Oikawa 2012a).



Fig. 6.20 Record of the Lesson learned from EJET

Left; “Move forward from East Japan Earthquake and Tsunami” published by Kesennuma City Principal’s Association, Kesennuma Board of Education and Miyagi University of Education,
 Right; “Lesson from East Japan Earthquake and Tsunami” published by Kesennuma BOE & Ministry of Environment

And they are also improving and rebuilding the disaster risk management (DRM) and disaster education utilizing lessons from disaster of East Japan Earthquake and Tsunami. For example, School Principals and BOE in Kesennuma have published three reports of DRM and recovery process of school through the experience of East Japan Earthquake and Tsunami (Kesennuma BOE et al 2012, 2013, 2014). 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. And teacher researching group (Kyoiku Kenkyuin) also published model lesson plans of disaster 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 (Kesennuma City Educational Researching Group et al 2012, 2013, 2014) (Fig. 6.20).

Moreover, Kesennuma BOE is now developing “Creative Recovery Education” based on Education for Sustainable Development which Kesennuma has done so far. To realize that educational concept, 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 will be held in Kesennuma City in March, 2013. All of these events and practices are expected to foster future leaders who can contribute to recovery process locally and globally.

6.5 Key Emerging Needs and Challenges

6.5.1 Disaster Impact of EJET on Schools and Students

Based on the observation of school damage of EJET in Kesennuma City, some features and key findings could be pointed out.

(a) Damage of schools is diverse

Kesennuma City suffered serious damage of massive disaster of East Japan Earthquake and Tsunami (EJET) in 2011. Disaster impact on the school and students also was also huge. Schools received serious damages of casualty and facility so that the function of school education was stopped for one month after the EJET. Aspect and characteristics of damage were different depend on school location and situations, therefore and Emergency needs were also diverse depend on school. Some school evacuated to upper floors and other school was changing evacuation place according to the situations. And some schools received lots of evacuees supported by community and students.

(b) Disaster Management efforts reduce damages of students

However, the schools in Kesennuma lost no students' lives at school under the control of teachers. Teachers of all schools did their best to protect students' lives, so that the schools in Kesennuma were able to rescue 99.8% students' lives except students who were out of schools. This achievement was made possible thanks to disaster management of each school and appropriate judgments of principals and teachers primarily.

(c) School-community Linkage is effect on DRR

Also, the cooperation between schools and community was very effect to protect students and residents, especially it was reported that community member rescued many students who had left school and on the way home by warning and evacuating together. The school-community linkage functioned in the case,

(d) ESD fosters linkage and collaboration with community

This linkage was fostered through educational activities based on community such as experience-based learning and Education for Sustainable Development (ESD) which schools of Kesennuma City have been promoting as whole city approach.

(e) Contribution and performance of junior high school students is remarkable

In addition, the contributions of junior high school students to shelter management and recovery process in community were identified. That is a remarkable performance utilizing experience of disaster education and ESD.

6.5.2 School Response to Disaster

According to the lesson from EJRT and the survey of school principals and teachers, some key findings are identified on school response to disaster of EJET.

(a) DRR plan and manual of school need to be renewed

It is critical that schools in Kesennuma should be decide to set safety evacuation places and route, and shelters for the future considering the situations of damage and the tsunami inundated areas of EJET as well as the tsunami running up the river. And sufficient stockpiles are needed at shelter and there is linkage between the stockpiles at schools and the teachers' consciousness of shelter.

(b) Disaster awareness and understanding of teachers should be raised

High awareness of teachers in Kesennuma achieved that schools have not lost any lives of students under the control of teachers in spite of massive disaster of EJET in 2011. Thus, through the tragic experience of EJET, teachers in Kesennuma are reaffirming the significances of disaster awareness and understanding of DRR plans. So that they are trying to improve their systems, plans and raise awareness for disaster risk reduction not to repeat tragedy of disaster.

(c) Improvement disaster prevention drill is required

It will be necessary that evacuation drills should be conducted in various conditions combining place, time and activities, and that practical DRR plans and manuals should be formulated. Also assuming the case of disaster suffering outside school, it is crucial that disaster education should be improved to foster the ability of protecting themselves by taking evacuation action proactively.

(d) Handing over students is critical issue

In the case of EJET, almost a half of schools in Kesennuma started handing over students before tsunami coming. It was the big problem of disaster risk management

(DRM) of the schools. Because of this judgment, the most tragic case is that students suffered tsunami disaster and lost their lives on the way home with families. Timing of handing over students was very difficult judgment as schools response and DRM. Based on the lessons, each school has improved DDR plans which should include the manual of handing over students with the description of the timing and methods.

(e) Handing over sometimes makes safety check difficult

Handing over students before tsunami inundated, sometimes makes very difficult for schools to check the safety of those handed students after the evacuation, because students have evacuated with families around the spreading area beyond the school district and city area to escape the massive tsunami. This is the reason why it took so long time to complete the safety check of those students.

(f) ESD accelerates to building network for recovery

Schools in Kesennuma have been promoting ESD establishing collaboration with these sectors, so that the schools recognized merits and methods of collaboration with outside sectors through ESD promotion. Thus, each school and teachers made the best use of these experiences and methods for establishing collaborative linkage and support system in order to solve the many difficulties caused by disaster toward educational recovery process.

6.5.3 Institutional Response in education sectors

Through analyzing institutional response of Kesennuma city Board of Education in the midst and aftermath of EJET disaster, it is found out what kind of strategies are needed and effective to the DRR and recovery process as governmental issues.

(a) Securing transportation of students is first step for disaster recovery

The school districts in Kesennuma City were also inundated by the earthquake and tsunami. This made difficult for students to go to their own schools. Therefore, Kesennuma City Board of Education had to provide students transportations from shelters to schools in order to restart the schools. Kesennuma BOE considered the round routs of school buses which link shelters to each school effectively. Finally, Kesennuma BOE could establish new school bus system and it could be in time for restarting school. This matter was indispensable condition to recover the schools education in disaster affected area.

(b) Resupplying School Lunch is life line for school education

To restart schools and to recover education, supplying school lunch was very important immediately after the disaster of earthquake and tsunami, 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. 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 immediately, the function of school lunch supply system in Kesennuma City stopped by damage of the earthquake and tsunami. Kesennuma BOE tried to seek for new supply routes and methods which provided food materials quickly and continuously. Thanks to these efforts all of school lunch center in Kesennuma City could supply school lunches to each schools adjusting to school restart day.

(c) Economical Supports contribute to long-term recovery of affected families

Over 80% citizens in Kesennuma City lost their jobs by the damage of disaster of EJET. It was very serious problem not only for students' economical situations but also for school education in Kesennuma City. Kesennuma BOE ventured to establish new grants for students who suffered physical and economical damages by East Japan EJET, collaborating with NGO and donated by a bank, companies and NPOs. Grants were very helpful for family budget of tsunami affected families, such as expense of learning materials, excursion, and club activities and so on. Therefore, the scholarship is taking role to cover some parts of these economical damages.

(d) Facility improvement is needed for education and forthcoming disaster

Beyond half of schools in Kesennuma provided their school yards to build the temporary houses. The school which provided school yards for temporary houses could not use their school yards for physical education and club activities. BOE was able to borrow lands from communities and to get financial support of NPO for building substitute school yards. On the other hand, learning from the experience that all of power supplies were cut off after the East Japan Earthquake and Tsunami immediately, Kesennuma BOE decide to construct emergency electronic and water supply system at schools those are used as shelters in disaster for the purpose of preparing next disasters in future.

(e) Improving DRM & DRR and disaster education is road to creative recovery

Education sectors in Kesennuma City have been proceeding with physical and psychological supports for affected students fostering their resilience. And they are also improving and rebuilding the disaster education utilizing lessons from disaster of East Japan Earthquake and Tsunami. Moreover Kesennuma BOE is now developing “Creative Recovery Education” based on Education for Sustainable Development which Kesennuma has done so far. All of these events and practices are expected to foster future leaders who can contribute to recovery process locally and globally.

(f) Multi-stakeholder approach establishes N-help for DRR and recovery

Finally, Kesennuma BOE and schools are implementing many activities collaborating with community and other institutions based on ESD and community learning. 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 (Oikawa 2012).

As described above, Kesennuma BOE and schools are taking many responses to educational recovery depend on phase and stage. All of these responses have been promoted by not only Kesennuma BOE and schools, but also diverse sectors such as community members, many companies, NGO/NPO, banks and other institutions including universities which collaborated and participated in this process. Namely, Kesennuma BOE has been promoting recovery 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 trying to establish recovery process through participation and collaboration among diverse actors.

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Chapter 7 New concept of ESD in the DRR and Recovery Process

Abstract: After the East Japan Earthquake and Tsunami (EJET), the importance and significance of disaster education were recognized at schools in Japan based on the lesson learned from its disaster. So that schools especially in tsunami affected area tried to fulfill disaster education and disaster risk management (DRM) of the schools after the EJET. Many of schools in Kesennuma City which had been promoting ESD as UNESCO Associated School from pre-disaster of EJET shifted their main focus of ESD to disaster education more to accelerate disaster education at each school based on the lessons learnt from EJET, comparing with pre-disaster. And schools in Kesennuma also tried to improve and enhance DRR perspectives in educational activities and school systems. Thus, disaster education has been incorporated into school curriculum and DRM practice has been reinforced in variable school systems through the catastrophic experience and vital lessons of EJET. On the other hand, the synergy between ESD and disaster education was highlighted and comprehended by schools and educators more and more as the new concept of ESD in the context of DRR and recovery process of after the EJET. There are three perspectives of the synergy – the first is that ESD surely functions to DRR as abilities, and the second is that ESD functions to DRR as networks. Moreover, the last is that ESD is the concept towards post-disaster recovery and reconstruction. Making the best use of the new synergy concept, the Kesennuma City Board of Education (BOE) have researched and proposed the new strategy by developing Disaster Education Sheets and Matrix as a method to incorporate disaster education into school curriculum and educational activities involving parents and residents. Some of schools in Kesennuma have also improved their disaster education and ESD programs and activities based on this concept, and they have been implementing DRR activities from ESD perspectives; students-centered, experience-based, action-based, enquiry-based and problem-solving process, linking and collaborating with local community. These innovative practices of the schools are the evidences of new concept of ESD with the synergy of disaster education.

7.1 Review of ESD Schools in the Disaster Context

7.1.1 Resuming ESD Practice at Schools in Kesennuma after EJET

Kesennuma City has been promoting ESD mainly in formal education since 2002 when DESD was proposed to Johannesburg Summit by Japanese government. At the

beginning of DESD Kesennuma was acknowledged as part of Greater Sendai RCE by United Nation University in 2005(Uehara 2010). Kesennuma City Board of Education (Kesennuma BOE) was also promoting UNESCO Associated School (ASPnet School) to accelerate ESD in formal education, so that all elementary and junior high schools along with some kindergartens and high schools in Kesennuma became UNESCO Associated Schools and have been implementing active and characteristic ESD activities based on each community (Oikawa 2011). Kesennuma City Board of Education hold “Kesennuma ESD/UNESCO School Training Workshop” twice per year for the purpose of teachers’ capacities building to promote ESD at each school effectively. First workshop is held at the beginning of Japanese academic year. Then, teachers in charge of ESD at each school bring their plans of ESD curricula, and they share and discuss how to improve them each other taking supports and advices from expertise of specialists at university. Second workshop is hold at the end of school year, and teachers bring reports of achievements of their ESD implementations and share their advancements. They also discuss and recognize the challenges which should be taken over to the next year for improving the quality of ESD at each school (Oikawa 2014a).

However, as described in Chapter 6, in Kesennuma City, Minami-Kesennuma Elementary School, Shishiori Elementary School, Hashikami Elementary School, Koyo High School, Ohya Kindergarten, and Karakuwa Kindergarten suffered severe damage by the East Japan Earthquake and Tsunami (EJET). Also many schools in coastal area were used as evacuation centers as well as bases for Self Defense Forces, police, and fire departments. The new school year was able to commence on April 21, 2011 due to the efforts of school teachers in Kesennuma City and the Kesennuma City Board of Education (Kesennuma BOE) as well as local residents. Not only ESD-related lessons but also general classes were impacted tremendously by the EJET (Oikawa 2013a).

In 2010 which is one year before of EJET, “Kesennuma ESD/UNESCO Schools Training Workshop” was held in Kesennuma, the results of which were summarized as the “Kesennuma ESD Joint Research Report: Towards Education for a Sustainable Society”, which was published on March 10th, 2011 which was just one day before of the East Japan Earthquake and Tsunami (Kesennuma BOE et al. 2011). In 2011, after the East Japan Earthquake and Tsunami immediately, Kesennuma BOE restarted teacher trainings, workshops, forums and symposiums related to ESD, although Kesennuma City including schools and Communities suffered serious damages by tsunami. Kesennuma BOE held “National Research Forum on Environmental Education of Elementary and Junior High Schools in Kesennuma” in November 2011 and

“UNESCO School Regional Exchange Forum” in January 2012 as well as the program of “Japan-East Asia Network of Exchange for Students and Youths (JENESYS Programme)” in March 2012.

Kesennuma BOE has restarted regular Kesennuma ESD/UNESCO Schools Training Workshop since 2012. The 2nd ESD/UNESCO Schools Training Workshop of FY 2012 was held on January 19, 2013 with attending by 5 kindergartens, 20 elementary schools, 13 junior high schools, and 2 high schools from Kesennuma City as well as 1 junior high school from Minamisanriku Town. The workshop also invited specialists of National Institute for Educational Policy Research (NIER), National UNESCO Federation in Japan (NFUAJ) and Miyagi University of Education (MUE). The result of the workshop was published as “Kesennuma ESD Joint Research Report: Towards the Education of Future Leaders in Restoration and Creation Following Disasters” in September, 2013, supported by NFUAJ and MUE (Kesennuma BOE et al. 2013). Comparing those two research reports above and the report of the First Kesennuma ESD/UNESCO Schools Workshop in July 2014, it is identified that the efforts by school teachers and students and local residents in Kesennuma rebuild ESD programs from their experiences and lessons of the disaster of East Japan Earthquake and Tsunami. And also it should be analyzed how the main focuses and trends of ESD at ASPnet schools in Kesennuma has been transforming before and after the East Japan Earthquake and Tsunami, according to the comparison of those three reports described by each school in Kesennuma including kindergartens and some of high schools.

7.1.2 Transition of Main focus of ESD at Schools through EJET

Table 7.1 and Figure 7.1 show the transition of ESD main focus in which each school implemented activities during FY2010 to FY2014. The list expresses items indicated in the submitted reports to the workshops as the “Main ESD focuses” implemented by the kindergartens/schools in Kesennuma.

7.1.2.1 Enhancing the focus of “Disaster Risk Reduction” as ESD

What firstly stands out is that there has been a large increase in the number of schools that have newly undertaken activities related to disaster risk reduction as Table 7.1 shows. While only two schools undertook “Disaster Risk Reduction” activities in FY2010, there were 11 schools/kindergartens implementing “Disaster Risk Reduction” activities in FY2012 —a drastic increase of nearly five-fold after the East Japan

Earthquake and Tsunami. In FY 2014, the number increased to 14 schools/kindergartens which are equal to 35.0% of whole schools/kindergartens in Kesennuma City. There were also numerous schools that did not list “Disaster Risk Reduction” as their main ESD focus, but described detailed activities related to DRR in the text of their reports (Table 7.1, Fig. 7.1). This change was spontaneous action by school mainly, considering the change of environment and society caused by the disaster of EJET. Also, enhancing the importance of disaster education by BOE after EJRT is the reason of this change.

Table 7.1 Transition of Main Focus of ESD as Schools in Kesennuma (FY2010-2014)

Main focus of ESD	FY2010		FY2012		FY2014		Comparison of 2010 and 2014
	Number	%	Number	%	Number	%	
Environmental Education	27	81.1	22	55.0	22	55.0	↓ - 26.1%
Understanding of Community	8	24.2	20	50.0	21	52.5	↑ + 28.4%
International Understanding	6	18.2	3	7.5	1	2.5	↓ - 15.7%
Food Education	4	12.1	6	15.0	5	12.5	+ 0.4%
Welfare Education	4	12.1	8	20.0	7	17.5	+ 5.4%
Disaster Risk Reduction	2	6.1	11	27.5	14	35.0	↑ + 28.9%
Energy Education	1	3.1	2	5.0	2	5.0	+ 1.9%
Traditional Cultural Heritage	0	0	1	2.5	5	12.5	↑ + 12.5%
Others	2	6.0	3	7.5	4	10.0	+ 4.0%

Note: Number is School (N=40, Multiple answers allowed), Date from Kesennuma Joint Research Report vol. 1(2011), vol. 2(2013) and ESD report of First Kesennuma/UNESCO School Training Workshop in 2014

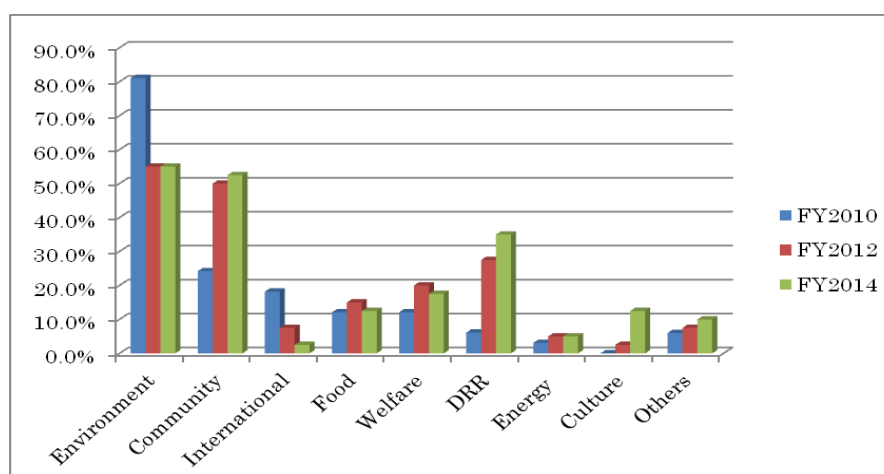


Fig. 7.1 Transition of Main focus of ESD at schools Kesennuma (FY2010-2014)

Note: Number is School (N=40, Multiple answers allowed), Date from Kesennuma Joint Research Report vol. 1(2011) and vol. 2(2013), and ESD report of First Kesennuma ESD/UNESCO School Training Workshop in 2014, Analyzed by Authors

Cases of schools which not only added “Disaster Risk Reduction (DRR)” as an ESD focus, but also integrated disaster education to their ESD activities were also identified. For example, Hashikami Junior High School has been carrying out activities of three cycle as Self-help, Mutual-help and Public-help converging with disaster education under the theme “We are Disaster Prevention Fighters of the Future” since 2005 before the East Japan Earthquake and Tsunami. Following the tsunami disaster, the school first of all changed the curriculum to a self-help based curriculum which teach students to protect their own lives and restructured the ESD program as effective disaster education focused on knowledge, preparedness and action (Oikawa 2014b). On the other hand, under the theme “Let’s think about how Kesennuma will be in 10 years’ time!” Kesennuma Junior High School has lectures on DRR inviting speakers from the Fire Department, and learned about methods for rescuing vulnerable people such as elderly and disabled people in times of disaster. In addition, they also create the disaster prevention maps as part of a disaster education curriculum that includes perspectives from other ESD focuses. The school reports that integrating themes has enable formulation of a three-year vision and made program guidance easier (Kesennuma BOE et al 2013).

At Elementary School level, Shishiori Elementary School which is located in tsunami affected area is trying to incorporate disaster education to school curriculum as the theme of school research and teacher training. They are also establishing the network for disaster risk reduction (DRR) with local community such as Community Learning Center, Disaster Management Agency, and Community Association. Even in mountain area, Shinjo Elementary School has developed disaster education curriculum which had activities specific to schools in a disaster affected area, such as activities to raise children’s awareness of the importance of food supplies, water, electricity, and other items that are in short supply in a disaster (Kesennuma City Educational Researching Group 2014a). In addition, practical learning activities in Kindergartens are being strengthening through such programs as DRR training carried out through cooperation with the local community, Fire and Disaster Management Agency, and elementary schools, and joint emergency evacuation drills with residents of temporary housing constructed on school ground (Sekiguchi 2013).

Moreover, according to the direct interview to superintendent and supervisor of the Kesennuma City Board of Education, disaster education is being carried out far more schools than shown by the Table 7.1, but there are also many cases in which the schools are not conscious of these activities as ESD through the discussion with principals and DRR chief (Bousai Shunin) of the schools in Kesennuma. Accordingly, it can be

pointed out that disaster education activities will be carried out in Kesennuma overall. Thus, disaster education has become key focus of ESD at each school in Kesennuma based on the experiences and lessons learnt from the disaster of East Japan Earthquake and Tsunami. For this reason, it should be recognized that DRR activities in Kesennuma City have a greater actual presence and spreading than indicated by the number of Table 7.1 and Figure 7.1.

Analyzing the reason why “Disaster Risk Reduction” activity increased as ESD main focus rapidly in Kesennuma, the following reasons could be indicated.

- (i) Disaster awareness of school principals and teachers have been raised through the tragic experience of unprecedented disaster of EJET
- (ii) School principals and teachers have recognized the significance and importance of the disaster education including evacuation drill, disaster prevention manual and DRR activity.
- (iii) School principals and teachers recognized that disaster education is the one of the important component and approach of ESD.
- (iv) Kesennuma City Board of Education enhanced disaster education introducing good practice and program of disaster education.

These points are found in the description in the report of each school on Kesennuma ESD Joint Research Report and could be identified in the interview to school principals and teachers as well as the superintendent and supervisors of BOE.

7.1.2.2 Focusing on “Local Community” and “Traditional Culture” as ESD

On the other hand, with regard to “Understanding of Local Community”, although only eight schools undertook activities related to understanding of local community in FY2010, this number had increased 28.6% to 21 schools/kindergartens which is more than half of whole schools in FY2014. The number of schools undertaking “Welfare” activities increased two-fold and “Traditional Cultural Heritage” has been also included to the ESD focus as a new perspective after the East Japan Earthquake and Tsunami.

Looking at the reports for schools that newly selected “Understanding of Local Community” as ESD focuses in 2012, several patterns emerge. Under the circumstances of the disaster of EJET, firstly, cooperation and collaboration between members of the local community and schools deepened, secondly, activities that gave a strong sense of orientation towards thinking about the future of the region have come out in learning at each school.

For example, Koharagi Elementary School changed its ESD program theme from “Environment” to “Local Community” and is raising students’ interest in the local area. Within activities in which students publish the message book of gratitude and they visit local Shinto shrines, the students have been able to face and overcome the challenges caused by the disaster of EJET, as well as develop a desire to contribute themselves to the region’s recovery. Moreover, listening to the words of the Shinto priests at shrines damaged in the disaster was also observed to have the effect of giving students awareness as a member of the local community as well as the meaningfulness of participating in traditional events (Kesennuma BOE et al 2013).

In terms of orientation towards the future, there were examples such as that of Karakuwa Junior High School, which selected the grand theme in the focus of “Energy” of thinking about the energy of Karakuwa area in 2050. The students are seeking for coexistence of energy and environment by research, experienced activities and discussion, inviting experts and resource persons in their community. This project was selected to “Strong Performers and Successful Reformers in Education” of OECD/PISA as a Model of Japanese Education (OECD 2012).

Conversely, there were cases in which the students themselves had an impact on the community. Kesennuma Elementary School carried out visits to the temporary stores in reconstructed commercial district in Kesennuma, and it was reported that these visits made the local people in temporary stores so happy, with some saying, “Elementary school students taking an interest in reconstruction has given us courage”. Thus, the school’s learning activities were able to contribute to the recovery of local community. Hashikami Elementary School has been promoting “Food Education” as their main focus of ESD and they are carrying out activities under the theme of “Slow Food”. It was reported that these activities have had the effect of regenerating awareness amongst local residents on the local community in spite of the disaster situation. Magome Elementary School carried out joint DRR evacuation drills with local residents and a kindergarten simulating landslides caused by heavy rain. These drills were used as opportunities for enabling students to learn how to respond when local residents evacuate to the school. And disaster education with an expanded view that includes local community perspectives and linkage is also observed at other schools (Sekiguchi 2013).

The reasons for increasing of “Understanding of Local Community” and “Traditional Cultural Heritage” could be found in the same context of EJET. Due to massive disaster of EJET, many people in Kesennuma including students and teachers suffered serious damage and some people lost their community devastated by tsunami.

Through the experience, people not only in Kesennuma but also other affected areas of EJET recognized and reaffirmed the importance of “community”. In this background, schools enhanced the learning focused on “Understanding of Local Community” and “Traditional Cultural Heritage” based on the recognitions as follows:

- (i) On the process of evacuation to the shelter, people supported each other in their community, so that “Mutual-help” based on community is very important for disaster recovery.
- (ii) Based on the lessons from EJET, Understanding community is very important in order to promote disaster education, so that, each school emphasized the learning of “Understanding of Local Community”.
- (iii) Disaster of EJET impacted on many aspects of local community such as environment, culture and economics as well as the bonds (Kizuna) in community. Therefore, on the recovery process from the disaster, the school in affected area tends to implement their education based on the community in order to these resources and heritages to future generations.
- (iv) On the process of disaster recovery, school education takes a key role to initiate to educate future leaders who achieve disaster recovery and build sustainable society. To achieve this, the school foster had respect and identity to their community through the learning of “Traditional Cultural Heritage”

Increasing numbers of schools are selecting “Welfare” as an ESD focus. This also means that schools reevaluated the relationship among residents or community members and the linkage between schools and community, because these bonds worked effectively on disaster risk reduction (DRR) in each community, such as evacuation and the management of shelters after the East Japan Earthquake and Tsunami immediately.

7.1.2.3 Reducing the focus of “Environment” and “International Understanding”

The focus in which there was a notable decrease in school activities was “Environment”, in which the number of schools undertaking related activities fell from 27 in FY2010 to 22 in FY2012 and 2014 (Table 7.1, Fig. 7.1). With regard to the move away from choosing “Environment” as an ESD main focus, a few schools provided explicit explanations for this change in their reports. For example, Koharagi Elementary School explained that the theme was changed because they could no longer use the ocean which they had previously used for field trips, and Omose Junior High School explained that they changed their ESD theme to “Sports as Culture” due to environmental changes

caused by the tsunami disaster, according to the report of those schools at the Second Kesennuma ESD/UNESCO School Training Workshop in 2012 (Sekiguchi 2013).

Furthermore, Kesennuma High School's program of carrying out inter-annual measurements of radiation levels in and around the school and surveys of seaside plants growing along the coast in the Kesennuma focus and comparing these results, which includes highly specialized activities, can be said to be a good example of activities investigating the impact of earthquakes and tsunami under an environmental theme (Sekiguchi 2013).

Moreover, some of the schools that dropped "Environment" as an ESD focus are located in areas that were unaffected by the tsunami, and in many cases schools that dropped "Environment" as an ESD focus continued to select environment-related themes according to the programs of schools which were presented to the workshop.

Based on the interview to teachers and supervisors of Kesennuma BOE as well as the research of Kesennuma City Educational Researching Group conducted by author (Oikawa), it could be pointed out that the main reasons for the decrease in the proportion of schools implementing Environment Education are:

- (i) The loss of locations for field trips due to the tsunami disaster and
- (ii) The loss (breakdown) of linkages with cooperative organizations and human resources (locally based); however, even for schools that were not directly affected by the disaster,
- (iii) The need to secure an overall balance between ESD focuses in order to contribute to the improvement of the ESD program
- (iv) Implement "disaster education", which is an urgent issue,

In addition, those are thought to have resulted in a sense of balance in which "Environment Education"—which had been the cornerstone of ESD in Kesennuma—is reduced. Therefore Environment has been incorporated into "Understanding Local Community" and "disaster education" as a part of theme, topic or components related to Environment in their ESD curriculum, although the share of "Environment" decreased as main focus.

In this way, after the East Japan Earthquake and Tsunami, ESD main focus of schools in Kesennuma has been getting local and practical, because each school has been implementing educational activities based on community linkage and focused on DRR and disaster recovery. As a result, the percentage of "International Understanding" as main focus of ESD has been decreasing since EJET in 2011. However, activities of

International Understanding have not disappeared in ESD of Kesennuma. Many students, especially junior high school and senior high school students have been in abroad such as USA, Asian, European countries to exchange learning and participate in international students' forum since EJET. Students international exchange programs in Kesennuma have gotten more active rather than pre-disaster time, supported by many sectors inside and outside of Japan such as companies, foreign embassies, UNESCO and NGO. These projects related to "International Understanding" had been promoting in not ESD curriculum but also extra-curriculum of each school, so that many school have not recognize these international program and project as ESD.

7.1.2.4 Transforming ESD Curriculum after EJET

Analyzing the reasons for the transformation of ESD curriculum implemented at each school in Kesennuma City, it could be indicated the transition of missions and motivations of ESD according to the changing of environment and circumstance surrounding each school after the East Japan Earthquake and Tsunami (EJET). There are some reasons why schools should change ESD curricula after the East Japan Earthquake and Tsunami. The fields and facilities which were able to use for field trips or excursions previously are available no longer due to the impact of the tsunami disaster, so that some of school had to change the focus or theme of ESD curriculum from the standpoint of safety. For example, Matsuiwa Elementary School is now carrying out activities aimed at thinking about the environment and disaster risk reduction instead of conducting surveys and making observations of the coastal region. And also, the students go on field trips to seaweed processing plant instead of providing students with hands on experience cultivating seaweed (Kesennuma BOE et al 2013).

However, as recovery progresses, schools can be seen to be making moves to reestablish activities that they were undertaking prior to the earthquake disaster. Karakuwa Elementary School previously carried out environment education through oyster farming, but the school's oyster rafts were washed away by the tsunami following the earthquake and these activities were discontinued. Although the school's teachers and students hesitated to even go near the ocean, in FY2012 experiential activities were revived because of reconstruction of their oyster rafts with the cooperation of local fishermen. Furthermore, Matsuiwa Elementary School was also able to restart seaweed plantation with the cooperation of the local community in FY 2013. Of course, as a prerequisite for the revival of these activities, measures for ensuring the safety of students were taken into consideration based on emergency situation predictions (Kesennuma BOE et al 2013).

With regard to these curriculum changes, it had been pointed out that ESD programs have been chosen and could be carried out on a temporary situations after the East Japan Earthquake and Tsunami immediately, and activities that focus on the present time have taken centre stage of curriculum, with insufficient attention paid to activities that “think about the future”, and so as recovery progresses curricular require further consideration (Kesennuma BOE et al 2013). However, as the time goes by and the reconstruction from the disaster progresses, each school in Kesennuma is trying to take the “Recovery” or “Reconstruction” from the disaster into consideration as ESD according to school and grade level in order to establish sustainable community and their future.

7.1.3 Main focus of ESD at School Level before and after EJET

Regarding the differences of ESD main focus at each school level after the East Japan Earthquake and Tsunami, “Environmental Education” is still key focus of ESD at elementary school, high school and kindergarten level except junior high school level although the percentage had decreased comparing with one in pre-disaster of EJET. “Understanding of Local Community” is also major as key focus of ESD at elementary, high school and kindergarten level as same as Environment Education, as schools in Kesennuma re-valued the importance of community through the experience of disaster of EJET (Fig. 7.2).

Junior high schools tend to develop and promote disaster education based on the lessons of the disaster of EJET. Junior high school students in Kesennuma were very motivated to contribute to DRR and disaster recovery in each community and schools such as the evacuation with local residents, supports for shelter management, initiation for DRR and recovery of community. Based on these experiences during and post disaster, students and teachers of Junior high schools tried to scale up and bluish up the disaster education as main focus and component of ESD curriculum. Elementary Schools and kindergartens also consider the importance and necessity of disaster education from early childhood for protecting children’s lives by their own, so that they are trying to include DRR topics and activities in their ESD curriculum. On the other hand, disaster education was not reported by high schools as ESD focus of their own. This is the reason why high schools in Kesennuma have not recognized disaster education as crucial approach of ESD yet, however, they are implementing DRR activities as evacuation drill or extra curriculum at schools. Thus, it can be said that DRR perspective of kindergartens, elementary and junior high schools is wider and

more diverse rather than one of high school at present.

Some of high schools are promoting International Understanding and Welfare Education for students' capacity building according to schools' characters and missions, exchanging students with people in other countries and local residents. High school students are expected to become contributors in community through Welfare Education and to become global citizens through Education for International Understanding who can contribute to reconstruct their community affected by disaster and to build sustainable society beyond the disaster.

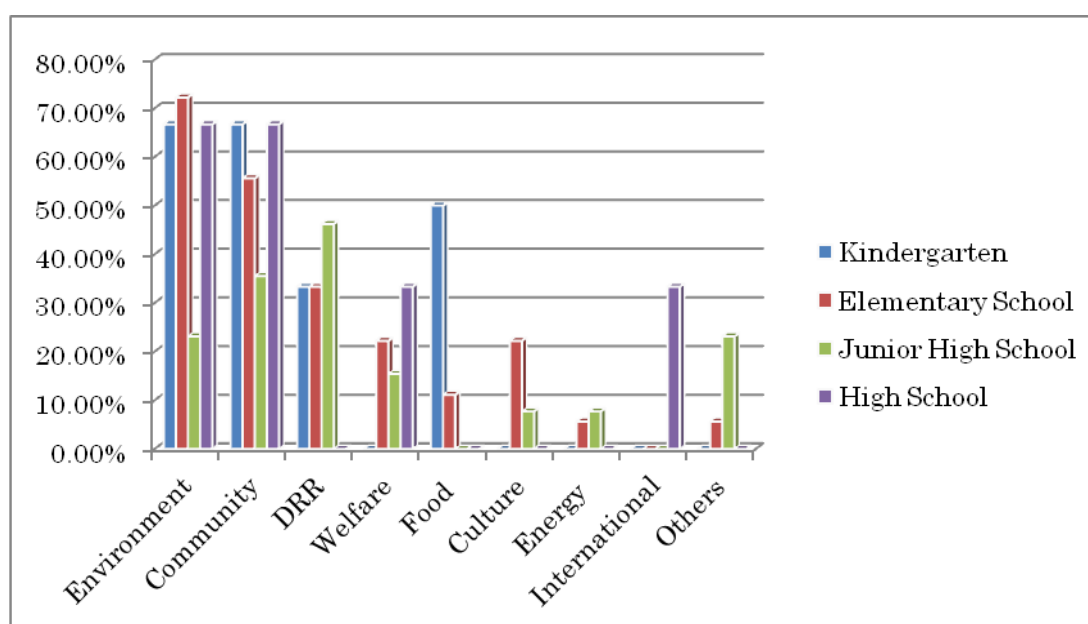


Fig. 7.2 Main Focus of ESD at Schools Level in Kesennuma FY2014

Note: Number is School (N=40, Multiple answers allowed) Date from ESD report of First Kesennuma ESD/UNESCO School Training Workshop in 2014, Modified by Authors

7.1.4 Improving DRR Activity at Schools in Kesennuma

Since the East Japan Earthquake and Tsunami (EJET), each school in Kesennuma has been trying to improve the quality of DRR activity and disaster education for the preparedness of the next disaster in future. They tended to improve their school systems, managements and curriculums based on lessons of EJET. Principal Association of Kesennuma Municipal Schools which consists of principals of public elementary and junior high schools in Kesennuma, and Kesennuma City Board of Education (BOE) published the reports named “To Advance Forwards after the Disaster” over 3 times as volume 1 – 3 from 2012 to 2014 in order not to forget the valuable lessons learnt from

EJET and to pass them to next generations. These reports describe how schools responded to the disaster and protected students' lives during the disaster, how they restarted school and lesson, and how they recover the school education supported by community and outside institutions and sectors. According to the description of the second report in 2013, it can be found out that there are many improvements in educational activities, school curriculum, management and systems, teacher trainings and others related to DRR and DRM after the disaster of EJET (Kesennuma BOE et al. 2013) (Table 7.2).

In FY2012 after the EJET, more than 30% of the elementary and junior high schools in Kesennuma tried to do the safety check by watching around their school zones and communities from the view points of the disaster risk especially, and they made Disaster Prevention Maps (Bousai Map) based on their safety checks in order to raise the awareness of students and teachers for Disaster Risk Reduction outside of schools. About 70% schools also improved their DRR manuals not only at schools but also on the way to school/home and at home considering challenges and lessons of EJET. Related to these manuals, the half of schools changed evacuation places or routes inside or outside of the schools for the preparedness against the next disaster. And some of schools were empathizing the needs or fulfillment of supplies and storages for emergency through the experience, which many schools were used as shelters during the disaster of EJET. Based on the experiences and lessons learnt from the disaster of EJET, each school are trying to improve and renew the disaster risk management (DRM) and disaster preparedness in their school system farther.

As having the same way of doing, the implementations of evacuation drills should be changed after the EJET. Almost all the schools improved their evacuation drills more practically and effectively on the assumption of various situations such as on the way to school/home, at recess, after school and so on, to take evacuation actions immediately during and after the disaster for protecting students' lives by teachers and by themselves. Moreover, many of schools (over 60%) renewed their disaster educations or lessons to foster students' abilities and attitudes for disaster risk reduction based on the lessons learnt from EJET. Some of schools made or improved their syllabus of disaster education, and some schools incorporated disaster education into their school curriculum such as existing subjects like science or social studies, special activities, integrated learning period (Sougotekina-Gakushu-no Jikan) and moral education. On the other hand, some schools also held special DRR lessons inviting specialists and parents, and utilizing the teacher in charge of DRR (Bousai Shunin/Shukan) of each school as the instructor. Thus, after the disaster of EJET, schools in Kesennuma have

been trying to promote disaster education systematically and effectively as prior educational theme in their school curriculum and education activities (Fig. 7.3).

In addition, psychological support for students and teachers was a very important challenge at each school in post-disaster. Almost all the schools took actions and measures to support psychological problem of students and teachers who were affected by tsunami disaster. Schools invited school counselors who were dispatched from other region and prefectures to give advices and supports from technical point of view to students and teachers who had psychological problems by disaster. Teachers, especially nurse teachers also took care of these students as daily work. They tried to investigate psychological condition of students utilizing questionnaires to recognize their problems and to support them effectively (Table 7.2).

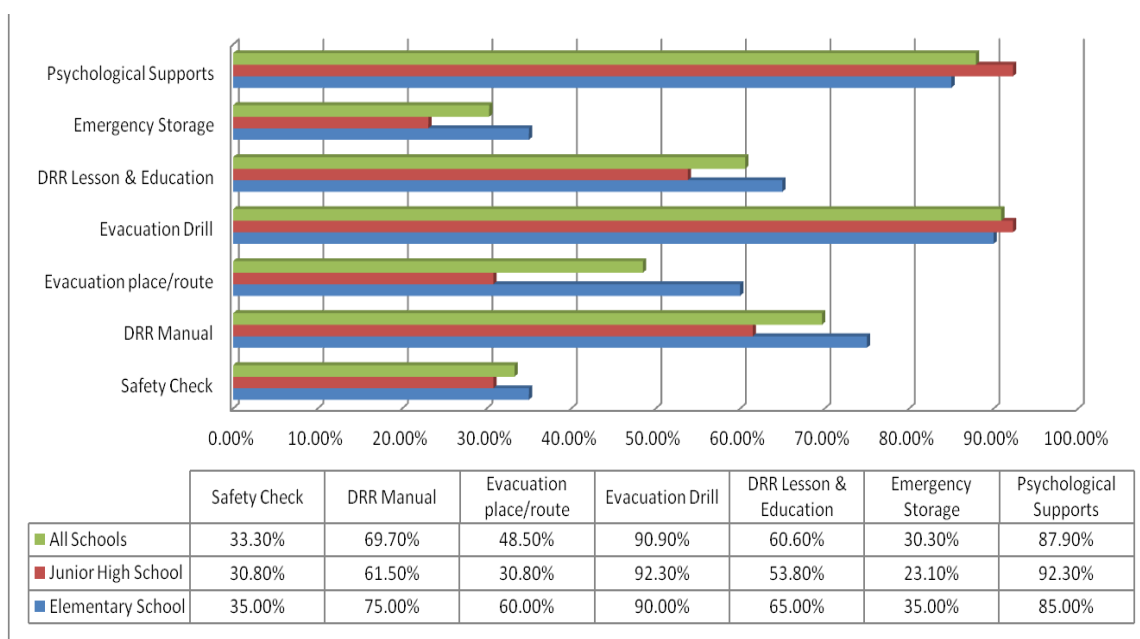


Fig. 7.3 Improvement of DRR activity of Schools in Kesennuma after EJET (FY 2012)

Note: Number is School Number (N=33, Multiple answers allowed)

Date from Kesennuma Joint Research Report vol. 2(2013), Analyzed by Authors

Table 7.2 Improvement of DRR and DRM of Schools in Kesennuma after EJET
(As of FY 2012)

School Name	Safety Check	DRR Manual	Evacuation place/route	Evacuation Drill	DRR Lesson & Education	Emergency Storage	Psychological Supports
Kesennuma ES	DRR Map, School Zone	At home	Inside School	On the way At recess	Into Syllabus With Specialist	Supplies Stockpile	Nurse Teacher Counselor Questionnaire Counselor
Kujo ES		At School Hand Kid		At School, On the way	Into Subjects		
Shishiori ES	DRR Map, School Zone	At School Hand Kid	Outside School	On the way At recess At School	Into Subjects With PTA		Nurse Teacher Counselor Questionnaire
Urashima ES	School Zone	At School, On the way		At School With residents			Teachers, Health Care
Hakusan ES	DRR Map School zone	At School	Inside/outside School	At School	Into Subjects	Supplies	Counselor
Matsuiwa ES		At School Hand Kid On the way	Inside School	At School, On the way	Into Syllabus Into Subjects		Counselor Questionnaire Teachers
Mizunashi ES		At School Hand Kid		At School,	Into Syllabus		Counselor Principal
Shinjo ES	DRR Map, School Zone	On the way	Outside School	At School, On the way	Into Subjects		Counselor
Tsukidate ES							
Ochiai ES				Outside School On the way	Into Syllabus Into Subjects	Stockpile	Counselor
Hashikami ES				With JHS On the way Role Play	Into Subjects		Counselor Questionnaire Teacher
Ohshima ES		At School, On the way	Inside/outside School		Video Viewing	Stockpile	Counselor Questionnaire Teacher
Omose ES	DRR Map, School Zone			With JHS, At School			Counselor
Karakuwa ES	DRR Map	At School Hand Kid On the way	Inside/outside School	At School, On the way	Into Subjects		
Nakai ES		Hand Kid On the way	Outside School	At School, On the way, With residents			Nurse Teacher Counselor Questionnaire
Koharagi ES		At School Hand Kid On the way	Outside School	At School, On the way, At home	Into Syllabus With PTA	Stockpile	Counselor Teacher
Tsuya ES		At School On the way	Inside/outside School	At School, On the way With residents & Kindergarten			Counselor Teacher
Magome ES				With Kindergarten and Residents		Supplies Stockpile	Counselor
Koizumi ES		At School Hand Kid On the way	Inside/outside School	With K, JHS, CLC On the way		Stockpile	
Ohya ES		At School On the way	Inside/outside School	At School, On the way	Into Syllabus Into Subjects		Nurse Teacher
Sub Total	7	15	12	18	13	7	17
%	35.0%	75.0%	60.0%	90.0%	65.0%	35.0%	85.0%

Kesennuma JHS	DRR Map			At School, On the way	Into Subjects With Specialist		Counselor Questionnaire Teacher
Shishiori JHS				With Residents		Supplies	Counselor Questionnaire Teacher
Matsuiwa JHS		DRR Committee		At School & Community			Counselor
Hashikami JHS	DRR Map, School Zone	Hand Kid At home		Short Drill With ES & Residents	Into Syllabus Into Subjects With PTA	Emergency bag	Teacher
Ohshima JHS	DRR Map, School Zone	At School On the way At home			Into Syllabus Into Subjects With Specialist		Counselor Questionnaire Teacher
Jonan JHS		At School	Inside/outside School	At School,		Supplies Stockpile	Counselor Questionnaire Teacher
Omose JHS				At School, With PTA & ES	With Specialist		Counselor
Niitsuki JHS				At School,			
Karakuwa JHS		At School Hand Kid On the way At home Shelter	Outside School	Short Drill, At School	Into Syllabus DRR Chief		Nurse Teacher Counselor Questionnaire
Koharagi JHS	Altitude Display	At School On the way At home		Simulation, With residents	With Specialist DRR Chief		Counselor Teacher
Tsuya JHS		Drill Manual Hand Kid Shelter		Simulation, At School, On the way	Into Subjects		Counselor Nurse Teacher Questionnaire
Koizumi JHS			Outside School	With K, ES & Residents			Counselor
Ohya JHS		At School Hand Kid	Outside School	With K, ES & Residents			Counselor Teacher
Sub Total	4	8	4	12	7	3	12
%	30.8%	61.5%	30.8%	92.3%	53.8%	23.1%	92.3%
Total	11	23	16	30	20	10	29
%	33.3%	69.7%	48.5%	90.9%	60.6%	30.3%	87.9%

Note: Number is School (N=33)

Made from “To Advance Forwards after the Disaster, Volume 2” (2013), Analyzed by Authors

7.2 Specific Schools based on Experiences of ESD and EJET

Based on the experience and lesson of East Japan Earthquake and Tsunami, each school and board of education in Kesennuma City tried to improve their Education for Disaster Risk Reduction (DRR) and recovery by making the best use of concepts and practices of Education for Sustainable Development (ESD). Here, two such cases are discussed from different junior high schools in Kesennuma City which areas were devastated by the tsunami: Hashikami Junior High and Koharagi Junior High School. It should be analyzed as new practices of disaster education from ESD perspectives based on experiences and lessons of East Japan Earthquake and Tsunami.

7.2.1 Case 1: Disaster Education of Hashikami JHS with Community

Hashikami Junior High School has been promoting three disaster education cycles known as “Self-help, Mutual-help and Public-help” for 8 years. With the experience gained from the East Japan Earthquake and Tsunami, they surveyed information and reexamined their previous disaster education guidelines.

Firstly, it is important to learn the correct information concerning natural disasters and to gain the proper skills to protect lives while at the same time, acquiring the firm decision making skills needed even in such unexpected situations. Secondly, it is also important to prepare for disasters at the community level and in each home. Thirdly, it is important to establish systems and lessons in order to pass on those experiences to future generations. As a result, with the “Self-help” lessons taught every year, students will work through effective disaster education lessons with the perspective of knowing, preparing and acting (Oikawa 2013a, b).

Hashikami Junior High School in FY 2012 focuses on Self-help and Mutual-help by working on disaster education with their local community in order to know, prepare and act against future calamities. They have been conducting DRR activities such as evacuation drills and hands-on activities for disaster preparation at each grade level.

In FY 2012, the school also started conducting small and primary evacuation drills with each community association, organized exercises to set up emergency centers (Fig. 7.4 Left). And they created a detailed disaster prevention map in the school district of Hashikami Junior High School.

In June, they conducted evacuation drills on the school yard with residents that live in temporary housing. The route for this exercise made participants follow a step-by-step procedure that saw them escape to higher ground behind the school—Hashikami Junior High School is at an elevation of 31.5 m. However, in case students and residents of the area believe that they are still in great danger, another evacuation drill was organized in order to bring everyone to even higher ground. They also conducted small scale evacuation drills to help foster the ability for immediate decision making in case another earthquake hits the area.

In September, hands-on activities included visits by first graders to the Tsunami Museum in Karakuwa District where they learned about earthquakes and tsunamis. They also learnt about natural threats and the history of previous tsunami disasters. The second graders went further in their education and took first aid and lifesaving courses while third graders conducted educational activities of DRR for elementary school students. The third graders also worked to reinforce children’s awareness of the DRR

system by using coloring picture-stories and playing cards for the early and middle grade students of elementary school (Fig. 7.4 Right).



Fig. 7.4 DRR Activities of Hashikami Junior High Schools

Left: Students taking lifesaving course Right: Presentation on disaster education with Picture Cards to Elementary School Students (2012) [Source: Hashikami Junior High School 2012]

7.2.2 Case 2: Altitude Display Project of Koharagi JHS after EJET

Tsunami, the major DRR project that students and staff at Koharagi Junior High School worked on was their “Altitude Display Project.” Students and staff at the school worked with their local community to install color coded altitude signs on telephone poles throughout the school district. Each sign indicates the approximate elevation above sea level from that point.

There are three major aims of this project. Firstly, through installing the signs above sea level on telephone poles, students as well as the local population will develop an awareness of altitude for disaster response management and guide young children’s evacuation route in case of another tsunami. The second is to strengthen the links with the local community, and the third is to remember the lessons learnt from the East Japan Earthquake and Tsunami (Oikawa 2013a, b).

(a) Activities of Altitude Display Project

Through the project, students found and marked on a map the 228 telephone poles in their school district. What to display and how to mount them were also investigated. The entire school worked together to develop their signs. After developing their ideas, the school principal and the local leader met with Tohoku Electric Power Company and Kesenuma City’s Division of Emergency Management to submit their request for a construction permit which was officially accepted.

From there, the students then constructed the signs with some assistance by the university who donated equipment and financial support. The signs were cleverly color coded in order not to confuse small children and the elderly. Students used five colors: red, orange, light green, dark green and blue. Based on what happened during the tsunami, they considered the height of 30 m or more as a safe evacuation point from a tsunami (Fig. 7.5 left). As a result, all the city's residents would know to evacuate to the green sign at least if and when another tsunami approaches.

Along with local people, they divided into five groups, and each group tackled 35 telephone poles to display altitudes in November, 2012. Actually, it didn't quite proceed as expected since students felt unfamiliar at first. However, residents gave demonstrations to students, and students were able to set the signs up safely and they completed the entire installation (Fig. 7.5 right).

(b) Effects, Dissemination of Altitude Display Project

Students' articles about the project appeared in some local newspapers in November, 2012. They also went to nursery schools and elementary schools in the Koharagi area to teach children about their project and how to use the signs to recognize the appropriate altitude. They also taught evacuation methods to small children. First of all, during massive earthquakes with long periods of shaking, it is important for children to protect themselves from moving or falling objects.

When the shaking has subsided, it is important to evacuate to places at least 30 m above sea level which are indicated by green or blue signs.



Fig. 7.5 Altitude Project of Koharagi Junior High Schools
Left: Making color coded altitude signs, Right: Installing the altitude signs [Source: Koharagi Junior High School, 2012]

7.3 Survey of Kesennuma Educational Researching Group: Disaster Education Sheet & Matrix

Kesennuma City Board of Education (BOE) has Teacher's Researching Group (Kyoiku-Kenkyuin) over 40 years. The Teacher's Researching Group was established in 1971 to improve educational activities of schools in Kesennuma City. This system has been also contributing to capacity building of teachers' research and teaching ability by promoting the research of the latest and crucial educational themes and issues. The members are selected from elementary and junior high schools in Kesennuma City. They have been researching disaster education on the job training since the East Japan Earthquake and Tsunami (EJET), conducted by Kesennuma City Board of Education.

Disaster Risk Reduction (DRR) education for school has been becoming more important since the Great East Japan Earthquake and Tsunami (EJET). It is vital that disaster education is conducted with careful planning during the whole school year and should not end up as a one-off event. Teacher's Researching Group has been researching systematic and holistic disaster education at school utilizing the practice of ESD and lessons learnt from EJET. And they have created new method and tools such as "Disaster Education Matrix" and "Disaster Education Sheets" to help teachers to plan school lessons containing disaster education.

7.3.1 Perspectives of Disaster Education Curriculum based on the Principle of ESD

(a) The concept of "Sustainable Development" based on DRR perspectives

It is necessary to define the factors (the concept) of realizing "Sustainable Development" from DRR perspectives in order to find out "the themes related to Sustainable Development". The concept of "Sustainable Development (SD)" is divided into mainly two categories: "The concept related to the environment surrounding people such as nature, culture, society, economy, etc."; "The concept related to people's (including groups, communities, societies and countries, etc.) intentions and actions". Disaster education attaches great importance to "Connection between human and nature", "Responsibility as a member of a community", "Thinking about constructing a new community and considering its future", and so forth, therefore its aim and the concept of "Sustainable Development" follow similar principles.

(b) The ability and attitude expected in Disaster Education from ESD perspectives

“Education for Sustainable Development (ESD)” represents “Sustainable Development” as education. In the process of implementing learning activities such as school subjects based on ESD perspectives, the National Institute for Educational Policy Research (NEIR) has established the concept of ESD in order to find out themes related to developing a sustainable society. They have also established the minimum ability or attitude to be able to specialize in ESD by making comparison with various abilities and attitudes, and “Zest for Living (a certain academic ability and rich humanity)” and “Key Competencies” proposed by the Organization for Economic Co-operation and Development (OECD) (NIER 2012).

Table 7.3 Synergy of Abilities and Attitudes between ESD and Disaster Education

Perspectives	Ability/attitude of DRR from ESD perspectives
Ability to think critically	Ability to think about the way of dealing with natural disasters and compare and review other’s opinions and information Ability to determine a better solution regarding disaster prevention actively and expansively
Ability to predict and to plan the future	Ability to think what they can do for the future and for the community and to plan with a sense of purpose by considering the past disaster as a precept
Ability to think versatility and systemically	Ability to have an idea regarding disaster prevention from various points of view of oneself, community and society
Ability to communicate	Ability to share opinions with each other regarding disaster prevention and to find better solution Ability to listen to other’s opinions in case of emergency
Ability to collaborate with others	Try to act with consideration to elderly and handicapped people in case of disaster Try to help and encourage others in a difficult situation in a post-disaster
Attitude of respect for a connection	Try to appreciate connections between people, oneself and community through DRR education Try to understand that disaster prevention requires cooperation and collaboration by the whole community
Attitudes of positive participation	Try to participate in the practices of DRR in the community such as evacuation drills positively with the awareness of DRR Try to take actions for enhancing DRR awareness of others

[Source: Kesennuma City Educational Researching Group (2014)]

The ability and attitude required for disaster education include “Ability to think critically”: to be able to solve problems by collecting and sorting out the necessary information regarding DRR and thinking deeply the ideas, “Ability to predict and to plan the future”: to be able to predict, estimate, expect and hope for the future by considering the past disaster as a lesson and to be able to plan by sharing ideas with

other people, “Ability to think versatility and systematically”: to be able to have a constructive idea regarding DRR from various perspectives such as oneself, community and society and “Respectful attitude towards connection”: to appreciate connections between people, oneself and community through DRR learning. In ESD it is important to be aware that educational materials used for school subjects (such as things, phenomena, subject matters and themes) are linked with educational materials used for other school subjects, other grades and other types of schools and also linked with real life and the real world. It is also essential to have an interest and awareness of those materials and to see and think about them linking together (Table 7.3).

7.3.2 Development of Disaster Education Sheets and Matrix

In FY 2012, Teacher’s Researching Group developed “Disaster education Sheets (Bousai-Gakushu-Sheets)” for promoting disaster education at each school in Kesennuma effectively. In order to create “Disaster Education Sheets”, firstly they considered the synergy between DRR and ESD, and they categorized and indicated “Abilities and Attitudes” which should be fostered to children in Disaster education from ESD perspectives. There are seven kinds of perspectives for abilities and attitudes such as “Critical Thinking”, “Imaginations and Planning for future”, “Systematic thinking”, “Communication”, “Collaboration”, “Linkage and Connection”, and “Participation” (Table 7.2) .

“Disaster Education Sheets” describe Grade, Subject or Field, Time period in which disaster education should be done, and Estimated Process or Activities of Disaster Education as Lesson Plans. The sheets also include the Points or Suggestions of Improvement and Step up the activities of DRR. The sheets also mention steps and cycle of disaster education curriculum and empathies the linkage and collaboration with families and community (Fig. 7.6) (Kesennuma Teacher Researching Group 2014b).

Teacher’s researching group developed over 71 sheets and made “Disaster Education Matrix”. They set these various sheets in school curriculum depend on developmental stage of students and subjects or fields. According to “Disaster Education Sheets” and “Disaster Education Matrix”, teachers at each school and grade are able to promote systematic and effective disaster education collaborating with community (Fig. 7.7) (Kesennuma City Educational Researching Group 2014b).

The features of Disaster Education Sheets and Disaster Education Matrix are as follows;

(a) Variable activity lengths

Each activity is placed individually in the Disaster Education Sheets to enable the inclusion of activities relevant to each school's situation. Most activities are designed to last one hour, some are as short as between 10 to 15 minutes and some are designed for after school, which enables each school to adjust flexibly. We have also stated targeted grades for each activity to create a suitable combination depending on students' development.

(b) Three viewpoints to conduct Disaster Education learning

Disaster Education Sheet sets "View Point of Learning for Disaster Risk Reduction". One is the Steps of DRR column on sheets which shows the stage of DRR, such as Self-help, Mutual-help, Public-help and N-help. When considering frameworks of Disaster Risk Reduction (DRR), there are said to be three levels of DRR: Self-Help, Mutual-Help, and Public- Help. However, in the case of the East Japan Earthquake and Tsunami, although Self-Help and Mutual-Help functioned to a certain degree, these alone could not be sustained over a long period of time. However, due to the immense scale of the disaster, it took time for Public-Help assistance to be provided, and in fact never reaching some areas. In that time, NPOs and NGOs played a new role of filling the time gap in such areas, providing a new form of support through networks comprising a diversity of actors. The Kesennuma City Board of Education refers to such assistance as "N-Help". Students can learn from each activity according to these steps.

Second is "DRR Learning Cycle" column on the leaflets which shows the abilities to be focused on such as "K/P (Knowledge / Preparedness)", "J/A (Judgment / Action)", "R/C (Review / Communication)", "R/R (Recovery / Reconstruction)". Third one is the "Ability / Attitude obtained from ESD perspectives" column. By aiming for a targeted ability or attitude according to this, more effective learning can be expected (Fig. 7.6).

No. 4 Make "Disaster Risk Reduction Maps"

Targeted Grade	Suitable Class Activity	Time length
Year 1-2, 6-4, 5-6, Junior high	School event Integrated Studies	3 hours



- Enter information such as evacuation routes, local refuges, hazardous areas on the map.
- Think about how to act in the case of disaster by referring to the map made in this activity.

<<Viewpoints of Learning for Disaster Risk Reduction>>

Step of DRR	• Promote the awareness of Disaster Risk Reduction and check how to act in the case of disaster by making the Disaster Risk Reduction Map of one's own residential area.
Self-help Mutual-help Public-help N-help	
DRR Learning Cycle	• Check how to act and where to go by entering the nearest refuge and evacuation routes.
K/P J/A R/C R/R	
Ability/Attitude obtained from ESD perspectives	• Think about how to act in the case of emergency by looking at the Disaster Risk Reduction Map.
• Ability to predict and to plan the future • Ability to think versatily and systematically	• Make the map considering that there are various things to note depending on the type of disaster since there is not only one type of disaster.

<<Lesson Plan>>

	Contents	Support by teachers	Notes
Time flow	1. Divide into groups by residential area. 2. Mark one's house on the map. 3. Enter various information on the map and complete the DRR map. <Examples of information to enter> • evacuation places • shelters • evacuation routes • past flood tsunami inundated areas • objects which could fall down and break due to earthquakes • places where there is the possibility of landslides	• Instruct students to work together with those who live near to one's house. • Hand out large maps (A0-A1 size) • Devise the way and details of what to write on the maps depending on the situation of the class because the types of possible disaster varies depending on the area. • Enter not only the primary evacuation route but also the secondary evacuation route. • Recommend students to write down preparedness against disaster, emergency contact, etc., if there is a space on the map. • Create maps, from which information is easily obtained by coloring with felt-tip pens, colored pencils, etc. • Instruct them to exchange opinions in groups.	• Observe students carefully since they may become anxious to recall the disaster. • Help students find where their houses are if some students cannot find them. • Encourage to work together within a group.
	4. Consider how to evacuate in the case of disaster using the completed maps		



Suggestions

- Students can create the maps by referring to "No. 3 Know your town <Town Watching>", etc., in which they actually see the town and take photos, which can be attached on the map. (However, note that permission to take photos may be required depending on the property and object.)
- The maps can be distributed to each household by taking photos of the maps and printing out on A4 size paper.



Psychological support

- Observe carefully their behaviors and pay attention to them, when students walk along the disaster-affected areas and/or when a class activity may remind them of any events of the past disasters.



Things to prepare

- ☐ Large maps of each area (the size of imitation Japanese vellum)
 ☐ Colored pencils
 ☐ Felt-tip pens



Fig. 7.6 Disaster Education Sheet
[Source: Educational Researching Group of Kesenuma BOE (2014)]

Disaster Education Matrix				Elementary School		Junior High School	
		Lower grades	Middle grades	Higher grades			
Subjects	Japanese (year 1,2) • Reading for specific purposes 12 Reading picture books about DRR Life environmental studies (year 1,2) • Safe journey to and from school • Safe life in the area • Safe use of public property 7 Know your town <Town watching> 9 Know where your refuge is Life environmental studies (year 1) • Self-help 36 Making plates with paper 11 Let's play "DRR cards (Karuta)"	Japanese (year 3,4) • Writing for specific purposes 47 Treasure of the town Social studies (year 3,4) • Local area and town 7 Know your town <Town watching> • Disasters in the area and accident prevention 13 What is in the Disaster Prevention Center? • The life of local residents 47 Treasure of the town	Social studies (year 5) • Natural disaster risk reduction 20 Learn the town history of disaster from stone monuments • The relation between information society and everyday life Social studies (year 6) • Political affairs in Japan Science (year 5) • The effect of water currents • Change of the weather Science (year 6) • Structure and change of the ground 28 Learn the mechanism of earthquakes PE (year 5,6) • Prevention of injuries and illness 37 First Aid 38 Make a stretcher with improvised materials	Social studies (Geography) • Natural disaster and the effort for Disaster Risk Reduction • The countermeasures against natural disasters 32 Tsunami countermeasures to protect our town Science (the second field) • Structure and change of the ground • Weather and change in the weather 28 Learn the mechanism of earthquakes 31 Earthquake Early Warning PE • Development of mind and body function and mental health • Health and environment 37 First Aid 38 Make a stretcher with improvised materials Technical course and Home economics (Home economics) • Home life and community • Cooking daily foods • Comfortable way of living	Social studies (Geography) • Natural disaster and the effort for Disaster Risk Reduction • The countermeasures against natural disasters 32 Tsunami countermeasures to protect our town Science (the second field) • Structure and change of the ground • Weather and change in the weather 28 Learn the mechanism of earthquakes 31 Earthquake Early Warning PE • Development of mind and body function and mental health • Health and environment 37 First Aid 38 Make a stretcher with improvised materials Technical course and Home economics (Home economics) • Home life and community • Cooking daily foods • Comfortable way of living	Social studies (Geography) • Natural disaster and the effort for Disaster Risk Reduction • The countermeasures against natural disasters 32 Tsunami countermeasures to protect our town Science (the second field) • Structure and change of the ground • Weather and change in the weather 28 Learn the mechanism of earthquakes 31 Earthquake Early Warning PE • Development of mind and body function and mental health • Health and environment 37 First Aid 38 Make a stretcher with improvised materials Technical course and Home economics (Home economics) • Home life and community • Cooking daily foods • Comfortable way of living	Social studies (Geography) • Natural disaster and the effort for Disaster Risk Reduction • The countermeasures against natural disasters 32 Tsunami countermeasures to protect our town Science (the second field) • Structure and change of the ground • Weather and change in the weather 28 Learn the mechanism of earthquakes 31 Earthquake Early Warning PE • Development of mind and body function and mental health • Health and environment 37 First Aid 38 Make a stretcher with improvised materials Technical course and Home economics (Home economics) • Home life and community • Cooking daily foods • Comfortable way of living
Moral education	Moral education (year 1,2) • Respect for life • Consideration and kindness • Moderate attitude • Love for one's home district	Moral education (year 3,4) • Respect for life • Consideration and kindness • Love for one's home district • Respect and appreciation • Work and service for society 48 Learn about volunteer activities	Moral education (year 5,6) • Respect for life • Sense of public morality • Responsibility and awareness of one's role in society • Love for one's home district • Work and service for society 48 Learn about volunteer activities	Moral education (year 5,6) • Respect for life • Prevention of injuries and illness 37 First Aid 38 Make a stretcher with improvised materials	Moral education (year 5,6) • Respect for life • Awareness of one's role and responsibility, promotion of communal living • Love for one's home district, respect and appreciation for people in the past • Work and service for society, public welfare 48 Learn about volunteer activities	Moral education (year 5,6) • Respect for life • Awareness of one's role and responsibility, promotion of communal living • Love for one's home district, respect and appreciation for people in the past • Work and service for society, public welfare 48 Learn about volunteer activities	Moral education (year 5,6) • Respect for life • Awareness of one's role and responsibility, promotion of communal living • Love for one's home district, respect and appreciation for people in the past • Work and service for society, public welfare 48 Learn about volunteer activities
Integrated studies	Integrated studies • Cross-sectional and integrated subjects 13 What is in the Disaster Prevention Center? 14 Experience of initial firefighting 15 Bucket Brigade 16 How do you call 119/110? 17 Check DRR and Emergency supply 21 Learning at Visitor Center / Tsunami experience 18 Create and play DRR Quiz	Integrated studies • Cross-sectional and integrated subjects 13 What is in the Disaster Prevention Center? 14 Experience of initial firefighting 15 Bucket Brigade 16 How do you call 119/110? 17 Check DRR and Emergency supply 21 Learning at Visitor Center / Tsunami experience 18 Create and play DRR Quiz	Integrated studies • Cross-sectional and integrated subjects 13 What is in the Disaster Prevention Center? 14 Experience of initial firefighting 15 Bucket Brigade 16 How do you call 119/110? 17 Check DRR and Emergency supply 21 Learning at Visitor Center / Tsunami experience 18 Create and play DRR Quiz	Integrated studies • Cross-sectional and integrated subjects 13 What is in the Disaster Prevention Center? 14 Experience of initial firefighting 15 Bucket Brigade 16 How do you call 119/110? 17 Check DRR and Emergency supply 21 Learning at Visitor Center / Tsunami experience 18 Create and play DRR Quiz	Integrated studies • Cross-sectional and integrated subjects 13 What is in the Disaster Prevention Center? 14 Experience of initial firefighting 15 Bucket Brigade 16 How do you call 119/110? 17 Check DRR and Emergency supply 21 Learning at Visitor Center / Tsunami experience 18 Create and play DRR Quiz	Integrated studies • Cross-sectional and integrated subjects 13 What is in the Disaster Prevention Center? 14 Experience of initial firefighting 15 Bucket Brigade 16 How do you call 119/110? 17 Check DRR and Emergency supply 21 Learning at Visitor Center / Tsunami experience 18 Create and play DRR Quiz	Integrated studies • Cross-sectional and integrated subjects 13 What is in the Disaster Prevention Center? 14 Experience of initial firefighting 15 Bucket Brigade 16 How do you call 119/110? 17 Check DRR and Emergency supply 21 Learning at Visitor Center / Tsunami experience 18 Create and play DRR Quiz
Class activities	Class activities • Adaptability to everyday life and learning, health and safety 3 Be pill bugs when earthquakes happen 4 Tsunami comes after earthquakes • Activities to promote enhanced and improved school life 50① School council activities (at school) 50② School council activities (outside high school representative meeting)	Class activities • Adaptability to everyday life and learning, health and safety 3 Be pill bugs when earthquakes happen 4 Tsunami comes after earthquakes • Activities to promote enhanced and improved school life 50① School council activities (at school) 50② School council activities (outside high school representative meeting)	Class activities • Adaptability to everyday life and learning, health and safety 3 Be pill bugs when earthquakes happen 4 Tsunami comes after earthquakes • Activities to promote enhanced and improved school life 50① School council activities (at school) 50② School council activities (outside high school representative meeting)	Class activities • Adaptability to everyday life and learning, health and safety 3 Be pill bugs when earthquakes happen 4 Tsunami comes after earthquakes • Activities to promote enhanced and improved school life 50① School council activities (at school) 50② School council activities (outside high school representative meeting)	Class activities • Adaptability to everyday life and learning, health and safety 3 Be pill bugs when earthquakes happen 4 Tsunami comes after earthquakes • Activities to promote enhanced and improved school life 50① School council activities (at school) 50② School council activities (outside high school representative meeting)	Class activities • Adaptability to everyday life and learning, health and safety 3 Be pill bugs when earthquakes happen 4 Tsunami comes after earthquakes • Activities to promote enhanced and improved school life 50① School council activities (at school) 50② School council activities (outside high school representative meeting)	Class activities • Adaptability to everyday life and learning, health and safety 3 Be pill bugs when earthquakes happen 4 Tsunami comes after earthquakes • Activities to promote enhanced and improved school life 50① School council activities (at school) 50② School council activities (outside high school representative meeting)
Student Council activities	Student Council activities • Health and safety, sports activities and drills 10-② Evacuation drill 14 Experience of initial firefighting 33 Learn about radiation	Student Council activities • Health and safety, sports activities and drills 10-② Evacuation drill 14 Experience of initial firefighting 33 Learn about radiation	Student Council activities • Health and safety, sports activities and drills 10-② Evacuation drill 14 Experience of initial firefighting 33 Learn about radiation	Student Council activities • Health and safety, sports activities and drills 10-② Evacuation drill 14 Experience of initial firefighting 33 Learn about radiation	Student Council activities • Health and safety, sports activities and drills 10-② Evacuation drill 14 Experience of initial firefighting 33 Learn about radiation	Student Council activities • Health and safety, sports activities and drills 10-② Evacuation drill 14 Experience of initial firefighting 33 Learn about radiation	Student Council activities • Health and safety, sports activities and drills 10-② Evacuation drill 14 Experience of initial firefighting 33 Learn about radiation
School event	School event • Local DRR activities 10-② Evacuation drill • Socializing 45 Visit to temporary housing	School event • Local DRR activities 10-② Evacuation drill • Socializing 45 Visit to temporary housing	School event • Local DRR activities 10-② Evacuation drill • Socializing 45 Visit to temporary housing	School event • Local DRR activities 10-② Evacuation drill • Socializing 45 Visit to temporary housing	School event • Local DRR activities 10-② Evacuation drill • Socializing 45 Visit to temporary housing	School event • Local DRR activities 10-② Evacuation drill • Socializing 45 Visit to temporary housing	School event • Local DRR activities 10-② Evacuation drill • Socializing 45 Visit to temporary housing
Special activities	Special activities • Morning meeting/Break etc. Local area, others	Special activities • Morning meeting/Break etc. Local area, others	Special activities • Morning meeting/Break etc. Local area, others	Special activities • Morning meeting/Break etc. Local area, others	Special activities • Morning meeting/Break etc. Local area, others	Special activities • Morning meeting/Break etc. Local area, others	Special activities • Morning meeting/Break etc. Local area, others

Fig. 7.7 Disaster Education Matrix

[Source: Educational Researching Group of Kesennuma BOE (2013)]

(c) Disaster Education Matrix

The Disaster Education Matrix is the table with the vertical axis representing ordinary school activities and the horizontal axis representing school grades, and contains 71 learning activity titles which are selected and set appropriately according to these axes of subject area or fields and developing stage. This table facilitates the selection of suitable learning activities by showing targeted grades and school time slots such as integrated studies, subjects and afterschool. It would be suggested that disaster education is promoted by applying to the whole school education by adapting for each school's situation (Fig. 7.7).

This Disaster Education Matrix utilized with Disaster Education Sheets makes it possible that interdisciplinary, integrated and systematic disaster education could be implemented at all schools according to each grade level based on students' developmental stage, and it is open door to promote disaster education at schools as curriculum-based and whole school approach.

7.3.3 Promotion of Disaster Education utilizing Disaster Education Sheets and Matrix

According to the Disaster Education Sheets and Matrix, school teacher could develop and implement suitable Disaster Education program depend on the situation of school curriculum and developmental stage (grade level) at each school.

At first, teachers think about a program plan of disaster education fixing activities according to suitable targeted grade level, subjects or fields and time length in which DRR lesson should be done. And then, teachers choose activities from Disaster Education Matrix, selecting sheets of activities which are suitable for students to acquire the abilities and attitude based on disaster education perspectives. And they decide lesson program of DRR considering timing and the combination of sheets and other subjects. At last, teachers conduct DRR lessons and activities utilizing resources and supplements of DRR, and sometimes collaborating with local community and specialists depend on the needs (Kesennuma City Educational Researching Group 2014a,b) (Fig. 7.8).

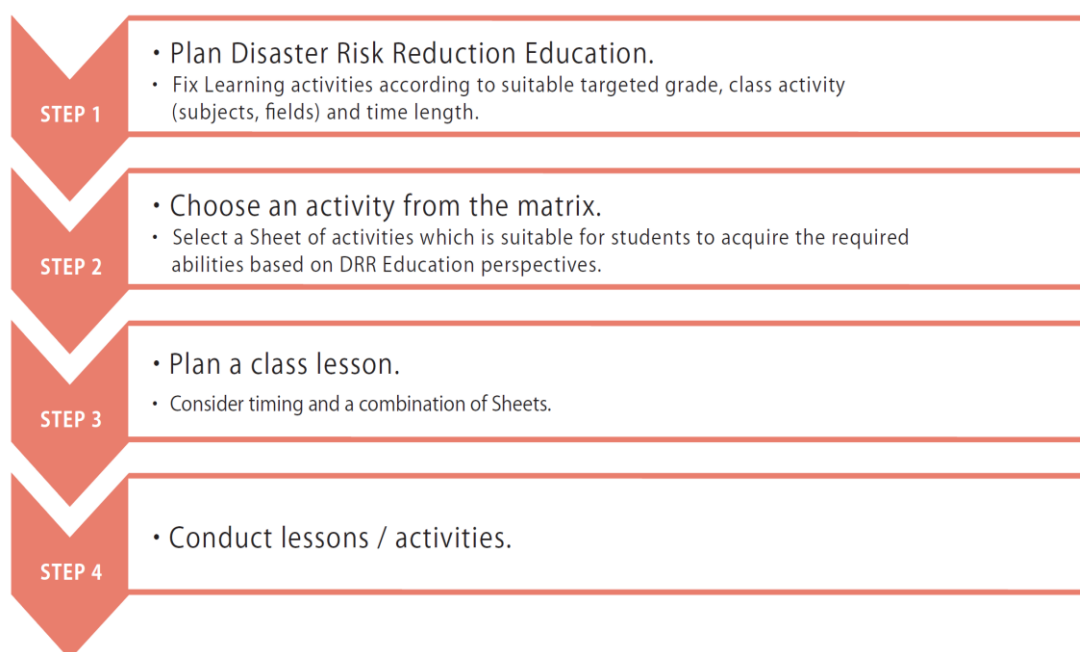


Fig. 7.8 Steps of DRR Program Design utilizing Disaster Education Sheets and Matrix
[Source: Disaster Education Sheet (Kesennuma BOE 2014)]

7.4 Role of ESD in DRR and Recovery

As stated in Japan's Basic Plan for the Promotion of Education, ESD is an important educational principle that converges with the principles of the New Basic Act on Education and aims to nurture "Zest for Living" in children as well as cultivate leaders of the future. In the East Japan Earthquake and Tsunami, it can be said that ESD most certainly played a role also in educational reconstruction after the disaster, such as emergency management and the reopening of schools. The relationship between ESD and Disaster Risk Management (DRM) and Disaster Risk Reduction (DRR) or Disaster-Preparedness can be considered from the following three perspectives;

- (i) The first is the question of how ESD actually functions in DRM and DRR at the time a disaster occurs.
- (ii) The second is the synergy between ESD (an educational orientation) and disaster education.
- (iii) The third is the strength for students to overcome and recover from disasters that is enabled by the flexibility and resilience fostered by ESD.

Kesennuma City has been promoting ESD since 2002 by collaborating with various sectors and institutions in the community and abroad. Almost all the schools in Kesennuma City have been acknowledged by UNESCO as an Associated School (ASPnet School) for moving ahead with ESD programs in formal education (Oikawa 2014a). Although the City had been hugely damaged by this terrible disaster, the schools did not lose any students at school, and they had the lowest number of victims also outside of school in total during this calamity.

Furthermore, ESD is being promoted through collaboration and cooperation with the local community, other regions, and related organizations. Following the disaster, these ESD ties also functioned effectively in each local community in terms of evacuation actions and evacuation center operation. Under these circumstances, rooted in and having promoted ESD in cooperation with their local communities, Kesennuma schools were able to play a leadership role as DRR and evacuation base in this crisis situation while working in cooperation with local residents (Oikawa 2014b).

7.4.1 ESD as Ability Enhancement

As time goes by from Disaster of the East Japan Earthquake and Tsunami, it should be researched and analyzed what kind of abilities and capabilities of teachers and students worked towards DRR of the schools and the communities and what kind of abilities and capabilities of them should be fostered in order to overcome the earthquake disaster. As described above, Kesennuma BOE and schools have been promoting “Education for Sustainable Development (ESD)” at community or regional level for the purpose of fostering students’ abilities and capabilities those will be need to shoulder “sustainable society and future”. As Basic Plan for Promotion of Education of Japanese government states, the concept of ESD corresponds with one of renewal Organic Law of Education in Japan, and it fosters “Zest for Living” to children, therefore it is a very important educational idea that fosters the leaders who should shoulder sustainable future. In emergency and difficult situation after the disaster, abilities of teachers and students on disaster risk management surely worked to keep their lives. And also in this earthquake and tsunami disaster, ESD surely functioned to disaster risk management, such as judgment, evacuation, management of shelters etc. immediately after the disaster (Oikawa 2012a).

The concept of ESD is a critical, systematic and holistic way of thinking that incorporates the ability of communication, collecting and analyzing information, and decision making and action; in other words, fostering abilities for problem solving,

imagination and creativity to overcome the difficulties for the future. ESD nurtures these abilities and skills through the approach and process of experienced and inquiry-based learning, those abilities and skills are all essential and indispensable in crisis situations at the time of disasters. And in the East Japan Earthquake and Tsunami, schools including students and teachers faced and overcame difficulties by fully utilizing these abilities and skills. In fact, the ESD abilities concerning disaster risk management worked to save their own and other's lives, and students also made use of their past learning experiences and poured effort into doing everything they could to contribute to the region's recovery. After the disaster of EJET, most Kesennuma schools are aiming to foster these abilities and capabilities through ESD beyond the many difficulties caused by the disaster of the East Japan Earthquake and Tsunami (Oikawa 2014b).

7.4.2 ESD as Network Development

ESD also emphasizes and establishes the linkage and collaboration with the local community, other regions and related organizations or institutions, and ESD is being promoted through collaboration and cooperation with them. Following the disaster, these ESD ties or solidarities also functioned to disaster risk management and disaster risk reduction effectively in each local community in terms of evacuation actions and evacuation center operation. Under these circumstances, rooted in and having promoted ESD in cooperation with their local communities, Kesennuma schools were able to play a leadership role as DRR and evacuation base in this crisis situation while working in cooperation with local residents.

It also helped to progress partnerships with domestic and international institutions so that Kesennuma City and schools could make the best use of the support from other regions and countries. And also in the process to recovery and reconstruction of communities in future, it is sure that ESD becomes more crucial concept again. These concepts and links were very useful and effective in the recovery process. In this context, ESD surely functions as a key concept of DRR and also as the concept towards recovery from the disaster (Oikawa 2012a).

Following the East Japan Earthquake and Tsunami, those areas where there are good ties between schools and their communities had high potential for successful evacuation, evacuation center operation, and reconstruction. Accordingly, cultivating good relationships between schools and communities by promoting ESD is extremely important for DRR, DRM and post-disaster recovery.

Furthermore, global networks with overseas institutions and organizations also provide tremendous power and strength for reconstruction. Following the earthquake disaster, Kesennuma City received various supports and encouragements from numerous schools, local governments, and organizations throughout the world with which it had forged deep ties through such organizations as UNESCO, the United Nations University, and the Japan Fulbright Fund, and also gained opportunities for recovery education. Furthermore, in future it will be hoped to pursue recovery education with a view to also nurturing the next generation leaders of reconstruction utilizing programs concerned with ESD such as OECD Tohoku School, UNESCO International Workshop and other programs. In this way, from the perspectives of both educational approaches and network-building, ESD is regarded as providing an undoubtedly important function as a major principle and means for promoting disaster education and carrying out reconstruction. In future, Kesennuma intend to continue to stride towards recovery and reconstruction by creating and establishing rich learning with the participation and collaboration among diverse actors through ESD (Oikawa 2014b).

These linkages expand as “Self-help”, “Mutual-help” and “Public-help” including collaboration with NPO/NGO. Kesennuma City Board of Education calls this linkage “N-help”. “N” means NPO/NGO and Network, that’s a Next and New help. In this context, ESD surely functions as a key concept towards DRR and recovery process from the disaster (Fig. 7.9).

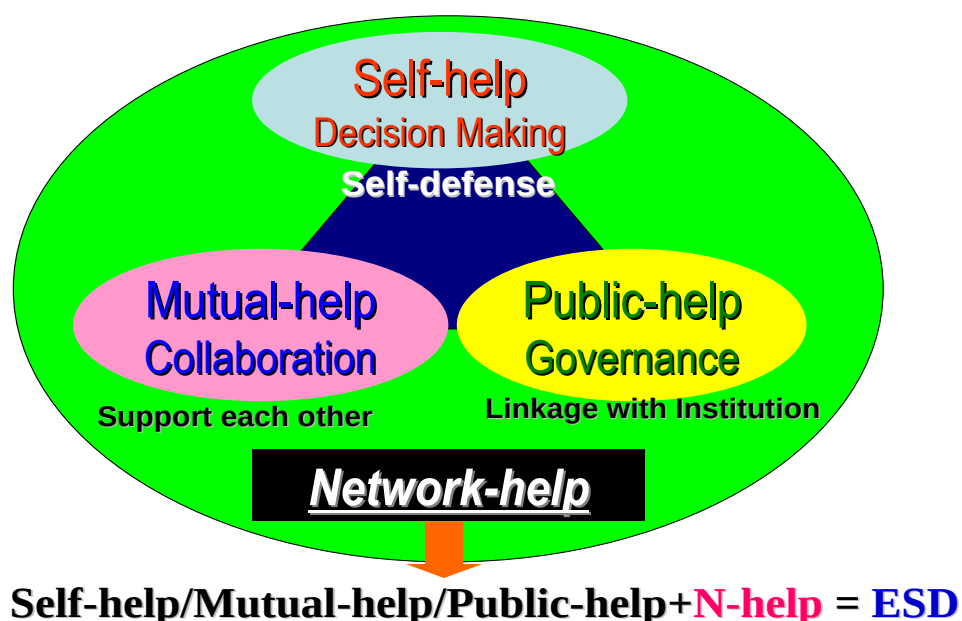


Fig. 7.9 Expanding DRR Network through ESD

7.4.3 ESD as Concept towards Post-Disaster Recovery and Reconstruction

ESD will undoubtedly be an important concept in the process of post-disaster recovery and reconstruction in the future with respect to the following five perspectives (Oikawa 2012a, b).

(a) Fostering Crisis-Response Skills in Cooperation with Local Community

As described above, it is often said that a cycle of “Self-Help”, “Mutual-Help”, and “Public-Help” is important in disaster-preparedness education, but due to the immense scale of the East Japan Earthquake and Tsunami—referred to as a “once per millennium” event—“Public-Help” did not function sufficiently immediately after the disaster, making “Self-Help” the primary means of assistance—that is to say, people’s lives were dependent on their own decision-making ability and crisis-management skills. Furthermore, there were many communities and evacuation centers where “Mutual-Help” was provided by neighborhood associations and volunteers during evacuations and at evacuation centers.

However, it is also true that some precious lives were lost due to assumptions such as “Normalcy Bias”, “Majority Synching Bias”, and “Altruistic Behavior” within these processes. It can be said that improving and expanding disaster education in cooperation with the local community by utilizing the lessons learned from these experiences is an urgent issue.

(b) Education Aiming for Coexistence with Nature

In the East Japan Earthquake and Tsunami, Kesennuma City was subjected to the astounding powers of nature in the form of an earthquake and tsunami, sustaining enormous damage. However, as a city surrounded by bountiful nature that developed through the blessings of the sea, Kesennuma is naturally orientated towards urban planning emphasizing coexistence with nature, as expressed by the city’s reconstruction plan catchphrase “Living with the Ocean”.

Having served as the cornerstone of Kesennuma’s pioneering environmental education and food education, ESD is expected to play an important role in realizing this goal in the future as well.

(c) Education that Passes Hometown Spirit Down to the Next Generation

The earthquake disaster had an enormous impact not only environmentally and

economically, but also culturally. Due to the human and material damage as well as the destruction of communities, the continued existence of traditional performing arts and other culture is under threat. In working towards reconstruction, it is essential that efforts are made to revive local traditions and culture, ESD is promoted as an introduction to regional heritage education, and pride in and affection for the local area be cultivated.

(d) Sharing Learning across Regional and National Borders

Immediately after the earthquake disaster, Kesennuma received assistance from a great number of sources, making people more aware than ever before of the ties between themselves and their community and other regions and countries around the world.

In the future, too, we must take a broad perspective, valuing and respecting our ties with the world. To enable this, we intend to nurture in students communication skills and international perspectives by creating opportunities for sharing learning experiences across regional and national borders.

(e) Education for Building the Future

When pursuing reconstruction education, it is important to nurture in children—especially future leaders in reconstruction—the ability to design a future for themselves and the region. To this end, Kesennuma City has held essay and drawing contests as well as workshops in which children are asked to imagine and design the future. In addition, to enable children to have hopes and dreams for the future even under the difficult circumstances of the disaster zone, effort is being poured into educational activities aimed at strengthening children’s “unbreakable spirit” and “supple mind”—in other words, their “resilience”. For example, schools holds workshops and lectures to which artists and sportspeople at the forefront of their fields, astronauts, and outstanding people are invited as guest speakers; children are sent to summer camps and on study abroad programs; and other activities aimed at nurturing children’s aspirations are implemented proactively (Oikawa 2014).

7.5 Key Issues and Challenges

After the disaster of East Japan Earthquake and Tsunami (EJET), because of catastrophic experience of disaster which has never been experienced, the Importance and significance of disaster education were recognized at schools all over Japan, so that

schools especially in tsunami affected area tried to fulfill disaster education in school curriculum and disaster risk management (DRM) of the schools systems after the EJET.

A) Focusing Disaster Education as Key Action Area of ESD after the EJET

Especially, as to ESD schools in Kesennuma City, Schools which had been promoting ESD as UNESCO Associated School from pre-disaster of EJET shifted their main focus of ESD from Environmental Education and International Understanding Education to disaster education more to reinforce disaster education at each school based on the lessons learnt from EJET, comparing with pre-disaster. On the other hand, ESD schools are also strengthening Understanding of Local Community at the same time. This means that people including teachers and students recognized the value and importance of their community for DRR and recovery from the disaster through the experience of EJET. Especially, when the school promotes disaster education, it is vital that students should know and understand their each local community as first. And the linkage and collaboration with local community is necessary for school to fulfill disaster education. Therefore, many schools in Kesennuma are focusing disaster education linking and collaborating with local community and various sectors.

B) DRR and DRM as Whole School/Institution Approach

Schools in Kesennuma also tried to improve and accelerate DRR and DRM perspectives in all educational activities and school systems. Disaster education has been incorporated into school curriculum in many of schools and DRM practice has been reinforced in variable school systems since EJET in 2011 through the catastrophic experience and vital lessons of EJET. The schools have been renewing various management or educational practice from DRR perspectives such as safety checking (school building/yard, school zone and school districts), manual for DRR/DRM including evacuation route/place and evocation drills, and storages for emergency situation. Disaster education was also improved more practically and systematically by incorporating into syllabus and implemented by taking expertise of specialists and inviting parents.

C) New Concept of Synergy of ESD and DRR

During Decade of Education for Sustainable Development (DESD), especially after the EJET, the synergy between ESD and DRR was highlighted and comprehended by schools and educators more and more as the new concept of ESD in the context of DRR

and recovery process of. There are three perspectives or aspects of the synergy as follows

- (i) ESD surely functions to DRR as abilities; the critical, systematic and holistic way of thinking, the ability of communication, collecting and analyzing information, and decision making and action, in other words, the abilities for problem solving, imagination and creativity to overcome the difficulties for the future.
- (ii) ESD functions to DRR as networks; the linkage and collaboration with the local community and other regions, the partnerships with domestic and international institutions and organizations, and global networks with overseas which expand as Mutual-help, Public-help and N-help including collaboration with NPO/NGO.
- (iii) ESD is the concept towards Post-disaster recovery and reconstruction;
 - Fostering Crisis-Response Skills in Cooperation with the Local Community,
 - Education Aiming for Coexistence with Nature
 - Education that Passes Hometown Spirit Down to the Next Generation
 - Sharing Learning across Regional and National Borders
 - Education for Building the Future

D) New Strategy to Incorporate DRR into Curriculum and Advocating to Schools

Making the best use of this synergy concept, the Kesennuma City Board of Education (BOE) have researched and proposed the new strategy by developing Disaster Education Sheets and Matrix as a method to incorporate disaster education into school curriculum and educational activities involving parents and residents.

- The strategy is analyzed what kind of ability and attitude school be foster in disaster education considering the synergy and links between abilities of ESD and those of DRR.
- And then learning components and activities of disaster education were developed as “Disaster Education Sheets” considering DRR learning process, abilities, kinds of disaster hazards and linking with existing subjects.
- According to developmental stage (grade level) of students (horizontal axis) and subjects or field (vertical axis), activities of Disaster Education Sheets was arranged in order and organized as Disaster Education Matrix.
- Disaster Education Sheets and Matrix were afforded to school teachers as a method or tool of disaster education in order for teachers to design DRR program and

curriculum at each school.

- According to the Disaster Education Sheets and Matrix, school teacher could develop and implement suitable disaster education program/curriculum depend on the situation of school curriculum and developmental stage (grade level) of students.
- Combining Disaster Education sheets and other existing subjects' topics and making the enquiry-based learning process will be more effective for disaster education.

E) Innovative Practice of Disaster Education as the Evidence of Synergy Concept

Schools in Kesennuma have been improving their ESD and DRR programs and activities based on this synergy concept, and they also have been implementing DRR activities from ESD perspectives; students-centered, experience-based, action-based, enquiry-based and problem-solving process, linking and collaborating with local community.

The disaster education practice of Hashikami Junior High School emphasizes the importance of collaboration with local community including elementary school in school district. The DRR Project of Koharagi Junior High School is advocating the significance of students' contribution to disaster recovery of local community. And the practice of Karakuwa Junior High School focused on energy raises the awareness and consciousness to select and make decision for our future. These innovative practices of the schools are the evidences of new concept of ESD in the DRR.

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Part 3 Discussion and Conclusion

Chapter 8 Emerging Concept through New Trends of ESD and DRR

Abstract United Nations' Decade of Education for Sustainable Development (UN-DESD) ended in 2014. However, local and global issues or challenges are spreading and getting more seriously locally and globally. As for disaster risk reduction, the disaster is extremely unsustainable situation and it is caused by natural, economical and social factors complexly. Therefore the significance and necessity of ESD and disaster education should be sustained toward the future beyond DESD. This chapter will discuss emerging synergy concept of ESD and disaster education based on the new trend of ESD and DRR at international level such as Global Action Programme on ESD (GAP), Sendai Framework for Disaster Risk Reduction (SFDRR) and Climate Change Education (CCE). At national level, the chapter will discuss the methods of curriculum development in disaster education introducing ESD practices during DESD and it also discusses on the establishment of regional network for promoting disaster education through ESD based on lessons learnt from East Japan Earthquake and Tsunami. Finally, taking these analyses into consideration, the chapter will prospect further promotion based on the new synergy concept between ESD and disaster education.

8.1 Convergence of Disaster Education and ESD in International Initiatives

To accelerate the promotion of ESD and disaster education at international level utilizing the synergy concept, it should be implemented linking with relevant international initiatives and trends such as Global Action Programme on ESD (GAP) and Sendai Framework for Disaster Risk Reduction (SFDRR) as well as Climate Change Education (CCE). And to move forward, these initiatives will be converged on the promotion of sustainable society through the synergy among ESD, disaster education and climate change education.

8.1.1 New concept of Disaster Education in the Framework of GAP

As discussed on the second half of DESD, DRR is one of the priority themes for promoting ESD (UNESCO 2010), and the linkage between ESD and disaster education is also emphasized in Aichi-Nagoya Declaration and Global Action Programme (GAP) furthermore (UNESCO 2013). Disaster education has the synergy with ESD on the concept, the abilities to foster, methodologies such as curriculum development, and partnerships or networks building for its promotion, therefore, disaster education could progress more in the context of ESD. In order to promote disaster education based on ESD forward, it should be considered and rebuilt in the framework of priority action areas of GAP (UNESCO 2014). Through the rebuilding of disaster education according to the following five priority action areas of GAP, the synergy between ESD and disaster education should be enhanced, and progress. As a result, the disaster education could be brushed up and scaled up not only to reduce disaster risks but also to build sustainable society.

(a) Advancing Policy Supports for Disaster Education

Policy support as governance takes a very crucial role of promoting disaster education. As roles of governance, it will be suggest the promotion of the following strategies. Disaster education should be integrated into international and national policies on education and sustainable development. The Ministries of Education and Board of Education of each country should integrate the disaster education into national and local curricula and quality standards, and developing relevant indicator frameworks that establish standards for learning outcomes. Also, disaster education needs to be seen as an important contributor to educational environment, and included in national education system measures of environment. National and international strategies dealing with the social, economic, and environmental dimensions of sustainable development should include DRR as a mean of implementation. Disaster education should also become a systematic part of bilateral and multilateral international cooperation frameworks. Government ensure adequate resources including funding and human resources for promoting disaster education

(b) Whole-institution Approach for Disaster Education

Whole institution approach is a very effective approach to spread and disseminate disaster education to the sector and to raise the driving force of disaster education. In order to establish whole institution approach, at first each institution has to develop a

vision and a plan to implement disaster education in the dedicated learning and training environment, in partnership with the broader community. Secondly, institutional leaders are prompted to take a holistic view of disaster education, focused not only on transferring content about DRR, but also on participating in DRR practices, including taking actions to reduce the institution's disaster risk. Thirdly, collaboration between the learning and training institution and the host community is important to promote disaster education.

(c) Building Capacities of Educators and Trainers for DRR

To accelerate disaster education, it will be needed to foster the superior teacher, instructor and coordinator who have the ability to understanding DRR issues and to conduct and coordinate disaster education. Therefore capacity building of educators and trainers are very important to enlance the disaster education. Disaster education should be integrated into pre-service and in-service teacher education which is conducted by university, Board of Education, Teacher Training Center, etc. Disaster education should be also integrated into training for early childhood, primary and secondary schools and Technical and Vocational Education and Training (TVET) institutions. At post-secondary level, higher education institutions can also integrate disaster education into faculty training, to improve the ability of the faculty to teach DRR issues and to conduct and supervise research related to DRR. And also DRR lens is introduced to the professional development programs for educators, trainers and staff members of various private institutions.

(d) Empowering and Mobilizing Youth to DRR Action

Involving young people to DRR activities is also very important because they shoulder building sustainable society including disaster risk reduction, therefore, youth would be main actor of disaster education. To accelerate youth involvement to DRR activities and disaster education, it is necessary to provide young people with opportunities to harness the enormous benefits of information and communication technologies including social media, not only for learning but also for networking for DRR actions. Promising approaches include e-learning on DRR and on-line platforms where young people can share their own ideas and actions on DRR. Mass mobilization of youth towards DRR requires empowering youth with information on the impacts of their daily choices and actions for DRR. Through empowering and mobilizing youth to disaster education and action, youth including secondly and high school level, would not be protected by adults

or parents, but they could also be contributors to their community by taking DRR actions.

(e) Accelerating Sustainable Solutions at Local Level from DRR Perspective

Disaster education should be promoted based on local community forming the linkage and the platform among diverse sectors and multi-stakeholders, because disaster education and DRR activities have to consider the disaster risk and hazard according to regional environment and geographical conditions, and utilize indigenous knowledge which had been passed on to many generations. So, strengthening multi-stakeholder networks at local level, and improving the quality of local platforms for disaster learning and cooperation are very effective for the promotion of disaster education. Therefore, it is important to mobilize many new stakeholders for promoting disaster education and activities. Local authorities and local leaders who have expertise and indigenous knowledge related to DRR, are called upon to increase and strengthen learning opportunities for the community through formal, non-formal, and informal venues. They empower and increase the resilience of civil society as critical agents of DRR. These concerned members and stakeholders will develop measures and mechanisms to resolve the disaster risk or challenges facing their communities.

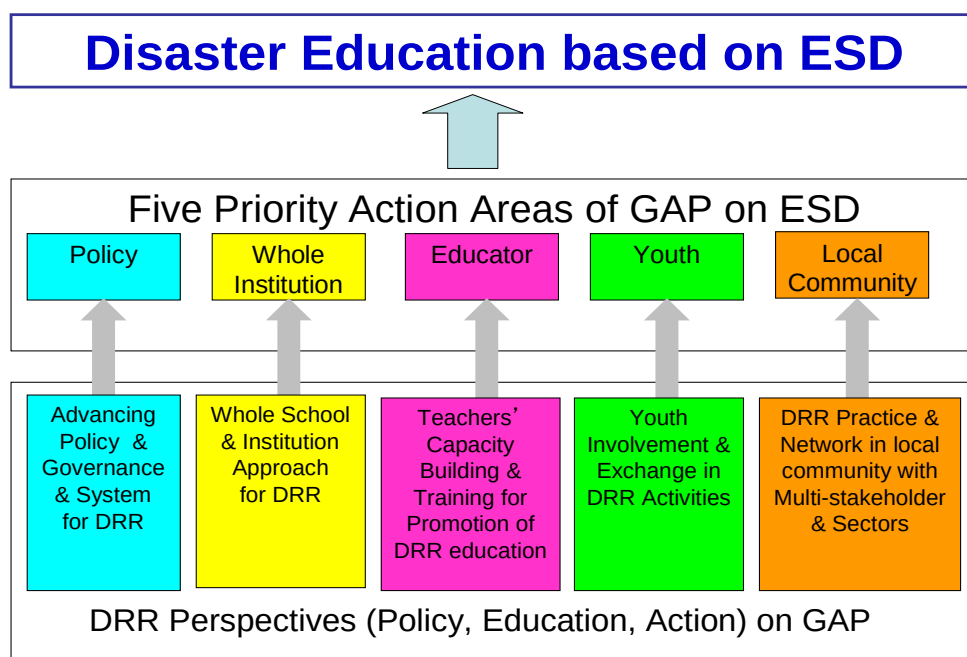


Fig. 8.1 Disaster Education from Global Action Programme (GAP) on ESD

By rebuilding and promoting disaster education from five points of view according to Priority Action Area of GAP on ESD which are: i) policy support, ii) whole institution, iii) capacity building of educators, iv) youth involvement and v) local communities, it could be more systematic and holistic approach, and its implementation can be more effective in formal, non-formal and informal education involving multi-stakeholders at local, national, regional and global level (Fig. 8.1).

8.1.2 Synergy concept of ESD and DRR in Sendai Framework for DRR

“Sendai Declaration” and “Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030” was launched in the World Conference on Disaster Risk Reduction (WCDRR) held in Sendai City, Japan, 2015 in order to enhance the efforts to strengthen disaster risk reduction as the follow-up to “Hyogo Framework for Action (HFA) 2005-2015” (UNISDR 2015). Considering further promotion of disaster education in the framework of SFDRR based on the synergy concept of ESD, the following three pillars will be emerged and identified.

8.1.2.1 Pillars of Synergy Concept between ESD and Disaster Education in SFDRR

(a) Disaster Education is essential to achieve Sustainable Development

The process of disaster risk reduction, recovery and reconstruction to “Build Back Better” and building resilience should be recognized and renewed in the context of sustainable development. And effective disaster risk management contributes to sustainable development. This means that disaster education is essential to achieve sustainable development. Thus, the development, strengthening and implementation of relevant policies, plans, practices and mechanisms need to aim at coherence across sustainable development, climate change and variability, environmental management and disaster risk reduction agendas at its Guiding Principles such as SFDRR.

(b) Establishing various cooperation and partnerships

Disaster Risk Reduction identifies modalities of cooperation based on commitments to implement a post-2015 framework for disaster risk reduction. To promote effective disaster education and DRR activities, it should be implemented with the view to establish diverse cooperation and partnerships by states, institutions, organizations, NGO/NPO and multi-stakeholders at local and national level as well as regional and global level. Also, it should be further enhanced to establish various kinds of global and

national cooperation, partnerships and platforms for its implementation. The concept and approach which links these aspects and implementations is also same as Education for Sustainable Development (ESD). That is the synergy concept of ESD and disaster education.

(c) Education is the bridge between Sustainable Development and Disaster Risk Reduction

The importance of disaster education including learning and training is now reaffirming. It should take a crucial role for not only disaster risk reduction but also reconstruction and building resilience through the implementation of the SFDRR. Thus, “Education”, including learning, training and research, would be the bridge toward disaster risk reduction, building resilient society and the “Build Back Better” at local, national and global level, which is the significance role of disaster education. Disaster risk reduction and its management should be based on an understanding of disaster risk in all its dimensions. Therefore, education including learning, training and research would take a key role for not only disaster risk reduction, but also reconstruction and building resilience, through the implementation of disaster education based on the synergy of ESD (Fig. 8.2).

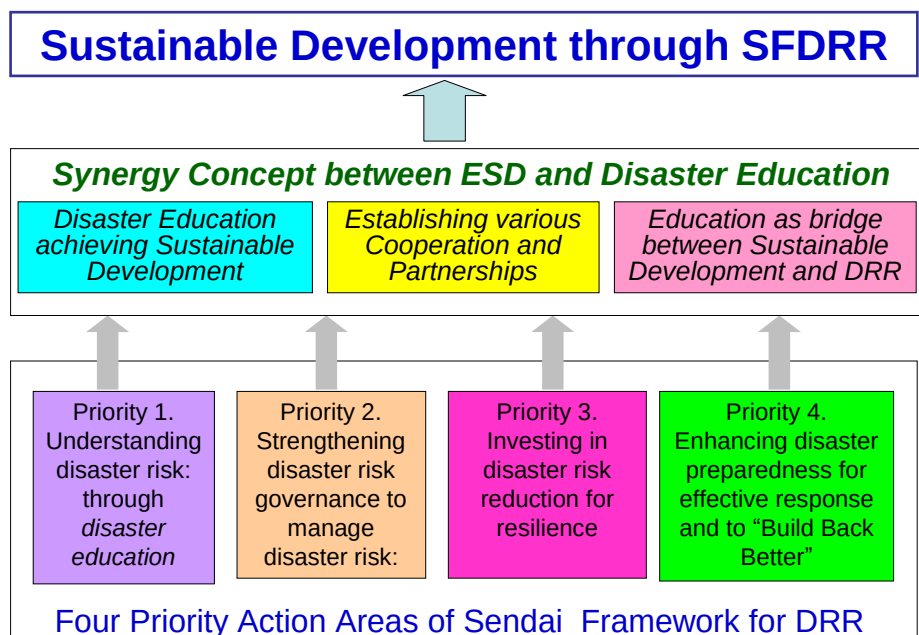


Fig. 8.2 Promotion of ESD through Sendai Framework for DRR

8.1.2.2 Key points of Disaster Education based on Synergy Concept of ESD

During the UN Decade of Education for Sustainable Development and Hyogo Framework for Action, disaster education is progressing in formal education as curriculum based education, especially in Japan, which is based on the lessons learned from “Hanshin Awaji Earthquake” and “East Japan Earthquake and Tsunami”. That will be introducing the synergy concept of ESD and DRR, and curriculum developing methods of ESD as well as establishing partnerships and cooperation for its implementation. The key points for the promotion of disaster education and its practices from ESD perspective are as follows:

(i) Realizing the Concept of Sustainable Development;

The Disaster is extremely unsustainable situation. ESD consists of the concept related disaster education such as Respect for Life, Human Security, Living Together and Building Sustainable Society to “Build Back Better”. Therefore, DRR should be the priority theme of DESD & GAP

(ii) Improving Disaster Education Quality introducing ESD learning Method;

ESD emphasizes the learning style of Inquiry-based Learning, Problem Solving Learning, Experience-based Learning, Community-based Learning and Integrated Learning. Disaster education will innovate by introducing these learning styles to its learning and curriculum.

(iii) Fostering Ability and Attitude for DRR through ESD;

ESD fosters these abilities and attitudes such as Communication skill, Information Collecting and Analysis, Critical Thinking, System Thinking, Holistic Thinking, Decision Making, Participation and Action. These are also important abilities to foster in Disaster Education: i) Information Collecting and Analysis as access to disaster information, ii) Critical Thinking, System Thinking, Holistic Thinking as thinking abilities for crisis or disaster situations, and iii) Decision Making, Participation and Action as response abilities and attitudes to disasters. Thus, it can be identified the synergy between ESD and disaster education.

(iv) Building Networks and Partnerships with Community and outside institutions through ESD;

ESD facilitates to build the network and partnership with community and multi-sectors such as outside institution and NGO/NPOs for its promotion. On the other hand, disaster education also needs to form Self-help, Mutual-help, Public-help, and Network-help as steps and ranges of its promotion. Therefore, disaster education can establish the linkage with community, outside institutions and NGO/NPOs which function as Mutual-help, Public-help and Network-help effectively through the promotion base on the synergy concept of ESD.

These are the key points of synergy concept between ESD and disaster education in the Sendai Framework for DRR

8.1.3 Convergence of Disaster Education in the learning process of ESD

As Sendai Framework of Disaster Risk Reduction (SFDRR) is mentioning, disaster education should be promoted and implemented as a learning process to sustainable development, not only as drills and events. Therefore, the curriculum development of disaster education needs to identify the process and steps for its effective promotion. In order to build its framework and develop its program to implement, it is crucial to integrate disaster education into the learning process of ESD, linking two global initiatives of GAP and SFDRR. This is the new perspective of disaster education from now on and it should be fostered abilities and altitudes of knowledge, skills of response and preparedness to students and people in disaster education.

By the convergence of disaster education in the learning process of ESD, the objectives and contents of disaster education can be categorized as the following four steps (Oikawa 2014).

- (i) As first step, the knowledge and understanding of disaster are very important through the learning disaster mechanisms of earthquake, tsunami, landslide and typhoon including climate change such as global warming, acid rain, ozone hall, desertification etc. with linking science and disaster education.
- (ii) Second step is recognition of relation and influence with disaster, through learning how disasters impact on own life and society. It makes links with disasters clear and enhances learners' motivation to disaster education.
- (iii) Third step is to get skills and attitudes of disaster responses and preparedness for disaster risk reduction and mitigation, through the learning of evacuation drill, setting up shelter, disaster map making, planning DRR Manual, establishing DRR organization, etc. as action-oriented learning.

(iv) Fourth step is fostering the abilities and attitude in order students to contribute to and participate in recovery and reconstruction process through the learning of infrastructure reconstruction, live hood rehabilitation as well as education, economy and community recovery etc. in the aftermath of disasters. It is very long-term learning with future perspectives such as “Build Back Better”.

Thus, this convergence approach between ESD and disaster education also makes the learning steps and process very clear and systematic with the following developing steps and process of sustainable development from the disaster to recovery and reconstruction (Table 8.1).

Table 8.1 Convergence of Disaster Education in the learning process of ESD

	1st step	2nd step	3rd step	4th step
Step	Mechanism of climate change and disaster	Impact to society and life	Response and preparedness	Recovery and reconstruction from disaster
Ability	Knowledge and awareness for mechanism	Recognition of influence and relation	Response and preparedness for mitigation	Creativity and col-laboration for recovery
Content	Understanding mechanism of climate change and disaster, scientifically and critically	Recognizing how climate change and disaster influence society and live hood	Learning response and preparedness for disaster risk reduction, and implementing	Learning process, perspective and contribution to creative recovery and reconstruction

[Source: Oikawa 2014]

Step 1: Mechanism of Natural Phenomena of Crustal Deformation and Climate Change

Understanding mechanisms of disaster and climate change, scientifically and critically to foster knowledge & awareness

Step 2: Impact to Society and Life: Science Education transforming to Disaster Education

Recognizing how crustal deformation and climate change influence society and live hood as disaster to foster recognition of relation human life and disaster

Step 3: Response and Preparedness: Disaster Education

Learning the response and preparedness for disaster risk reduction, and implementing to foster skill of response and preparedness for mitigation

Step 4: Recovery and Reconstruction from Disaster: Disaster Education transforming to Education for Sustainable Development

Learning the process, perspective and contribution to creative recovery and reconstruction to foster the imagination and creativity for recovery

8.2 Proposal for Creation of New Disaster Education Curriculum in Japan

In Japan, which advocated for the “United Nations Decade of Education for Sustainable Development (DESD),” a variety of ESD (Education for Sustainable Development) programs in school education have been implemented and ESD curricula for carrying out the programs have been developed in the last ten years centering on UNESCO Associated Schools, of which members dramatically increased during the decade. Based on these accumulated practices, this section discusses a method for developing disaster education curriculum to be incorporated into school curriculum and its effective implementation, based on the method of ESD curriculum development in Japan.

8.2.1 The fundamental principles of ESD curriculum development

First of all, in promoting disaster education at schools as formal education, it is necessary to consider ESD as an educational philosophy and method that reforms the conventional education, and to keep the following seven points in mind when developing and implementing disaster education based on ESD (Oikawa 2015).

- (i) Fitting in the local context and considering sustainable development (SD)
- (ii) Promoting changes in learners’ behaviors
- (iii) Interdisciplinary learning centered on human activities
- (iv) Various learning methods are guaranteed
- (v) Integrated into the whole educational activities
- (vi) Value-oriented and enhancing quality of education
- (vii) Fostering global perspectives and collaboration

8.2.2 Disaster Education Curriculum Development based on approaches of ESD

To promote disaster education effectively, it needs to enhance the disaster education in school curriculum of each school level. In order to incorporate DRR activity into curriculum in school education and implement it as formal educational activities, it should be utilized ESD curriculum developing methods and steps, and it should be founded that they are very effective for quality disaster education.

It could be proposed the following three approaches:

- (i) “Infusion Approach” in which disaster education is incorporated into the existing subjects and areas of study,
- (ii) “Integrated Approach” in which curriculum is comprehensively developed and carried out by utilizing Periods of Integrated Study, etc., while correlating the subjects
- (iii) “Holistic Approach” in which disaster education is promoted by the whole school, taking such aspects into consideration as school administration, teacher training and collaboration with the local community, not to mention the development of curriculum.

By taking these approaches incrementally while considering the actual state of each school and its formation of curriculum, disaster education curriculum will be incorporated into the whole school curriculum and education activities, which will spread as everyday affairs (Oikawa 2015).

8.2.2.1 Infusion Approach

This approach promotes disaster education learning within the context of existing courses of study by highlighting the learning topics and contents related to disaster education in the existing subjects and areas of study, and clarifying what abilities and attitudes should be fostered in disaster education. This does not mean the change of framework of existing subject contents, but regard the contents from the perspective of disaster education. By clarifying the abilities and attitudes emphasized as disaster education in a subject, while achieving the objectives of the subject itself, and by deepening and developing the learning as disaster education, disaster education is infused into the existing subjects. For example, as shown in Fig. 8.2, many learning topics and contents related to disaster prevention are contained in the existing subjects and areas of study for sixth graders. By reviewing the contents from the perspective of education on disaster prevention and developing a curriculum for the purpose of constructing sustainable society while correlating the subjects, disaster education can be realized as ESD.

However, the infusion approach is not sufficient to develop disaster education curricula. Limited by the framework of curriculum of existing subjects, its objectives and contents of teaching and time, it is possible that the necessary contents and activities as disaster education cannot be guaranteed. In fact, some teachers have

difficulties in deciding to which they should give priority, the objective of the subject or the purpose of disaster education. These two primarily do not contradict each other, but complement each other. It is, however, difficult to clarify the relations between them and promote disaster education in daily classes. Above all, it is difficult in this approach to construct curriculum in which students learn in a dynamic and interdisciplinary manner, extending beyond the framework of subjects, in the process of inquiry-based learning and problem-solving that are emphasized in disaster education (Fig. 8.3).



Fig. 8.3 Infusion Approach; Example of Elementary School Curriculum (5th grade)
[Source: Kesennuma City Shinjo Elementary School (2014)]

8.2.2.2 Integrated Approach

Whereas disaster education is basically implemented in subject areas in the infusion approach, the “integrated approach” guarantees inquiry-based learning and problem-solving processes extending beyond the framework of subjects and develops a curriculum as disaster education. It is possible to construct a disaster education curriculum that emphasizes problem-solving and linkage by integrating important learning contents and activities as disaster education by utilizing Periods of Integrated Study, etc. that is impossible to be guaranteed within the framework of subjects.

For example, when developing a curriculum from the viewpoint of disaster prevention, “regional disaster prevention,” “making of disaster prevention map” and “disaster prevention-related learning at home and among different grade levels” are critical components in education on disaster prevention, although they are not treated in the curriculum of existing subjects and areas of study as shown in Fig. 8.2. In addition,

“future community development after disaster” is not contained in textbooks, but “sustainable community development” after disaster is essential from the perspective of ESD. Developing new components of disaster prevention learning and making a curriculum in which children learn with a certain storyline by utilizing Periods of Integrated Study, etc., will enhance their abilities of problem-solving and awareness for connections with other people and communities (Fig. 8. 4).

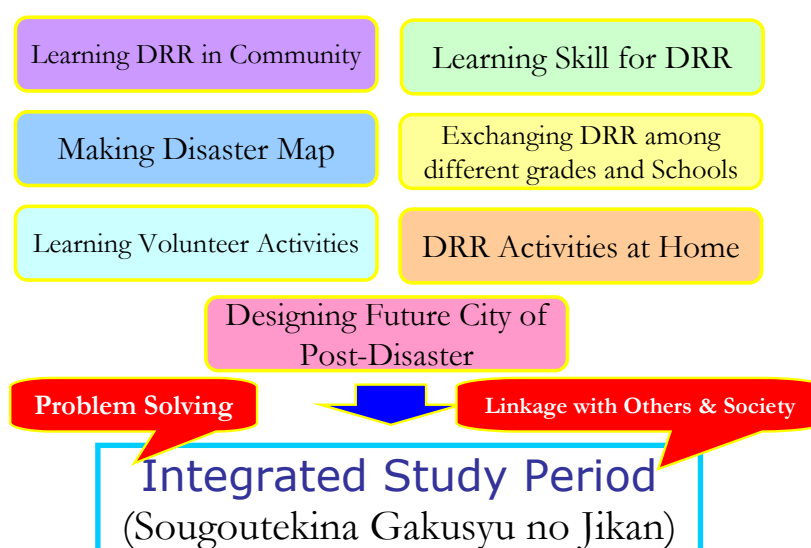


Fig. 8.4 Integrated Approach; Example of Elementary School Curriculum (5th grade)
[Source: Kesennuma City Shinjo Elementary School (2014)]

Moreover, as mention chapter 7, Kesennuma City Educational Researching Group (Kyoiku-kenkyu-in) of Kesennuma Board of Education has been developed “Disaster Education Sheet” for promoting disaster education effectively at each school in Kesennuma (Kesennuma BOE 2014). They developed 71 sheets and made “Disaster Education Matrix” (Kesennuma BOE 2014). The matrix set these various sheets of activities in school curriculum depend on student’s developing stage and subjects or fields. According to “Disaster Education Matrix and Sheets”, teachers are facilitated to enable to promote systematic and effective disaster education as “Interdisciplinary and Integrated Approach” at each school (Fig. 8.5).

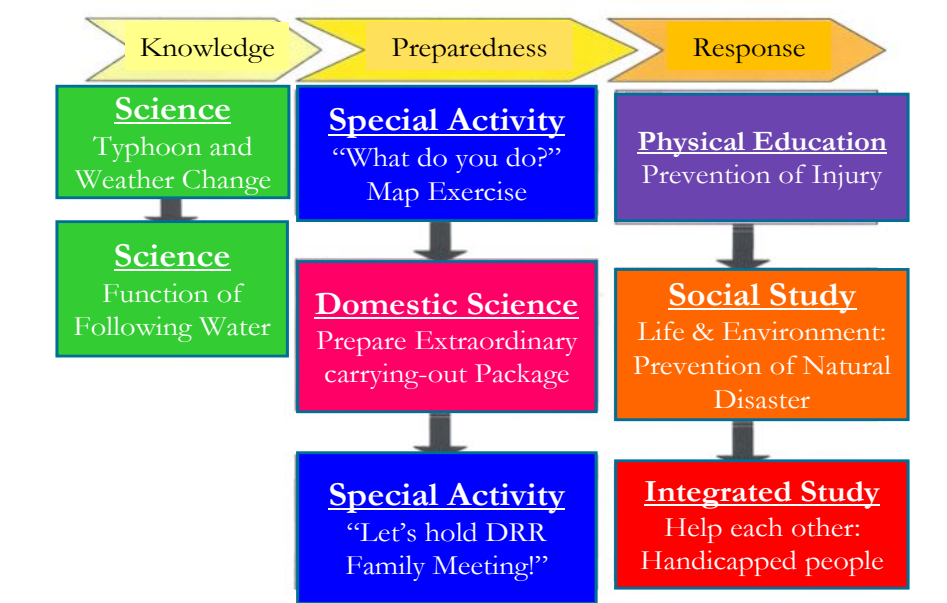


Fig. 8.5 Example of Disaster Education Unit of 5th grade at Elementary School

[Source: Kesennuma City Shinjo Elementary School]

8.2.2.3 Holistic Approach

It is necessary to develop a framework in which the whole school promotes disaster education using the holistic approach by incorporating the principles of disaster education not only into the curriculum itself but to other aspects such as school administration, teacher training, and collaboration with local community (Fig. 8.6). Through these efforts, disaster education will become common in school education and spread to parents and local communities. The school itself serves as a local hub for the promotion of disaster education and contributes to the sustainable community building as a driving force. These are specified in the second of priority action areas of Global Action Programme (GAP) issued at the “UNESCO World Conference on ESD” held in Nagoya City. It is expected that educational institutions including schools strive to promote disaster education in a comprehensive manner.

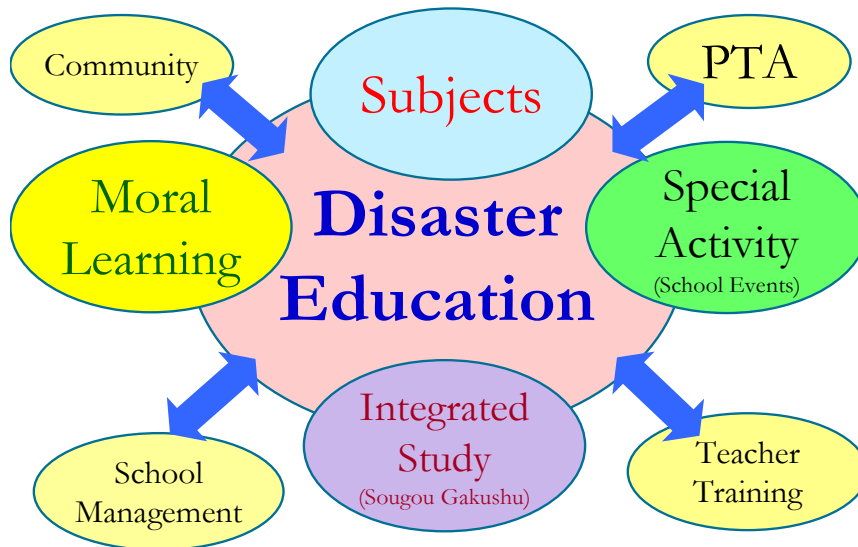


Fig. 8.6 Holistic Approach of Disaster Education

8.2.3 Clarification and Evaluation of Abilities and Attitudes in Disaster Education

When developing a disaster education curriculum, it is necessary to specifically determine what abilities and attitudes should be developed in order to define the purpose and direction of learning and to assess students' development through the learning. In such point, a structure of the ability, the attitude and the evaluation of ESD can be also reference.

In clarifying what abilities and attitudes should be developed in ESD, each school is generally using one of the following four frameworks in the present school education in Japan. The first framework is based on the scheme for objectives and assessment of existing subjects and areas of study defined in the Courses of Study, although there is a slight difference in wording and scheme depending on the subject, focusing particularly on the following four points:

- i) Interest, Motivation and Attitude,
- ii) Ability to think, Ability to make decisions and Ability to express themselves,
- iii) Skills and Expression
- iv) Knowledge and Understanding,

Some schools are still using this conventional framework to set goals and conduct assessment for ESD.

As second, other schools independently define the abilities and attitudes to be developed in ESD and assess students' development based on the observation during the "Periods of Integrated Study (Sougotekina-gakushu-no-jikan)."

- i) Ability to define the issue,
- ii) Ability to solve problems,
- iii) Ability to communicate, etc.

The third framework is based on the "abilities to be developed in ESD" proposed by Japanese National Commission for UNESCO (Japanese National Commission for UNESCO 2014). The abilities include:

- i) Values related to sustainable development (ability to show respect for people, respect for diversity, non-exclusiveness, equality of opportunity, and respect for environment),
- ii) Systematic thinking (understanding of the background to problems and phenomena, multidimensional and comprehensive standpoint),
- iii) Ability to think of alternatives (critical thinking)
- iv) Ability to collect and analyze information,
- v) Communication skills,
- vi) Leadership.

The fourth framework, which has been spreading rapidly in schools in recent years, is seven abilities and attitudes for ESD, proposed by National Institute for Educational Policy Research (NIER). This framework was developed while comprehensively taking into consideration the objectives and assessment scheme defined in the Courses of Study and abilities to be developed proposed by UNESCO mentioned above, and key competencies identified by OECD. The framework categorized into the following seven abilities and attitudes (NIER 2012). In addition, as Table 8.2 shows Kesennuma Educational Researching Group of Kesennuma City Board of Education has added one more attitude considering the "Self-help" (Kesennuma Educational Researching Group 2014).

Table 8.2 Ability and Attitude to foster Disaster Education based on ESD

Ability / Attitude	Contents
1. Ability to think critically	Ability to think and judge attentively, constructively, cooperatively and alternatively by understanding the true nature of the situation based on rational and objective information and impartial judgement. 【Examples of DRR education】 ◆ Ability to think about the way of dealing with natural disasters and compare and review other' s opinions and information. ◆ Ability to determine a better solution regarding DRR actively and expansively.
2. Ability to predict and to plan the future	Ability to predict, estimate and hope for the future based on the past and the present and to plan by sharing the ideas with other people. 【Examples of DRR education】 ◆ Ability to think what they can do for the future and for the community and to plan with insight and a sense of purpose by considering the past disaster as a lesson.
3. Ability to think versatility and systemically	Ability to understand a connection, relation and expansion (a system) of people, objects, matters, society and nature and to consider them versatility and systemically. 【Examples of DRR education】 ◆ Ability to have an idea regarding DRR from various perspectives such as oneself, community and society.
4. Ability to communicate	Ability to share one' s own feelings and ideas, to respect other' s feelings and ideas and to communicate to others actively. 【Examples of DRR education】 ◆ Ability to share opinions with each other regarding DRR and to find better solution. ◆ Ability to listen to other' s opinions in the case of emergency.
5. Cooperative attitude towards others	Sympathetic attitude towards other' s ideas and actions standing in other' s place and which enables you to proceed by cooperating and collaborating with others. 【Examples of DRR education】 ◆ Try to act with consideration to people such as the elderly and handicapped in the case of disaster. ◆ Try to help and encourage others in a difficult situation in a post-disaster.
6. Respectful attitude towards connection	Respectful and proactive attitude towards connections and relations of people, objects, matters, society and nature by having an interest in them. 【Examples of DRR education】 ◆ Try to appreciate connections between people, oneself and community through DRR learning. ◆ Try to understand that DRR requires cooperation and collaboration by the whole community.
7. Spontaneous and positive attitude towards participation	Spontaneous and proactive attitude towards participation by taking responsibility for what you say and do in a group and society by understanding one' s role. 【Examples of DRR education】 ◆ Try to be aware of DRR and to participate regularly and spontaneously in DRR drills in the area. ◆ Try to act proactively for others, for example, by recommending DRR.
8. Positive attitude towards thinking for action	Positive attitude towards thinking about better behavior and taking action aggressively, based on his/her situation.

[Source: Kesenuma Educational Researching Group (2014), edit by Author]

- i) Critical thinking ability,
- ii) Ability to predict future images for making plans,
- iii) Ability to think in multifaceted and comprehensive ways,
- iv) Ability to communicate,
- v) Attitude to cooperate with other people,
- vi) Attitude to respect for connections
- vii) Attitude to participate willingly
- viii) Positive attitude towards thinking for action (Setting by Kesennuma City)

Kesennuma Educational Researching Group also proposed more concrete abilities focused on disaster education according to eighth abilities or attitudes above conducted by author (Table 8.2). This makes it clear the synergy between ESD and disaster education as well as the abilities to focus and foster in disaster education.

Elementary School			Junior High	Targeted Abilities & Attitudes of ESD
Lower Grade	Middle Grade	Upper Grade		
				Communication Skill
				Positive Thinking for Action
				Respect for Connection
				Holistic & System Thinking
				Cooperative Attitude
				Positive Participation
				Design & Plan for future
				Critical Thinking

Fig. 8.7 Abilities and Attitudes of ESD focusing on Developmental Stage
[Source: Oikawa (2015)]

These frameworks are only examples, and it is not necessary to incorporate all of these abilities and attitudes and make children acquire all of them in one project. Each school needs to make their original framework and apply it to their curriculum by considering what abilities and attitudes they should focus on, select and complement depending on their students' developmental stages and learning contents (Fig. 8.7).

It has been discussed the basic views and methods when developing disaster education curriculum in school education based on ESD practices which have been implemented in Japan. What is important in developing the curriculum is to consider how to realize inquiry-based learning in which children proactively engage in their own theme, not to merely fill in the format of the curriculum by incorporating too many activities and abilities to be developed. In order to realize such learning, it should be pursued education to make children understand the local strengths and challenges or risks they face, connect with a variety of people and subject matters, acquire knowledge and means through many experiences to live harmoniously with nature, community, society and the world, and put them into practice. Efforts made by both teachers and children to weave the stories of disaster education based on ESD perspective and concept that are full of passion along with a sense of necessity and seriousness lead to a sustainable future beyond the issues such as disaster, that can be realized through education.

8.3 Building Consortium for Promoting ESD and Disaster Education

In order to foster citizens who have global perspectives as well as disaster awareness and resilience, it should be sustained to promote ESD and disaster education based on the synergy beyond DESD and HFA establishing regional network or consortiums which is organized with schools and multi-stakeholders in each region.

The Consortium is expected to consist of multi-stakeholders such as city board of education, schools, universities and business enterprises especially, in addition, prefectural board of education, NGO/NPOs, non-formal education institutions and sectors, etc. The consortium is expected the following activities and missions:

- a) Implementation of ESD and DRR activities at each school and diverse sectors
- b) Exchange and collaboration among schools and multi-stakeholders at regional, national and international level
- c) Collaboration with non-formal education institutions and sectors
- d) Public presentation to share the results inside and outside of the region
- e) Linkage with prefectural government such as board of education
- f) Drawing up the concrete plan to sustain the function of consortium

8.3.1 Establishing Regional Consortium and its Practice

Tohoku region, especially Miyagi prefecture, is active region for promoting ESD past 10 years during the UN Decade of ESD. Greater Sendai area which consists of Sendai City, Kesennuma City and Ohsaki City, Shiroishi and Shichigashuku area was acknowledged as “Regional Centres of Expertise (RCE) on ESD” by United Nations University in 2005. After the acknowledgement of RCE, this area is promoting ESD based on community and region, utilizing rich nature and resource, and establishing multi-stakeholder network as a model region of ESD promotion in Japan and world as well as Okayama City.

Kesennuma City which is one of the Greater Sendai RCE is very famous as advanced city for ESD promotion, especially, in formal education. Since 2002, the schools in Kesennuma City have been developed innovative ESD curriculum and implemented ESD practice collaborating with various sectors and institutions in community and abroad. Since 2008, under the leadership of Kesennuma City Board of Education, almost all the schools in Kesennuma have been promote ESD being acknowledged as UNESCO School and it has been leading ESD practice of formal education in Japan during DESD (Interministerial Meeting on UN-DESD 2014).

However, as described in Chapter 4 and 6, this region, especially Kesennuma City suffered catastrophic damage by massive disaster of East Japan Earthquake and Tsunami (EJET) in March 2011. A lot of communities in this area collapsed by tsunami and fell into unsustainable situation. Therefore, people as well as schools in this region recognized and reaffirmed the importance of community and disaster education including evacuation, DRR activities, the measures of disaster risk management and disaster preparedness. Also, through the linkage and network with regions and institutions all over Japan and the world, which was fostered through ESD practices so far, Kesennuma City could receive tremendous supports for disaster recovery, especially in education sector. Moreover, thanks to accumulated practices and methods of ESD, Kesennuma City is trying to improve disaster education utilizing infusion, integrated and holistic approaches for curriculum developing and disseminate to the inside and outside of region.

Learning from the lesson of ESD promotion and the experience of establishment of RCE committee in Kesennuma, it is initiated by author as a coordinator to establish regional consortium for the disaster recovery though the disaster education based on ESD which is spreading from Kesennuma city to other city and areas in Tohoku Region utilizing the budget and framework of “ESD Promotion Project toward fostering Global

Human Resource” by MEXT. Overlooking whole Tohoku Region, there are gaps for ESD and disaster education promotion among each city and prefecture. For example, in 2015, Tohoku region have 87 UNESCO Associated Schools in total, but 76 UNESCO Schools of all concentrate to Miyagi Prefecture and the half of those schools belong to Kesennuma City (MEXT 2014). It cannot be also said that the recognition to ESD as well as disaster education is high in not only formal but also non-formal and informal education sectors in Tohoku region excepting some of cities in Miyagi Prefecture. Therefore, the practice of ESD and disaster education must be spreading to all prefectures and many cities in Tohoku region to develop new momentum of the synergy of ESD and disaster education.

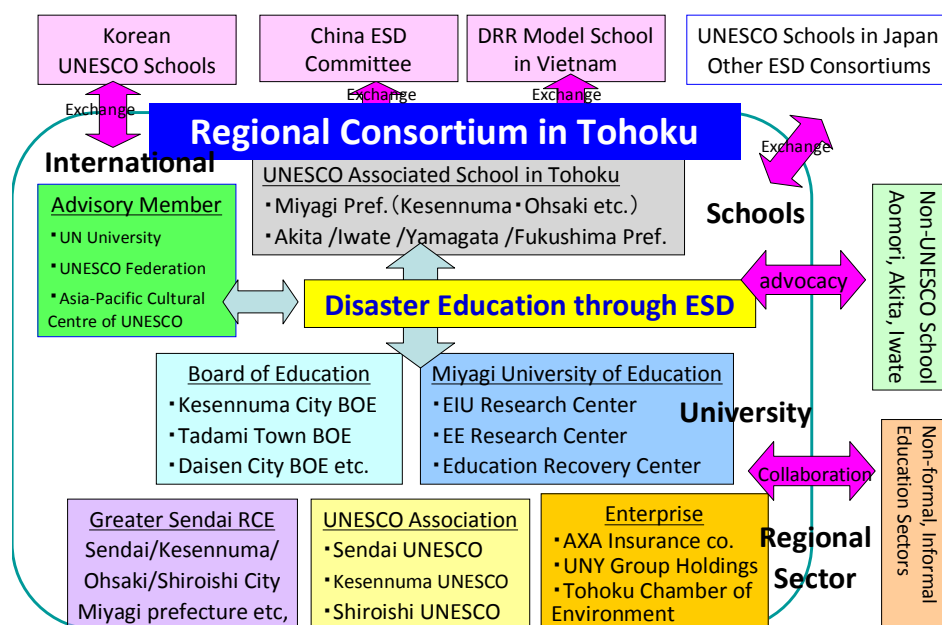


Fig. 8.8 Proposal for Structure of Regional Consortium in Tohoku,
Modified by Author

To realize this mission, Creating ESD Tohoku Regional Consortium focused on Natural Environment, DRR and Global Collaboration in Tohoku Region” was launched by Miyagi University of Education in July 2014 and tackled on building the consortium in Tohoku involving various sectors and stakeholders coordinated by author. Tohoku Consortium consists of UNESCO School in Tohoku (87 schools), some of board of education in Tohoku, UNESCO associations, enterprises, non-formal education sectors and the composition members of Greater Sendai RCE such as city and prefectural government, NGO/NPO etc. In addition, United Nations University (UNU), National

Federation of UNESCO Associations in Japan (NFUAJ) and Asia-Pacific Cultural Centre for UNESCO (ACCU) are also invited to Tohoku Consortium as advisory members to connect the consortium to other ESD project and initiative at national and international level. Through the platform of this consortium, these composition members can share information and their practices each other within the consortium, and they are able to promote the exchange programs and cooperation with consortiums in other region and the counterparts in foreign countries (Fig. 8.8).

8.3.2 Strategy of Establishing Regional Consortium

However, it is very difficult to involve multi-stakeholders and organize the network to function effectively because Tohoku is very extensive region and there is a wide range of initiative and activities. To establish ESD consortium, it is crucial to respect the diversity of characteristics and backgrounds of each prefecture and city in Tohoku. Therefore, on the process of building up the consortium, multilayer method should be taken into consideration. There are three layers to build up: i) the first layer is the city level consortium, ii) the second layer is regional consortium which is Tohoku consortium and iii) the third layer is domestic and international consortium or exchange network. As for city level consortium, there are various practices and activities related to ESD, utilizing rich natural and cultural resources in Tohoku, such as World Natural Heritage Site in Shirakami, World Cultural Heritage Site in Hiraizumi, UNESCO Eco Park in Tdami, Slow Food Movement in Kesennuma, Ramsar Convention in Ohsaki, etc. Respecting these existing practices or initiatives based on precious resources, it is necessary to build city or town level consortium in some of cities as satellite are of ESD promotion not only in Miyagi prefecture but also in whole Tohoku region. At next step, gathering these characteristic initiatives in Tohoku to the regional consortium, it is possible to share and scale up their activities for promoting disaster education through ESD communicating each other and linking together. Through this process, regional consortium will be established.

This regional consortium in Tohoku also facilitates to access to other consortiums in other regions and initiatives in foreign countries. This linkage fosters the exchange and cooperation at domestic and international level. As a result, regional consortium expands its possibility of ESD and disaster education promotion and collaboration through the process of building up the consortium locally to globally to achieve disaster recovery in Tohoku (Fig. 8.8).

8.4 Emergency Concept of ESD and Disaster Education toward Further Promotion

Based on the analysis of the linkage and synergy of ESD and disaster education through new trends and initiatives, new concept which consists of three levels and methods could be emerged proposed at international, national and regional level. At international level, convergence of disaster education in the learning process of ESD linking international initiatives and governance such as GAP and SFDRR could be emerged. At national level, curriculum development and capacity development through three steps of approaches such as Infusion, Integrate and Holistic Approach could be proposed. And at regional level, the network and consortium which could be transforming between normal time and emergency situation should be established through the practices of ESD and disaster education to promote and sustain the two international and national methods above. These three proposals could be generalized and disseminated to other countries and regions (Fig. 8.9).

8.4.1 Governance Issue: Future Promotion linking with International Initiatives

United Nations Decade of Education for Sustainable Development (UN-DESD) ended in 2014, and Hyogo Framework for Action also ends in 2015. However, new momentum of ESD and DRR are emerging by new frameworks and proposals in the world such as Global Action programme on ESD (GAP) and Sendai Framework for Disaster Risk Reduction (SFDRR). There is the linkage and synergy identifies in both concepts and priority action areas of GAP and SFDRR. Through the promotion of disaster education according to five priority action areas: i) Policy support, ii) whole institution approach, iii) educator training, iv) youth involvement and v) solution of local issues forming the partnership, disaster education could be more effectively enhanced and brushed up. Because disaster education is one of the crucial components and priority action themes of ESD, therefore, whole five priorities of GAP can be adapted to the promotion and improvement of disaster education. Thus, adapting GAP for the implementation of disaster education is very significant for further promotion of disaster education.

On the other hand, SFDRR has also close synergy with ESD. SFDRR is emphasizing sustainable development as well as sustainable world, society and community through the promotion of Disaster Risk Reduction (DRR). To achieve this, disaster education takes a key role as the bridge between also ESD and DRR. Also, cooperation, collaboration and partnership, which are kinds of “Linkage (Kizuna in

Japanese), is very important to accelerate the implementation of SFDRR. In this context, ESD also can be done in the framework of SFDRR from DRR perspective thorough disaster education in contrast of GAP. For this reason, disaster education should be contained ESD curriculum or program and DRR activity should be introduced to ESD practices in not only formal education but also non-formal and informal education. In addition, after the UNDESD, Japanese government is renewing National Implementation Scheme of ESD in order to sustain and scale up the ESD practice which should implemented in all over Japan. The government should incorporate disaster education to new implementation scheme and mention the linkage of SFDRR with ESD as one of important international initiatives related sustainable development.

In this context, it can be said again that ESD and disaster education have very close linkage and synergy each other. However, they have been sometimes discussed separately although some of objectives and components of both educations are overlapping and complemented mutually. Therefore, disaster education should converge in the learning process of ESD which is the learning from the mechanism of disaster to the recovery and reconstruction (Build Back Better) introducing the components of science, climate change, DRR and ESD in order to foster knowledge, understandings, awareness, skills, attitudes and visions for disaster resilience. It will be emerged as sustainable developing process and it can be proposed as the new type of disaster education based on ESD concept (Fig. 8.9).

8.4.2 Quality of Disaster Education: Curriculum Development and Ability

The synergy between ESD and disaster education can be identified in the method of curriculum development and abilities or attitudes to foster thorough their learning. To raise the quality of disaster education, systematic curriculum is necessary. ESD curriculum development methods are very useful and effective to the curriculum development also in disaster education, because its approach is same as one of ESD such as community-based, experience-based, inquiry-based as well as interdisciplinary and integrated learning method.

It was proposed three types or steps of curriculum development methods: i) Infusion Approach, which utilizes existing curriculum of each subject, ii) Integrated Approach, which organizes specialized disaster education curriculum incorporating DRR activities to integrated learning, and iii) Holistic Approach which promotes disaster education not only in lessons but also school management, teacher trainings and PTA activity etc. as whole school approach. Those methods are expressing stage of curriculum development, so that, very helpful to develop the curriculum of disaster education depends on the progress of disaster education of each school. The schools can select the approach to adjust their school curriculum or progress of disaster education (Fig. 8.9). These three curriculum developing methods could contribute to enrich the learning and raise the quality of disaster education. They could be disseminated to schools not only in Japan but also foreign country.

In addition, abilities and attitudes to foster through disaster education are identified utilizing the evaluation framework of ESD. And based on the lessons learned from East Japan Earthquake and Tsunami, it is proposed more concrete abilities and attitudes focused on disaster education according to the framework of ESD. This makes it clear the synergy between ESD and disaster education as well as the abilities to focus and foster in disaster education.

8.4.3 Building Network for Disaster Education: Regional Consortium for ESD and Disaster Education

Kesennuma City have been developed innovative ESD curriculum and implemented ESD practice collaborating with various sectors and institutions in community and abroad. And Greater Sendai area is also promoting ESD based on community and region, utilizing rich nature and resource, and establishing multi-stakeholder network as a model region of ESD promotion. However, Kesennuma City suffered catastrophic damage by massive disaster of East Japan Earthquake and Tsunami (EJET) in March 2011. Many communities in this area collapsed by tsunami and fell into unsustainable situation. In spite of this massive damage, through the linkage and network with regions and institutions all over Japan and the world, which was fostered through ESD practices so far, Kesennuma City could helped each other as Mutual-help and collaborated with governance agencies such as fire department, self-defense force and city government as Public-help, moreover, could received tremendous supports for disaster recovery, especially in education sector. Thus, ESD could establish linkage and partnerships with community as well as outside institutions, and it surely functioned as Network-help.

Learning from the lesson, it will be established regional consortium for the disaster recovery though the disaster education based on ESD, spreading from Kesennuma City to other city and areas in Tohoku Region. The Consortium is expected to consist of multi-stakeholders such as city board of education, schools, universities and business enterprises especially, in addition, prefectural board of education, NGO/NPOs, non-formal education institutions and sectors. To establish ESD consortium, it is crucial to respect the diversity of characteristics and backgrounds of each prefecture and city in Tohoku. Therefore, on the process of building up the consortium, multilayer method should be taken into consideration: i) the first layer is the city level consortium, ii) the second layer is regional consortium which is Tohoku consortium and iii) the third layer is domestic and international consortium or exchange network. Thus, regional consortium broadens its possibility of ESD and disaster education promotion and collaboration through the process of building up the consortium locally to globally to achieve disaster recovery in Tohoku.

This consortium is the network in normal time, in order to promote ESD and disaster education for preparing future disasters. But, in emergency time of disaster, Mutual-help, Public-help and Network-help are necessary to response to and recover from the disaster, as mentioned above. At that time of critical situation, the consortium of normal time is transforming to the emergency linkage as Mutual-help, Public-help and Network-help with strong bands. Thus, another objective of establishing regional consortium is also to foster the bonds in normal time for the emergency situation of disasters (Fig. 8.9).

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Chapter 9 Key Findings and Future Perspectives

Key findings of this research could be categorized four pillars: i) governance issues, ii) improving disaster education, iii) ability and attitude, and iv) partnership and networking, corresponding to the research questions. And some future perspectives will be also emerged and identified.

9.1 Key Findings from ESD and Disaster Education Convergence

9.1.1 Governance issue

ESD enhances educational governance functions as institutional response to DRR, recovery and reconstruction in the midst and aftermath of the disaster. This finding can be proved by the observation and analysis of educational governance responses of Kesennuma City Board of Education (BOE) and schools in Kesennuma City to evacuation and recovery process in the midst and aftermath of East Japan Earthquake and Tsunami (EJET).

As the evidences of this findings, Kesennuma BOE and schools have been taking many responses to educational recovery depend on phase and stage, for example, securing transportation of students as first step for disaster recovery, resupplying school lunch as a life line for restarting school education, economical supports contributing to long-term recovery of affected families, facility improvement as preparedness for forthcoming disaster, and psychological supports for affected students fostering their resilience. All of these responses and measures which Kesennuma BOE and schools have been implementing flexibly as problem solving method functioned effectively to the recovery process in education sector of Kesennuma City.

On other hand, all of these responses have been promoted by not only Kesennuma BOE and schools, but also diverse sectors such as community members, many NGO/NPOs, banks and companies, other institutions including universities which collaborated and participated in this process. Namely, Kesennuma BOE has been promoting their governance measures for recovery, making collaboration and partnerships with diverse sectors and multi-stakeholders. Kesennuma BOE calls this collaboration for recovery “N-help”. This network was also fostered and established through ESD practice for over ten years.

9.1.2 Improvement of Disaster Education

ESD improves and enriches disaster education, especially, contribute to curriculum development through infusion, integrated and holistic approaches utilizing guidebook and teaching materials such as Disaster Education Sheets.

As one of the evidence, schools which had been promoting ESD such as UNESCO Associated School since pre-disaster of EJET have shifted their main focus of ESD to disaster education comparing with pre-disaster in order to reinforce disaster education at each school based on the lessons learned from EJET. Schools in Kesennuma have tried to improve and accelerate DRR perspectives in all educational activities and school systems since EJET in 2011. As other evidence, Kesennuma BOE has researched and proposed the new strategy by developing Disaster Education Sheets and Matrix as a method to incorporate disaster education into school curriculum and educational activities, which made the best use of the synergy concept between ESD and disaster education.

Moreover, ESD curriculum development methods are very useful and effective to the curriculum development also in disaster education, because its approach is community-based, experience-based, inquiry-based as well as interdisciplinary and integrated learning method. It could be proposed three types or steps of curriculum development methods of disaster education based on ESD learning methods: i) Infusion Approach which utilizes existing curriculum of each subject, ii) Integrated Approach which organizes specialized disaster education curriculum incorporating DRR activities to integrated learning, and iii) Holistic Approach which promotes disaster education not only in lessons but also school management, teacher trainings and PTA activity etc. as whole school approach.

9.1.3 DRR Abilities and Attitude

ESD fosters the abilities and attitudes of teachers and students which can address emergency situation also in the disaster to keep their lives as judgment, evacuation, management of shelters etc. immediately after the disaster and contribute to the process of recovery and reconstruction. They are the critical, systematic and holistic way of thinking, the ability of communication, collecting and analyzing information, and decision making and action, which surely functions as the abilities for problem solving, imagination and creativity to overcome the difficulties on DRR and recovery process for the future. ESD nurtures these abilities and skills through the approach and process of

experienced and inquiry-based learning of ESD, those abilities and skills are all essential and indispensable in crisis situations at the time of disasters.

In fact, in the case of EJET in Kesennuma, the ESD abilities of students and teachers concerning disaster risk reduction worked to save their own and other's lives, so that any students did not lost their lives at schools, and also students made use of their past learning experiences and poured effort into doing everything they could in order to contribute to the region's recovery. After the EJET, Hashikami Junior High School students are emphasizing the importance of collaboration with local community including elementary school through their disaster education practice. On the other hand, Koharagi Junior High School students are advocating the significance of students' contribution to disaster recovery of local community as unique DRR project. These innovative practices of students are the evidences of students' DRR abilities and attitudes based on community.

In addition, more concrete abilities and attitudes to foster through disaster education are identified and proposed by the research of Kesennuma City Educational Researching Group utilizing the evaluation framework of ESD, and based on the lessons learned from East Japan Earthquake and Tsunami. This made it clears the synergy between ESD and disaster education as well as the abilities to focus on disaster education to foster.

9.1.4 Partnership and Network Development

ESD facilitates to establish partnership and network among multi-sectors and stakeholders for DRR activities and disaster education promotion based on the community and drawing expertise. ESD emphasizes and establishes the linkage and collaboration with the local community, other regions and related organizations or institutions, and ESD is being promoted through collaboration and cooperation with them. Following the disaster of EJET, these ESD ties or solidarities also functioned to disaster risk management and DRR effectively in each local community in terms of evacuation actions and shelter management. Those areas where there are good ties between schools and their communities had high potential for successful evacuation, evacuation center operation, and reconstruction. Accordingly, cultivating good relationships between schools and communities by promoting ESD is extremely important for post-disaster recovery.

Kesennuma BOE and schools have been implementing many activities collaborating with community and other institutions based on ESD and community

learning. Thank to these strong linkages and bonds, almost all the students were able to evacuate safely in the disaster of EJET. And then, these linkages also functioned at management of each shelter in the communities including schools. These linkages expand as Self-help, Mutual-help, Public-help and Network-help in collaboration with community, NPO/NGO and other sectors serving as network.

Furthermore, national and global networks with domestic and overseas institutions or organizations also provide tremendous power and strength for reconstruction. Under these circumstances, Kesennuma City and schools could make the best use of the support from other regions and countries for recovery from EJET.

In this way, from the perspectives of network-building, ESD is regarded as providing an undoubtedly important function as a major principle and means for promoting DRR activities and carrying out reconstruction. Therefore, establishment of partnership like regional consortium through ESD is very crucial to continue to stride towards recovery and reconstruction by establishing partnership with the participation and collaboration among diverse actors through ESD.

9.1.5 Generalization and Dissemination of the Key Lessons

In order to generalize and disseminate key findings of this research which learned from the analysis and observation base on the case study of Kesennuma City mainly, some points could be identified as follows.

With regard to governance issue, decision making and linkage with outside are very crucial to implement appropriate governance measures in critical situation such as disaster. To achieve it, capacity building of administrators is very important. In this way, the training from ESD perspective for administrator and officials of government at local, prefectural and national level should be effective to raise skill for decision making and ability for building linkage and partnership with outside institution and sectors through the workshop as experience-based and problem solving method.

As to the improvement of disaster education and capacity building of students and teachers, three curriculum developing methods: infusion, integrated and holistic approaches could contribute to enrich learning and raise the quality of disaster education as methodology. Those methods are expressing stage of curriculum development, so that schools can select the approach to adjust their school curriculum or progress of disaster education. Moreover, “Disaster Education Sheets and Matrix” developed by Kesennuma Educational Researching Group is very useful and helpful for developing and implementing disaster education as well as setting abilities and attitude for disaster

education as guidance and tools. According to the Disaster Education Sheets and Matrix, school teacher could develop and implement suitable disaster education program depend on the situation of school curriculum and developmental stage (grade level) at each school. Thus, both of them could be disseminated to schools not only in Kesennuma City but also Japan and foreign countries.

Lastly, regarding network building, multi-stakeholder approach is very effective to establish partnership which contributes to DRR activity and recovery through disaster education. In this context, the strategy and process of Regional Centre of Expertise (RCE) and Regional Consortium in Tohoku are very helpful to establish networks and forming consortiums in other regions and countries. In addition, at emergency situation this network with diverse actors functions as Network-help which contributes to DRR activities and recovery process.

9.2 Concluding Remarks

During the UNDESD and Hyogo Framework for Action, disaster education is progressing in formal education as curriculum based education, especially in Japan, which is based on the lessons learned from “Hanshin Awaji Earthquake” and “East Japan Earthquake and Tsunami”. That is introducing the synergy concept of ESD and DRR, and curriculum developing methods of ESD as well as establishing partnerships and cooperation for its implementation.

The key points for disaster education promotion and its practices from ESD perspective are as follows:

- (i) Realizing the Concept of Sustainable Development focusing on Respect for Life, Human Security, Living Together, Building Sustainable Society “Build Back Better”
- (ii) Improving Disaster Education Quality introducing ESD learning Method such as Inquiry-based Learning, Problem Solving Learning, Experience-based Learning, Community-based Learning, Integrated Learning
- (iii) Fostering DRR Ability and Attitude through ESD such as Communication, Information Analysis, Critical Thinking, System Thinking, Holistic Thinking, Decision Making, Participation & Action
- (iv) Building Networks and Partnerships with Community and outside institutions through ESD functioning as Mutual-help, Public-help, Network-help

Another point to be indicated is “Long-term Memory” of the lessons learned from EJET. Even catastrophic experience and memories of disaster are usually fading away with time. According to this fading process, the motivation of teachers and parents is decreasing as time goes by, as a result, the quality of disaster education would come down also. To avoid this and sustain the practice of disaster education based on precious lessons of disaster such as EJET, curriculum-based learning is necessary along with project-based learning. In this context, Infusion Approach would take a key role of sustainable promotion of disaster education in addition to Integrated Approach. On the other hand, to sustain disaster education at local level as community-based learning, rooting the culture for DRR in the individual community based on the lesson of past disaster, disaster education should be promoted utilizing local wisdom and indigenous knowledge in whole community.

9.3 Future Perspectives

9.3.1 Proposals

As international perspective, there is the linkage and synergy identifies in both concepts and priority action areas of Global Action programme on ESD (GAP) and Sendai Framework for Disaster Risk Reduction (SFDRR). Through the promotion of disaster education according to five priority action areas of GAP, disaster education could be more effectively enhanced and brushed up. Thus, adapting GAP for the disaster education is very significant for further promotion of disaster education. On the other hand, SFDRR is emphasizing sustainable development, disaster education as the bridge between ESD and DRR, and cooperation to accelerate the implementation of SFDRR. In this context, ESD can be done in the framework of SFDRR from DRR perspective thorough disaster education. Based on the synergy of GAP and SFDRR, disaster education should be promoted and implemented as a learning process to achieve sustainable development, and it needs to identify the process and steps for its effective promotion. In order to build its framework and develop the process to implement, it is crucial to integrate disaster education into the learning process of ESD linking two global initiatives of GAP and SFDRR. Through this convergence of disaster education in ESD, the learning process from mechanism of disaster to the recovery and reconstruction will be emerged as sustainable developing process. It will be proposed as the new type of disaster education based on ESD concept. To promote this framework and process, the curriculum development in formal education is vital at each country at

national level. It was proposed three types or steps of curriculum development methods: i) Infusion Approach, ii) Integrated Approach, and iii) Holistic Approach. Those methods are expressing stage of curriculum development, so that, very helpful to develop the curriculum of disaster education depends on the progress of disaster education of school at each country.

On the other hand, as local and regional perspective, it will be proposed to establish regional consortium for the disaster recovery through the disaster education based on ESD learning from the lesson of East Japan Earthquake and Tsunami. The Consortium is expected to consist of multi-stakeholders and sectors. To establish ESD consortium, it is crucial to respect the diversity of characteristics and backgrounds of each prefecture and city. Regional consortium broadens its possibility of ESD and disaster education promotion and collaboration through building up the consortium locally and globally to achieve DRR and recovery based on ESD in region. This type of consortium is the network in normal time, in order to promote ESD and disaster education for capacity building and preparing future disasters. But, in emergency time of disaster, the networks are necessary to response to and recover from the disaster. At the time of critical situation, the consortium of normal time is transforming to the emergency network as Mutual-help, Public-help and Network-help with strong bands. Thus, another objective of establishing regional consortium is also to foster the bonds in normal time for the emergency situation of disasters.

9.3.2 Challenges

The research was conducted based on the case study of Kesennuma City as evidence-based research, so that findings are provided by the evidences through the analysis and observation of case study of ESD and disaster education in Kesennuma. However, although the performance of governance, education and network through ESD in Kesennuma after EJET is outstanding comparing with other cities in affected area as discussed in the thesis, there are some possibilities that all of findings and results related to governance issues, disaster education, DRR ability and attitude, and networks are provided by the effects of not only the synergy of ESD but also other factors such as other education practices, linkage of community, indigenous knowledge and culture for DRR, and other initiatives. Therefore, comparative analysis should be needed to identify the effect of synergy and linkage of ESD and disaster education more clearly by selecting another case study in affected area of EJET which is not promoting ESD. That is the limitation and future challenge of this research to analyze more academically.

Appendix: Questionnaire Survey Sheets of Principals and Teachers in Kesennuma City
“School Response to East Japan Earthquake and Tsunami: Survey of Schools in Kesennuma”

(校(園)名)

調査票 1

＜東日本大震災を受けた防災管理・防災教育に関する実態調査＞
学校調査票

○あてはまる番号の□にレをつけるか、回答欄の () や に回答を記入してください。

○本アンケートは、校長先生(教頭先生)にお答えいただくものです。

1 東日本大震災以前の地震・津波に対する防災体制について

(1) 学校(園)内での避難行動(一次避難)の計画はありましたか。(1つ選択)

- ① ☐ あった ② ☐ なかった

(2) 校(園)外への避難先は、津波被害を想定した場所を指定していましたか。(1つ選択)

- ① ☐ 東日本大震災規模の津波を想定し、避難場所を指定していた。
② ☐ 東日本大震災以下の規模の津波を想定し、避難場所を指定していた。
③ ☐ 津波を想定せずに、避難場所を指定していた。
④ ☐ 校(園)外または、高所への避難計画はなかった。
⑤ ☐ その他 ()

(3) (2)で③または、④と回答した学校(園)に伺います。理由としてもっとも近いものを選択してください。(1つ選択)

- ① ☐ 内陸部や高台に立地しているため津波が来ないと想定していた。
② ☐ 沿岸部であったが津波の被害を想定していなかった。
③ ☐ その他 ()

2 東日本大震災発生時の児童生徒（園児）の状況及び避難行動について

（１）地震発生時児童生徒（園児）はどこで何をしていましたか。学年ごとに書いてください。

学年等	どこで	何をしていたか
(例) 1年1組	教室で	学習中

（２）学校（園）内での避難指示は計画に従ってできましたか。（1つ選択）

①☐ 計画通りにできた ②☐ だいたいできた ③☐ 変更した

「③変更した」と回答した学校（園）は、変更後の指示の内容を具体的に書いてください。

変更前の計画と変更後の指示とその理由

(3) 児童生徒（園児）の学校（園）内での避難行動は、適切にできましたか。(1つ選択)

① ☐ できた ② ☐ だいたいできた ③ ☐ できなかった

「③できなかった」と回答した学校（園）は、避難の様子を具体的に書いてください。

児童生徒（園児）の様子

(4) 津波警報に応じ、学校から高台への避難，または，校内の安全な高所への避難ができましたか。(1つ選択)

① ☐ できた ② ☐ だいたいできた ③ ☐ できなかった
④ ☐ 浸水のおそれがない等の理由から行わなかった。

(5) (4) で①②③と回答した学校（学校から高台への避難，校内の安全な高所への避難を行った学校）は，避難経路と児童生徒（園児）の安全が確保された時刻と最終的な避難場所を書いてください。

避難経路	安全が確保された日時と場所
(例) 校庭→○○広場→△地区高台	<日時> 3月 日 時 分ごろ <場所>

3 児童生徒（園児）の引き渡し、安否確認について

(1) 保護者への児童生徒（園児）の引き渡しの開始時期について、近いものを選択してください。（1つ選択）

- ☐ ① 地震発生後、すぐに引き渡しを開始した
- ☐ ② 津波警報発令後、引き渡しを開始した
- ☐ ③ 津波到来後、引き渡しを開始した
- ☐ ④ 日没頃、引き渡しを開始した
- ☐ ⑤ 翌日以降、引き渡しを開始した
- ☐ ⑥ 保護者への引き渡しを行わなかった
- ☐ ⑦ その他（ ）

(2) (1) で①②③④⑤と回答した学校（園）（引き渡しを行った学校園）に伺います。引き渡しは、学校（園）側、保護者側どちらの意向により行いましたか。（1つ選択）

- ☐ ① 学校（園）側
- ☐ ② 保護者側
- ☐ ③ その他（ ）

(3) (1) で「④日没頃、引き渡しを開始した」「⑤翌日以降、引き渡しを開始した」「⑥保護者への引き渡しを行わなかった」と回答した学校（園）へ伺います。理由としてもっとも近いものを選択してください。（1つ選択）

- ☐ ① 学校（園）が安全な場所である確信があったため、児童生徒（園児）を学校（園）へ留め置いた
- ☐ ② 学区の被害が予想されるため、児童生徒（園児）を学校（園）へ留め置いた
- ☐ ③ その他（ ）

(4) 学校（園）に保護者が迎えに来た様子や学校（園）側と保護者の話し合いの内容について具体的に書いてください。（自由記述）

(5) 児童生徒(園児)の保護者への引き渡し・留め置きの連絡はどのように行うよう計画して
いましたか。(複数選択) ※東日本大震災前の計画とします。

- ①☐ 電話連絡網(固定電話・携帯電話)
- ②☐ 一斉送信メール
- ③☐ 保護者に協力してもらう
- ④☐ 地域の方に協力してもらう
- ⑤☐ 災害伝言ダイヤル171
- ⑥☐ 学校(園)からは連絡しない
- ⑦☐ その他()

(6) 震災当日(5)で回答した方法での連絡は可能でしたか。(複数選択可)

- ①☐ どの方法も全く連絡がとれなかった
- ②☐ 電話連絡網での通信が可能であった
- ③☐ 一斉送信メールでの通信が可能であった
- ④☐ 保護者に協力してもらったことで連絡がとれた
- ⑤☐ 地域の方に協力してもらったことで連絡がとれた
- ⑥☐ 災害伝言ダイヤル171を活用したことで連絡がとれた
- ⑦☐ その他()

(7) 震災後、児童生徒(園児)全員の安否確認ができたのは、いつですか。日時を書いてくださ
い。(死者・行方不明者を除く)

月	日	時	分	頃
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(8) 津波被害後の児童生徒(園児)の安否確認は、どのように行いましたか。(複数選択可)

- ①☐ 家庭訪問
- ②☐ 病院や避難所等の巡回
- ③☐ 避難所や商店の掲示板を活用し、連絡を呼びかけ
- ④☐ 地域の協力
- ⑤☐ その他()

4 防災拠点としての学校のあり方について

(1) あなたの学校(園)は、気仙沼市地域防災計画により「避難場所及び避難所を開設する施設等」に指定されていましたか。(1つ選択)

- ① ☐ 避難場所及び避難所を開設する施設に指定されていた
- ② ☐ 避難場所及び避難所を開設する施設に指定されていなかった
- ③ ☐ わからない

(2)(1)で「① 避難場所及び避難所を開設する施設に指定されていた」と回答した学校に伺います。学校(園)独自の避難所等運営計画(マニュアル)はありましたか。(1つ選択)

- ①☐ 運営計画があった
②☐ 運営計画がなかった

(3) (1) で「① 避難場所及び避難所を開設する施設に指定されていた」と回答した学校に伺います。学校(園)が避難場所及び避難所を開設する施設であることを教職員が知っていましたか。(職種ごと、1つ選択)

管理職（校長・教頭）	① ☐ 知っていた	② ☐ 知らなかった	③ ☐ その他	
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一般職員（教諭等） ①□全職員が知っていた ②□多くの職員が知っていた ③□一部の職員が知っていた ④□誰も知らなかった

(4) 避難所となった学校(園)に伺います。備蓄品はありましたか。

- ①☐ 備蓄品があった ②☐ 備蓄品がなかった

(5)(4)で「①備蓄品があった」と回答した学校は、備蓄していた物品の種類と保管場所を教えてください。

備蓄して いた物品	① ☐ 乾燥ご飯 ② ☐ 乾パン ③ ☐ 粉ミルク ④ ☐ 毛布 ⑤ ☐ 紙オムツ ⑥ ☐ 救急セット ⑦ ☐ 日用品 ⑧ ☐ 簡易トイレ ⑨ ☐ その他（ ）
保管場所	

(6) 避難所となった学校(園)に伺います。避難所となった際、運営上困ったことにレ印をつけてください。次の3つの時期ごとに分けてそれぞれ答えてください。

A: 震災発生直後(3月11日～18日)

B: 学校開始準備期(3月19日～4月20日)

C: 学校開始後(4月21日～避難所解消まで)

	A	B	C
① 食事、飲料水の不足	☐	☐	☐
② 毛布等の不足	☐	☐	☐
③ 暖房器具の不足	☐	☐	☐
④ ライフライン(ガス・水道・電気)の停止	☐	☐	☐
⑤ 避難者の宿泊場所の確保	☐	☐	☐
⑥ ガソリン等燃料の不足	☐	☐	☐
⑦ 必要な情報が得られなかった	☐	☐	☐
⑧ 教育委員会との連絡がとれなかった	☐	☐	☐
⑨ 市防災担当者との連絡がとれなかった	☐	☐	☐
⑩ 疾病・精神的に不安定になった人への対応	☐	☐	☐
⑪ ボランティアへの対応	☐	☐	☐
⑫ 学校の職員の不足	☐	☐	☐
⑬ その他()	☐	☐	☐

(7) 震災発生日及び直後(3月11日～18日)は、震災に関する情報をどこから得ていましたか。(複数選択可)

- ①☐ テレビ ②☐ ラジオ ③☐ 新聞
 ④☐ 防災無線 ⑤☐ 各種たより・チラシ ⑥☐ 携帯電話
 ⑦☐ 自治体等HP ⑧☐ インターネット ⑨☐ 災害対策本部
 ⑩☐ 教育委員会等の職員巡回 ⑪☐ その他()

(8) 学校(園)備え付けの停電時に情報を得るための機器はありますか。(複数選択可)

- ①☐ 手回し充電ラジオ ②☐ 防災無線受信機
 ③☐ ワンセグ放送ができる機器(携帯電話など)
 ④☐ 携帯型でインターネット接続ができる機器
 ⑤☐ その他()
 ⑥☐ ない

(9) 防災拠点として学校(園)に必要なと思われる事柄は何ですか。(複数選択可)

- ①☐ 運営マニュアルの整備 ②☐ 地域との日常交流
 ③☐ 動員体制の確立 ④☐ 一般行政との役割分担の明確化
 ⑤☐ 一般行政からの人的支援 ⑥☐ ボランティアの積極活用
 ⑦☐ 円滑な教職員間の関係 ⑧☐ 家庭・学校・地域の連携・協働のためのコーディネーター
 ⑨☐ その他()

5 防災体制の見直し・改善について

(1) 学校(園)安全計画(危機管理マニュアルを含む)は東日本大震災を受け、内容を変更・改善しましたか。

- ① ☐ 東日本大震災を受け、内容を見直し、変更・改善した
- ② ☐ 東日本大震災を受け、内容を見直したが、変更・改善の必要がなかった
- ③ ☐ 東日本大震災を受け、内容を見直したが、変更・改善までに至っていない
- ④ ☐ 東日本大震災を受け、内容を見直していない

(2) (1)で「①東日本大震災を受け、内容を見直し、変更した」と回答した学校(園)に伺います。どのような点を改善しましたか。番号を選択し 内に変更・改善後の内容を具体的に書いてください。(複数選択可)

- ① ☐ 避難行動や避難場所を変更した

- ② ☐ 災害時の保護者への連絡方法を変更した

- ③ ☐ 児童生徒(園児)の引き渡しに関する内容を変更した

- ④ ☐ 防災教育の充実を図った

- ⑤ ☐ その他

(3) 平成23年度に実施した(または、実施予定の)避難訓練について伺います。実効性を高めるために工夫したことは何ですか。(複数選択可)

- ① ☐ 消防関係者や危機管理課職員の指導を受けながら、避難訓練を行った
- ② ☐ 児童生徒(園児)のいる場所や時間、活動状況を考慮して避難訓練を行った
(放課後や休み時間、部活動中の避難訓練の実施)
- ③ ☐ 校(園)外での活動や下校時を想定し、校外での避難場所等を確認しながら行った
(校外学習や登下校途中を想定した避難訓練の実施)
- ④ ☐ 緊急地震速報を活用して避難訓練を行った
- ⑤ ☐ 停電等を想定し、連絡方法等を工夫した
- ⑥ ☐ 学校と地域が連携して避難訓練を行った
- ⑦ ☐ その他 ()
- ⑧ ☐ 特に工夫はしていない

6 震災の教育活動への影響について

(1) 4月21日に学校(園)を開始するにあたり、登下校時の通学路の安全確保は、どのように行いましたか。(複数選択可)

- ①☐ 教職員による通学路の点検 ②☐ 教職員の通学路への要所配置
③☐ 教職員による引率 ④☐ 児童生徒(園児)の集団登下校
⑤☐ 地域人材(地区防犯協会等)の見守り ⑥☐ その他()

(2) 学校(園)を再開するにあたり、どのような課題がありましたか。(複数選択可)

- ①☐ 給水設備(水道、高架水槽)が復旧していなかった
②☐ 施設・設備が破損して使用できなかった(一部でも)
③☐ 施設の一部が避難所となった
④☐ 校庭に仮設住宅が設置された
⑤☐ 学校(園)に、警察、消防、自衛隊、ボランティアなどの拠点が設置された
⑥☐ 遠隔地に居住する児童生徒(園児)の通学手段の確保が困難だった
⑦☐ 在籍移動の確認ができない児童生徒(園児)がいた
⑧☐ 教科書・教材・教具が不足している児童がいた
⑨☐ 授業や部活動に昼食(給食)を提供するのが困難だった
⑩☐ 通勤のための自家用車がない職員がいた
⑪☐ その他()

(3) (2)の制約を補うために、どのような努力をしましたか。(複数選択可)

- ①☐ 他校の施設設備を借用した ②☐ カリキュラムの工夫
③☐ 家庭・地域との連携 ④☐ 教育委員会との連携
⑤☐ ボランティアの活用 ⑥☐ NPO等外部からの支援
⑦☐ その他()

(4) 開校時に解決できずに残った課題は何でしたか。(自由記述)

自由記述

(5) 児童生徒(園児)の心のケアに関する活動として、どのようなことを行いましたか。(行っていますか。)具体的に書いてください。(自由記述)

自由記述

7 防災教育について

(1) 東日本大震災以前、防災教育としてどのような活動・学習に取り組んでいましたか。(複数選択可) ※学校(園)全体で行う避難訓練は除く。

- ① ☐ 教科・領域で(教科・領域名)
- ② ☐ 総合的な学習の時間の中で(活動名)
- ③ ☐ その他()
- ④ ☐ 避難訓練以外の防災教育に取り組んでいなかった

(2) 当地方にも津波遺跡や津波に関する石碑、言い伝え等がありました。東日本大震災以前にこれらの存在や、過去の記録、伝承を児童生徒(園児)に知らせていましたか。(1つ選択)

- ① ☐ 教科の教材として扱い、知らせていた
- ② ☐ 総合的な学習の時間の教材として扱い、知らせていた
- ③ ☐ 朝会講話等で扱い、知らせていた
- ④ ☐ その他()
- ⑤ ☐ 学校(園)では、特に知らせていない

(3) 東日本大震災で、防災教育の成果が表れた場面がありましたら、具体的に書いてください。
(自由記述)

自由記述

(4) 東日本大震災を体験して、児童生徒(園児)が得たものは何だと思いますか。(最も得られたと思う順番に1～10の数字を記入のこと)

- | | |
|--------------------------|----------------------|
| ① () 命の大切さ | ② () ボランティア活動のすばらしさ |
| ③ () 生きるたくましさ・勇気 | ④ () 家族の絆 |
| ⑤ () 人とのふれあい | ⑥ () 助けあう心 |
| ⑦ () 物の大切さ | ⑧ () 避難行動の大切さ |
| ⑨ () 警察や消防、自衛隊等公共の仕事の意義 | ⑩ () 情報の大切さ |

(5) 今後、防災教育を通して、特に児童生徒(園児)に身に付けさせたい力は、何ですか。(最も身につけさせたいものから順番に1～12の数字を記入のこと)

- ① ☐ () 津波、地震からの避難の仕方
- ② ☐ () 災害時における心理的特性(正常性バイアス^{※1}・愛他行動^{※2}・同調バイアス^{※3})の克服 ※1 ここは安全という思い込み ※2 自分が助けなければという思い込み ※3 みんなでいれば安全という思い込み
- ③ ☐ () 被災後の生活を乗り切る力
- ④ ☐ () 他地域支援へのかかわり方
- ⑤ ☐ () 防災・減災に関する知識
- ⑥ ☐ () 地域の歴史や自然環境の理解
- ⑦ ☐ () 災害発生メカニズムの理解
- ⑧ ☐ () 復旧・復興へのかかわり方
- ⑨ ☐ () 危険や災害への備え方
- ⑩ ☐ () 地域の一員として防災・減災活動に貢献する力
- ⑪ ☐ () 教訓や支援への感謝の気持ちの記録や伝え方
- ⑫ ☐ () 弱者の視点に立った福祉教育

(6) 防災教育として、具体的にどのような学習活動を行っていきたいですか。(複数選択可)

- ① ☐ 命を尊重する心を育てる活動
- ② ☐ 人と人とのふれあいを大切にする心を育てる活動
- ③ ☐ ボランティア活動
- ④ ☐ 自然災害の種類と発生のメカニズムの学習
- ⑤ ☐ 防災団体の活動内容や災害発生時の関係機関の役割を学ぶ(防災施設の見学含む)
- ⑥ ☐ 自然環境と防災の関係の学習
- ⑦ ☐ 地域の災害の歴史と対策について
- ⑧ ☐ 防災関係者による防災教育講座
- ⑨ ☐ 災害時に身を守る方法
- ⑩ ☐ 応急措置や心肺蘇生法
- ⑪ ☐ 救出訓練
- ⑫ ☐ 応急手当の仕方
- ⑬ ☐ 防災伝言ダイヤルの使い方
- ⑭ ☐ 炊き出し・非常食調理

- ⑮ ☐ テント・トイレの設置
 ⑯ ☐ 家具の固定等備えの技術
 ⑰ ☐ (児童生徒園児による)防災マップづくり
 ⑱ ☐ 防災カルタ、絵本づくり
 ⑲ ☐ その他 ()

(7) 今後、地域の復興に向けて力を入れるべきだと思う教育活動は何ですか。(最も力を入れたいと思う順番に1～6の数字を記入のこと)

- () ① 防災教育 () ② 環境教育
 () ③ 国際理解教育 () ③ 福祉教育
 () ④ 人権教育 () ⑤ 健康教育
 () ⑥ 地域学習

(8) 東日本大震災に関する内容を教育活動(防災教育を含む)に取り入れ、効果的に学習を進めて行く上で、必要と思われるものは何ですか。(最も必要だと思う順番に1～8の数字を記入のこと)

- ① ☐ () 防災教育等推進全体計画の例示
 ② ☐ () 指導計画の例示
 ③ ☐ () 実践事例
 ④ ☐ () 指導資料や副読本
 ⑤ ☐ () デジタル教材(震災に関する動画、写真等)
 ⑥ ☐ () 教材データベース
 ⑦ ☐ () 防災関係団体との連携
 ⑧ ☐ () 人材バンクの作成

(9) 東日本大震災と関連づけて行った「ESD」「志教育」の事例を具体的に書いてください。
 (自由記述)

ありがとうございました。

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平成23年度気仙沼市教育研究員

担当：気仙沼市教育委員会副参事 及川幸彦

