# UNESCO CHAIR WENDI
# RESILIENCE BRIEF 2020
# BY GRADUATE STUDENTS

KYOTO UNIVERSITY UNESCO CHAIR WENDI
Course for Creating Resilient Societies

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*The UNESCO CHAIR WENDI Resilience Brief* 2020 is a collection of brief reports by Kyoto University UNESCO Chair WENDI graduated students, who have worked on their independent studies or fieldworks under a compulsory elective subject: 1) "Social Innovation and Resilience" or 2) "Practices for Creating Resilience" provided by Course for Creating for Resilient Societies (CRS) in UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (WENDI), Kyoto University, during 2019-2020. As a part of this activity, we organized Workshop on Creating Resilient Society on Feb. 27, 2020 to share their activities and drive collaborative dialogues with invited participants from different backgrounds based on the presentations by the graduate students and authors of this report. We hope this report will contribute to building collaborative knowledge on creating resilient societies. We will keep working on the theme of Creating Resilient Societies with relevant vigorous activities and research.

KYOTO University WENDI

Course of Creating Resilient Societies Faculty Member/Associate Professor, Mika Shimizu

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*UNESCO CHAIR WENDI Resilience Brief 2020*

# Moving forward into Resilient Society:

# Toward ten years after the Tohoku Earthquake in Japan

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## Background: After the Tohoku earthquake

After nine years since the Tohoku earthquake (平成 23 年東北地方太平洋沖地震) with a 9.0-magnitude earthquake, tsunami, and the Fukushima Daiichi Nuclear disaster(福島第一原子力発電所事故) in 2011 happened in Japan. Japan is facing another recovery phase: The Japanese government established the Reconstruction Agency( 復 興 庁 ) in 2012. The objective of rebuilding the devastated areas within ten years but is about to extend the Agency's term by ten years until 2031 confront a wide range of social and economic challenges. Challenges to recovery in the Northeastern(Tohoku/東北) area is still ongoing. The Japanese government has exerted efforts to restore the infrastructure and facilities. Some locals feel that the Japanese government has focused too much on the reconstruction of infrastructure while they hope to take care of other different priorities - for recovery in their hometown. Visiting the affected sites in Tohoku reveals the challenges and issues that need to be addressed to make society resilient to natural disasters.

Resilient society can cope with disasters and produce better outcomes in the face of adversity. More specifically, United Nations Office for Disaster Risk Reduction(UNISDR, 2009) defined resilience as the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of the hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions

While reducing disaster risks is one portion for the resilience involves plural aspects in humans, societies, economies, ecologies, and others, with heterogeneous stakeholders from the varied levels. To understand resilience better, we should be able to understand the linkages between the three among multi-dimensions interacting closely with each other. Regarding the Sendai framework statement, which says that enabling 'Build Back Better' is the key to disaster recovery, from a resilience perspective, multiple stakeholders should agree on 'what' are better things and 'how' they will make it. It seems the Japanese government needs to look into more on people and the natural and social environment so it can gear toward a resilient society.

## Bridging Gaps Between the Government and Local Communities

In the Northeastern (Tohoku/東北) area, governments have steadily taken steps to rebuild the Tohoku area, but, in terms of the linkage of approaches for recovery between the government and local communities, there are disarrays. Building seawalls is an example to represent the disarray: What the government did is that building massive concrete seawalls like another the Great Wall in Japan around the north-eastern coastline, which costs more than ¥1 trillion to defend from tsunamis.

This seawall construction work is going ahead, despite protests from locals and controversies

continue. Locals oppose these giant seawalls, claiming that these will cause environmental problems, destroying the eco-system and ruining the beautiful scenery. To be sure, seawalls block the flow of water, sand, and living creatures between land and sea so that biodiversity issues come into play, but also the livelihoods of local people. Locals I met during the visit of Maehama District(前浜地区) in the southern region of Kesennuma City(気仙沼市), Miyagi Prefecture(宮城県), pay attention to the linkages between humans and nature, which is a critical component for building a resilient society. (Shimizu and Clark, 2019). Particularly the inhabitants born and bred in the local areas feel disconnected from nature in facing the seawall. One resident who spent his life as a fisherman said, "Human beings cannot live apart from nature. The Tohoku earthquake was vicious, so that there was nothing we could stop it, but we should be together with it. I think building such a large structure evades the connection." He knows well that humans and societies in nature are inseparably linked. Another inhabitant said, "I was born in the sea, and would like to die at sea even though still I am terrified of the previous catastrophe."

The head monk of Rinno-Temple(輪王寺), Hioki Doryu(日置道隆) has initiated to construct another seawall, which is more biological and environmental. He founded the Forest Breakwater Seawalls Association(森の防潮堤協会) and has promoted to plant the forest seawalls. One Thousand Hope Hills(千年希望の丘) in Iwanuma City(岩沼市), Miyagi Prefecture represents how he responded to a natural disaster in collaboration with Iwanuma City and his colleagues. They build large hills by mixing tsunami trash with soil and planting various trees with the most robust roots from biodiversity, on top of them to create 'forests which protect the life of lives.' Before the Tohoku Earthquake and Tsunami, the government planted only one species of pine trees, and they learned it is not adequate to protect themselves. The point here is Doryu did not go to concrete materials; he has studied more forestry to get over the next tsunami. He also utilized lands that have become uninhabitable to use as a refuge for tsunami and earthquake, while leaving the memory of the Tohoku earthquake as green embarkment where people planted various types of seedlings from all across the country. While infrastructure is critical, rebuilding a new and more robust infrastructure does not bring back the lives of citizens who suffered from disasters. The government decided to keep nature and people apart to protect residents by reinforcing the concrete seawalls, while residents want to preserve their local culture, lifestyle in communion with nature. Two contrasting responsiveness, concrete seawalls versus forest seawalls, articulates that the government took a fast-track rather than thinking through the implications.

Based on the above example, the key to understanding the gap is 'resilience.' It is all-important that the government and stakeholders do not lose sight of the holistic approach, which is a critical component of resilience. The holistic approach tends to lack in the bureaucratic systems, under which organization schemes define the genetic makeup of its moves, people deal with their works according to specific rules and procedures, not based on flexible processes, creative thinking, and relationships. Bureaucrats tend to focus only on specific points within their defined roles and have limitations in looking at the whole situation beyond their territories in collaboration with others in handling complicated tasks through multiple scopes. If the government seeks to for building a resilient society, they need to transform their way of doing their works through resilience perspectives.

Processes are critical in the linked with individual, social, ecological, environmental contexts since a resilient society is not only about one aspect; it encompasses multi-dimensions. That is why 'resilience' means a multi-dimensional social organism. Resilient society calls for elastic and inclusive countermeasures through social organisms rather than a stiff system. How could we function the social organism for a resilient community/ society?

**Strengthening resilience in a traditional way**

Mainichi Newspaper (毎日新聞) surveyed 1,274 men and women over the age of 18 between October and December in 2018. According to the result of the survey, 78 percent of people think the Tohoku earthquake is 'the most memorable event'

that happened in the Heisei era(平成: 1989-2019)[1], Japan always emerges stronger from adversity. Many researchers and locals have instituted in several domestic and international literature on the memories and lessons learned from this natural calamity. It guides how the next generations can prepare and recover for the coming disaster and will produce motivation in which old ways are updated and conferred interests overcome to create a new accord that results in a resilient, sustainable and competitive society.

Ishinomaki NEWsee (石巻ニューゼ) exhibited a collection of articles from the hand-written Ishinomaki Hibi Shinbun/The daily Ishinomaki Newspaper (石巻日日新聞社) and preserved the vivid scenes of the day since it was not able to print right after the earthquake. This devastated Ishinomaki city(石巻市) makes locals anticipate the possibility of earthquakes and tsunami in the future. The created images fires away fear among locals and give what they should do to survive and stressed the need for constant vigilance. Ishinomaki NEWsee is a modern version of stone makers recording the level of tsunamis warning not to build one's home below this point. As such, both central and local governments, local organizations, and locals have commemorated and to hand down the Tohoku earthquake. UNESCO said about the role of culture in its paper "The Future We Want," the significance of culture in a resilience concept. It described that culture plays a vital role in both pre-stage and post-stage of a disaster by reducing risk incorporating traditional knowledge and rebuilding a sense of community. In this regard, Japan is outstanding to bequeath the civic spirit of resilience as a culture. This collaboration offers a valuable glimpse at a resilient perspective and considered social capital.

**Looking Ahead: Reshaping Paradigm for a Resilient Society**

Another grassroots initiative by the Japan Car Sharing Association(日本カーシェアリング協会) allows us to see how civic movement could bring social change from the bottom up. It launched a ride-sharing service for people, especially those who are the elderly and socially disadvantage in greatest need. It took note of the sharing economy to know down isolated locals, strengthen mobility and community network. Botsman and Rogers proposed in 2010 from their book, "What's Mine is Yours." They defined the sharing economy is an economic model based on sharing underutilized assets or services, for free or for a fee, directly from individuals through an online platform. Some companies like Airbnb, Uber, and many others have become global operations but not so much in Japan; for example, the Japanese government restricted ride-sharing services due to protests by taxi companies. Still and all, the Japan Car Sharing Association kept an eye on the benefits of sharing economy, such as increasing self-reliance, sustainable consumption, less negative environmental impacts, and forming a supportive community.

This innovative car-sharing has engaged in solving the problems that the government could not take care of in some parts of the community. Needs come in all ages and lifestyles, and it turns out that the government can't respond in the front lines on account of equality, procedure, and cost with vehicles lost and damaged during the Tohoku earthquake. Emergency Instructions state in an emphatic tone, that one must evacuate to shelters, but some people could not go out of the house because they were afraid for their pets, or one of the family members has physically or mentally constraint to go out. These circumstances impinge on the lives and hardly appear within the documentation, limiting the assistance from the government. The Japan Car Sharing Association contributes to solving these problems. This is the reason why bottom-up social innovation is indispensable.

The Japan Car Sharing Association provides riding-sharing at a fraction of the fee, which is about to fuel charge; it receives subsidies from the government for labor costs and accepts monetary and vehicle donations from citizens and companies. All the users have to do is making a reservation on the phone. The Japan Car Sharing Association utilized online access to collect contributions through

[1] https://mainichi.jp/articles/20181230/ddm/002/040/041000c

Amazon or other crowdsourcing sites, not for the users. It is for the reason that the elderly require training to understand the function of the platform and device; they often feel frustrated to learn new technology. Arranging training programs for the elderly is a demanding task at the moment beyond its capacity. This ride-sharing service organization adopted the latest economic platform in conjunction with traditional modes in such a way that no one becomes isolated. What is noteworthy is that the Japan Car Sharing Association cuts to the heart of how you make social networking useful, notwithstanding someone might not agree to call the Japan Car Sharing Association as a part of the new economic system because of its lack of digital platform.

Prof. Kenichi Masaki (正木 賢一) and his students at Tokyo Gakugei University (東京学芸大学) stand up for this movement by producing a new logo symbolizing the link for the ride-sharing service providers and users. This work is much more collaborative and looks beyond academia and business boundaries for the ethic of cooperation.

The ideal approach for a resilient society resides in the way of transdisciplinary thinking and knowledge sharing. Rome wasn't built in a day, and a journey of a thousand miles begins with a single step. The Japan Car Sharing Association leads to better results by cooperating with the government and applying the new approach-the Sharing Economy, providing a high level of service at a low cost by the use of underutilized assets. Through these voluntary initiatives after the Tohoku earthquake in Japan, we can learn how to organize civil society to move toward a resilient society.

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# Are local communities pushed beyond their adaptation capacity? : a case study in Tagondaing village, Kayin State, Myanmar

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## 1. Introduction

In the face of hardships, poor people struggle and adapt to survive. Most often in the past, their adaptation strategies to natural disasters worked to a degree. But now with the added effects of climate change to the already worsening situation, most of them around the world are close to the limits of their capacity to cope (Dobie, P., et al., 2007).

Myanmar is the third country most affected by extreme weather events in the past two decades between 1997 and 2016, with the highest overall death toll (Germanwatch Global Climate Risk Index 2018). It is crucial for the country to build the capacity of local people for mitigation and adaptation to natural disasters. In December 2019, I studied a Kayin community called Tagondaing in the southeastern part of Myanmar, some 90 km to Thailand border. This small study seeks to understand how local people have been coping with and adapting to the disasters caused by climate change. Through personal (semi-structured) interviews with local people, it was found that out-migration to Thailand has been the strategy that most of local people in the study area have adopted and resulted in myriad of social problems such as lack of working youth and drug abuses.

## 2. The village

Tagondaing village has about one thousand households with more or less five thousand residents, and the majority are Kayin Buddhists, one of the major ethnic groups in Myanmar. Nobody knows exactly when the village was established or who pioneered there and settled down first. Very few bothers to ask such questions as their origins. They are naturally more concerned about their daily lives and how to pay off tuition fees for their children next month.

Throughout the Karen conflict with Myanmar Armed Forces from 1949 until Nationwide Ceasefire Agreement in 2015, the village endured the long and violent civil war, and its unimaginable consequences such as forced labour and human shield in battle or for mine clearance to name a few.

With annual rainfall ranging from 3000 mm to 5000 mm, agriculture and fishery have always been the most important livelihood activities until when there is not enough fish in the ponds and farms no longer yield enough to feed families. Rubber plantations have served as a major income source to some families until the gradual fall of rubber price starting 2013. Nowadays, remittance from Thailand has become one of the most important income sources for over 50% of the households.

*Tagondaing village lake*

### ３. Environmental deterioration, climate change and disaster

The village used to be inside Tagondiang Reserve Forest but recently the government abolished part of reserve forest for the village. As the government's writ has never fully reached the area to this day, there is virtually no law enforcement in land and forest management. Local people traditionally shared and managed these lands among themselves without government intervention for many decades. The forests adjacent the village were converted primarily into agriculture lands and fishponds almost 25 or so years ago. Fuelwood for cooking also comes from the surrounding forests. But almost all the forested lands were cleared cut after people started establishing rubber plantations in 2006-2007.

Agricultural activities, whether it is during growing or harvesting season, are constantly threatened by the variability of weather. Soil deterioration coupled with erratic rainfall and early drought brought about by climate change meant rainfed paddy fields did not produce even to cover the production cost. To compound matters, government commissioned a project without consultation with community members to dig the creek (near the village paddylands) in 2016 which changed the underground water table forever and contributed the early water scarcity in dry season. This has rendered a huge area of arable lands uncultivable which can otherwise be used for double cropping.

Flooding occurs every year, but the frequency of major flood has increased over the past ten years with 2019 being the most hazardous and destroyed all the paddy fields. For the first time in decades, charity groups visited the forgotten village and distributed bags of rice and clothes. Although local people were thankful, that was by no means sufficient nor the most effective way of tackling the problem that requires serious and sustained investment from the government.

### ４. Adaptation

Although people do not usually use the term 'climate change' per se, they clearly perceive the changes in weather patterns and its impacts on farmlands, and they often talk about the matter among themselves. It is obvious that they are well aware of climate change and its impacts on their livelihoods. The majority of local communities attribute such changes to land clearing and deforestation. But other significant causes such as human-induced GHG emissions are naturally beyond their grasp and not in their discussion. It is a clear indication that awareness raising activities are urgently needed.

Discussion with local farmers and elders revealed that they did not have a collective system or sufficient resources as a community for disaster preparedness. Their traditional knowledge about weather forecast and natural disasters have served them well until climate change has made nature less predictable. No alarm system is put in place nor evacuation route designated in case of emergency in the village. To this date, there has never been any awareness raising activity by government or NGO regarding disaster preparedness. It is striking that there was no support from government whatsoever for strengthening resilience of local people except for rice seeds distributed to some farmers in 2019 after the flooding. Local people try as they have always done to deal with what they see as "their own

problems" by themselves. Nobody bothers to request help from government. It was found that strong bond among family members is the most important factor in overcoming the hard times.

As an adaptation strategy, local people tried to diversify their income sources and livelihood activities, or they double their efforts in farms to make their ends meet. This strategy worked for some time. But such push factors as environmental deterioration, climate change, insufficient jobs became so strong that local people were left with no option but leave their homes to save them. In early 1990s, a few people illegally started out-migrating to Thailand in search of jobs. Gradually, through growing networks in Thailand, the number of people going there increased. In the beginning, many families saw this as an opportunity to overcome their problems at home and very few intended to stay abroad for the rest of their lives. Yet the reality is that very few come back home down to numerous reasons. As a consequence, in the long run, more and more working people migrated to Thailand and less than 10% of villagers work in farm today. This was the beginning of the vicious cycle that prevails even today. Children and elders are the only residents you will encounter if you visit the village. This pattern of out-migration and abandonment of farmlands is common in many parts of Kayin State, Mon State and Tanintharyi Region that border Thailand.

> *One respondent laments, "Now fewer and fewer people speak and write their mother tongue (Kayin language). Because most of the young people who are supposed to carry on our rich tradition are in Thailand."*

It is undeniable that there are positive sides to out-migration such as economic development, thereby education and other aspects of living standard. In this particular case study, social problems far outweigh positive aspects. There is labour shortage in economic and social activities in the village which are important for preservation of cultural identity. When a cultural ceremony such as 'Kayin Soul Binding Ceremony or Wrist Tying Ceremony' is organized, there are fewer and fewer youth to carry on the tradition. Children grow up without their parents around and many of them become social misfits in the community. Drug addiction is rampant even among high school students. Not surprisingly, school dropout rate is getting higher and only 20% of high school students annually pass Matrix Exam. Without a degree for job hunting, they chose the easy way. They again follow the parents' footsteps and go to Thailand for job and this vicious cycle goes on.

## 5. Are they resilient?

To be fair, the residents of Tagondaing have been self-sustained and resilient to tough condition for many decades. Now their struggle seems insurmountable without outsider support. While there is a tendency to view resilience as a local or community issue, it is important to note that, in the context of a modern risk society, the size, complexity, and impacts of cascading disaster risks are often beyond the capacities of local communities to handle (Shimizu & L. Clark, 2019). Therefore, it is crucial to apply 'system thinking' and understand the complex relationships among different systems to create resilience of individuals and communities (Figure 1).

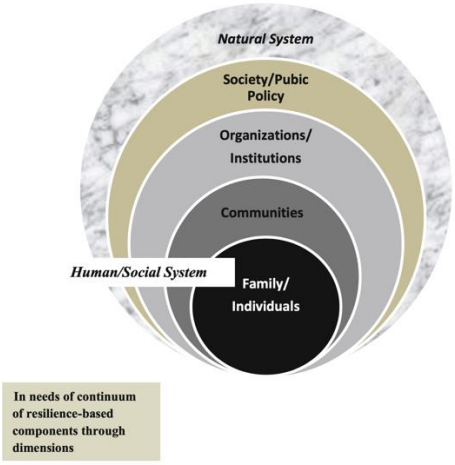


*Figure 1. Resilience in human, social, and natural systems and their relationships (Shimizu)*

## 6. Way Forward

Although it is impossible to suggest a 'one-size-fits-all' solution to all the challenges above, different actors and stakeholders need to adopt holistic approaches in order to create resilience in communities. For example, there are opportunities for businesses and local communities to work together in areas such as rubber wood and furniture production. As in the case in Thailand, smallholder rubber planters can gain higher prices for latex and rubber wood through Forest Stewardship Council (FSC) certification. Government's policy and support from international organizations are critical to realize this potential. Morever, with national and international support, long-term forest restoration programmes such as agroforestry initiatives that integrate local land practices will make communities more resilient in case of environmental and economic shocks.

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# Are social and ecological resilience important assets for buffering the effects of external shocks? A case study in the Tohoku region, Japan.

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## 1. Background

Japan is one of the countries most affected by natural disasters in the world. In Japan, many types of disasters occur as tsunamis, earthquakes, typhoons, floods and volcanic eruptions. However, how the Japanese sought to confront them to adapt is often invisible to the outside world. This is certainly true of Japan where history and tradition are ubiquitous. For a deeper understanding of how Japan adapts and survives, we need to delve into the society of a country.

To see the portrait of a nation with a history of overcoming successive waves of adversity from repeated natural disasters, we visited the Tohoku region and learned the adaptative capacity and social cohesion of resilient society.

## 2. Study area

Tohoku is located in the northeast part of Japan and that is what people called the region where the tsunami struck by the earthquake on 11 March 2011 (YAGASAKI, 2017). This was something entirely extraordinary as it was the fourth most powerful earthquake in recorded history with measuring 9.0 on the Richter scale. The epicenter was beneath the seabed, about forty-five miles off the northeast coast of Japan.

## 3. The role of the ecological diversity of the forest during the disaster and in post-disturbance recovery

In the traditional scene of Japan, it could be seen the beautiful beach with white sand, tall and green pine trees. Along the coast, the green pine, which is easy to plant and can grow faster, has long been used to protect from tide and strong winds as green walls. When planting trees, it is essential not to make the wrong choice of trees to utilize. Is the pine tree the right choice for coastal areas to serve as a green wall? Do they really withstand at times of disasters?

Pine trees near the coast of Sendai

After the tsunami, many pine trees were uprooted as their roots do not penetrate deeply as those of broadleaf evergreen trees which may go deeper ground in sandy areas. It had seen that forests of one kind of tree were weak at times of disaster. On the other hand, some native broadleaf evergreen trees left after the disaster. That would be the point to look at why and how these trees withstand the harshest conditions.

The natural forest is formed by many kinds of natural resources. The composition of trees is native to a specific area. The tree which is rooted deeply and firmly in the soil becomes the dominant tree of such forest. It is rich in organic matter and it hosts many kinds of microorganisms, insects, and animals. This unique characteristic is something that resists in the harshest environment withstanding the disaster.

After the incident, a mixed forest of Tabunoki, oak trees and camellia species were found to survive near the coast where the tsunami hit. It seemed that they could withstand the impact of the high tide because of their thick body and firm roots. Those trees are native to the area for a long time ago. It reflects simply that some group of trees which are native to the area will hold much more resistance to disasters other than pure stands. This capacity of native trees in withstanding the stress has been noticed by an ecologist, Mr. Akira Miyawaki from Yokohama National University and the priest Mr. Hioki Doryu, the head of Rinnoji Temple in Sendai city. They worked together and have initiated the tree-planting project called **"A Green Tide Embankment"** with the motto of **"Creating forests that protect life"**. They planted over 33,000 trees of 60 different varieties that are native to the area. The reason why they have attempted to revive such a genuine forest with miscellaneous native trees was as they become conspicuous of the native forests and their strengths which are attributed to post-disturbance recovery. Although diversity plays a pivotal role in natural processes (Gunderson, 2010), contrasting the ecology of an area is just a part of the puzzle and we need to explore more about the social cohesions which are embedded in the society.

## 4 . Collective actions and local learning promote social cohesion in communities.

After the tragic 2011 Tohoku earthquake and tsunami disaster in Japan, not many trees remained along the coast. However, locally grown camellia plants with strong roots survived and became a symbol of hope. "Sanriku" refers to a Tohoku coastal region and "Tsubaki" means camellia in Japanese. We had seen a unique local community who has been working on the project called **"Tsubaki Project"** in the Maehama District, Kesnennuma City. They create networks that can improve the efficiency of the community by facilitating coordinated actions.

They build up the community center after the disaster and have been working on reviving the unique local forest via planting Tsubaki trees. One of the community leaders said that

**"No need to debate on planting trees on public lands or private lands. Even private properties (trees on private lands) could protect their lives during disasters."**

The strength of social cohesion plays a pivotal role in the reorganization of communities after the disaster (Patel and Gleason, 2018). Local people should be at the center of local development projects as local knowledge, and local techniques are highly adaptable to their environments and their capacity to recover quickly from difficult conditions.

## 5. Lessons learned

From this case study, it could be learned that the diversified environment outperformed a less-diversity environment as it possesses the capacity to adapt to external stress. For instance, forests made up of one kind of tree are

weak against a disaster. However, we could hope that various supported native trees will hold much more resistance to external stress.

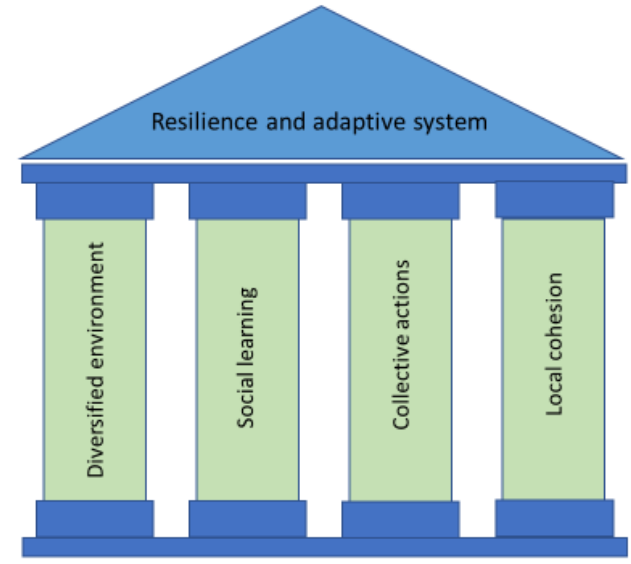
Social learning, the diversity of environment, the promotion of strong local cohesion and mechanisms for collective actions have all served as pillars for a resilient and adaptive system. Albeit resilient social-ecological systems reduced the vulnerability to the impacts of the external shocks and encouraged a positive response, this response needs to be sustained in the longer run (Adger et al., 2005).

We live today is not by chance. To build up a more concrete resilient society, any sources of the resilience of societies should be sustained, their life-supporting systems must be enhanced and ecological knowledge that can be applied in the community should be generated.

Local community center at Maehama

## 6. Way forward

What we learned from this case study could be applied to disaster-prone South East Asian countries like Myanmar, Philippines, Indonesia, etc. In Myanmar, for example, frequent drought and flooding often have devastating impacts on people's lives, crops and properties ever year (Mercy Corps, 2015). It is not surprising as it fails to build up concrete institutions and more importantly it has been destroying its environment by cutting trees. Therefore, it needs many areas to build up the capacity to be more socially and ecologically resilient based on the four pillars that we had learned from this case study and these pillars continue to guide planning for the future.




Pillars for resilient and adaptative system

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# Disaster Prevention Class for Children from Single Parents Family in the Temple, Nagoya city

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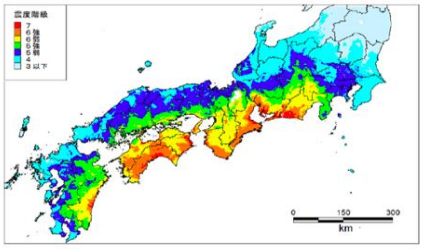
## 1. Introduction

The big disaster that is predicted to happen in Japan someday is the Nankai Trough earthquake. According to the Japan Meteorological Agency (2019), when a Nankai Trough earthquake occurs, the intensity will be 7 in strongest, and tsunamis exceeding 10 m are said to occur from the Kanto region to Kyushu region. To prepare for this mega disaster, most elementary schools in Japan conduct evacuation drills, and most children will be able to hide under their desks and protect their heads in the event of an earthquake. However, those evacuation drills are for the scenario for a disaster occurs while you are at school. If an earthquake occurs when a child is alone, can they deal with it?

In this project, evacuation drills were conducted for children from single-parent families. Children from single-parent families spend a lot of time alone while their parents are working. Also, in many cases, there are no relatives living in the neighborhood to rely on. When an earthquake occurs, children are forced to act alone. The aim is to improve the survival rate of children in times of disaster by understanding how to deal with earthquakes when they are alone (First response, confirmation of designated evacuation sites, confirmation of evacuation routes, actions to be taken when arriving at evacuation centers, etc.).

The project was carried out at a temple in Atsuta Ward, Nagoya city. As can be seen from Figs. 1 and 2, when the Nankai Trough occurs, there is a strong possibility that Nagoya City will be damaged not only by earthquakes but also by tsunamis. The temple is entrusted by Nagoya City to look after single-parent children from 5 o'clock to 9 o'clock every Wednesday and Friday, twice a week. The wife of the chief priest has a disaster prevention expert certificate. Based on this, in this resilience project will be evacuation drills for children.




南海トラフ巨大地震の震度分布
（強震動生成域を陸側寄りに設定した場合）

**Fig1. Intensity Distribution during Nankai Trough Earthquakes**

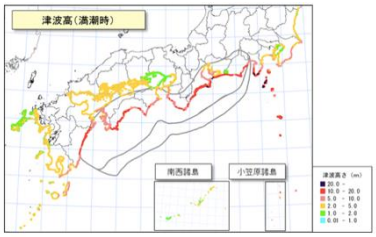



**Fig2. Tsunami height at the time of the Nankai Trough earthquake**

## 2. Resilience

Resilience often refers to recovery after some tragedy happens. But resilience is not limit to recovery, resilience applies to all the processes before, when and after something happens. Also, resilience is a word that applies not only to social systems and physical things, but also to individuals, human connections, and communities. This is the point I focused on before an emergency such as an evacuation drill. From there, the author would like to consider the factors involved in resilience as described by Shimizu (2015).

<Point to Line>

There are various points among the temples that we focused on in this project.

・The wife of the chief priest is a disaster prevention officer.

・During the Great Hanshin-Awaji Earthquake, the chief priest visited the affected area and actively participated in visits not only at morgues, but also at evacuation centers, and had the experience of being close to the hearts of the victims.

・Temples are preparing for operating as emergency evacuation centers (It is not a shelter designated by the municipality.).

・Nagoya City entrust temple to look after children from a single-parent family in twice a week

・ They hire an outside lecturer and give lectures for the Nagoya City consignment project

・ Many university students from Aichi Prefecture come to help as a staff member to Nagoya City's commissioned project.

- Atsuta Ward is located at a high-altitude place, where it is difficult for tsunamis to reach and floods to occur (From the Nagoya City Hazard Map)

The author considered whether we could make a line by combining all of them. In a nutshell, the author felt that it was a shame that we had not given children evacuation drills and lectures on disaster prevention, even though the conditions were so perfect.

<Continuous Learning>

The Nagoya municipal government contract project for the temple will end in March this year. Therefore, there is no plan to continue holding this prevent evacuation class.

This project will be evaluated by the wife of the chief priest and the university students who are helping as a staff member.

This temple offers summer camps for elementary school students to stay at the temple. Not only children from single-parent families but also other children will be participating. If the content of this project is useful, the author will consult with them about whether they can use it for summer camp or if it is continued as a Nagoya City consignment project after April.

<linkage x process>

As I mentioned above, there has been no opportunity to pass on information and knowledge to children in this temple. Before the Nagoya City project, few children had visited the temple, and there were few opportunities to interact with adults such as university students and staff. As Shimizu (2015) stated, "Relationships between people are created on a daily basis, but in extraordinary situations, that is, when an accident or crisis occurs suddenly, those relationships are reflected." (p. 48). This project was carried out in February, one and a half years after the Nagoya City consignment project started. Children, the chief priest, the wife of the chief priest, and the staff, including university students, have built relationships with each other, and by visiting the temple twice a week, students have become less reluctant to come. Although the children live in Nagoya city, many of them do not know each other's neighbors. Also, there are many cases where relatives who can be relied on do not live nearby. For children, the temple and its staff are the "neighbor" they can rely on in an emergency. However, it is unclear whether the students are aware of this.

<Resilience building>

The author believe that this project can be engaged in three major areas of resilience building.

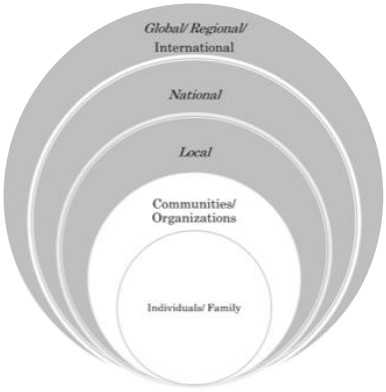



**Fig.3 systems views of resilience societies**
Source: M. Shimizu and A.L. Clark (2019)

One is the resilience of individual resilience. We believe that this project will help to increase the internal resilience of children. At this temple, evacuation drills and other activities have not been conducted for children. There is no place other than elementary schools that can tell children how to respond to evacuation drills or emergencies. Indeed, the lack of continuity of the event will not contribute to the sustainable development of resilience. However, there is a big difference between zero and one. If we held at least one event to children, that can increase children's internal resilience. It is hoped that evacuation drills and simulations will help children become more aware of disaster prevention. This event will be triggers for children to be able to take action even when they are alone in an emergency. It is also related to human resilience, but we believe that the presence of adults who can help in an emergency and the presence of a place where children can evacuate in an emergency gives them a sense of security and help reduce their loneliness. We believe that by connecting with the community, children will be able to enhance their individual and internal resilience.

Second, we believe we can increase the resilience of communities and organizations. One of the reasons the wife of the chief priest of the temple obtained a disaster prevention expert certificate was to learn how to operate an emergency shelter in the temple. Temples are not designated as shelters by municipalities, but they are thought to be able to serve as shelters. In addition, the role of religious facilities in times of disaster has been attracting attention recently. There are two reasons.

1) role as a shelter. There are 40,000 convenience stores and 80,000 temples nationwide, and temples generally have spacious rooms for memorial services in Japan (Suzuki, 2016, p. 24). At the time of the Great East Japan Earthquake, some temples were operated as shelters. Of course, the temple was not operated by itself but received a lot of support from Rotary clubs, local residents, and Buddhist parishioners (Suzuki, 2016, p. 26 -30).

2) It is a religious facility as a place of spiritual support. Inoue (2016) said that many people need resilience in order to overcome the death of their loved one, "Important factors for building resilience include feelings of self-esteem that cherish oneself, bonding in a stable parent-child relationship, religious support, and a model that serves as a norm." (p. 140) （author translated). For the Japanese, it does not necessarily mean that they are followers of the sect. The Japanese, who were in a culture of joining hands from childhood, have been living in close contact with Buddhism and Shintoism without realizing it. I think there are many Japanese who can say "Namu Amidabutsu (南無阿弥陀仏)" even if they don't realize that they are Buddhists. The sudden loss of a loved one is common in everyday life, but the pain of losing a loved one is hard to imagine, especially in times of disaster. Having a place where you can calm down and put your hands together when your loved one dies has a big meaning as a source of support. It is considered to be one of the resilience performed by religious institutions.

According to the pre-interview to the chief priests and his wife, although they are studying the operation of evacuation shelters, they have never conducted simulations. This project is expected to contribute to the operation of evacuation shelters in the event of an emergency

mainly by considering what kind of support should be provided to children in single-parent families.

The third is to strengthen local resilience. As Shimizu (2015) stated, "The face of the neighborhood is always visible, we are in a relationship to help each other whenever something happens, and the process of what to do when a disaster occurs is widely understood." (p. 49) (author translated) is one of the measures required of communities in the event of a disaster. It is hard to say "be familiar with one's neighbors" because some areas of Nagoya have lost their children's associations. In particular, it is difficult for children from single-parent families to identify the adults in their neighborhoods whom they can rely on. This event focuses on temples that are commissioned by Nagoya City. Through this event, we believe that it will lead to the awareness that there is a child with a single parent in the community and that it will lead to a "helping each other" relationship in the event of a disaster, as well as that awareness. It is hoped that these efforts will increase local resilience.

## 3. Project Target and Purpose

In this project, the target place is a temple in Nagoya city, Aichi prefecture. There are three reasons why I chose this temple as my project place. First, As I already explained, Nagoya has a high possibility to affect by the Nankai Trough earthquake. Prediction said, 7 Earthquake intensity and 5 to 10m Tsunami will hit to Nagoya city when the Nankai mega trough earthquake happen. Second, that temple is conducting Nagoya city-commissioned project. In Nagoya city-commissioned project, temple looking after children who live in Nagoya city in twice a week, from 18-21. Those children are from single parents' family. There are staff members who help the city-commissioned project. Most of the staffs are university students who want to be a schoolteacher. Third, the wife of the chief priest took a disaster prevention expert exam two years ago, and she got a certificate. There is a possibility that the temple will become an evacuation shelter since that temple is located in a high-altitude area.

Target people in this project are 1) Children, 2) staff members 3) staff members from the temple. 1) This project's main target is children who participating in Nagoya city-commissioned project. Those children's ages are 10-14, elementary and junior high school students. Most of the children are from single-parent families. Their parents are working until late at night, sometimes they work overnight. Therefore, children spend a long period of time alone. 2) Staff members of the Nagoya city-commissioned project are mostly university student who wants to be a teacher in the future. Some staff members are worked in the social welfare section and retired. 3) A staff member from the temple is basically, chief priest in the temple and wife who has a disaster prevention expert certificate.

The purpose of this project is for each target person. 1) For children, there are three purposes. First, provide an opportunity for children, to disaster prevention awareness. The second purpose is to provide a place for children giving them an awareness of who and where they can rely on an emergency situation. The third purpose is by simulating what to do in an emergency, they can evacuate calmly even they are alone when an earthquake happens. 2) For Staff members especially university students, the purpose is to think about how to protect your children during a disaster when they become a teacher in the future. 3) For all the staff members including university students and staff members from the temple, the biggest purpose is to practice operating evacuation shelters as staff in the temple.

Before the activities, the author had a meeting with staff members and the wife of the chief priest. We had a discussion about the activities and exchange information about the situation of children. probably children cannot concentrate for a long time, so we decided to have quizzes and games rather than just lectures.

In the activities, the author distributed to disaster prevention cards and worksheets of

evacuation gabs. The author created this for children by referring to pages created by fire departments and disaster prevention experts.

## 4. Activities

The author conducted a disaster prevention class for the children. Although the first plan was only one class will be held, we decided to do one more class as a result of staff meeting after the first class. We were trying to do real evacuation drills such as no electronic city, no water supply, etc. However, we decide not to since this is the first trial. The restriction was imposed such as we cannot use the gas. What we can use was electricity and things in the temple such as water that emergency stored.

### 4.1. 1st class on 7th February

The first class was held on Friday, February 7, 2020. We chose Friday because there are many children and can hold classes until 20: 45. A total of seven people, two boys, and five girls participated in the event. Three staff members and the wife of the chief priest also participated.

It was dinner time from 18: 45, and the author discussed it with the staff and decided to eat emergency food. The emergency food consisted of alpha rice with hot water, miso soup with hot water and fish sausage. The water was boiled in an electric pot and stored water was used. The children said they didn't want to eat at first. It was because they had an opportunity to eat emergency food curry at school once a year, and from that experience, they thought that emergency food was not delicious. The wife of the priest told the children about two things. One is to eat whatever food is served, even if you don't like it. The second is that in an emergency, you cannot choose what to eat, and you must eat to live. When the children heard the story from the wife of a chief priest, they followed the instructions and began to prepare by pouring hot water. On the assumption that they were eating at the evacuation shelter, we did not take out their desks and chairs, but sat on the floor and ate. Probably because they chose Gomoku-Gohan which was relatively easy to eat, no children left their meals. staff members are concerned that children would spill miso soup on the floor but children didn't. We played a card game of disaster prevention from 19: 30 after we finished cleaning up the meal.

**Fig.4 children are pouring hot water to their emergency food**

We did it to get children are interested in the theme by playing card games. The game is divided into categories, such as children's rights, tsunami, and lives in an evacuation shelter, and each category has its own explanation on each card. You would win if you collected four cards from the same category. We asked children to read the instructions on the card every time you collected. By reading the instruction and playing the cards, children could learn about the basic idea of disaster.

After the card game was over, the author distributes the disaster prevention card and ask children to fill out. It is an assumption that an earthquake occurred when a child was alone. the author told them to protect their heads whenever they are when earthquakes happen and talked about the process of going to the evacuation shelter. Each disaster prevention card has space for emergency contact information, evacuation sites, and identification. For children who did not know where the nearest evacuation site was, we checked the evacuation site from the hazard map. In the identification part, there was a space to write down allergies and chronic diseases. As for emergency contact information and other items that cannot be filled out immediately, we

asked children to ask and talk with their parents and fill out the form after they returned home.


**Fig.5 disaster prevention card in Japanese**

**Fig.6 wife of chief priest showing children hazard map of Nagoya city**

After filling out the disaster prevention card, a portable pouch and light were distributed. The light is small and turns on when you push the button. Lights illuminate your feet and call for help when an earthquake occurs at night. They held a workshop where they put tissues and disaster prevention cards in a pouch and put a light on the ring by themselves. And the author asked them to keep them all the time.

**Fig.7 practice to ask help by using light**

The last exercise was an evacuation drill. The assumption is that an earthquake occurs when children are outside alone. The room where we ate dinner was used as an evacuation shelter, and the staff members practiced operating the shelter. The children moved to the entrance; the author suddenly told them the earthquake happened. Caution was taken to protect the head and ensure that the children moving away from a pole. What do you do after the earthquake stops? The author asked the children and reviewed the disaster prevention card. When the children arrived at the shelter, they went to the reception desk and told the receptionist their names, addresses and that they come alone. After that, the author gave a

lecture on what to write on a bulletin board. This completes the first class.

**Fig.8 During the Evacuation drill**

**Fig.9 Practice of operating evacuation shelter and children are arrived at the shelter alone**

After the class was over, we had a staff meeting. There are three main opinions. First, we need to check whether children bring disaster prevention cards every time, and we need to do another evacuation drill. Since the project is held twice a week, the staff said they will check it out next week. Secondly, it was pointed out that children lacked a sense of crisis. It was also good to have disaster drills with friends, but they were worried that they would not be able to act in an emergency. Thirdly, if a second disaster prevention class will be held, it would be a good idea to list the contents of evacuation bags. When we asked if they had prepared an evacuation bag, only one child said they had one, so they thought it would be better to give a lecture on evacuation bags. Based on these, we decided to hold the 2nd disaster prevention class on February 19.

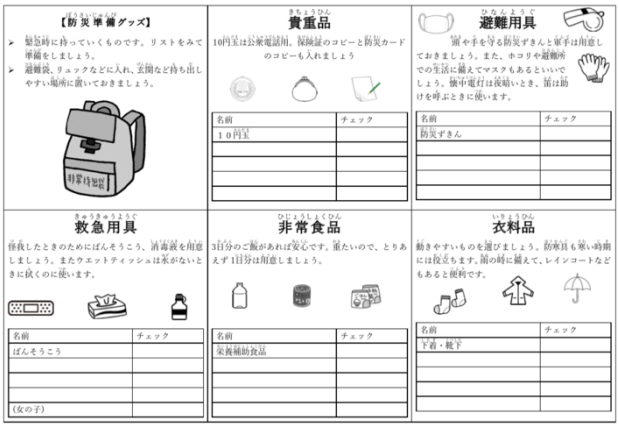
### 4.2. 2nd class on 19th February

The 2nd disaster prevention class was held on Wednesday, February 19. The reason why we chose Wednesday was that the participants were different between Friday and Wednesday. However, they have school the next day, so it was necessary to finish earlier than last time, and there was a time limit. There was a total of eight participants, three boys, and five girls. Six of them participated in the previous class. Three different staff members, and also the chief priest and his wife participated.

The second meal included an activity to keep the dishes clean with plastics wrap. There was no resistance to eating with plastic wrap. However, most of the children had their plastic wrap ripped while eating because they had been pushed or caught with a spoon. Only one child achieved the goal of eating meals without getting dirty. As for drinking water, stored water was taken out as a box. Since it is a type with a faucet, the purpose is to give them the experience of turning on the water by pushing the bar upward with their fingers.

**Fig.10 child trying to pour water from the stored water box to cup**

After the meal, the participants were asked to fill out a worksheet with quizzes about what to put in the evacuation bag. the author brought her evacuation bag, took out the items of answers of the quizzes, showed to children, and had them experience it. The first things the children saw were portable toilets, aluminum blankets, paper




pants and emergency water bags.

**Fig.11 worksheet of evacuation bag**

**Fig. 12 children are trying aluminum blanket**

After that, we reviewed the previous lesson, although it was for the children who participated in the first lesson. We asked them how they would act in the event of an earthquake. After that, an evacuation drill was conducted. The procedure is the same as the previous one. This time, however, an emergency earthquake warning was broadcast to raise awareness of the danger. After that, videos of Sendai airport at the time of the Great East Japan Earthquake on March 11, 2011, were shown. The video included people screaming, crying and the sound of broken windowpanes. The children, who were protecting their heads with smiles, were frightened by the unimaginable length of the shaking and sound. Two children lost their smiles and wept. After about seven minutes of video, they started moving to the shelter. At the evacuation center, the staff was practicing reception and operation as before. The children who experienced it last time were able to tell their names and they came alone smoothly, and even write their names on the bulletin board.

**Fig.13 evacuation drill by showing video of Sendai airport in 2011.3.11**

## 5. Discussion

At the second staff meeting, three good points were raised. The first was the ability to change the consciousness of children. The children, who said they were okay and could do it, listened seriously. Secondly, the previous class review was also a good point. The staff was surprised because the child remembered the contents more than expected. Then lastly, children have experienced the actual sound of the earthquake. Those sounds scared the children, but also the sound of the actual earthquake made them realize the scariness of the earthquake. Also, the video is not shown in the school evacuation drill.

There are three things to be done in the future. First of all, even though we gave a lecture on evacuation bags this time, we did not actually have them tried to carry. The author showed each item but forgot to talk about the overall weight. When children experienced the weight of bags, children might have understood why each person needed an evacuation bag. The second concern point is the operation of the evacuation shelter. By preparing this event's meal, the wife of the chief priest said she was able to practice preparing meals in an emergency situation. However, when the shelters were actually operated, it became clear how to sort out evacuees and how to operate them. Thirdly, there is concern that if children arrive alone, whether the people who run the evacuation shelter able to protect children or not. Many people gather at the shelter. Violence and sexual crimes have also occurred in the evacuation shelter. Staff members were worried that it would protect children from not only earthquakes but also other incidents that might occur at evacuation shelters.

We don't have a plan to hold the third class at the moment, but if we were to hold the third class, a suggestion from staff members is to write the evacuation route on a map by children themselves. Some children live in areas where zero above sea level, while others live just beside rivers. The point is that children may be able to check the evacuation route by themselves by first simulating from home to school, shelter, etc.,

on a map and then actually walking. In fact, there are cases where children can reach the evacuation shelter faster and more safely on the road that they usually use than the evacuation route established by the city. If we have a chance, we would like to hold the third one.

## ６． Conclusion

Among the staff, some had already found employment in elementary and junior high schools. They are in a position to protect their children when an earthquake occurs. They took disaster prevention classes more seriously than children. Also, some staff said they want to get a qualification of disaster prevention experts and study, and they talked with the wife of the chief priest.

This event able to achieve the goal for the staff as well as the goal for the children. This time, we could only hold two disaster prevention classes, but as the awareness of the staff has changed, the author hope they will continue to hold disaster prevention classes.

In this activity, we succeeded in changing the consciousness of children and staff. Although this event are only two times, this event could increase children and staff member's internal resilience. Training in operating the shelter also increased the resilience of the organization and the community and helped achieve its objectives. We could increase short-term resilience. Mid-term resilience, including staff and local people, needs to be enhanced. There is also a need for a long-term plan to enable this to continue. Unfortunately, the Nagoya City consignment project ended in March, and it is undecided after April. we need to discuss about how to continue those activity sustainably.

In the future, we hope that children will be able to act calmly in the event of an actual earthquake, and that the trained staff will be able to protect them. We also note the need for continued implementation.

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# Community Engagement in Resilience Building in Disaster-Prone Regions: Application of Tohoku Practices to Myanmar

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## 1. Community Engagement in Tohoku Region

A three-day trip to Tohoku Region where the Great East Japan Earthquake and Tsunami hit in 2011 realized the significance of civil society or local community's involvement for the development of recovery plans aftermath of the disaster.

In this region whereas the government has constructed concrete seawalls and dykes as a post-tsunami construction plan, the local community has also been trying to build green embarkment. For example, the "Hill of 1000 Years of Hope" at Iwanuma city in Miyagi Prefecture, a 10 years plan, is the first major project of the Green Tide Embankment Project after the 2011 Tohoku Disaster initiated by civil society in collaboration with ecological experts, NGOs and city governments. The project uses waste generated from the 2011 tsunami to landscape banks, which are then planted with native trees that can withstand the force of tsunami, and act as a barrier in disaster prevention.

The local people in Maehama District in Kensennuma City is also implementing "The Greening Campaign" after the Tohoku Disaster. Most of the trees are Tsubaki, Tabunoki and Shirodamo and Yuzuriha etc. The salient point of this campaign is that not only to cope with future disasters but also maintain communities' linkages with natures and cultivate community bonds.

**Forest Plantation in Kensennuma City**

The above examples represent the importance of inter-connectedness of humans, communities and natures for sustainable society,

and one of keys in operationalizing in interconnectedness is community engagement for building resilience.

## 2. Case of Rakhine State and Reasons: Hinder for recovery process aftermath of disasters

Rakhine State is located near the bay of Bangal so much so that the place is highly exposed to a wide array of natural disasters including floods, cyclones, storm surges and tsunamis. Myanmar is ill-equipped to cope with such kind of catastrophes which resulted in loss of life and extensive damage of assets and infrastructure. For example, Extremely Severe

Cyclonic Storm Nargis struck in 2008 resulted in 90000 fatalities and 56,000 were missing. Furthermore, 95 percent of buildings in the Irrawaddy Delta area were destroyed and caused widespread damage which is approximately $12 billion. Cyclone slams into Rakhine State every year. But one more important point is that it takes many years to recover especially in comparison with other areas like Ayeyarwaddy Region etc. In addition, there has been intercommunal conflict and violence between the Rohingya ethnic minority and the Burmese population for decades (Johnson et al., 2019). Furthermore, there is also fighting between Myanmar Army and Arakan Army (AA). And the fighting itself results in the slow recovery process from disasters. A shortage of Aid Funding is also one of the hardships for recovery process in this area. Poor transportation and communication are also holding back the recovery works. Those factors have hindered the recovery programs in Rakhine State.


Rakhine State, Myanmar
Source: Google

## 3. Application of Tohoku Practices to Rakhine State, Myanmar

The aforementioned insights gained from the Tohoku Region can be applied to my study area so-called "Rakhine State, Myanmar, in terms of the need of systems thinking of humans, communities and natures, and the necessity of role of community decision making for resilience.

It is recognized that local community involvement can play a crucial role for resilience building in this region like local communities in Tohoku Region where the community resilience is a paradigm shift from vulnerability to strength. For example, following the aforementioned practice in Maehama District in Kensennma City, the local people in Rakhine State can engage in growing and conserving Mangrove Species which are native species in this region not only to cope with future disasters but also maintain communities' linkages with nature and cultivate communities' bonds. Fortunately, the natural regeneration capacity of these mangrove forest in Rakhine State is so quick (2019 Regeneration Survey in Wunbaik Reserve Mangrove Forest by San San Htay). Besides, these mangrove forest can store carbon emissions which is a great benefit for resilience building toward sustainable society.

To promote the resilience building activities, the residents from Rakhine State should also build community centers in their cities like the local community center in Kensennuma city, Maehama District. These kinds of community centers are essential in such disaster-prone coastal area of Rakhine State to promote community resilience building by communities. Relying on government alone is not working well for the recovery plans because of difficulties that are mentioned above in this region and the local community should participate actively for the development of recovery from disasters in this region.

## 4.Necessity for Community Resilience Building in Myanmar

To assist the community resilience

building, developing countries like Myanmar, agricultural insurance should also be considered to improve food security and reduce the effects of future disasters. As Myanmar is an agricultural country and the vast majority of people rely on crop production especially in disasters-hit regions. That is why, this crop insurance is inevitable needed for the farmers. Agricultural insurance plays an essential role in reducing the vulnerability of the global food systems to acute food shocks thereby contributing to resilience and sustainability. In Japan, paddy insurance and sugarcane insurance are started in 1947 according to Agricultural Natural Disaster Compensation Law. In a similar way, developing countries should also have these kinds of insurances.

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# A Key Practical Concept to Create Resilient Society through *Omoyai* (おもやい) -Sharing and Coexisting-

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## 1. Background of Disaster Volunteer Centers

In this paper, the author focuses on a private volunteer center "*Omoyai* Volunteer Center (hereafter call "*Omoyai* VC")" established in Takeo City, Saga Prefecture, which was damaged by the torrential rain in northern Kyushu in 2019. The purpose of this paper is to clarify how *Omoyai* VC works to solve local problems in disaster recovery and reconstruction by focusing on resilience thinking. At first, *Omoyai* (おもやい) means "sharing and coexisting", and which is a Japanese word originally from Kyushu region dialect.

From August 27, 2019, due to the active weather front, the area of heavy rain spread over a wide area of Kyushu, causing heavy rain mainly in Nagasaki Prefecture, Saga Prefecture, and Fukuoka Prefecture, which resulted in extensive damage in various places [1]. In response to a request from the city of Takeo, which suffered damage, citizens of Takeo, who had experience in disaster relief, and private volunteer groups from inside and outside of the prefecture cooperated to launch "*Omoyai* VC" as a private volunteer center. The volunteer center plays an intermediate role in understanding the needs of the disaster victims, and after volunteer supporters have matched the needs of the disaster victims to solve the needs, the supporters visit the disaster victims and help them solve the needs.

Generally speaking, in Japan, there have been tons of issues about disaster volunteers since the 1995 Great Hanshin-Awaji Earthquake partly because of the failure to grasp and coordinate the needs of disaster victims. Therefore, the "Disaster VCs" were established by the local Council of Social Welfare (社会福祉協議会) as a sector to grasp and organize the needs of disaster victims for volunteers who come immediately after the disaster and to coordinate activities in the affected areas [2]. In 2013, the Disaster Countermeasures Basic Act (災害対策基本法) stipulated that the local government would make efforts to cooperate with volunteers, and the government was obliged to take such countermeasures. However, since most of the employees of the Council of Social Welfare and the administrative staff live in the disaster-stricken areas, it is difficult for them to respond to disasters by themselves in the event of a disaster involving administrative functions such as the Great East Japan Earthquake in 2011. As a result, systems such as external support have gradually been developed, and external support personnel such as support for verbal communication and block dispatch by prefecture are now involved in the management of disaster VC [2].

As Daimon & Atsumi claimed that through the fieldwork at Kumamoto after the Kumamoto Earthquake, the authors learned that many welfare council staff in Mashiki town were also affected by the earthquake but had to work at the VC to match volunteers with survivors' needs [2]. During the early response stage (about 1-2month), the social welfare

council staff worked to support survivors even though the staffs were also survivors. However, they were sometimes compelled to refuse support to survivors due to bureaucratic rules despite understanding their needs. On the whole, the welfare staff had to become supporters of survivors but faced barriers that the rules didn't satisfy with the needs, while they were also survivors, but by refusing survivors' needs, they failed to fulfill this role.

On the other hand, *Omoyai* VC is very unique compared with the above cases, because this VC is not organized by the local Council of Social Welfare, but by local and general volunteers. That means, the staffs are not social welfare council staffs, but local people and also affected persons in Takeo City (Fig 1).

To rethink the situation of VC and the relationship between resilience and the VC, resilience is broadly defined 'as the capability of building systems that can keep their functions even after the impact of unexpected events' [3]. To emphasize the linkage of human, social and ecological systems and resilience aims at fostering human resources who can engage in creating resilient societies collaboratively. However, the relationship between VC and resilience still remains a key topic to be investigated. That is why, hereafter, this paper tries to do a deep dive into resilience thinking through *Omoyai.*

Fig 1. A Whole View of *Omoyai* VC
(This center was originally kindergarten, but the kindergarten was closed as a low birthrate. After the hard rain disaster, some volunteers reused as a center for DVC now)

## 2. *Omoyai* VC

The author conducted fieldwork at *Omoyai* VC for 5 days in February 2020. The author participated and observed mainly as a volunteer to clean affected housings and rooms, and as a staff to help the event for revitalizing on the site (Fig 2 & 3). Hereafter, the author describes what I saw and did what is based on the field notes and fieldwork.

Fig 2. A work in a day as disaster volunteer
(Tearing up the floor with a crowbar)

Fig 3. Chatting and playing some games with local elderly people at a small community center

2020/02/14 Evening

I arrived at *Omoyai* VC and met Mr. S who is a representative of VC. I briefly introduced myself and he accepted some circumstances. He told me the story about the launch of *Omoyai* VC and how the VC works in locally. After the hard rain disaster in Takeo city, some volunteers personally visited the homes of their acquaintances and cleaned them up. However, they noticed that since the area has a large number of elderly people (actually one third are elderly people in Takeo city), there must be many people who do not know what to ask the "volunteer" and how to ask them to help. On September 4, "Team *Omoyai*" was launched and started its activities. On September 7, a

private volunteer center was established in coordination with the Social Welfare Volunteer Center.

Mr. S said that in order to ensure that no ones are left behind including the victims of the disaster, we will cooperate with various organizations and people to create "community" that will make them to rethink "Still, I'm glad I'm living here" and "community" that will make them to feel "I'm glad I came here." Now, this center teamed up with 44 organizations including outside of Saga Prefecture, and some universities, Non-Profit Organizations, International Non-Governmental Organizations and so on. Therefore, he thought that it is important how to manage on the site with a wide variety of human resources and organizations not only to help people but also to share the emotions and coexist with their lives.

After his story, I participated in a small meeting with the VC staff at the center. They discussed some topics such as a number of today's volunteers, report and awareness of today's activities, sharing information, other topics to be discussed, plans of tomorrow's activity, and how to allocate staff at the center tomorrow. During the meeting, staff told us that when the staff went to and joined the general meeting for disaster rehabilitation organized by Saga Prefecture, the staff thought that it is difficult to negotiate for how the affected people feel and live precariously from day to day with little compensation with official officers. "They are not on the same page as us. They exclude people." After this complaint, Mr. S told us "Yes, exactly there are some problems with councils. But, we just do as a private VC. Live together with local residents."

### 3. *Omoyai* VC 'with' the Local

Some other day of helping the center as a volunteer staff, I visited a festival at the *Omoyai* VC for local people. Also, I had an opportunity to participate in *Iki-Iki* club (gathering and chatting with snacks and tea) for elderly people at a small community center (Fig 3).

During the festival and the club, I listened and talked to elderly people. They said that many of them evacuated at home or voluntarily. The challenges of disaster and aging have created a situation in which the only option was to continue evacuating at home rather than at home. In particular, the VC staffs try to approach self-displaced people repeatedly so that the staff could be trusted to meet. According to the hearing at the club, the following issues were mentioned as problems that emerged from the flood;

・Disaster in areas with many elderly households,
・Inexperience with no volunteer support,
・Concerns that the sustainability of the region will decline if this situation is left unaddressed,
・Fear that some may be left behind by the lack of information, and
・Fear of not knowing what to do about water disasters.

However, still facing these serious situations in Takeo city, an 81 years old woman said to me " I am very happy now. My husband has gone 30 years ago, so I am lonely. I managed this club with other elderly people, but it is too hard to manage now. Like this club and the festival yesterday, there are lots of local people and we can communicate and share some feelings with each other not only elderly communities but also young and outside people. That communication made me cheered up even though they are unknown people. Thanks to *Omoyai* VC, I am not lonely. Please keep continuing *Omoyai* VC activities with us."

### 4. Creating a Resilient Society

Going back to consider resilience, it is understood as 'the capability of building systems that can keep their functions even after the impact of unexpected events' [3]. How does the *Omoyai* VC leverage the community and resilience? The VC tried to create the linkage of human, social systems through some events as well as volunteer works. Aiming to foster human resources who can engage in creating resilient societies collaboratively for the present and future, the *Omoyai* VC aims to change its approach from VC centered thinking to community-centered thinking to engage with the community, people, and VC. Because *Omoyai* VC is a private voluntary association now, the VC can freely think and connect with others by reaching out to what the staffs and communities are aware of (Fig 4). By skillfully borrowing the power and resources from the outside and conveying the thoughts of the local people and staff, we can surely demonstrate the power here. It is

important not to exclude individual residents because residents are not the customers who receive social welfare services from the government, but the members who form the community like government officials.

The author does not want to evaluate whether the case of *Omoyai* VC is successful or not quickly at this time. However, this case can provide a key practical concept in seeking for what is a better way to create a resilient society through mutual assistance in areas where the population continues to decline. The author believed that there are potential or possibilities to coexist with the local through this case study to survive and transform in the locality which has serious problems such as facing super-aging society, and depopulation after the critical disasters.


Fig 4. *Omoyai* Tree (*Omoyai* no Ki)
(Volunteer staffs, affected people, volunteer from outside of Saga prefecture imagined and wrote down their hope, future, needs and opinion and attached this tree picture)

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# Can the establishment of tide protection forest be one of the resilience approaches after Tohoku Disaster?

## A case study of Iwanuma City, Miyagi Prefecture

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### 1. Background Information of Tohoku Disaster

The Great East Japan Earthquake (GEJE) struck 130 km east of Sendai city in the East Coast of the Honshu Island, Japan on March 11th 2011. It took about five minute and produced the violent shaking which destroyed the untold number of roads and buildings. After the earthquake, tsunami waves struck the Eastern seaboard of Japan with a wave towering in excess of 12-16 m (Holguin-Veras J et. al., 2011).

In the Tohoku region, the most critical infrastructure affected by that disaster are the Sendai Airport, Port of Sendai, Tohoku Motorway, Johan Expressway, Routes 4, 6 and 45, the East-West arterials connecting the Tohoku Motorway to the coastal areas, Fukushima Daiichi Nuclear Plant and Onagawa Nuclear Plant (Holguin-Veras J et. al., 2011). In addition, agriculture and human settlement in hundreds of miles of populated area were affected. In disaster history, the earthquake and tsunami of the Tohoku disaster are among the strongest on record in Japan (Holguin-Veras J et. al., 2011). The miraculous large-scale disaster caused not only human (approximately 16,000 death tolls and 3,300 missing) and physical (more than 14 city, town or village public buildings including disaster management centers) but also social and economic impacts in short term as well as long term (Shimizu and Yasui, 2012).

After the disaster, the government, the local people and the volunteers tried to recover the various impacts affected by the disaster. Shimizu and Yasui (2012) stated that even one year after the Tohoku disaster, there are tremendous social and economic problems such as removal of many tons of debris, shelter management, relocation to new residence areas, public health for radioactive concern and psychological issues, unemployment issues and local economy issues including fishery, agriculture, and tourisms. To solve these issues and recover the affected areas, the estimated indirect cost of 35 to 60 trillion yen (approximately US$ 453 to 766 billion) was spent.

### 2. Resilience Approach after Tohoku Disaster in Iwanuma City, Miyagi Prefecture

Our tour group visited the Tohoku region from 28th to 30th September 2019, in order to learn how the ongoing recovery work from the 2011 Tohoku disaster is related to resilience or resilience approach. I use the word of resilience here, which is the capacity to recover from the disaster or the ability to withstand shocks (Alexander, 2013). A resilience approach makes the system, which can facilitate to recover from the past disaster and to resist against the

future disasters.

Currently, the Tohoku region is still carrying out the ongoing recovery processes after the disaster. Among them, the establishment of tide protection forest, one resilience approach in Iwanuma City, Miyagi Prefecture, observed during the tour is described below.

In order to recover from the disaster, the residents of Sendai city and non-profit organizations including volunteers had been planting approximately 33,000 trees of 60 different native tree varieties at Rinnouji Temple, Iwanuma City, since 8 years ago, under the guidance of Prof. Akira Miyawaki, a botanist (Doryu H, 2011). And the project of green tide embankment was also carried out under the leadership of the Head Priest of Rinnouji Temple, according to the suggestion of Prof. Miyawaki.

**Photo of the campus of Rinnouji Temple, Iwanuma City**

In Iwanuma City, there was a mountain of debris after the disaster. The project sorted the debris at the disaster area to remove the poisonous and indecomposable waste materials and dug a hole of 10 m depth and 30 m width in the seashore and filled the hole with the mixture of the soil and the debris. On the top of that, a mound of 20-30m height was created for planting the trees. When planting trees for tide protection forests to protect the future tsunami, the most critical factor is the right choice of tree species, which are suitable to the area. They selected and planted the native and evergreen broad-leave tree species including the multi-layer types of trees (tall trees, medium-height trees and short trees) because the root of those native broad-leave species could penetrate deeply into the soil at the highest level of natural strength and were able to resistant to disease and insects. In 15-20 years after planting the trees, a forest that will protect the human and their properties from the tide and tsunami will be obtained.

The tide protection forests may result in many advantages for the local people. In the view of disaster risk management, when the tsunami strikes, the tide protection forest will stand as a green seawall to break the tsunami up, by reducing its strength and lowering its speed and wave height, in order to earn more time to evacuate the people. When the tides recede, that forest will prevent the people and the properties being washed out to the sea. In the economic and social points of view, the planted tree will last for many decades and when the trees become taller, the local people can cut down and utilized for the household use in order to save the regional economy. In the environmental point of view, the planted trees become taller and larger and finally become a naturally occurring forest. At that time, that forest will absorb the carbon dioxide ($CO_2$), which emitted by human development activities such as the emission of $CO_2$ from industries and motorcar driving etc. Reduction of carbon emission is important to climate change mitigation. And that forest will release the oxygen ($O_2$), which are necessary for human beings.

And Shimizu and Clark (2019) also described that the characteristics of formation and implementation of the project of the tide protection forest from the view of resilience as follow:

1) Tide protection forests protect the people from the future tsunami and provide the green space for future generation, which is eco-friendly and results in both land and sea conservation.
2) The forest addresses the city's necessities in the short-, mid- and long-

terms by connecting the past (disaster), current (recovery), and future (sustainability), and by connecting natural (ecological), human and social systems.

3) The project is collaboration between the city, scientists, and non-profit organizations including volunteers with different backgrounds, which links different stakeholders and generations and people inside and outside of the city.

**Photo of Tide Protection Forest behind the Tsunami Memorial Monument, Iwanuma City**

## 3. Conclusion based on the knowledge about Tide Protection Forest from Tohoku Tour

In conclusion, the establishment of tide protection forest has many advantages from the various points of views as above-mentioned, although the tide protection forest (forest seawall) may not be as strong as the concrete wall and it may take at least 15-20 years to become a mature forest to protect from the tsunami. In addition, the tide protection forest will stand for many centuries and so it may provide long-term resistance from the tide and the tsunami. Therefore, the establishment of tide protection forest or forest seawall is one of the effective and efficient resilience approaches for the future tsunami according to the definition of resilience, which is a systemic approach to disaster avoidance, survival and recovery with expertise from a multitude of disciplines to an unprecedented degree (Jackson, 2010). Thus, the local government should encourage the establishment of forest seawall against the tsunami in other seashores in the Tohoku region. And this resilience approach may also be applicable in the coastlines of South East Asian countries such as Indonesia, Malaysia, Thailand and Myanmar, affected by the tsunami very often, since UNISDR (2010) affirmed that tsunami was the third dominant disaster risk in terms of human casualties in South East Asia during the last 40 years (1970-2009).

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# Communication as linkage among stakeholders to improve resilience in international cooperation

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## 1. Introduction

International cooperation has long been an important opportunity for developing relationships between countries and for promoting a widely diversified range of scopes. Major international documents, notoriously the Paris Agreement and the 2030 Agenda for Sustainable Development recognize cooperation as a mechanism to achieve sustainable development goals, not only at the national government level, but also at regional and local spheres, bringing together different sectors of stakeholders, such as national governments, international community, civil society, and the private sector.

Resilience can be broadly understood as the system's capacity to change while adjusting to stress in order to maintain the long-term sustainability of a human-environment system (Stokols, Lejano, Hipp, 2013), or as the capability of building systems that can function even after the bump of unexpected events, by recognizing these systems broadly, supported by its various linkages (Shimizu and Clark, 2019). When systems are considered broadly, and not individually, then the idea of linkage is essential to build resilience, because it recognizes that systems are connected and influence each other (Fiksel, 2006).

Linkage can be understood in different manners, such as linkage of resources, systems and stakeholders. In the case of intercity collaboration, the primordial linkage that can be recognized is among the people involved in the activities and connected by communication. A participatory, open and wide communication is a minimum requirement for international cooperation be considered resilient and adjust to stresses and challenges that may arise in the process. Communication is not only a way to exchange knowledge and information, but also local needs, capacities, interests and priorities from involved agents, who are from different cultures, understandings and backgrounds.

Since its industrialization, Japan became one the most active countries in international cooperation. Japanese cities undertook the role as sub-national actors able to connect the domestic and the international environment, in the sense of turning global strategies into local action (Takao, 2017). Moreover, in the last decade, Japanese government has been expanding more multi-stakeholder governance schemes, prioritizing higher participation and engagement of multiple stakeholders, such as NGOs, universities and private sector (Kato, 2016).

One of the most engaged cities in international cooperation is Kitakyushu, in Fukuoka Prefecture. In the 1960s, the city was torn by a serious air and sea pollution due to its intense industrial activities, but multiple stakeholders were engaged through partnerships to recover the environmental quality of the city (IGES, 2018). Among other projects, Kitakyushu is involved in a

cooperation scheme for exchanging know-how for improvement of waste management in Davao City, in Philippines, a growing city with over 1.5 million inhabitants that produces 600 to 700 thousands kg of waste per day.

This research conducted semi-structured interviews with key stakeholders from both local governments and local agencies for international cooperation, directly involved in the collaboration activities: in total, six individuals interviews with Japanese stakeholders and one group interview with eight Philippine stakeholders were conducted from October until December of 2019, with the objective of accessing the communication aspects that influence the process of cooperation between these cities.

## 2. Communication drivers and challenges

Communication in international cooperation faces its first struggle in the sense that, during most of the time, the stakeholders are distant from each other, in their respective countries. Online communication can support mainly logistics issues (such as selecting participants for study tour, setting date and details of missions or events), but the discussion about details and contents of the project must be done through face to face meetings, through a few hours of dialogue. Although the online communication was supported by easy access to internet connection from both sides, it was a challenge to adjust to the different uses of online tools: while the Japanese agents use email on the daily life and promptly reply to it, the Philippine side mostly utilizes the Facebook Messenger and takes a long time to reply the email. To solve this issue, the stakeholders agreed on using email for official communication, and Facebook Messenger as a reminder that an email was received.

The communication openness was also presented as driver and challenge for the collaboration. During the interviews, Japanese stakeholders referred that it is very typical that stakeholders in the developing country side are quiet and refrain from voicing out new proposals, and they might feel uncomfortable if a project does not match with their mayor's intention. Despite this challenge, Japanese respondents also highlighted that Philippine agents are not only very fluent in English, but also very friendly and receptive, either from the city government, barangay officers, or citizens, was a driver for communication. As for the Philippine respondents, the group expressed their satisfaction with the communication with Japanese stakeholders, not only for the speed, but also for the considerate support, so they were very satisfied about the openness of the dialogue among them.

The presence of any situation of conflict among stakeholders was also inquired during the interviews. Japanese and Philippine respondents agreed that the participants in international cooperation are respectful and are not likely to face a delicate situation of quarrel or hard topic, since the effort from both sides is targeted to enhance the conditions of waste management in Davao. However, there are some challenges that arise, such as changes in the staff involved in the project (problem that was faced in both cities), delayed response mainly from Philippine agents' side, and necessity to conciliate the collaboration activities with political intention in Davao.

Question was raised about differences on the communication among Japanese and Philippine stakeholders. Japanese respondents referred to an inner cultural difference between Japanese and Philippine's commitment, in the sense that Japanese stakeholders are more serious and punctual; besides, the conversation in a Japanese group is easier in the sense that people have similar knowledge, background and understanding, while the knowledge and background in Philippines is different and requires more time to establish an understanding. Philippine respondents also mentioned that the sense of urgency between Philippines and Japaneses is different and, while Japanese stakeholders are punctual, Philippine people tend to be more laid-back, even if the reason behind it is culture or busy schedule; besides, among Philippine agents, specially from the city government, the communication is considered efficient, not only because the staff members are cooperative with other offices, but also because they have their own communication application, developed by the IT team from city government.

Communication in international cooperation can be a long arduous process, with many perspectives and functions. It can support relationship-building among involved stakeholders, developing trust and familiarity between different sides; it establishes an environment of information-sharing and capacity-building, as agents can exchange knowledge, know-how, ideas, proposals and data that can create a common understanding about a problem and its solution; it defines rules and conventions in order to solve conflicts, misunderstandings, and disagreements; and it encourages the sharing of interests, priorities, strengths and limitations of stakeholders.

## 3. Communication: linkage builder towards resilience

Resilience is characterized for three main features: (I) persistence, which means the ability to change but still remain within a stability domain, (II) adaptability, which is the capacity to adjust to internal or external impacts, and (III) transformability, capacity to create stability despite the disturbance (Folke, Carpenter, Walker, Scheffer, Chaplin, and Rockström, 2010). Persistence, adaptability and transformability are the basis for the understanding that resilience in a system is dynamic, complex and interwined with other systems. When a system is struck by an event that disturbs its functioning and activities, the impacts of such event are predictable or isolated from a broad context, because different elements from a system are connected with this system but also with the systems beyond.

In this sense, linkage is proposed by literature as basic element to build resilience. Linkage can be understood in different dimensions, such as linkage between resources, systems, and stakeholders. To understand the existence and importance of linkage is to recognize that this complex net of elements mutually influence each other and, therefore, must be considered holistically when addressing resilience in public policies. In this sense, linkages have to be considered in project-making or public policy, to address the influence that a system have on others, as well as the influence of others in it.

For Shimizu and Clark (2019), linkage is one of the operational lenses or components for a resilience-based approach. Building or enhancing linkage means developing trustworthy relationships and interactive communication, understanding the linkage in many dimensions, and coordinating function for all this dimensions. The importance of linkage emerge with the understanding that a holistic overview of resilience requires that different systems are identified, along with their boundaries. Systems and subsystems influence each other, and components of resilience can be incorporated in community and local or national systems through public policy (Shimizu and Clark, 2019).

As mentioned in the previous section, an efficient communication establishes a common ground that can provide a vast range of awareness to be considered by stakeholders in decision-planning and making. If there is a good understanding among agents and a fair share of information about the projects and involved people, there is a higher chance of addressing emerging challenges and adjusting to disturbances, stresses and events that can interfere, delay or hinder international cooperation. Therefore, communication enhances the resilience of international cooperation by strengthening the linkage among stakeholders.

## 4. Conclusion and way forward

International cooperation is a complex, time-consuming process that requires open and respectful dialogue, information-sharing, full involvement of stakeholders, as well as wide investigation of their interests, demands and priorities. The more diversified the group of involved stakeholders, the more interests should be explored and discussed, and the more likely to become a challenging procedure. In this vein, collaboration at the international level approaches stakeholders not only with diverse interests, but also with different culture, language, ethnicity, religion, economic background, standing in distinct political, legal, and institutional arrangements.

Despite that, convening such a variety of stakeholders, who are willing to sit on the same table and discuss until reaching a common

understanding and a joint solution, is also a fruitful learning opportunity; actors can bridge various perspectives and share information, knowledge, governance and project experience, and technologies to address diverse issues.

For this research, communication was considered by most respondents as the most important and critical driver for international cooperation, not only for the demand of express and share various perspectives on the problems and solutions, but also as the tool for conflict resolution, for project development, and to reach an agreement. When so many different stakeholders with particular profiles and priorities assemble, sometimes one's interests and needs are not visible from the very beginning by the others. Additional challenge is that the initial weak connection between stakeholders might cause that some actors are not comfortable in freely expressing their opinions or stances. Establishing open lines of communication requires time, face-to-face meetings, events, casual meals, and other practices that can enhance trust building, warming up, and familiarity among participants. Moreover, communication was presented as a necessary instrument to foster and strengthen the linkage among stakeholder and, thereupon, as a mechanism to support international cooperation resilience.

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**Workshop Photos** (Workshop on Creating Resilient Society on Feb. 27, 2020)

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