



## CONTACT Information

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## FY 2019

Ministry of Education, Culture, Sports, Science and Technology (MEXT),  
EDGE-NEXT, Common Fundamental Project  
Entrepreneurship Program for Leading a Resilient Society

# Future Resilience through Review of the Reconstruction Process

— Kobe, Tohoku and Hokkaido visits —

## A REPORT



## Program Overview

All kinds of disasters occur around the world every year, causing huge damages. According to the United Nations Office for Disaster Risk Reduction (UNDRR), approximately 61.77 million people worldwide were visited by disasters such as earthquakes, tsunamis and floods in 2018, with 10,373 people dying. The scale of disasters depends not only on the types and extent of natural phenomena but significantly on the social structure as well.

Many disasters, including the Hanshin-Awaji Earthquake in 1995, the Great East Japan Earthquake in 2011 and the Hokkaido Eastern Iburi Earthquake in 2018, have also struck Japan. In Kobe, we now find ourselves in a situation where we can look back on the reconstruction period from our current standpoint, arrange the changing issues and efforts along a timeline, then consider what is needed for the best reconstruction methods, in addition to what we should have done better.

Meanwhile, with the Tohoku region still in mid-reconstruction, we are at a stage where we can look back on the reconstruction process up to now while reexamining the future course thereof. Examination of these two reconstruction phases, together with that of the Hokkaido Eastern Iburi Earthquake also still in mid-reconstruction, allows us to consider our overall approach upon handling future disaster recoveries in Japan. Under this program, we provide training in a residential format so as to nurture the knowledge and thinking ability necessary for building resilient societies of the future.

This program is a part of the EDGE-NEXT project by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), and conducted by Consortium EARTH on EDGE.

(Cover photo)

A "Symbolic Space" overlooking the sea in front of JR Onagawa Station, Miyagi Prefecture

(Back cover photo)

A 1/500-scale reproduction of the "Lost City" of Okawa district, Ishinomaki, Miyagi Prefecture

## About EDGE-NEXT

Exploration and Development of Global Entrepreneurship for the **Next** Generation

### A human resource development program supervised by MEXT.

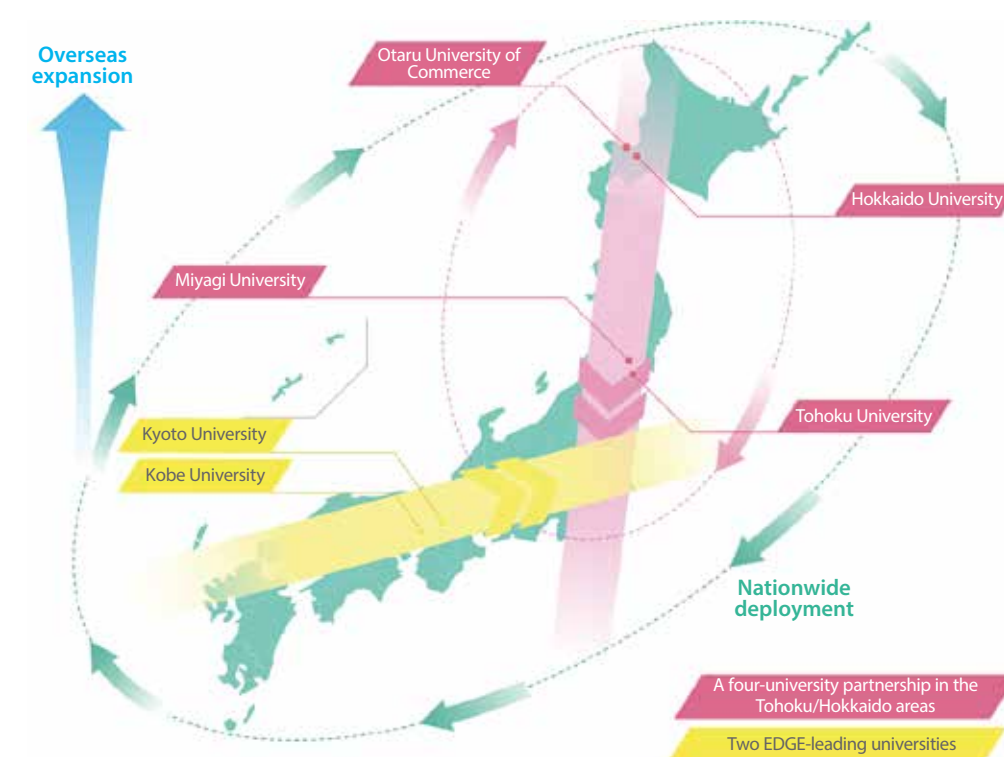
The program educates next-generation entrepreneurs based on Research & Development results gained at institutions such as universities in order to stimulate production of Japanese innovation. It aims to apply knowledge from entrepreneurial education provided by universities throughout Japan to develop and implement educational programs, not only for turning undergraduate and specialized graduate students but also for turning junior researchers into human resources, capable of generating ideas and building business models that bring about transformative changes to future industrial structures.

## About EARTH on EDGE

Entrepreneurial Action Renaissance in Tohoku and Hokkaido on **EDGE-NEXT**

### A consortium formed by six institutional universities in the Tohoku and Hokkaido areas for the EDGE-NEXT program

EARTH on EDGE, an entrepreneurial consortium providing impetus for enterprise-focused education from the Tohoku and Hokkaido areas, works in tandem with Tohoku University (principal university), Hokkaido University, Otaru University of Commerce, Miyagi University, Kyoto University and Kobe University, as well as government, industry, academia and financial institutions, to undertake the "EDGE-NEXT" program for next-generation entrepreneurial education.

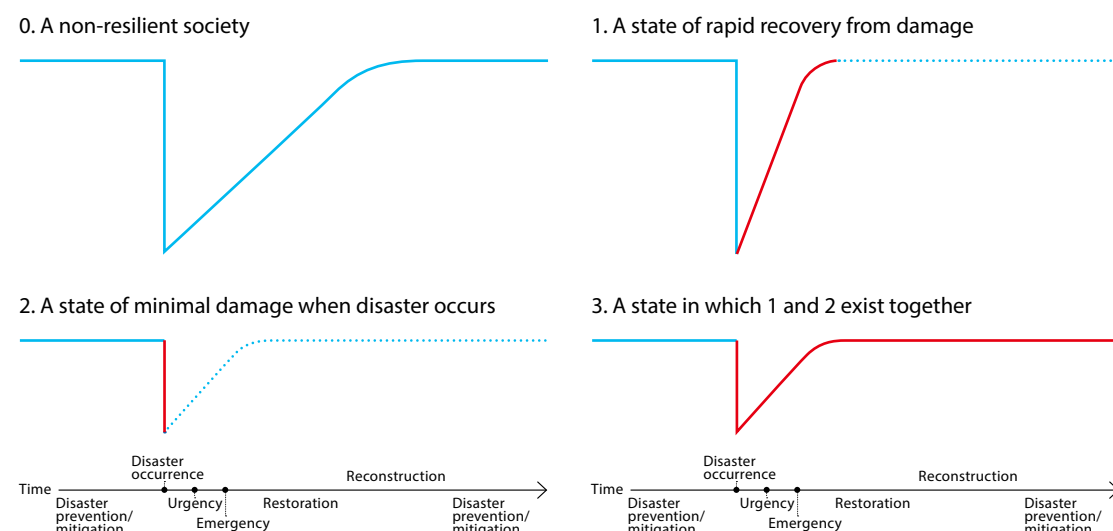




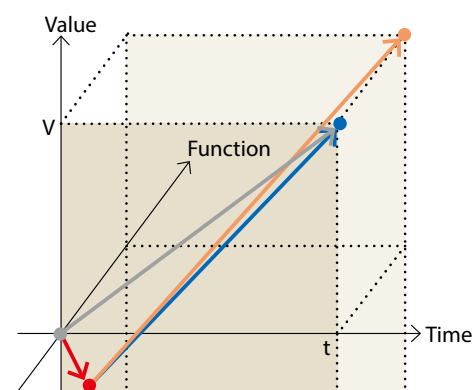
## What Is a Resilient Society?

The word "Resilience" generally means "the elasticity, restorative force, capacity to recover from illness, etc., or toughness" (*Digital Daijisen*, Shogakukan Inc.). It is a word used more recently in the context of psychology to refer to "processes or capabilities that adapt deftly despite circumstances posing difficulties and threats." Moreover, the concept of resilience has come to be seen as a crucial capacity for disaster prevention and mitigation which must be found within industrial and governmental organizations, not to mention in the social and economic fields.

For this program, "resilience" is defined as "the capacity of a system, enterprise, or a person to maintain its core purpose and integrity in the face of dramatically changed circumstances" (Andrew Zolli and Ann Marie Healy, *Resilience*, 2013), and a resilient society as "a society that can maintain its core purpose and integrity in the face of dramatically changed circumstances." It is supposed that a resilient society is one that can achieve the following three states.



Rather than trying to restore society to the same circumstances found before the damage caused by a disaster, achieving a resilient society in the future will most certainly require a new mindset of *creative* restoration. We must aim for regeneration in a form that improves on the past in light of our newfound clarity on how our living spaces were exposed to high risk of earthquake and tsunami (Nobuaki Hamaguchi, *On Creative Restoration*, 2013). We must also encourage activity that builds new regional histories (Toshihiko Hayashi, *Economics of Major Disasters*, 2011).



## Human Resources Driving Construction of a Resilient Society

Based on the definition of resilience and the concept of creative restoration put forward by Andrew Zolli and Ann Marie Healy, this program defines the "human resources that drive the construction of a resilient society" as "people who create and sustain enterprises that give rise to creative value by discerning the vulnerabilities of social systems and forecasting the changes brought on by disaster." We believe that having the following four capabilities - together with basic entrepreneurial skills and ability - will drive construction of a resilient society through the design and realization of new enterprises, in bringing about reconstruction and disaster prevention/mitigation.

### 1. Discerning the Vulnerability of Social Systems

The causes of vulnerability in social systems can be divided into (1) design, (2) realization and (3) operation. Moreover, even within the same social system, different vulnerabilities may emerge depending on the context (historical, cultural, geographical, industrial, etc.).

### 2. Understand impacts due to dramatically changed circumstances

Rather than merely understanding current circumstances, it is necessary to forecast the ways in which society could change due to potential future disasters.

### 3. Adopt the perspectives of self-help / mutual aid / public assistance

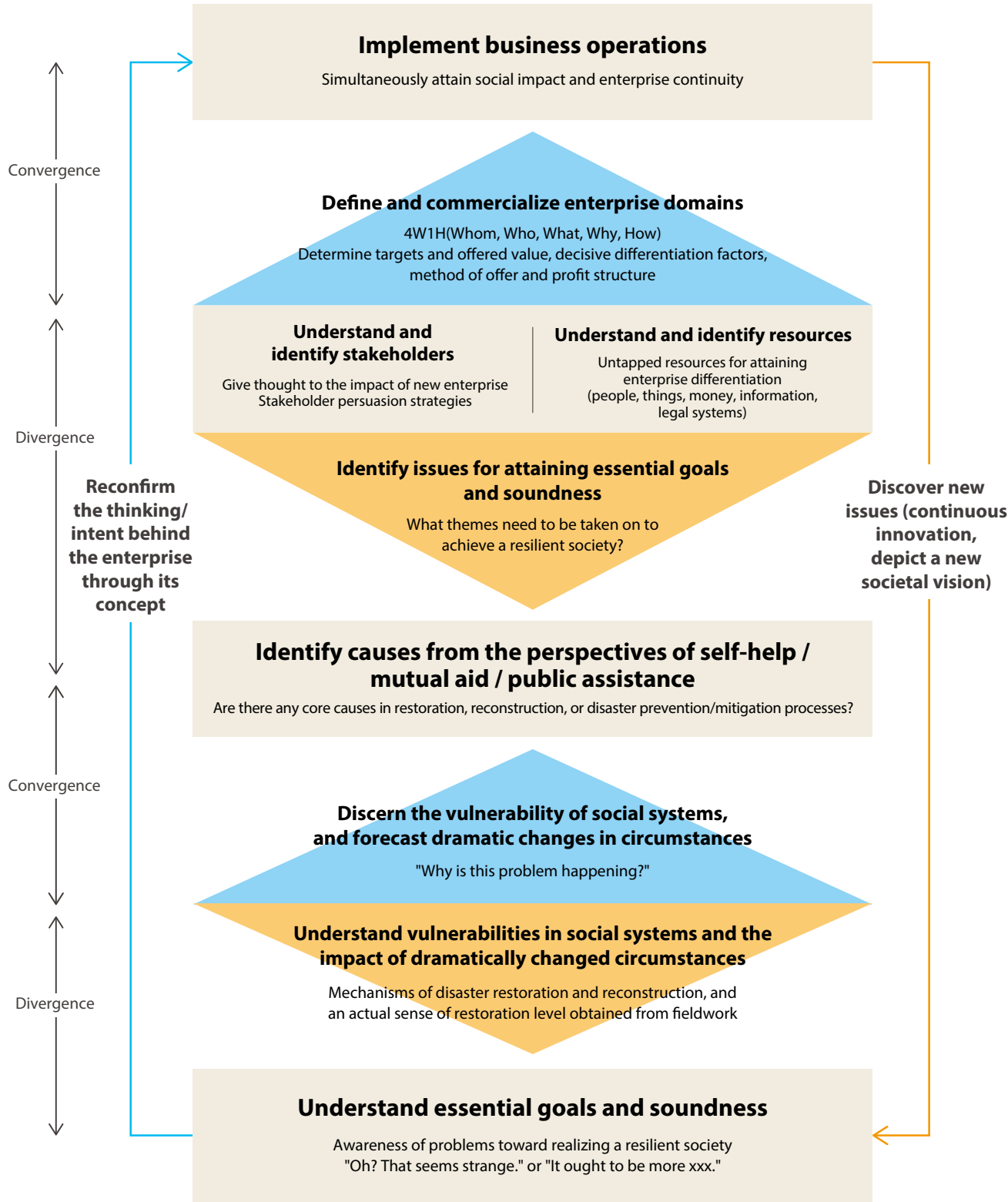
By making use not just of individual personal abilities but also of local communities and governments as well as the national government, enterprises that contribute to reconstruction and disaster prevention/mitigation can improve the potential for instituting and sustaining results.

### 4. Establishing social value together with economic value

We aim to achieve sustainability of enterprises by providing economic value simultaneously with value related to reconstruction and disaster prevention/mitigation (social value).

# Program Process Frame

In considering a project which contributes to the construction of a resilient society, we designed this program assuming that the project makes advances by intercommunicating with processes (iteration).



04

Venue Overview / Schedule

# Venue Overview / Schedule

<b>Kobe Session</b>	Time and date: Sept. 14 (Sat.) - 16 (Mon. [holiday]), 2019 Location: Kobe Port Island Center, Nichii Gakkan Co., Ltd. 7-1-5 Minatojiminamimachi, Kobe Chuo-ku, Hyogo 650-0047 Phone: 078-304-5991
<b>Tohoku Session</b> (Change of plans due to the impact of Typhoon No. 19)	Time and date: Oct 14 (Mon. [holiday]), 2019 Online lecture
<b>Hokkaido Session</b>	Time and date: Nov. 2 (Sat.) - 4 (Mon. [holiday]), 2019 Location: Otaru University of Commerce, Sapporo Satellite 5-7 Kita 5-jo Nishi, Sapporo, Hokkaido 060-0005 Hokkaido University Conference Hall Sapporo55 Bldg. 3F 5-8-1 Kita-ku, Kita 8-jo Nishi, Sapporo, Hokkaido 060-0808 Phone: 011-706-2042
<b>Tohoku Fieldwork</b> (Complement for change of plans due to the impact of Typhoon No. 19)	Time and date: Dec. 14 (Sat.) - 15 (Mon. [holiday]), 2019 Location: Onagawa Machinaka Kouryuukan 2-65-2 Onagawa, Onagawa-cho, Osihkagun, Miyagi 986-2265 Phone: 0225-24-6677

<b>Kobe Session</b>	<b>Hokkaido Session</b>
9/14 (Sat.)	11/2 (Sat.)
Orientation/Lecture / Group work Accommodations: NICHIIIGAKKAN Kobe Meals: breakfast [no] / lunch [no] / dinner [yes]	Fieldwork (Atsuma-cho/Abira-cho) Accommodations: Untapped Hostel Meals: breakfast [no] / lunch [no] / dinner [yes]
9/15 (Sun.)	11/3 (Sun.)
Fieldwork (Disaster Reduction and Human Renovation Institution) / lecture / fieldwork Accommodations: NICHIIIGAKKAN Kobe Meals: breakfast [yes] / lunch [no] / dinner [no]	Lecture / presentation / individual work / fieldwork Accommodations: Untapped Hostel Meals: breakfast [no] / lunch [no] / dinner [yes]
9/16 (Mon. [holiday])	11/4 (Mon. [holiday])
Lecture / Group work Meals: breakfast [yes] / lunch [no] / dinner [no]	Individual work / presentation Meals: breakfast [no] / lunch [yes] / dinner [no]
<b>Tohoku Session</b>	<b>Tohoku Fieldwork</b>
10/14 (Mon. [holiday])	12/14 (Sat.)
Individual work / presentation / lecture Meals: breakfast [no] / lunch [no] / dinner [no]	Fieldwork (Onagawa-cho) / group discussion Accommodations: Hotel El Faro Meals: breakfast [no] / lunch [no] / dinner [yes]
	12/15 (Sun.)
	Fieldwork (Okawa Elementary School /Ogatsu district, Ishinomaki) / group discussion Accommodations: Hotel El Faro Meals: breakfast [yes] / lunch [no] / dinner [no]

## Faculty

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(In no particular order)



## Session Overview

Kobe Session

Tohoku Online Session

Hokkaido Session

Tohoku Fieldwork



## Kobe Session

The Kobe Session was conducted with a focus on understanding the social systems context (history, culture, geography, industry, etc.) and on forecasting the impacts of dramatically changed circumstances (damage to social systems and psychology of stakeholders, etc.).

[Assembly]

Time and date: Sept. 14 (Sat.), 2019, 1:00 PM

Location: Kobe Port Island Center, Nichii Gakkan Co., Ltd.

7-1-5 Minamimachi Minatojima, Chuo-ku, Kobe, Hyogo, 650-0047

Phone: 078-304-5991

U R L : <https://www.nichiigakkan.co.jp/service/kobe-pi/>

### Timeline

Venue/accommodations:

Kobe Port Island Center, Nichii Gakkan Co., Ltd

Time	Sept. 14	Sept. 15	Sept. 16
9:00 AM		Relocation	Lecture/ Group work Social Value and Economic Value
10:00 AM		Fieldwork Tour of Disaster Reduction and Human Renovation Institution Interviews with Victims (Storyteller) Collecting Information on the State of Damage	
11:00 AM			
12:00 PM			Conclusion
	Reception begins at 12:30 PM at NICHIIGAKKAN CO., LTD. building	Lunch Break	
1:00 PM	Orientation Greetings Yoshinori Yajima, Executive Vice President, Tohoku University Matsuto Ogawa, Executive Vice President, Kobe University Program Overview / Self-introductions	Relocation	
2:00 PM		Lecture/ Group work Deciphering the Vulnerability of Social Systems	
3:00 PM	Lecture On Resilient Societies Marutani Tomomi, Vice President, Hokkaido Research Organization		
4:00 PM	Lecture Forecasting Changes Caused by Disaster Occurrence *Forecasting change from historical heritage Norika Yamamura, Researcher, Disaster Reduction and Human Renovation institution Masakazu Matsushita, Project Associate Professor, Kobe University *Changes in psychological state Seiichi Saito, Associate Professor, Kobe University		
5:00 PM			
6:00 PM	Review	Review	
7:00 PM	Dinner Meeting		

## Looking back on the Great Hanshin-Awaji Earthquake of 24 years ago to learn about natural disaster and social systems, disaster occurrence and changes, and what a resilient society is.



Day 1

### Learning about Disaster from Various Perspectives

#### [Four lectures on basic knowledge in planning a project and business]

The following four lectures were given, presenting knowledge essential to planning a project and business to support reconstruction and disaster victims including the actual circumstances of major disasters (particularly major earthquakes), the social systems context (history, culture, geography, industry, etc.), and changes caused by disaster occurrence.

Lecture 1. Natural Disaster and Resilience of the Nation's Land  
(Tomomi Marutani, Vice President, Hokkaido Research Organization)

A commentary was given regarding the crucial importance of networks in a resilient

society, explaining the impacts of natural disasters from various perspectives including those of the nation's land, society and region, as well as the lives of its citizens.

Lecture 2. Researching Past Natural Disaster by Deciphering Ancient Texts  
(Norika Yamamura, Earthquake Disaster Documentation Specialist, Disaster Reduction and Human Renovation Institution)

We can understand the actual circumstances of past major earthquakes by combining modern observational data with records of major earthquakes written in ancient texts. An explanation was given as to the importance and potential of forecasting disaster from materials and/or remains.

Lecture 3. Supporting Voluntary Disaster Prevention Activities with Historical Sources  
(Masakazu Matsushita, Project Associate Professor, Kobe University)

Presentations explained the major impact





that history, geography and culture can have on devastation/reconstruction, and presented examples of local community disaster prevention activities such as festivals that hand down historical materials, evacuation training, etc.

Lecture 4. Psychological change of disaster victims  
(by Seiichi Saito, Associate Professor, Kobe University)  
Role-playing activities were used to outline the emotional issues and ways of addressing them as constituting the most crucial element of support for disaster victims, based upon understanding the emotional aspects of surviving a disaster.

Day 2

**Knowing the Actual Circumstances of the Great Hanshin-Awaji Earthquake, Seeking out Problems and Issues**

**[A visit to the Disaster Reduction and Human Renovation Institution to experience disaster victim narratives]**

The Disaster Reduction and Human Renovation Institution is a facility established to pass on the experiences and lessons of the earthquake that struck southern Hyogo Prefecture in 1995, thereby communicating the information necessary for disaster prevention/mitigation. Visitors can view the detailed exhibits and image content on each floor for a realistic experience of the Hanshin-Awaji Earthquake, and learn about the sequence of events throughout a reconstruction effort spanning 24 years, as well as the struggles of the victims. Students learned what an enormous catastrophe had occurred, hearing firsthand

accounts from narrative volunteer Toshiteru Inaya, and browsing voluminous materials on the earthquake disaster and reconstruction.

**[Sorting out the circumstances at the time of the disaster to discern vulnerabilities of social systems]**

Based on the knowledge they gained at the Disaster Reduction and Human Renovation Institution, students split into groups to discuss problems and issues that could be addressed by enterprise proposals. One group noted the problem that many evacuation centers did not allow pets, raising the issue of evacuation accompanied by pets. Another group raised the topic of how quickly people could be moved in order to save lives. One focused on the issue of getting to know neighbors ahead of time, so that neighbors can help each other during crises. Yet another group selected the point of whether some alternative to evacuation centers could be found for evacuees during the process of relocating to temporary housing.

Day 3

**Coming up with solutions while thinking about "value"**

**[The social and economic value of achieving resilience]**

A form of puppetry called Awaji Ningyoza provides an example from Minami Awaji City in which social and economic values are realized together. Awaji Ningyoza is a theater for performances of Awaji ningyo jurori, a genre of puppetry with a 500-year tradition. It was built to function as a theater during ordinary times and to serve as



an evacuation center in times of disaster.

That is, the economic value derived from performances of puppet dramas maintain the facility, while it provides social value by functioning as an evacuation center in case of emergencies.

Next, the students used the customer value chain analysis method to consider the specifics of social and economic value, thereby discovering what kind of value would be generated, and for whom, by solutions to the issues identified the previous day.

After group work concluded, each individual student sorted out the issues associated with problems they personally found interesting and compiled the social as well as the economic value relevant for consideration.

During the interim before the next session, students worked their way through a planning worksheet to compile their own enterprise proposals. In particular, the worksheet homework included consideration of "Forecast of dramatically changed circumstances," "Problem definition (understanding social systems)" and "Issue identification."





## Tohoku Online Session

An online substitute lecture was held due to the impact of large typhoon No. 19 {Hagibis} in 2019.

[Assembly]

Time and date: Oct 14 (Mon. [holiday]), 2019, 1:00 PM

Location: Online



### Thoughts on enterprise and business contributing to a resilient society: Learning from case examples of self-help, mutual aid and public assistance in restoration/reconstruction from the Great East Japan Earthquake.

#### [Commentary on the Program Process Frame]

The Program Process Frame (see p. 06) is a conceptual tool for formulating enterprise proposals.

Moving from bottom to top, the inverted triangles (with base on top) represent divergence/diffusion in upward-moving processes, while the triangles (with base at bottom) represent confluence/convergence in upward-moving processes. Moving from start to finish through this process of repeated iterations of divergence/diffusion (gathering information to expand ideas) and confluence/convergence (organizing/analyzing information and refining ideas) is a distinctive characteristic of this Program Process Frame. That is, outstanding enterprise ideas do not result from thinking in just one pass. Crafting ideas through repetition of the conceptual progression of

this process frame improves the precision of business projects and strengthens entrepreneurship.

#### [Virtual fieldwork for getting acquainted with Onagawa-cho and Ogatsu-cho]

Akinari Abe, an academic researcher (Tohoku University) shared his own experience of the Great East Japan Earthquake. He is from Ogatsu-cho, Ishinomaki. Engulfed by the tsunami, he spent a night adrift on a fishing vessel. Since the earthquake, he has been working hard for reconstruction, starting businesses in fishing and forestry. He displayed aerial photos of Onagawa and Ogatsu from before and after the earthquake to illustrate his explanation of how the landscape has changed. Districts in which homes were concentrated

everywhere before the earthquake were almost entirely flushed out by the tsunami, transformed into rubble-strewn vacant lots. "If I were to talk about what an ideal society would be for me, it would be a society in which we look at the people (disaster victims) rather than the (disaster-stricken) land as we think about the future," Abe said.

#### ["Self-help, mutual aid and public assistance" actually functioning in the disaster-stricken areas]

Self-help, mutual aid and public assistance are terms originating from the concept of "subsidiarity" laid down in the Maastricht Treaty concluded among European Union nations in 1992. Put succinctly, when subordinate actions cannot be completed, they are supplemented by superordinate actions. Also, self-help, mutual aid and public assistance are likened to the mesh structure of a net. When three nets are stretched one over the other, the risk of things (people) falling through the openings is reduced. And even when bearing a heavy burden, neither net will tear and their elasticity will let it bounce back. This "elastic toughness" is just resilience. This is called the "Theory of Bouncy Networks."

A survey of living situation trends in the Osawa district of Kesenuma city from just before the disaster struck and continuing through to reconstruction shows that many disaster victims passed through the familiar forms of housing, designated evacuation centers and temporary housing. They then eventually arrived at a number of other choices, such as rebuilding outside the district, group relocation for disaster prevention, or public disaster recovery housing. Many of these choices included public assistance measures. On the other hand, there were

also people who took immediate post-disaster refuge at family or friends' homes instead of designated evacuation centers. Many fled to homes in their neighborhoods. This form of evacuation, which was able to function as a type of mutual assistance, is related to the context of plentiful foodstuff and water in which it occurred. As is typical of fishing towns, each household had a storage freezer where food was stockpiled. Moreover, the geographical area is one that features numerous wells with no shortage of potable water. It could be said that this form of evacuation incorporates an aspect of mutual aid.

Public disaster recovery housing is inhabited by gatherings of residents from various locations, so that they cannot necessarily be expected to naturally organize themselves into customary neighborhood associations. At the Oroshimachi Community Plaza disaster recovery public housing project in Sendai city, the government began by selecting a key person to serve as neighborhood association organizer. He/She then visited each home individually to offer an invitation to join the neighborhood association, thus growing its membership. The buildings (hardware) were made with public assistance, while the community within was built almost entirely through self-help and mutual aid.

#### [Important perspectives in making enterprise proposals]

Even after thoroughly considering social value and understanding what needs to be solved, the simultaneous establishment of economic value cannot be hoped for unless a system is created which continuously generates things (results) with great efficiency and at high levels of quality. Linking social value (societal aspects) to economic



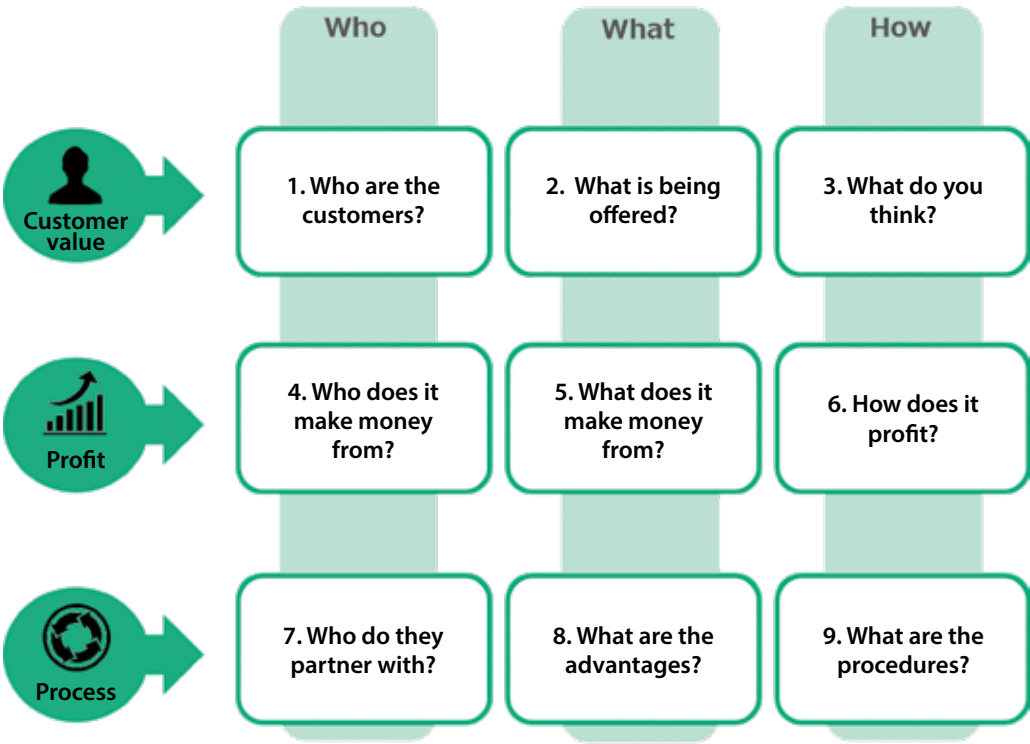


value (business aspects) is no easy task, with enterprises that effectively reconcile these aspects said to produce innovation. Resilient enterprises consist of projects that reconcile the two aspects as mentioned above. The actual form they take is structured in such a way that the enterprise itself addresses social issues and survives by being supported by the market (when products or services sell).

Constructing a system that produces value and profit comes down to two crucial points: creating excellence that is chosen by customers and applying ingenuity to monetize in order to increase profitability.

The "3 x 3 = 9 perspective" is a conceptual tool that provides a framework for thinking about such matters. It is a tool that takes the perspective of the three topics of Who, What and How in verifying the customer value, profit and process of a business proposal. The Study Sapuri app offered by Recruit Co. was raised as a concrete example of the profit element, and students were prompted to think about who provides the money. Uber was then raised as a concrete example of the process element, facilitating explanations of changes among stakeholders, the advantages of the user interface, and payment procedures.

Thinking of Business from the 3 x 3 = 9 Perspective



Source: "Nine questions to ask in generating profit from your business," by Masanao Kawakami, *Nikkei BP magazine*, Feb. 2016

Hokkaido Session

In the Hokkaido Session, lessons learned from the Kobe Session and Tohoku Online Session were put to use in presenting and receiving feedback on projects as well as businesses that contribute to the construction of a resilient society.

[Assembly]  
Time and date: Nov. 2 (Sat.), 2019, 11:00 AM  
Location: Chuo Bus Counter, New Chitose Airport 1F

Timeline  
Venue: Otaru University of Commerce, Sapporo Satellite / Hokkaido University Conference Hall  
Accommodations: Untapped Hostel

Time	Nov. 2	Nov. 3	Nov. 4
			Individual work Presentation preparation
9:00 AM		Lecture / individual work Envisioning enterprise for a resilient society	Opening greeting
10:00 AM		Sharing issue resolution / enterprise / business ideas & offered value	Lecture Knowing What Is Right and Not Doing It Is a Want of Courage —The strength to move forward— Sei Iuchi, Principal, Hayakita Educational Center for Children
11:00 AM	Meet at 11:00 AM, New Chitose Airport Relocate	Establishing value related to disaster prevention/mitigation and reconstruction in tandem with economic value	Lunch break (brunch buffet)
12:00 PM		Lunch break	
1:00 PM	Fieldwork Forecasting Changes Caused by Disaster Occurrence Consideration of Social Systems Observation of Atsuma-cho	Lecture On producing presentation materials	Presentation (Section 1) Designing new enterprise contributing to the construction of a resilient society
2:00 PM		Individual work/feedback Designing new enterprise contributing to the construction of a resilient society Presentation preparation	Presentation (Section 2) Designing new enterprise contributing to the construction of a resilient society
3:00 PM			Evaluation
4:00 PM	Relocate		Closing
5:00 PM	Fieldwork Forecasting Changes Caused by Disaster Occurrence Thinking about Social Systems Observation of Abira-cho		
6:00 PM	Relocate	Presentation/feedback Presentation practice	
7:00 PM	Dinner	Dinner	

Taking a step toward constructing a resilient society by refining and presenting original enterprise proposals while looking out upon areas stricken by the Hokkaido Eastern Iburi Earthquake.



Day 1

[Inspection of Atsuma-cho, where the greatest seismic intensity was observed during the Hokkaido Eastern Iburi Earthquake]

Hisashi Miya, Chief Administrator, Atsuma-cho Dept. of Industry and Economy / Town Development Promotion, guided us around Atsuma-cho.

Of 44 people who lost their lives throughout Hokkaido in the Hokkaido Eastern Iburi Earthquake, 37 were in Atsuma-cho. It was found that the mountainside had shifted, resulting in a massive landslide. The land in the vicinity of Atsuma-cho was originally formed by an accumulation of settling volcanic ash about 9,000 years ago. Heavy rains in July and August 2019 are thought to have increased the fluid content of the soil in Atsuma-cho to 140%. At that point, the Eastern Iburi Earthquake occurred, resulting in large-scale landslides and mudslides. Excavation studies

of buried cultural sites reveal that similar major landslides occurred 4,000 years ago.

With so much time between then and now, it becomes impossible to leave behind traditions that convey the facts of major disasters. By uncanny coincidence, Miya began working at the Atsuma-cho town administrative office in 2011, the year in which the Great East Japan Earthquake occurred. "Since that time," he said, "I have been eager to work for town development looking at people as its starting point." Miya thus started up a venture school that overlaps with his projects to welcome people moving to Atsuma-cho to live. "I have always wanted to make Azuma-cho a community of happy individuals," he said. "I think that with an earnest, resolute approach, I can make it happen. I haven't changed this thinking even today, though we yet have earthquake reconstruction work to do. I think that, for this town's inhabitants, reconstruction means creating the circumstances under which everyone can make rational decisions,



and positively undertake activities to achieve the ideal image for themselves."

[Learning from the Abira-cho Volunteer Centers]

In Abira-cho, Principal Sei Iuchi of Hayakita Educational Center for Children, established the Abira-cho Disaster Volunteer Center after the earthquake occurred. Kenji Hayashi, joint representative of Founding Base, also joined in that effort. Iuchi and Hayashi subsequently developed and operated the Disaster Volunteer Center, then established the Abira-cho Reconstruction Volunteer Center. Rather than engaging in restoration tasks like clearing away rubble, their organization was created in response to the diverse difficulties suffered by the disaster victims, and to the voices of those eager to do something for the town. One of the activities of this organization, called "Abira Mirai Jyuku," was set up to provide middle-school learning support. "In the past, Japan used to have 'mutual aid,' but these days it doesn't seem to function much anymore, not just in big cities but in small towns like Abira-cho as well," said Hayashi. "That's why we felt like creating some 'mutual aid' in Abira-cho."

Day 2

Thinking about enterprise which contributes to the realization of a resilient society

[Refining enterprise proposals using planning worksheets]

Planning sheets provide spaces for specific content on enterprise vision and social problems/issues, and plus solutions. Social value is entered on the lefthand side, while economic value is entered on the right (see p. 25). Monetization is crucial to an enterprise that realizes social value while being highly sustainable. Monetization methods can be broadly organized into eight categories: Product sales consist of making things and selling them. Retail enterprise consists of buying-in and selling things. Advertising consists of gathering information and informing the market. Matching consists of linking people who want something with others who want to provide it. Consumable goods enterprise consists of profiting from goods used by something, rather than the thing itself. Subscription businesses profit continually through monthly or other regular payments. Aggregation and reuse businesses are exemplified by online aggregator websites. Freemium businesses are designed to serve both free and paid users. The most important aspect of an enterprise or business is whether all stakeholders are benefitting from it. Students then discussed their enterprise proposals with the above points in mind. After returning to their dormitories, they continued refining their enterprise proposals late into the night.

Day 3

Students present their enterprise proposals

[From a moment of silent prayer for earthquake victims to the keynote speech by Sei Iuchi]

The presentation conference was held upon welcoming guests Takuya Saito, Director of the Division of Regional Support Industry-Academia Collaboration in the Science and Technology Policy Bureau of MEXT, Abira-cho Mayor Shuichiro Oikawa, Tamagawagumi Corp. President Yuichi Tamagawa, and Hokkaido Research Organization Director Tomomi Marutani. After observing one minute of silent prayer for the victims lost in the Great Hanshin-Awaji Earthquake, the Great East Japan Earthquake and the Hokkaido Eastern Iburi Earthquake, greetings were presented by Tohoku University Executive Vice President Yoshinori Yajima, Hokkaido University Graduate School of Engineering Research Director and Dean Tsuyoshi Setoguchi, as well as Mr. Saito.

Next, Abira-cho Reconstruction Volunteer Center Director and Hayakita Educational Center for Children Principal Sei Iuchi delivered a keynote address titled "Knowing What Is Right and Not Doing It Is a Want of Courage." In clear and lucid manner, Iuchi gave a detailed account of the sequence of events from the occurrence of the Hokkaido Eastern Iburi Earthquake of September 6, 2018, up to the current moment one year later. "The Hokkaido Eastern Iburi Earthquake occurred at 3:07 AM on September 6, 2018. With shaking at level 7 on the seismic intensity scale, it was impossible to stand up, and we could only crawl on all fours," he said. "I'll now show you some video of the inside of the building, where things were being thrown off of shelves by the shaking. This is an image taken on the day after the quake. It occurred on the very day that 5-year-olds were having an 'overnight childcare' night, and by coincidence, a TV station was there to report on it."

The manual for Hayakita Educational Center for Children specifies that if an earthquake or other such event occurs, the parents of the children are to be contacted to come pick up their children. Upon experiencing the violence of the quake, however, Iuchi considered the possibility that there could be parents who were injured or had died and chose to continue to care for the sleeping children without sending them home. He also sent out a group e-mail several minutes after the quake, reassuring parents that "Everyone at the center is unharmed."

Many parents came to pick up their children the next morning, Sept. 7, but local administrative officials and medical professionals were so preoccupied with the earthquake disaster response that they hardly had time to come pick up their children. It was from some of these parents that calls came in asking when the center would start taking in children again. Iuchi decided to reopen the





center on Sept. 8, just two days after the earthquake. Since some of the center staff were among the disaster victims, however, it was very short-handed. This was when Iuchi used Facebook to make a sudden recruiting post: "We can reopen the center tomorrow, but there aren't enough teachers. Please help us." An hour after this was posted, offers had come in from 30 people. Upon contacting Abira-cho Mayor Shuichiro Oikawa to ask if there was anything he could do to help, he was told that the Abira-cho Disaster Volunteer Center was to be established and asked to serve as its director. He stayed up all night creating and publishing the website, not to mention a Facebook account and page, as well as a Twitter account. He adapted the center's attendance system without alteration to online volunteer registration. Possibly because it was so easy to use, it gathered a great many volunteers. The number of volunteers registered at the Abira-cho Disaster Volunteer Center eventually reached 2,400. Since a wide range of requests for help other than disaster restoration rubble-clearing came in from local residents, he joined with Kenji Hayashi to launch the Abira-cho Reconstruction Volunteer Center. The Reconstruction Volunteer Center works for local community revitalization by planning numerous events that local residents could participate in, such as barhopping and rice cake pounding events. "I think of earthquake reconstruction as something that's centered around the people of the town, rather

than the town administration," Iuchi said in concluding his address. "It's reconstruction that moves forward based on what you might call 'mutual aid.' We continue these activities with the idea that the Reconstruction Volunteer Center exists as a hub for the diverse people of our town. The title of today's talk, "Knowing What Is Right and Not Doing It Is a Want of Courage," comes from the words I heard when I was a middle school teacher, from another teacher to whom I owe a debt of gratitude. These are words that have always remained with me, and with which I constantly question myself."

**[At last, the enterprise idea presentations are made, as students hold forth passionately on their ideas]**

In the afternoon, the long-awaited crowning moment of the program came, in which the enterprise ideas were presented. The students gave presentations in which each person was allotted five minutes, followed by evaluation. The panel of six evaluators included Abira-cho Mayor Shuichiro Oikawa, Abira-cho Reconstruction Volunteer Center Director Sei Iuchi, Atsuma-cho Municipal Office Senior Staff member Hisashi Miya, Tamagawagumi Corp. President Yuichi Tamagawa, Kyoto University Professor Tetsuo Kitani and Miyagi University Professor Senhiko Nakata. The titles of enterprise proposals by students are shown on the next page.

Title of enterprise proposal	Name	University
Let's (re)build our "ways."	Ryo Onodera	Hokkaido University
"Emergency Survival Kit Periodic Check Service" like household medicine kit distributions	Haruka Mishima	Kobe University
Emergency Economy Class Syndrome Prevention System	Keita Nakaji	Shiga University of Medical Science
Creating a Location Yamamoto-cho Residents Can Enjoy	Akane Teshima	Miyagi University
Local Buffer	Naoto Inagaki	Waseda University
1.5th Place to Stay	Ryosuke Hino	Kyoto University
Collective House for One	Rika Nakayama	Miyagi University
Itacolumite (jelly stone)	Saiya Ikihoshi	Nagoya Institute of Technology
Industry/Regional Mutual Aid	Keita Shiomitsu	Kobe University
Tsunami Evacuation Guidance Signage to Protect Foreign Tourists	Masaki Ono	Nagoya Institute of Technology
Reeling in the Future: "Spinning Thread"	Yoshimitsu Sawaoka	Kobe University
Personal Banking Equipped with Disaster Support Functions	Ryota Nara	Kobe University
Hitch-fighter	Takafumi Shimizu	Hokkaido University
Evacuation with Pets Pet Crates Supplied to Evacuation Centers	Kotoko Watanuki	Miyagi University
Student Volunteer Support System	Keisuke Uzu	Tohoku University
From Sandbox to Real Society	Takafumi Mochizuki	Hokkaido University
Hazard Simulation Game	Yudai Nishi	Kobe University
Disaster Prevention Cafe	Yuki Koroku	Kobe University
Voice Pick Up	Hiroto Tsuchiya	Shizuoka University
A Society That Shares When Personal Belongings Are Urgently Needed	Atsutoshi Tanaka	Kyushu University

(Participant Atsutoshi Tanaka was unable to attend the event on that day and gave his presentation to the faculty in charge and the students on the previous day.)

The content of the enterprise proposals was diverse. It ranged from projects involving Fundamental construction to those that narrowed the focus to individual circumstances, and from those assuming circumstances during a disaster to those that would be of use months or years afterward. The evaluators appeared to find each enterprise proposal extremely appealing, expressing strong interest and engaging in lively question-and-answer exchanges. Each one of the enterprise proposals was designed to operate both during ordinary times and during emergencies, and to be sustainable from the standpoint of monetization. Each enterprise proposal was worked up into a plan that incorporated the fourth capability in our definition of "human resources that drive construction of a resilient society." Each one was a challenging enterprise proposal to realize a resilient society.





# Tohoku Fieldwork

Tohoku Fieldwork consisted of gathering information on reconstruction and disaster prevention/mitigation through on-site observation and interviews.

[Assembly]  
Time and date: Dec. 14 (Sat.), 2019, 12:00 PM  
Location: Sightseeing Bus Stop, Sendai Airport 1F

Timeline Venue: Onagawa Machinaka Kouryuukan  
Accommodations: Hotel El Faro

Time	Dec. 14	Dec. 15
		Relocate
9:00 AM		Fieldwork Consideration of Social Systems Observation of Okawa Elementary School
10:00 AM		Relocate
11:00 AM		Fieldwork Consideration of Social Systems Observation of Ogatsu district, Ishinomaki city
12:00 PM	Meet at 12:00 PM, Sendai Airport	
	Relocate	Lunch break
1:00 PM	Fieldwork Consideration of Social Systems Observation of Onagawa-cho	Relocate
2:00 PM		Group discussion Discerning the Vulnerability of Social Systems
3:00 PM		
4:00 PM		
	Relocate	
5:00 PM		
	Social gathering	
6:00 PM		



## Day 1

### Learning about reconstruction of Onagawa-cho

#### [Learning about the relationship between administration and private sector in Onagawa-cho]

We spoke with Takahiro Aoyama, director of the Public-Private Partnership Office of the Onagawa-cho Industry Promotion Section and a key figure in the reconstruction of Onagawa-cho, as well as Office staff member Hideki Doi. There lies a broad, beautiful brick road, with modern, chic storefronts of wooden construction lining each side. This is the scene along Onagawa Station-Front Nigiwai Kyoten, a short retail shopping street that continues in a straight line to the ocean. From the observation space atop the new Onagawa Station Building (designed by architect Shigeru Ban), the ocean can be seen beyond the brick road. On New Year's Day, visitors can watch the first sunrise of the year directly in front. Since the station building was completed in 2015, word of the view of the New Year's Day sunrise from this spot has gradually spread by social network services and word of mouth. As many as 1,000 people now gather in the station-front plaza every New Year's Day.

Having suffered widespread damage from the Great East Japan Earthquake tsunami, Onagawa-cho made the decision to implement group-relocation of public offices and housing rather than building a seawall. However, National Highway 398, which cuts through the town, was laid down on a 5.4-meter embankment, so that it effectively functions as a seawall. In Onagawa-cho, historical data reveals that 4-meter tsunamis come about once every 100 years. It was for this eventuality that the national highway was located on top of an embankment. Aoyama explains: "When a tall tsunami like the one that struck eight years ago comes, everyone needs to flee together to high ground. The area around here will

be submerged during the tsunamis that come once in 100 years. Why, then, did we build this Nigiwai Kyoten spot in such a low-lying area? It's because we wanted to build a facility to attract visitors which is not (solely) for the purpose of consumption, and to make that the center of Onagawa." Doi adds that, "Town development in Onagawa-cho is different from those found in other towns. I have been involved in town development for all of the past eight years, but it's recently that we've been having about 1,000 visitors a year from companies who come here on observation visits. Among private-sector companies in recent years, there's been an increase in those that tout efforts like 'sustainable society' and 'contributing to local communities.' I think that Onagawa's town development reconstruction process can provide a very useful case for companies like that to refer to. I think it provides valuable lessons for cultivating leaders 10 years down the road. I would like to communicate this Onagawa reconstruction process across generations. I want you to know that as we develop our town, we do so with a desire to convey this to generations such as yours."

In Onagawa, a Restoration Plan Formulation Committee was formed only a month after the Great East Japan Earthquake, centering on the Onagawa Town Society of Commerce and Industry chaired by Masanori Takahashi. Although it was a voluntary organization lacking incorporated status, its membership grew to as many as 70, and formation of the organization marked the start of Onagawa's reconstruction and town development. Takahashi began his opening address as follows at the gathering on the first day of the organization's formation: "I have been working on Onagawa's town development over the past 30 years. Although now 60 years old, if told to 'Do it once again' by my elders, there's nothing that I can't do. However, having the mindset of the older generation, as I do, I cannot make a new Onagawa myself. I hope to leave the future reconstruction and town-building efforts



entirely up to people of a younger generation in their 30s and 40s. I want their town reconstruction to be informed by the adage that says, 'people over 60 should keep their mouths shut.'"

This was Takahashi's way of declaring a delegation of authority over town development to a younger cohort of Onagawa business managers.

"If this scene had not occurred, we wouldn't have the Onagawa we have today," said Aoyama. "It was from this moment that reconstructive town development by our generation began. By the time that first meeting ended, my generation had determined that we were resolved. To all of you who are college students, when in the future you are adults with full-fledged careers, the day will definitely come when your elders entrust you with the future. When that happens, I want you to undertake it bravely."

"I am a public servant," added Doi. "But government administration alone will not be sufficient to carry out the commitments of public service as we move forward. It is having the government and private sectors form one team with a shared vision, each doing what it does best, that I think represents the future of public service. Mr. Aoyama is a professional in commerce, but he couldn't build a road. I've never done any business, but I know a thing or two about city planning. If we pair up and do what we're good at, then we can do things like make a retail street and align it with the rising sun. It's by doing things in this way that I aim to realize a sustainable local economy for Onagawa-cho."

Day 2
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Visit to Ishinomaki, and the ruins of Okawa Elementary School and Ogatsu-cho

[Learning about the scars that remain from the earthquake]

The Kamaya district, in which Okawa Elementary School was situated, was devastated by two tsunamis, one flowing in toward the mountains from the sea, and another which flowed back down toward the sea after surging up the Kitakamigawa River. We now know that it was the latter, reverse river-borne tsunami that had the most forceful flow. That is why the crossing corridor at Okawa Elementary School collapsed toward the ocean. Yuto Naganuma, a college student who serves as a narrator

for the Okawa Tradition Society, explained the scene of disaster damage: "The Great East Japan Earthquake itself is not the reason I decided to become a narrator. Two days before that earthquake disaster, there was an earthquake centered off Sanriku which had a maximum intensity of lower 5. I was a high school freshman at the time. It happened to be a day off, and I was on the beach when the earthquake occurred. I felt terror at the violent shaking and went home as fast as I could. But that was it, and once I got home, there was no conversation with my family about what to do if a tsunami were to come." Two days later, the Great East Japan Earthquake struck. Of Naganuma's family of eight, three lost their lives in the tsunami, his grandmother, great-grandmother and a younger brother. The younger brother was a second grader at Okawa Elementary School. The number of people in his family was cut in half.

Ever since the devastation, Naganuma said, he has suffered continual regret: "Why didn't I talk with my family about things like an escape route after the earthquake two days before? If we had talked it over then, we might have saved the three of them."

Okawa Elementary School had an evacuation manual, in which it was written, "Flee to a park in your neighborhood." But there are no parks in the vicinity of Okawa Elementary School, which is backed up against a mountain. The mountain behind the school was familiar to the students as a site for lessons in cultivating Shiitake mushrooms. At the moment that the manual proved useless, why didn't the students choose to flee to the mountain? "This event well demonstrates the fact that it is not mountains and buildings themselves that protect lives from tsunamis," Naganuma said. Rather, it is people who protect lives by choosing these as places of refuge. "I hope you will all learn from this lesson."

[Thinking about what reconstruction means to people]

In Ogatsu-cho, an enormous seawall 9.7 meters high and 1.8 kilometers long was built immediately, in full view. It is only upon passing through the wall to the seaside that the ocean first comes into view. Ogatsu-cho, which in the past was together with the sea, has now been cut off from it. After the earthquake, while building this giant seawall, Ogatsu-cho also created an area of high ground 20 meters above sea level about 100 meters away. It was to this high ground that the group-relocation was carried out.

Planning Sheet Sample



**Planning Sheet**  
Columns are provided for participants to conceptualize their enterprise visions on their own, describe problems and issues in society, specify content of their solutions, etc., with the social and economic values being entered on left and right side, respectively.

Evaluation Sheet Sample



**Feedback Sheet**  
A set-up has been structured to allow participants, after presentations, to evaluate and score the clarity, explicitness and other aspects of own advocated items, with instructors being enabled to offer their feedback about these presentations.

# Toward the Next Fiscal Year

The entrepreneurs who are needed all over the world are most likely those who are able to act now to solve the complex social problems likely to emerge in the future. From the standpoint of Sustainable Development Goals (SDGs), the people needed are those who can take a bird's-eye view of the ripple effects of a project, establish social and economic values in tandem, and solve specific problems. This Educational Program to Drive Construction of a Resilient Society by Inculcating the Entrepreneurial Spirit takes on the challenge of developing such human resources on themes of disaster prevention and mitigation.

One of the issues left over from the program carried out in Fiscal 2019 was that most of the enterprise proposals presented by the students ended up as no more than proposals. While there were some that advanced to the execution phase, we would like to consider how we could induce implementational action so that the proposals will not end as mere ideas. With involvement by universities alone, there are limitations on taking enterprise proposals through to execution, which makes cooperation by numerous stakeholders such as industry and local government essential.

The Fiscal 2019 program was designed and implemented with universities collaborating with the EARTH on EDGE consortium at the core. During the coming fiscal year, 2020, participation will be promoted among numerous universities, research institutes, local governments, corporations, NPOs and others with the aim of building a fuller system. And in Fiscal 2021, we plan to partner with overseas universities and institutions in order to seek out ways of implementing activities overseas. If you concur with the aims of this program, we would gratefully appreciate any support or cooperation you may be able to give. We would very much like to work together to educate entrepreneurs who will drive the construction of resilient societies.

Driving Construction of a Resilient Society  
A Program to Inculcate the Entrepreneurial Spirit,  
Design/Operating Faculty

# Main Sponsorship / Support / Cooperation

This project is conducted as a part of the Exploration and Development of Global Entrepreneurship for NEXT Generation (EDGE-NEXT) by the Ministry of Education, Culture, Sports, Science and Technology.

## Kobe Session

Hosted by: EARTH on EDGE  
Multidisciplinary Integration for Resilience and Innovation (MIRAI)  
Research Unit, Kobe University  
Creative Dojo, Graduate School of Engineering, Kobe University

## Tohoku Session

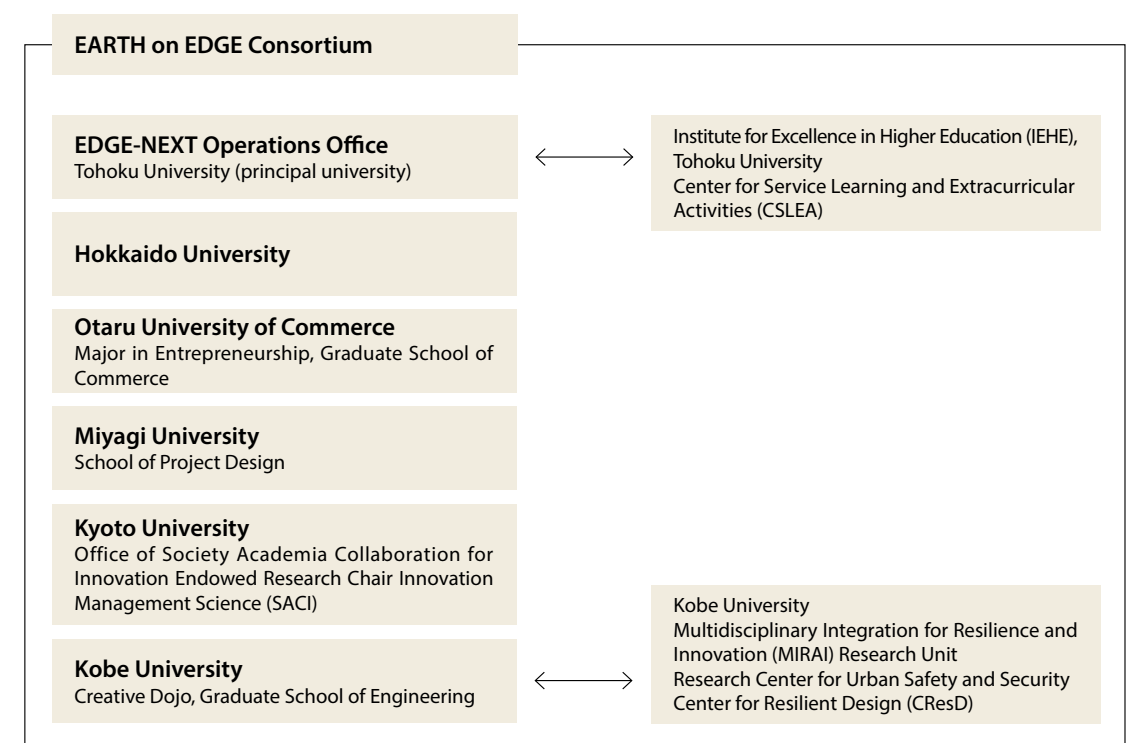
Hosted by: EARTH on EDGE  
Supported by: Onagawa-cho

## Hokkaido Session

Hosted by: EARTH on EDGE  
Supported by: Center for Natural Hazards Research, Hokkaido University  
Atsuma-cho  
Abira-cho  
Abira-cho Reconstruction Volunteer Center

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Nexco-Maintenance Kanto Company Limited  
IHI Fundamental Systems Co., Ltd.

# Implementation System



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Designer: Oval Co., Ltd.