

Six Months Since Western Japan Flood

Lessons from Mabi

Published and distributed by

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actalliance

Foreword

In 2018, IPCC (Intergovernmental Panel on Climate Change) released the 1.5 Degree! Report, which says that in spite of climate change mitigation efforts to keep the! temperature increase under 1.5 deg C, there would be increasing impacts of disaster! events, and Asia would be one of the key hotspots. The report also suggests the! importance of climate change adaptation and disaster risk reduction in reducing the! impacts. The extreme weather of past is becoming “new normal” of present.

Last year we saw several major climatic and non-climatic events in different parts of! Japan. The West Japan flooding is of particular importance not only due to its vast! area of inundation but also because of cascading effects of flood and heat waves.! The Mabi town of Kurashiki city in Okayama prefecture is one of the worst affected! areas, where several during and post disaster issues have emerged.

CWS Japan made a modest attempt to make couple of field surveys, conduct deep! interviews with key stakeholders and prominent residents in Mabi, and tried to!develop this 10 issues compilation. The key purpose of this document is to!share the issues/ lessons widely, especially outside Japan. The issues/ lessons include!both positive and negative aspects, and need to be thought on the perspective of the!scale of the disaster. Needless to say that there are many more important lessons, which are not included in the report, however, these 10 issues can!be a good starting point in understanding complexity of the disaster.

During the preparation of the report, we have been blessed with the cooperation of! many people, in spite of their busy schedule. I sincerely thank them, especially to! Professor Sakiko Kanbara and Ms. Junko Kaneto. People / residents, local! governments and non governments organizations have always been very generous,! and my sincere appreciation to them.

I hope and wish that the report serves its purpose, and the readers find it useful.

Tokyo
January 31, 2019

Rajib Shaw
Board Chair
CWS Japan

The research and publication of this report was funded by

United Church of Canada
The Interboard Senkyoshi Shadan
Presbyterian Disaster Assistance
Evangelical Lutheran Church in America

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January 2019

Please refer this publication as follows:
Das S. (2019): "Six Months Since Western Japan Flood: Lessons From Mabi", 28 pages, CWS Japan, Tokyo.

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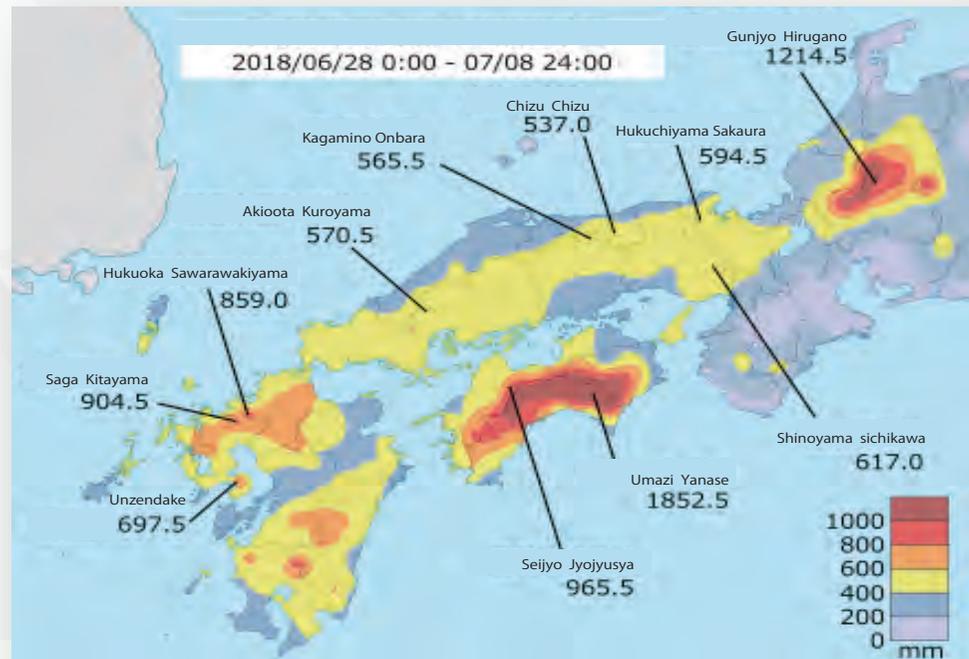
Acknowledgements

We are greatly indebted to Prof. Sakiko Kanbara of Kochi University, without whose help this report would not have been possible. Ms. Junko Kaneto of Rhizome KK, who bravely documented each minute of the flood from Mabi memorial Hospital, has very generously given us all the pictures and videos for this report. We have seen a lot through her eyes during our visits, and learnt about the opinions of the residents through the internet surveys conducted by her team. We are grateful to Prof. Yumiko Ohashi of Tama Art University, who has taken out time from her busy schedule to guide a team of students for the graphic design of the entire report. We would also like to thank Mr. Hara of the Construction Bureau of Kurashiki City, and Mr. Saga of Okayama Council of Social Welfare (Shakai Fukushi Kyogikai) for meeting us and providing us with extremely valuable information for this research. Ms. Shikanae of Okayama NPO Center has helped us with all kinds of information whenever we contacted her. Ms. Karashima of Peace Boat Foundation has told us about some of the challenges of managing volunteers after a large disaster. Last but not the least, we would like to express our sincerest gratitude to the residents of Mabi town, who, in spite of being severely affected and displaced by this disaster, have made time to meet and talk to us.

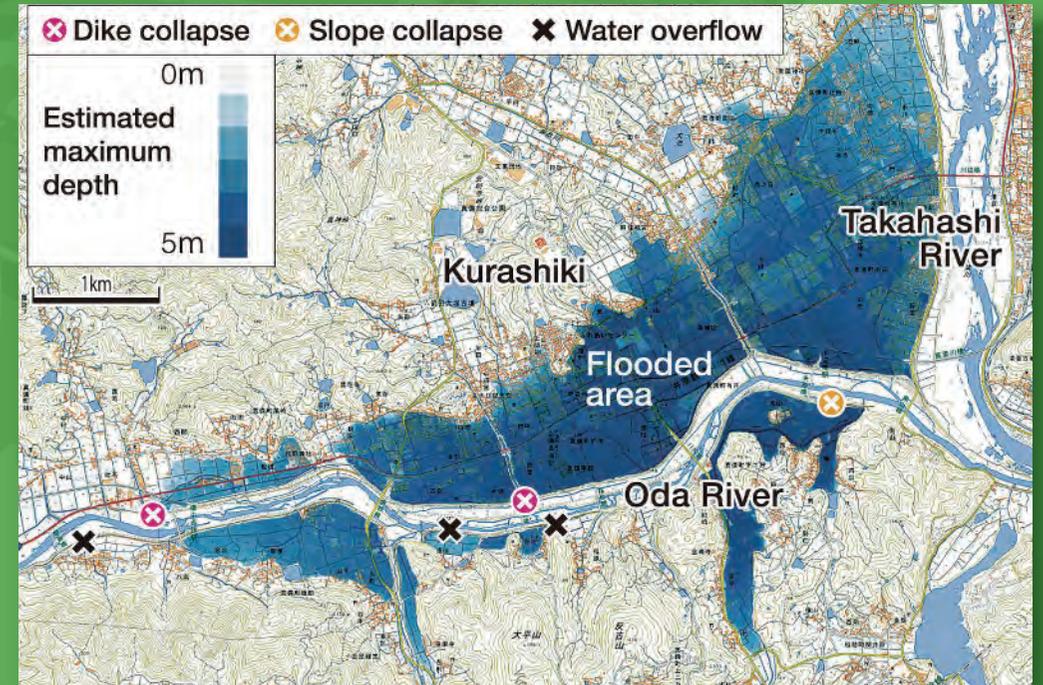
Introduction

The Western region of Japan saw successive heavy rainfalls from the end of June to mid July of 2018, causing devastating floods in many areas including Hiroshima, Okayama and Ehime. One of the most severely affected areas was a small peaceful town called Mabi in Okayama prefecture. The town stands on two rivers called Takahashi and Oda, both of which overflowed and flooded almost one-third area of the town. The embankments broke down at 8 places and the floodwater rose as high as 5 meter in many areas. About 4600 houses were affected and 51 people were killed, most of whom were above 70 years of age.

CWS Japan has responded to this emergency along with its partners during the first month. After seeing the situation we decided to go back to study and understand the important lessons this disaster has taught us, and then share the knowledge as widely as possible. We revisited the town twice after that, and interviewed affected residents as well as volunteers and city office personnel. Newspapers and magazines were reviewed, important facts were carefully studied. This report summarizes the key findings of the research done through literature survey and field visit during the period of November 2018 to January 2019.



Source: Wikipedia



Source: The Daily Mainichi, July 11, 2018

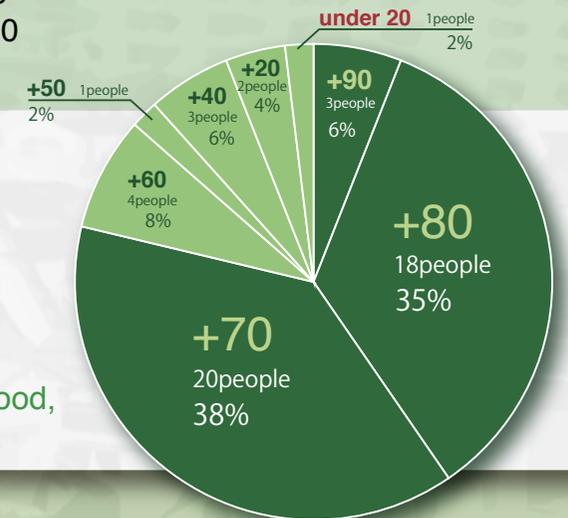
Summary of Damages

Levee break down: 8 places along 4 rivers
 Total area submerged: 12 Hectare
 (one-third of the town)
 Total houses submerged: about 4600
 Total number of people rescued: 2350

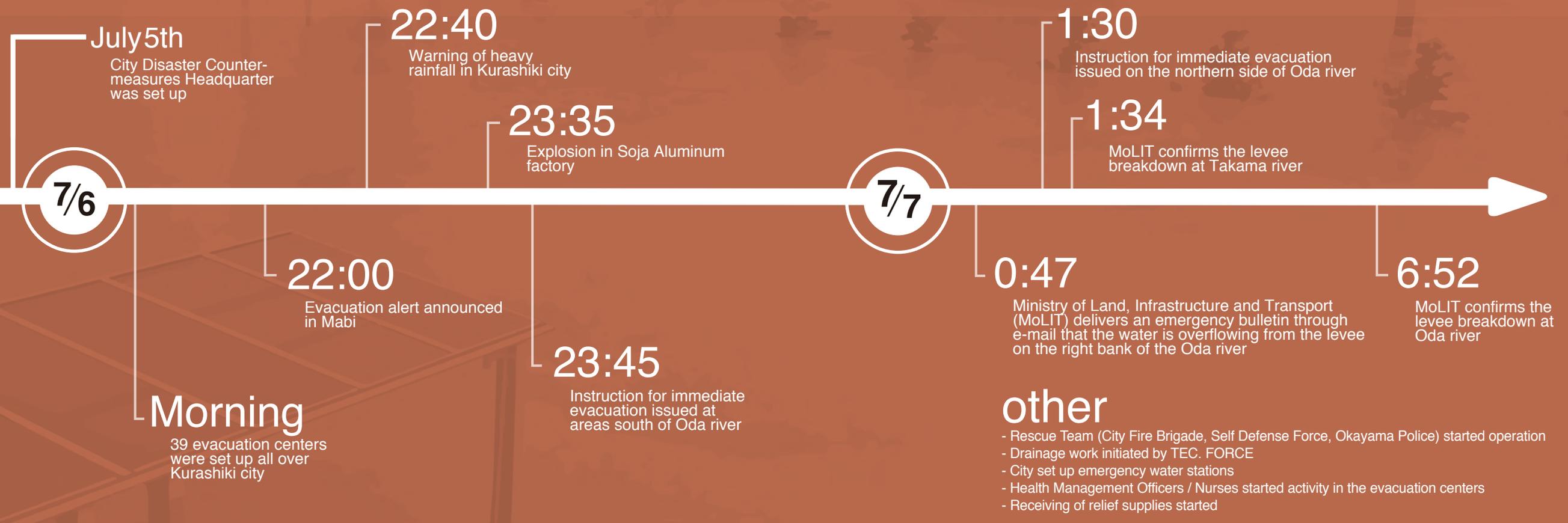
Casualty

Total number of Death: 51
 Male: 22, Female: 29
 (90% because of drowning)
 Average Age: 73.8 years

Source: Nikkei Architecture,
 Special Edition on Western Japan Flood,
 August 9, 2018



Timeline of Five Days



- 7/8** - KuraDRO was set up to provide help by combining the Health Insurance System and Medical System (Picture of KuraDRO)
- 7/9** - Non-drinking water supply was restored Mabi. Application for "Disaster Victim Certificate" started. Around 6200 applications were accepted by Oct, 12. Minister of Disaster Management visited the Mabi area

- 7/10** - Self-Defense Forces (SDF) started to remove the debris
- Coolers were installed in the evacuation centers
- SDF started bathing support
- Bus service started between the evacuation center and the bathing facilities
- Temporary operation of Sewage Purification Center started

Mabi has a history of devastating floods. In 1893, the Oda river overflowed following heavy rainfall and it is said that the flood water went as high as 14 meter (picture below). In recent years, especially since the 70s, the town has seen repeated floods almost every few years, but the water level never exceeded 50 cm. This, unfortunately, had resulted in the general misperception that the water could never ever go above that height.

The town was required under a 2005 law to create “Hazard Maps” outlining areas at high risk of flooding, landslides and other disasters, and the locations of evacuation centers. But the official hazard map was distributed only in 2016, by which time most of the high risk areas were already occupied. The map clearly mentions about the risk of severe flooding and the possible frequency (every 100 or 150 years), where the water may rise as high as 5 meter. Unfortunately most residents did not comprehend the level of risk even after the Hazard Maps were distributed to them. The residents were also unaware of Backwater Phenomenon, where the smaller rivers become much more dangerous. It is necessary to raise the awareness in community level by holding meetings, side by side with distributing individual hazard maps. A booklet with comprehensive explanation about the risks and the necessary protective measures can also help the residents take timely actions in both individual and community level.



Hazard Map of Kurashiki City (Source: City Website)



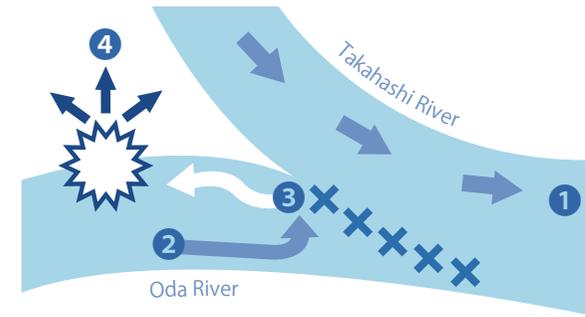
Mr. Hiromichi Morimoto, a Lecturer at Kawasaki College of Allied Health Professions, showing the location of his

house right at the border of the high risk area. He heard about the flood risks before buying the house, but he never imagined it could be so devastating.



A document describing the horror of the 1893 flood (Source: Dr. Sakiko Kanbara)

How backwater phenomenon occurred in the Oda River



- 1 Water level rises due to rain.
- 2 Water level rises as downstream flow is stopped by the Takahashi River with a rising water level.
- 3 Stagnant flow pushes up water level further.
- 4 Barks breach and flood occurs.

A stone in the playground of Kawabe Elementary School shows the maximum water level after the September 1976 typhoon (about 50 cm).



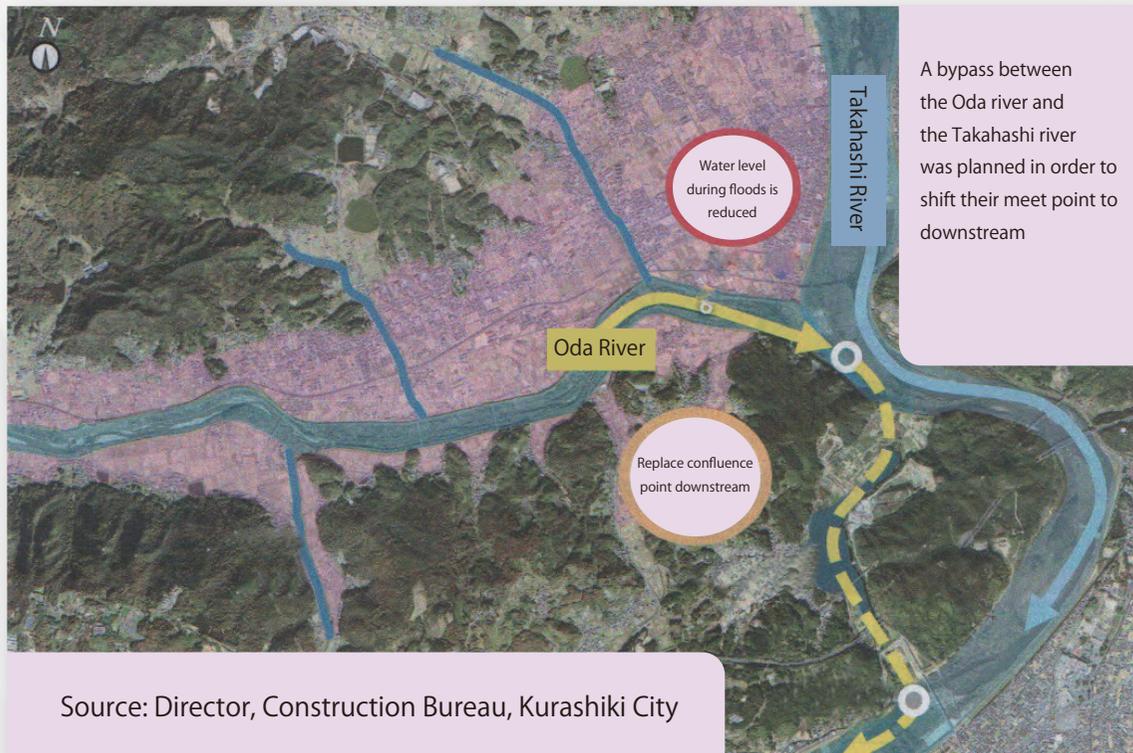
1976



2018



According to reports, there were talks of a river bypass and a weir, or small dam to supply water to farms and reduce flood risks along the Takahashi and Oda rivers since as far back as 1968. It is said that resistance from residents on the southern side of the Odagawa river over being cut off from groundwater stalled the plans (from Reuters report). The matter was on the table again when Mabi became a part of the city in 2005. There has been several discussions between Kurashiki City and the Land Ministry to start the work on the project. The project finally won approval in 2010, and in 2014, 28 billion yen was allocated for a 30-year plan that included a bypass between the Odagawa and the Takahashi river. Work on that project was scheduled to get under way from Autumn 2018.



Source: Director, Construction Bureau, Kurashiki City



Source: Reuters Graphics, July 16, 2018



Source: Director, Construction Bureau, Kurashiki City

The water level of the Suemasa river increased due to heavy rain, and about 1 km north from its meet point with the Oda River, a bridge collapsed.



Source: Director, Construction Bureau, Kurashiki City

The Takama river meets the Oda river at Mabi town of Kurashiki City, and the embankment at the meet point of the two rivers broke down.

In 2015, Japan's Central Land Ministry came up with a policy to better cope with disasters, which included training local authorities on when to issue warnings. Advisories and orders to evacuate, however, are still left up to local authorities.

In Kurashiki City and the nearby areas heavy rain had started since the morning of July 6th. The weather forecast showed continuous rainfall over the next two days, and the city office was getting prepared for an emergency since the morning of July 5th. The first evacuation order for the area south of the Oda river was issued at 11:45 p.m. on July 6th. Some residents said that they did not know the difference between an emergency warning and an evacuation order. Some came to know about the difference through social media after the warning was issued. At 1:30 a.m. on July 7th, using loudspeakers, mobile phone alerts, and television and radio messages, the city ordered residents in the heavily populated area north of the river to seek shelter. Only four minutes later the failure of the first levee on Takama river was confirmed. Within the next few hours four more levees broke down, flooding one-third area of the entire town.

Some residents said that they got the emergency order for evacuation, but they did not know which areas were in danger. Ms. Kaneto of Kawabe area said that she drove with her parents at 5 in the morning of July 7th towards Mabi Sogo Park looking for shelter, which was actually in the direction of the flooding (next page). They were in danger of drowning on their way, had they not been stopped by the police.

Diagram of Warning Systems



Morning of July 7



All of the 51 deaths caused by this disaster were deaths in water, and as many as 40 of the victims have died in their own houses. From our interviews and from newspaper reports, it was revealed repeatedly that the residents did not start evacuating to a safer place until almost midnight of July 6th, even after hearing the first warning. The reasons for this delay can be broadly summarized as follows:

1

Physical inability.
Elderly people could not move out of their houses on their own in the dark of the night.

2

Underestimation of the danger.
Most people did not think the water would come from the relatively smaller rivers or would rise above knee-height.

3

Many residents reported that they did not move out of their houses because no one in the neighborhood did.

4

Some of the residents were worried about their pets, as they are generally not allowed inside an emergency shelter.

5

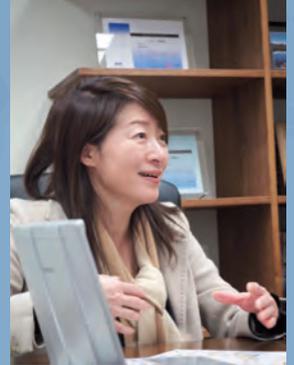
Many did not know where to go. Three out of six elementary schools, which are also designated emergency shelters, were under water by the morning of July 7th.

6

Many did not know how to go to the shelters. The Hazard Map shows the locations of the designated shelters, but it does not suggest the evacuation route.

7

Unlike earthquake, the residents never had any drill for a situation like this. It was already too late for those who waited for the sunrise to evacuate.



Ms. Junko Kaneto, Resident of Kawabe area

“On July 6th at around 9 PM I saw the evacuation advisory in the news and went to pick up my mother and our dog, who lived right next to the banks of the Takahashi river. I drove them to my rented apartment in the neighborhood, which is in the second floor of the building, and on our way we saw the water of the river rise almost to the level of the narrow road on the bank. My father drove his own car and joined us later. After 2 AM on the 7th, I got a phone call from a friend who informed us that the nearest emergency shelter (Okada Elementary School) was already fully occupied. I talked to my parents about evacuating for safety, but they did not think it was necessary, as they did not think the water could rise up to the second floor. Besides they were also worried that we would not be allowed to take our dog inside the shelter. So we decided to spend the night in my apartment. At around 4 AM we were awoken by the sound of the emergency evacuation order in our phones. We realized the seriousness of the situation and left my apartment at around 5 AM. We wanted to go to Mabi Sogo Park at first, because it was the nearest public facility that had a large open space. I understood later that it was actually towards the areas that were affected first. We were stopped on our way as the road to that place was already inundated. After considering everything, we decided to go to Mabi Memorial Hospital, which was very close to where we were stopped. By 6 AM, the water came up to the parking area of the hospital, and kept rising for the next few hours. About 30 evacuees, including ourselves, were gathered in the 2nd floor at first, but eventually had to move to the upper floors as the water started entering there. As many as 300 people had to spend the night that way, till the Self Defense Force came to rescue us in the morning of July 8th.”

In Japan it is usually the public elementary schools that are the designated emergency shelters. Unfortunately, as mentioned before, three out of six such elementary schools were submerged by early morning of July 7th. The residents who evacuated, needed to find an alternative in the middle of the night in bad weather. Many people took shelter in Kumano Shrine, which is not a designated shelter, but became a “Notified Shelter” 3 weeks later. A good number of people continued staying there till the end of August because of lack of space in the designated shelters.

The handing over of the designated shelters is also an important issue. According to the Headmaster of Sono Elementary School, although there is a manual on how this should be done, the teachers were completely at a loss about this since they never had a training or drill. Another crucial issue is serious shortage of NGOs who specialize in Shelter Management. Ms. Yamanaka Yumiko of Kyushu Christ Disaster Relief Center suggested that the only way to deal with this is to develop manpower for shelter management at local levels through training of volunteers.

Shelter	No. of evacuees on July 7th
Okada Elementary School	About 2000
Nima Elementary School	About 1000
Sono Elementary School	About 800
Kawabe Elementary School	Submerged
Yata Elementary School	Submerged
Kurese Elementary School	Submerged

Source: Sanyo Shinbun January 12, 2019

Mr. Kitani, the Headmaster of Sono Elementary School



“Our school has never been used as a shelter before, as far as I know. There was a manual with some general instructions, but on July 6th, we did not have the time to check those instructions. The first warning was issued after 11 AM on the 6th, but people started coming in only after 11 PM. Within a matter of hours there were over 900 people in our school, and they needed food and shelter. Not having enough knowledge about the manual was not an excuse anymore. There were only three personnel from the city to take care of the management. Since we live close by, the Principal and I came over to help. There was severe shortage of food, so the Principal made arrangements to prepare some warm food. The toilets could not be flushed, so we had to take care of that too. Everything needed our attention and we had to act fast.”

Mr. Hiroyuki Ohta Flood victim, trained Disaster Management Officer



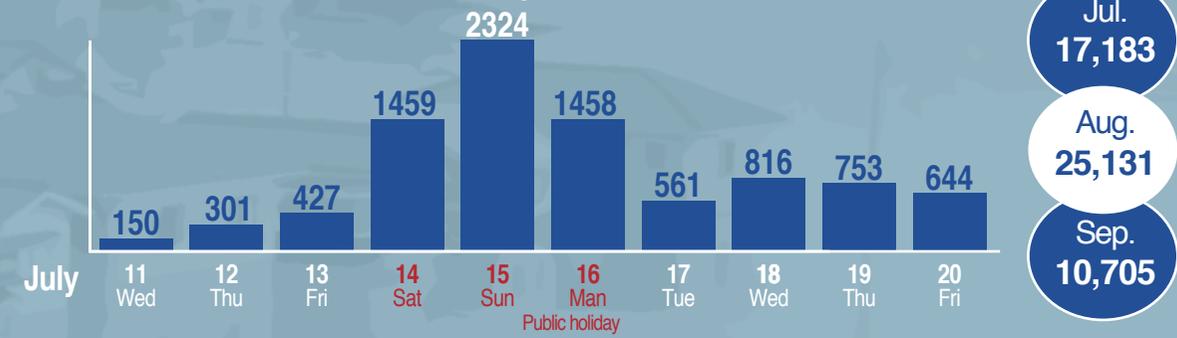
I became a trained Disaster Management Officer a few years ago because I wanted to make myself useful for my community. When I look back now, it feels as if it was my destiny to get that training only a couple of years before the devastating flood washed my town. On July 6th, after I heard the sound of explosion at the factory, I knew something was seriously wrong. I talked to my wife and son, and in a few hours we decided to walk to Okada Elementary School just to be safe till the rain stops. None of us imagined we were leaving the house for months. Within half a day the shelter filled with about 2000 people and hundreds of cars. I joined the shelter management team and some quick decisions had to be taken. I never read the 121 pages long, A4-sized Shelter Management manual even during my training, to be honest. All our decisions and actions were based mainly on our team discussion and common sense. We had to manage food, rest and toilet facilities for 2000 people, and we also had to be careful about spreading of diseases. We got a good supply of sanitizers along with all kinds of relief goods, and I believe that helped us fight the diseases that usually break out at shelters. We also came up with little ideas to keep the shelter clean—like a game called “clean up the shoes”.

According to Okayama Council of Social Welfare (*Shakai Fukushi Kyogikai*) records, as many as 53,019 persons volunteered during the first month after the disaster. Most of them came from the nearby areas to volunteer for a day. Some came from different parts of the country to volunteer during the weekends. Managing such a large number of people is a difficult task by itself. No NGO has enough manpower to handle the management only by its own staff. Therefore those who can stay for two to three weeks and have previous volunteering experience are requested to help with the management. In case of Mabi, the most important aspects of Volunteer Management were as follows:

- 1 To decide who works where. Sometimes the residents came to the Volunteer Center seeking help, sometimes the Volunteer Managers walked up to the residents to find out if they needed help. Once the need assessment of an area was done, the Managers distributed the work among the volunteers who registered on that day.
- 2 Because of the nature of work, many volunteers got injured and needed immediate medical care. Also, because it was mid July, extra care was necessary to make sure that the volunteers did not get heat strokes.

Ms. Yukari Karashima of Peace Boat Foundation mentioned that even though there was a serious shortage of volunteers compared to the amount of work in Mabi, there were some areas where the residents were not very welcoming of the volunteers. No disaster affected area, she adds, can recover from the damage on its own, and hence it is really necessary that the affected people are accepting of the volunteers who are willing to help them.

Volunteers in Kurashiki City



Source: Website of Okayama Council of Social Welfare Shikai Fukushi Kyogikai
<https://team-kibidango.vc/%E6%B4%BB%E5%8B%95%E6%A6%82%E6%B3%81/vn/>

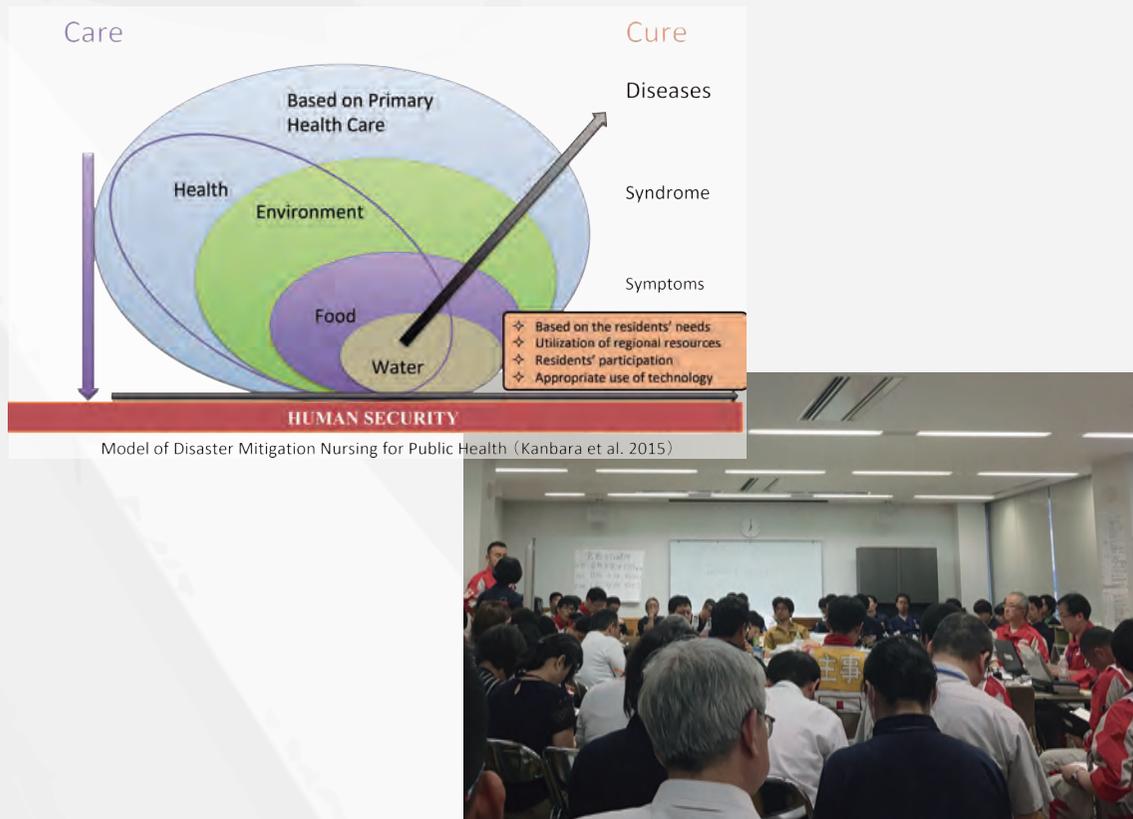
Kantan Map

The volunteers needed the residents' information to keep track of their work. Unfortunately the City could not provide the data because of the Personal Information Protection Law. Compelled by the urgency of the situation, the volunteers, with the assistance of an Osaka based company called At Creation KK, and support from Apple Japan, developed an iPad based tool called *Kantan* (meaning "Simple") Map. It contains information like the name of the owner, age and health issues, most of which the volunteers collected while helping the owners clean up their houses. They are now adding the information about the residents' present whereabouts too. The process, however, takes a lot of time they mentioned, since they are doing the collection and input of the information one at a time, manually.



Ms. Shikanae of Okayama NPO Center explaining about the *Kantan* Map.

The temperature on July 7th went as high as 37 degree, so the immediate concern was heat strokes caused by the heat. The water supply was severely affected, hence dehydration was another big concern. Toilets could not be flushed, which could also spread diseases. Unfortunately almost all the medical care facilities and drug stores were affected by the flood, so the town had to depend entirely on the emergency medical care support provided by the government during the first few days. Some people staying at the emergency shelters said that the medical team appointed by the government always visited the shelters during the day, when most of them were out for their day jobs or to clean their houses. Volunteer nurses took turns to stay at the shelters during the first few weeks and provided the much needed care at the much needed time.



Meeting of the Medical Team(Source: Dr. Sakiko Kanbara)

Imakara Techo: Diaries From Now



- ① Basic information about each family member.
- ② A Calendar to record health conditions. The lower rows contain health advices (in blue) and certain things that need to be done till one can get back to normal life (in green).

CWS Japan supported a team from Kochi University to create and disseminate Imakara-Techo (Diary from Now) to help evacuees manage their “assessment fatigue” and create integrated information about themselves and their situation to be shared with all agencies and aid providers for their recovery. This proved to be a very useful tool to share all their basic information, situation details, medical records and other information so that they don’t need to answer similar questions repeatedly. The concept of this diary came from Dr. Sakiko Kanbara, the head of global program for disaster nursing at Kochi University, through her years of experience in Nepal and Japan. A team of students of Tama Art University’s Product Design Department, guided by their teacher, gave it shape based on their close observation of the situation in Mabi. After the success of Imakara-Techo, a new version called “Korekara-Techo” was developed and distributed by the same parties towards the end of October. The diaries are now available online (Japanese only), which was developed by an Okayama based company called Rhizome KK. (Website: <https://app.imakara-techo.com/login>)

There were about 4600 affected families who needed immediate temporary housing, but the total number of constructed (and furnished) temporary shelters as of December 2018 is 298. Some people moved outside the town to live with their families, some rented houses on their own within or nearby the town. About 80% of the displaced families have been living in the *Minashi* Temporary Houses (unoccupied private houses rented and allocated by the Government), most of which are outside the town (Asahi Shinbun, January 6th). The *Minashi* Houses were not furnished, and some of them are very old and very difficult to live in during winter. The biggest problem with the *Minashi* Houses is that they are scattered in various areas outside the town, and it is not possible to reach the residents to find out about their needs, as the authority is yet to link their whereabouts with their original addresses. This also makes it difficult for the children to reach their designated schools, because they are no more within a walking distance. In case of Kawabe Elementary School, which is presently located in a prefabricated building on the playground of Sono Elementary School, it takes 8 buses more than an hour to collect all the children from their respective *Minashi* houses.

The Construction Bureau is now trying to make a GIS based map that will contain all the important information about the owners, including their present *Minashi* House location.



Prefabricated building of Kawabe Elementary School in the playground of Sono Elementary School

Rebuilding of the affected Houses



Source: Asahi Shinbun, January 6, 2019



Prefabricated Temporary Houses near Sono Elementary School

1 Reconstruction of Infrastructure

By year 2023 a bypass of the Oda river will be created 4.6 km downstream from its present meet point with the Takahashi river (from the government's emergency disaster management budget). Embankments and levees will be made stronger and higher at several areas along the Oda river.

2 Rebuilding of the affected Houses

The Government has started several soft loan schemes to cater to the different kinds of needs of the owners of the affected houses. It has also started a hotline number to provide guidelines and help to the affected residents regarding the rebuilding of their houses. As of November 12, 2018, the Government has covered the cost of the removal of the damaged parts of 850 houses.

3 Rebuilding of small industries

The government has started several loan schemes with different interest rates to help the owners restart their businesses. As of November 2nd, the government has provided group subsidies to 133 business owners. Arrangements were also made to help 177 smaller businesses who need more continued support.

4 Restoration of Agriculture

As of November 10th, 460 owners applied for rebuilding and repair of green houses, 82 people applied for fertilization management, and 103 people applied for help in harvesting of rice.

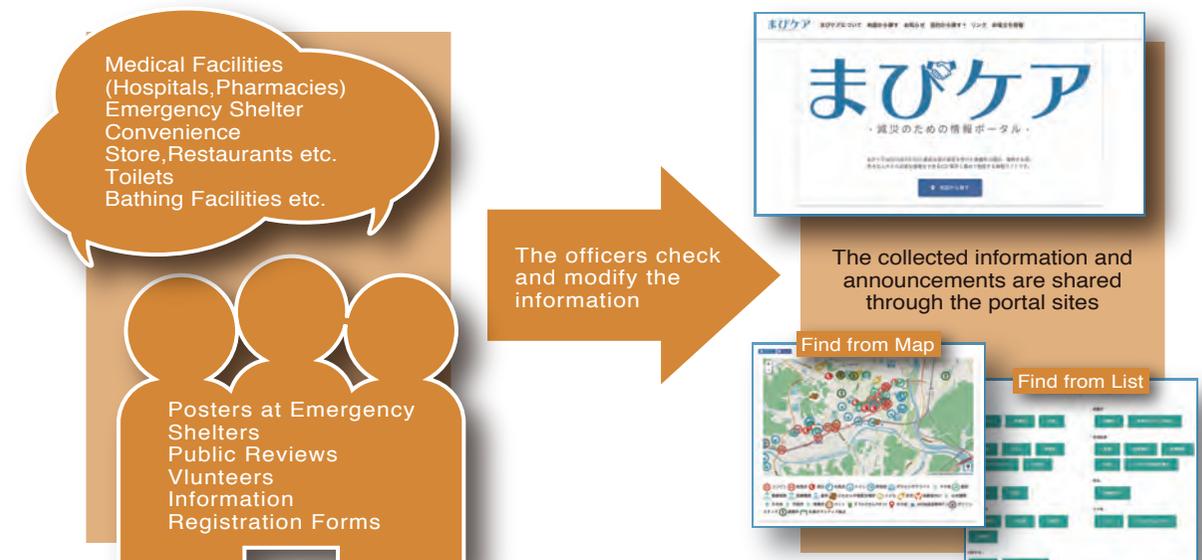
Mabi Care

Mabi Care is a website that collects and shares all the information the residents of a post-disaster town may need during the recovery process. About a week after the flood, Dr. Sakiko Kanbara of Kochi University, who was born and raised in Mabi, realized that the residents, most of whom lost their cars and were staying in a shelter in an entirely different neighborhood, needed information about various kinds of facilities to slowly start getting back to normal life. All the information needed to be in one place, yet needed to be very simple to search. During her field survey she found that some of the facilities within Mabi and the nearby areas, like convenience and drug stores, toilets and supermarkets, were unaffected and were operating. Mabi Care collects and updates the location and opening hours of all those facilities and more, from which the residents have been greatly benefitted.

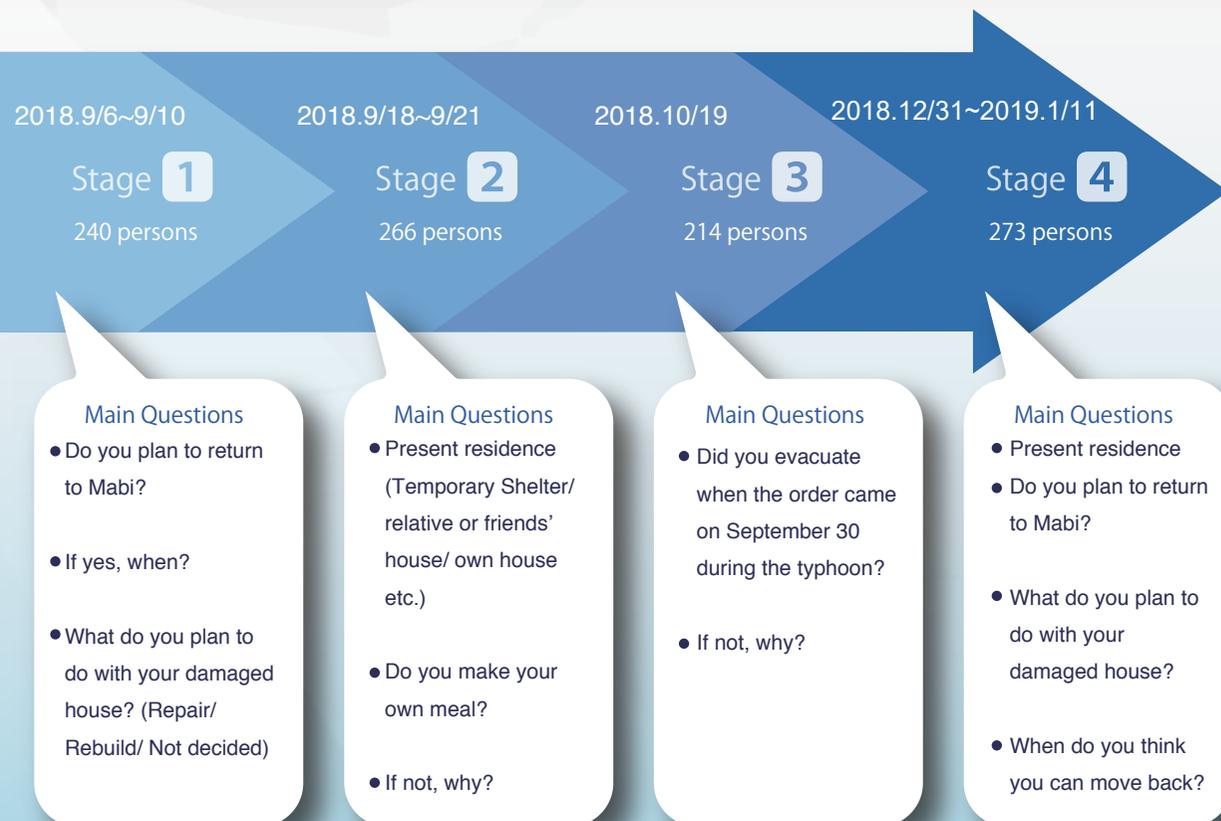


Tentative recovery plan given by the City Chief at the opinion exchange session with the residents of Kawabe area on November 10, 2018

How Information is Collected and Shared in mabi-care.com



Kawabe (meaning River-side) was a beautiful neighborhood next to the western bank of the Takahashi river. 99% of this area went under water, and most of the 1700 households had to evacuate and move into temporary shelters located in different areas within and outside the town. Many of them wish to repair or rebuild their houses and move back, but because of the limitation of the number of construction companies, they do not know when their turn will come. To keep in touch and stand by each other during this very difficult time, the residents formed an NPO called “*Aruku*” (to walk) in October 2018. It started as an internet network circle in August, through which they have been conducting periodic surveys. Even though the survey was conducted among residents who use the internet and social network, much of the real situation is reflected in the results.



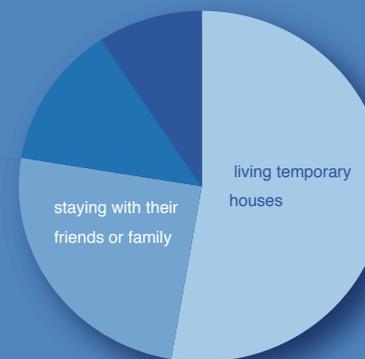
Key Observations

In the first stage, when asked whether they want to return to their houses in the severely affected Kawabe area after they are rebuilt, 90.4% answered Yes. This percentage did not change in four months between the first and fourth stage (91.6%).



36% of the respondents of the first stage hoped to get back by Spring of 2019, where another 35% said they do not have any idea.

65.4% owners of the affected houses plan to repair their houses. 13.3% said they want to break down the older house and rebuild. 21.3% said they have not decided anything yet.



In the second stage, out of 266 respondents 56.8% are presently living temporary houses. 15.4% are staying with their friends or family, and a large number of them are living in rented houses with government subsidies.

About meals, most (78.9%) people are already cooking by themselves. The others are either buying ready-made food, or receiving cooked food provided at the shelters.

Of those who are not cooking their own meals (96 persons), about 60% said they don't have the willpower to go to the kitchen and prepare the food. The others said they either do not have the utensils or facilities or the time.

In the third stage, out of 214 respondents only 23.4% is living in Mabi town at present. 57% is living outside the town and 14.5% is living in Soja city.

When asked whether they evacuated after the 24th typhoon on September 30th, 64.8% of the 71 respondents who are living in Mabi town said they did not.

Among them, 30.9% said they did not think this typhoon was going to cause much damage, and 19.1% said they could not go because they had pets.



In the last decade Japan has seen floods almost every year. The effects of Climate Change have been becoming more and more visible through weather disasters like rainfall induced / river floods as well as typhoon induced coastal floods.

Although there are variations of the issues/ challenges and lessons, based on the local contexts, there are also similarities when it comes to early warning and evacuation behavior of communities, emergency shelter / temporary housing issues, post disaster recovery planning etc.

Key point is how we learn from these lessons, and how these lessons are reflected to future disaster preparedness. Japan faces tremendous challenges of resources (financial, technical as well as human resources) in small and medium sized towns and rural areas.

De-population, aged population is increasing in these areas. It would be important to think of innovative solutions on how to utilize new technologies, blended with social networking and capital to develop resilient communities in these areas. We hope this report will encourage innovative thinking in this regard.

Reference

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