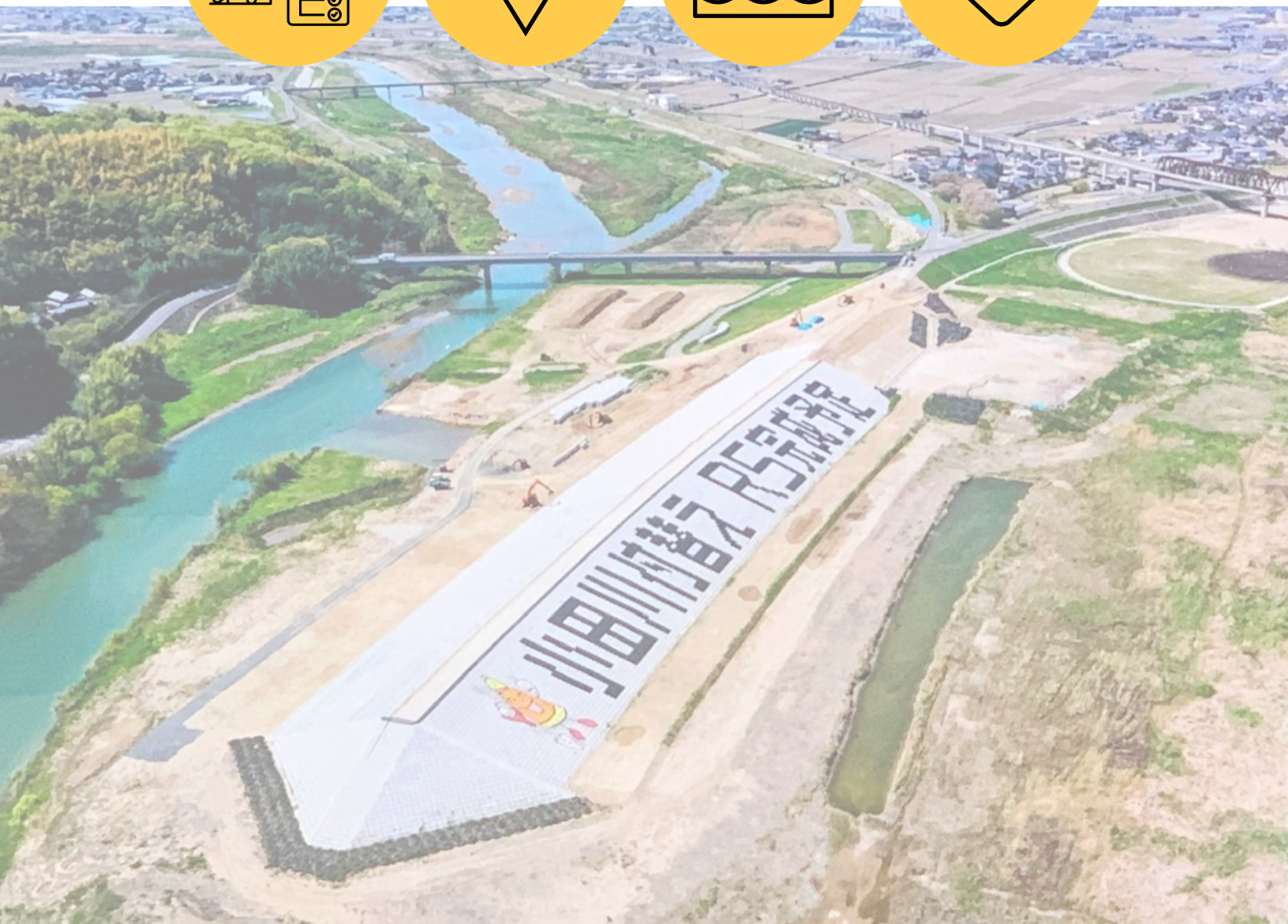


Lessons from Mabi: Five Years of Recovery from the 2018 Western Japan Flood



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LIST OF ABBREVIATIONS

GEJE	Great East Japan Earthquake
MLIT	Ministry of Land, Infrastructure, Transport and Tourism
NGO	Non-Government Organization
NPO	Non-Profit Organization
SDF	Self Defense Force
SFDRR	Sendai Framework for Disaster Risk Reduction
TEC-FORCE	Technical and Emergency Control Force

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CHAPTER 1: BACKGROUND

In early July of 2018, successive heavy rainfalls battered western Japan causing devastating floods in many prefectures including Hiroshima, Okayama and Ehime. Mabi town in Okayama prefecture was one of the most affected areas, as it stands on two rivers – the Takahashi and the Oda – both of which overflowed and flooded one-third of the town. As many as 52 people were killed, and 5,977 houses were damaged, partially and fully in Kurashiki city, where Mabi is located. Over 20,000 people were displaced and were forced to live away from their homes for months.

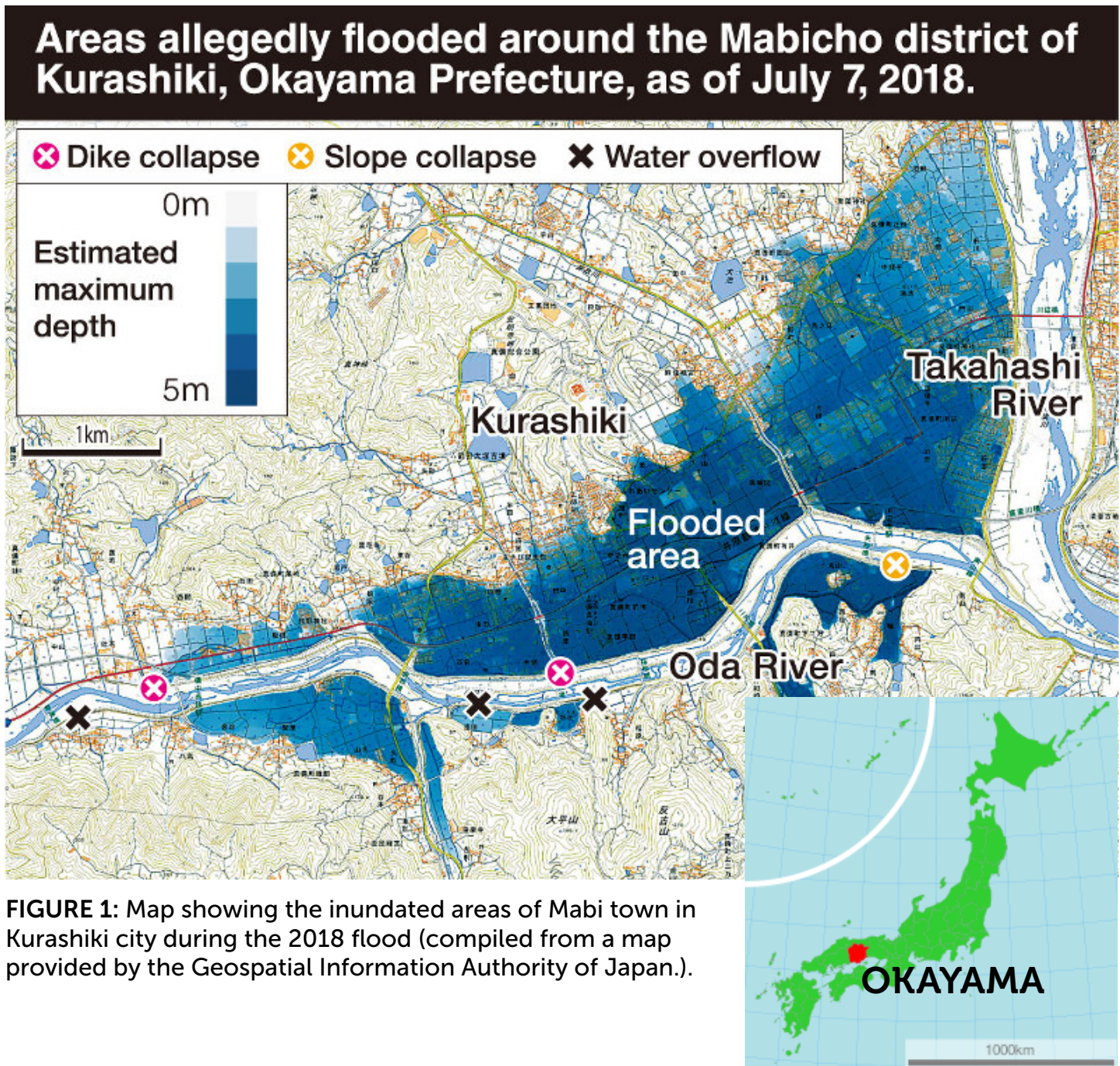


FIGURE 1: Map showing the inundated areas of Mabi town in Kurashiki city during the 2018 flood (compiled from a map provided by the Geospatial Information Authority of Japan.).

CWS Japan responded to this disaster along with its partners during the first month, then decided to publish a report summarizing the important lessons. The report *“Six Months since Western Japan Flood – Lessons from Mabi”*¹ (hereinafter referred to as *“the Six-month report”*) was published in January 2019, about six months after the disaster, where issues such as risk communication, early warning, infrastructure measure, evacuation behavior, shelter and volunteer management were discussed. A second report titled *“Towards Mabi’s Recovery – Lessons One Year On”*² (hereinafter referred to as *“the One-year report”*) was published in July 2019, a year after the disaster, which mainly focused on the recovery process. In July 2023 it will be five years since the flooding that took so many lives and displaced so many people. While the first two reports captured many important lessons regarding the immediate response and the early stages of the recovery, a large part of the process can only be studied after a certain period has passed. This is the reason the team went back to Mabi in April 2023, to capture the most important lessons learned through the recovery process of five years.

The first thing that one can notice, are the roads and embankments constructed

over the last five years. According to the city officials, more than 90% of the affected families have already rebuilt their houses. To see beyond these visible changes, the team talked to city officers and stakeholders, as well as members of the affected communities and local organizations.

This report is not an account of all that was done during the recovery process of the last five years. It simply attempts to look into the main issues, most of which were discussed in the previous reports, and tries to understand the lessons that were learnt in the process of addressing those issues. The authors hope that the essence of the lessons captured in this report will, in some way, help the preparedness as well as the recovery process of future disasters in and outside of Japan, especially of water-related disasters like heavy rain and floods, which have become more frequent in the recent years because of the effects of climate change.³

¹ Das S. (2019): *“Six Months Since Western Japan Flood: Lessons From Mabi”*, 28 pages, CWS Japan, Tokyo.

² Alexander J., Das S., Ishiwatari M., Kanbara S., Izumi T., Komino T., Sakurai A., Shaw R. (2019): *“Towards Mabi’s Recovery—Lessons One Year On”*, CWS Japan, 25 pages, Tokyo, Japan.

³ According to [the 6th Assessment Report](#) by Working Group 1 of United Nation’s Intergovernmental Panel on Climate Change (IPCC), the climate has warmed at a rate that is unprecedented in at least the last 2000 years, and this is already resulting in changes such as extreme heat, heavier rainfall, drought, and ocean warming across the globe.

CHAPTER 2: RECONSTRUCTION AND RESTORATION OF THE INFRASTRUCTURE

The reconstruction and restoration of the flood protection infrastructure damaged by the 2018 Western Japan flood encompasses vital interventions along the Oda River, including modifying the confluence point between the Oda River and the Takahashi River, reinforcing the levees, and excavating riverbeds (FIGURE 2). While it would have been a challenge to complete such a large-scale project within the targeted five years even during normal times, three out of five years of the construction period coincided with a global pandemic, and the last two years coincided with significant price hikes because of a war in Europe and its consequences. Yet, when the authors visited the construction sites in mid-April of 2023, nearly 80% of the construction was complete, and the progress was on track for the work to be done by the expected date of March 2024.

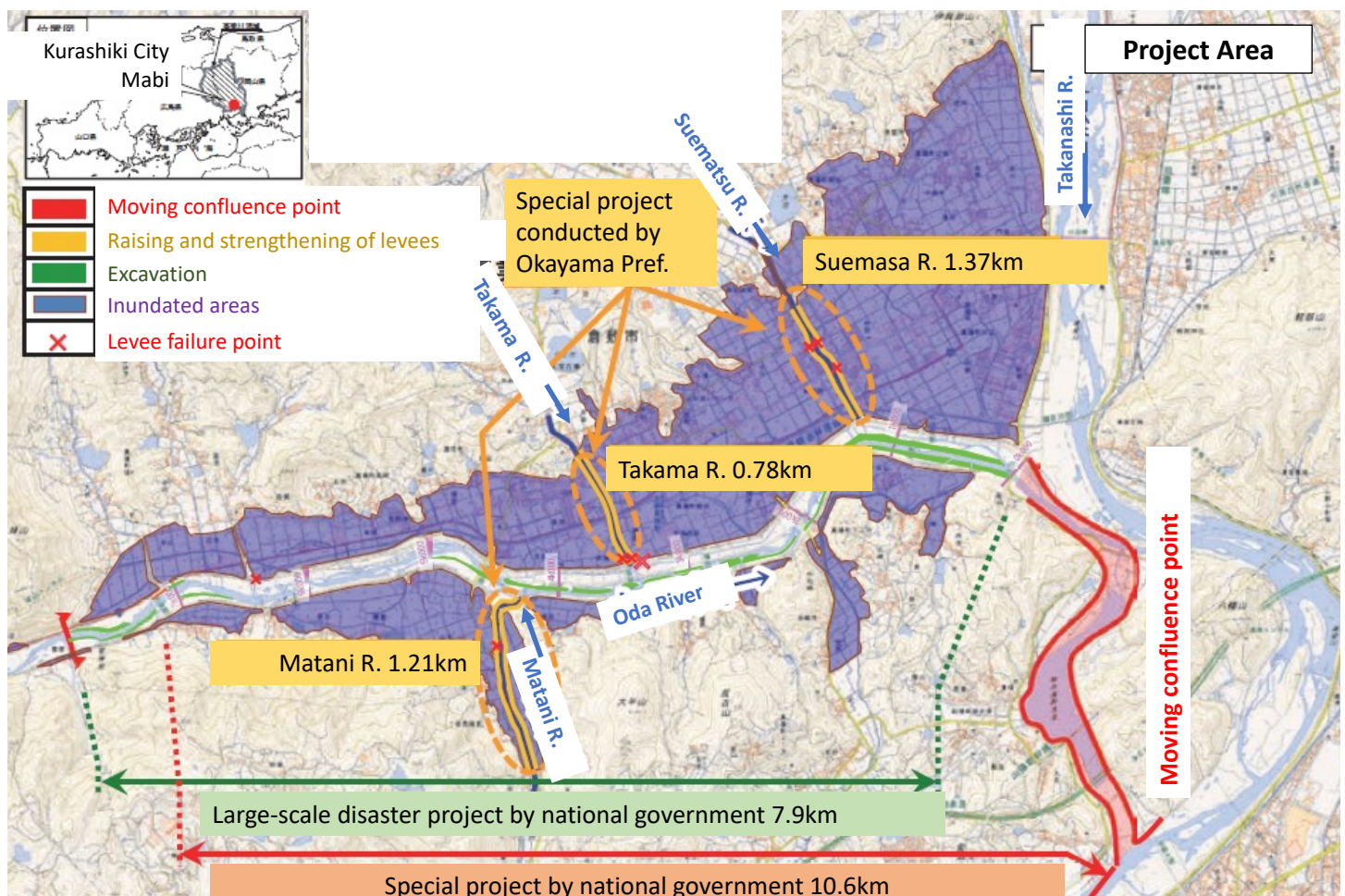


FIGURE 2: Map showing overview of the infrastructure reconstruction project.

To make this possible, quick steps were taken right from the initial stages. The TEC-FORCE (see right) as well as the local government, used drones and open GIS to determine estimated flood heights and the extent of total inundation, which dramatically reduced the time required to survey the damage. According to a 2022 MLIT document on TEC-FORCE⁴, the number of personnel deployed on a single day after the 2018 flood (607 persons on July 13), exceeded that after the 2011 Great East Japan Earthquake (maximum 521 persons on a single day).

Technical and Emergency Control FORCE or TEC-FORCE, established in April 2008 by MLIT, supports local governments by quickly assessing the damage situation to prevent the expansion of damage after a large disaster. They also provide technical support to quickly restore the important functions of the affected area. TEC-FORCE started with 2,500 personnel all over the country. However, in April 2022, the number of personnel was increased to 15,074 amid growing concerns of Tokyo Inland Earthquake and a megaquake along the Nankai trough in western Japan (Fukushima et.al., 2023; MLIT website).



PHOTO CREDIT: THE YOMIURI ONLINE ([HTTPS://WWW.BOSAI.YOMIURI.CO.JP/FEATURE/1069](https://www.bosai.yomiuri.co.jp/feature/1069))

⁴ See page 28 of this MLIT document: <https://www.mlit.go.jp/river/bousai/pch-tec/about/pdf/overview.pdf>

ABOUT THE RECONSTRUCTION AND RESTORATION PROJECT

The Takahashi is a Class-A River⁵, and its management of the main channels is done by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). Therefore, this massive reconstruction work was led mainly by the MLIT, with Okayama prefecture managing the work along the three tributaries of Oda River. The comprehensive initiative to protect the river from flooding has a budget of 61 billion JPY (approximately 0.43 billion USD)⁶, and is scheduled to be completed by March 2024.

The reconstruction and restoration project has the following main focuses:

RESTORATION OF THE ODA RIVER LEVEES

The Oda River levees that failed due to the heavy rain in July 2018, were temporarily repaired by stacking sandbags. This was done to prevent further damage and to create a temporary and alternate levee. The work progressed quickly, and an alternate levee was ready by July 21, 2018, around two weeks after the flood. The sandbags were then removed and the areas were refilled with soil and reinforced with concrete. This process was completed on June 14, 2019, in less than a year after the flood.



PICTURE 1: The temporary levee (source: MLIT Mabi Bureau)

⁵ The term “Class A River” is applied to rivers and waterways deemed to be important to the economy of the nation as a whole, as well as those deemed important to the conservation of nature within Japan

⁶ According to city officials, the budget will be revised soon because of inflation.

RIVER CHANNEL EXCAVATION WORK

Channel excavation works aimed at increasing the flow capacity of the Oda River commenced in fiscal year 2018 and were concluded by June 2021. Approximately 300,000 cubic meter of excavated soil was used to strengthen the Oda River levees.



PICTURE 2: Excavation of the river channel to increase flow capacity (source: MLIT Mabi Bureau)

STRENGTHENING OF THE LEVEES

Spanning a length of 9.5 kilometers, the top width of the levees along the Oda river was expanded from 5 to 7 meters, accompanied by a gentle inclination (approximately 30%) of the slopes. In addition, provision for drainage was created for quick drainage of excessive water. These enhancements were initiated in fiscal year 2019 and achieved completion by fiscal year 2021 (**PICTURE 3**).



PICTURE 3: Levees along Oda River after completion (source: MLIT Mabi Bureau)

RELOCATION OF THE ODA RIVER CONFLUENCE

The primary focus of this large project is on relocating the confluence of the Oda River and the Takahashi River downstream. By constructing a new dike at the current confluence, the flow of the two rivers will be separated, while creating a new channel for the Oda River will shift the confluence point 4.6 kilometers downstream (FIGURE 3). To construct the new channel, the 76-meter-high Nanzan Mountain was excavated using dynamite blasting and huge heavy machinery.

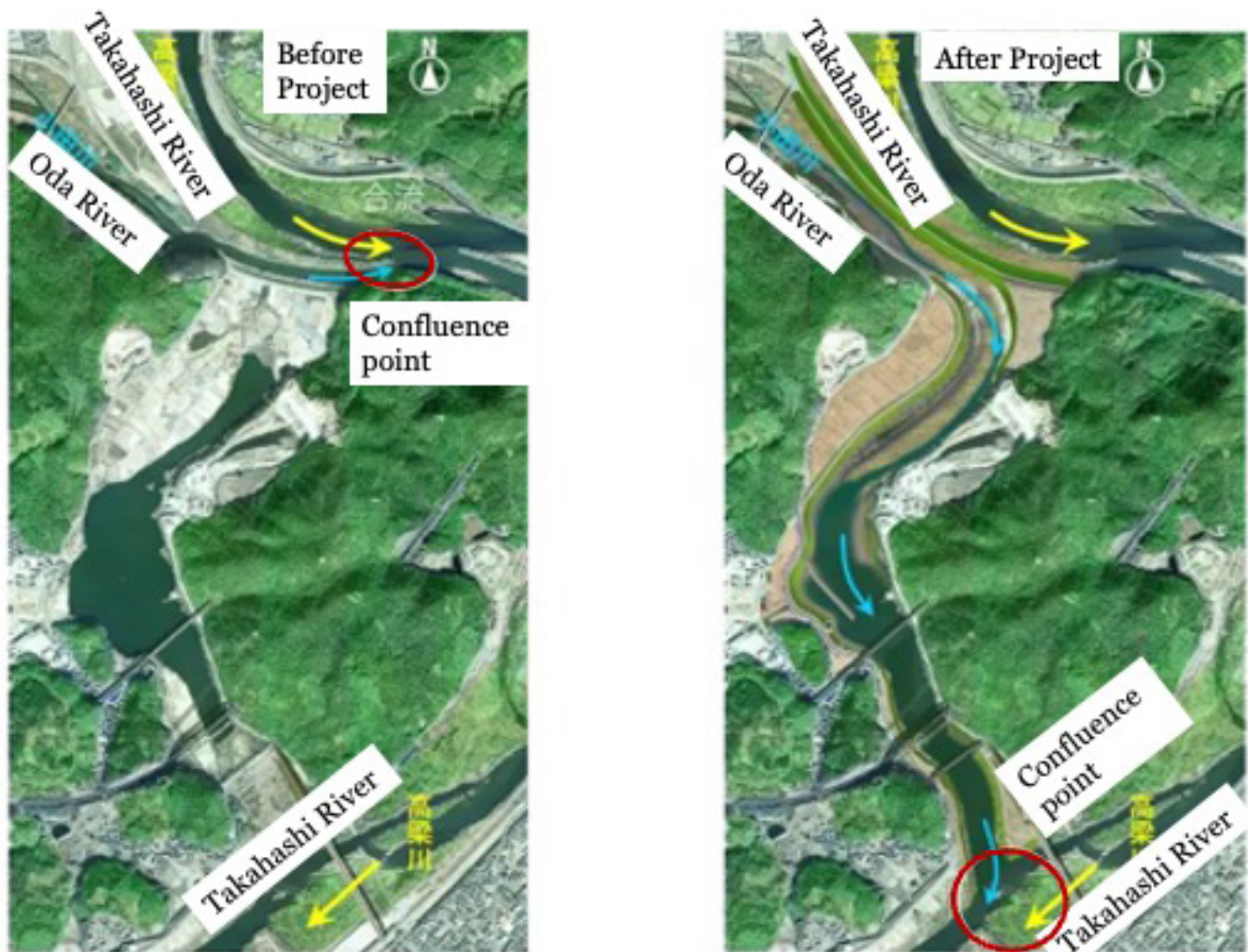


FIGURE 3: Relocation of the Oda River Confluence

These measures will mitigate the impact of backwater from the Takahashi River on the Oda River during flooding and significantly reduce the water level in the Oda River, thereby enhancing flood resilience (FIGURE 4). Moreover, the downstream movement of the confluence will reduce the flood risk in the Kurashiki downtown area along the Takahashi River.

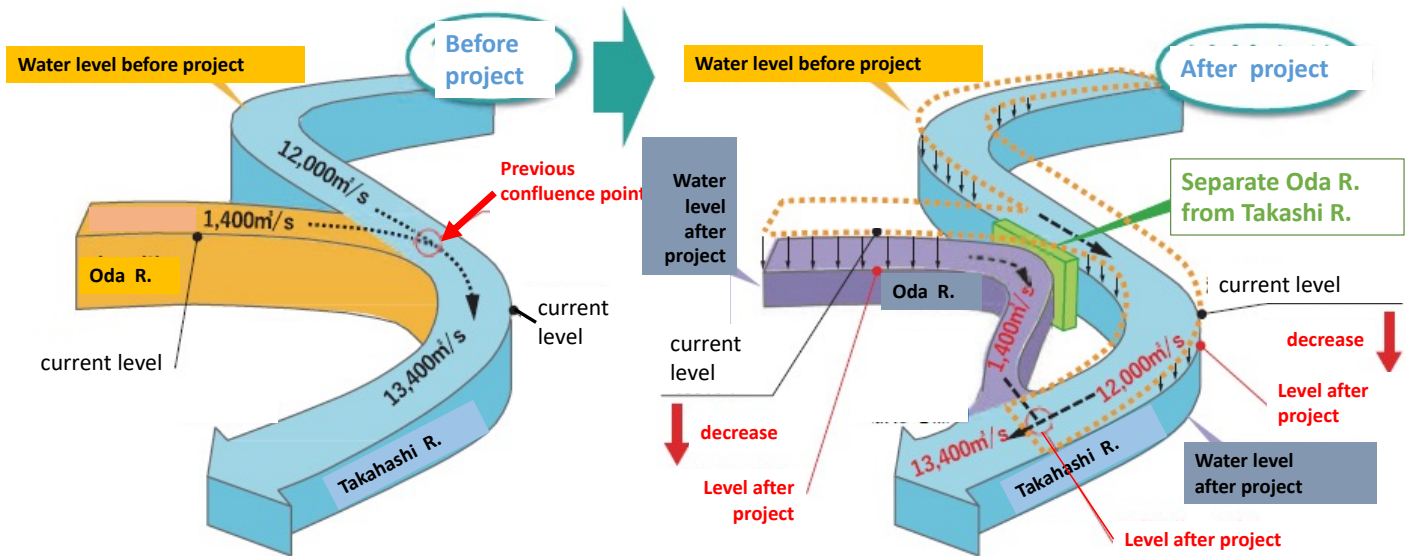


FIGURE 4: How the infrastructure measures will help reduce flood risk.

NEW FACILITIES

Apart from the restoration of the flood protection infrastructure, several new facilities are being planned on the open space along the rivers. Two of the most important new facilities will be a Disaster Prevention Park and a River Disaster Prevention Station.

For centuries the rivers have been a part of lives of the people living on their sides. They have brought devastating floods, but they have also been a source of strength and inspiration. The new facilities, therefore, are aimed to create a good connecting space that integrates the rivers and local landscapes with the town and its history, culture, tourism infrastructure, as well as the creative “wisdom” of the region. They will also create a space where the local residents and private business operators can learn about disaster preparedness, and cooperate directly with the river administrators in building disaster resilience.

FUKKO BOSAI KOEN OR RECOVERY AND DISASTER PREVENTION PARK

Along the Oda River in the Yata district of Mabi town – an area that was severely damaged by the flood – a “Recovery and Disaster Prevention Park” is going to be built. Designed by architect Kengo Kuma and others, the 4.5-hectare park will be used as an emergency evacuation site in the event of a disaster. The Six-month report mentioned about the lack of emergency shelters (3 out of 6 emergency shelters were inundated)⁷, as well as of open spaces where temporary shelters

⁷ See page 16 of the Six-month report.

could be built. Providing enough open space for several hundred cars to park at the same time, where families can spend the emergency hours in the privacy of their own cars, the Park will offer a solution to the residents who reported of “*evacuation hesitance*” because of reasons such as having a member with disability or having pets.

In addition to the open space, there will be a 480-square-meter building in the center of the park, which will have a warehouse for storing emergency food and blankets, and a glass-enclosed multi-purpose room. Playground equipment with slides and athletic facilities will be installed at the open space, so that it can be used as a park by families during normal times.

Apart from the above, the Park within this facility will be used as a base for community exchange activities. A panel focusing on flood disaster prevention awareness will be displayed inside the Center, so that it can be used as a place to learn about disaster prevention. The “Recovery and Disaster Prevention Park” is scheduled to be completed by the end of fiscal year 2023.



PICTURE 4: Image of the planned Recovery and Disaster Prevention Park
(source: [KSB news article](#))

KASEN BOSAI STATION OR RIVER DISASTER PREVENTION STATION

The “River Disaster Prevention Station” located in Yanaihara District will work in cooperation with the existing disaster prevention related facilities as a stockpile base to make up for the drastic shortage of flood control materials and restoration materials over a wide area. This facility will store emergency materials such as earth and sand necessary for flood prevention in advance, and also to secure the work area necessary for carrying in and out of materials and taking off and landing of helicopters. In the event of a flood, it will support the flood prevention activities of municipalities, and in the event of other disasters, it will serve as a base for swiftly carrying out emergency restoration.



PICTURE 5: Images of the River Disaster Prevention Station

It will also serve as a base for implementing river management and conservation activities in order to minimize the damage that may be caused by future floods.

“We wanted to give the residents more than the restored infrastructure. When the river channel excavation work was progressing, a huge amount of river-bed soil needed to be disposed. After discussing the matter with all the stakeholders, it was decided that the soil will be used to create a park, whose construction was manageable within a period of five years.

For the reconstruction of Mabi, we had two clear objectives. First was to build a stronger Mabi – stronger than how it was before the flood (i.e., to “Build Back Better”). The second was to build a system where not a single affected person will be left behind during a disaster (i.e., “No one left behind”). Based on these two ideas, we decided to build the new park. Through the construction of this park, we wanted to provide the local residents with an open space where they can safely evacuate by their cars in the event of a flood.”

- MR. HARA TAKASHI,
DEPUTY MAYOR,
CITY OF KURASHIKI

In addition to the above, cycling roads will be constructed along the Oda River as a part of the *Kawamachi-zukuri* or Rivertown Planning project, in order to create an environment for interaction as well as to develop a space for enjoying the river.

INFRASTRUCTURE MEASURES ALONE CANNOT ENSURE “SAFETY”

Since the people of Mabi town have been witnessing the large-scale construction using very advanced technology right in front of their eyes, it is very easy to assume they are entirely safe from any kind of floods now. It is true that the levees are safer than they were in 2018, but this does not guarantee full protection against future floods – especially if the scale of the flood is larger than 2018, which may become a reality amid the changing climate. At the end of the day, it is their own action that will protect the residents. The City of Kurashiki as well as the MLIT has been promoting this message and the importance of early evacuation through their website and printed materials. They are also trying to give a real sense of the limitation of the levees by drawing blue lines on structures to show the height of water during the 2018 flood (PICTURE 6), and orange lines to show the maximum height of water the levees can stop (PICTURE 7).



PICTURE 6:
Example of blue line (showing the height of water during the 2018 flood)



PICTURE 7:
Example of orange line (showing the maximum height of water the levees can stop)



PICTURE 8:
Example of other graphics showing the maximum height of water during the 2018 flood.

CHAPTER 3: RECOVERY OF PEOPLE'S LIFE AND PREPAREDNESS FOR FUTURE

The Six-month report mentioned that the initial Recovery Plan for Mabi town had four main focuses: reconstruction of infrastructure, rebuilding the damaged houses, rebuilding of small industries, and restoration of agriculture.

The previous chapter presented the latest status of the infrastructure. According to city officials, about 90% of the affected residents have already reconstructed their houses. The government provided different types of subsidies and offered soft loan schemes to help these families. The schools that were functioning as designated emergency shelters, resumed regular classes after September of the same year. The schools that were inundated, like the Kawabe Elementary School, held their classes in temporary structures till their buildings were fully rebuilt. In terms of small industries and agriculture, different types of loans and

subsidies were provided to help the residents rebuild their lives. The Six-month report mentioned about the difficulty of online applications, because many residents did not have or could not use smartphones or computers. For paper applications they had to travel to the town's office, which was not possible for many, as they were living in temporary houses outside the town and did not have the means to travel. It appears that the government's support eventually reached all the residents who were willing to return to the town, which is why about 20,000 of the 22,000 residents who left the town, are now living in Mabi.

When a family starts rebuilding its home that was damaged by a disaster, it starts to put the fearful experience behind and slowly move forward. Unfortunately, the possibility of a disaster – large or small



– remains in a disaster-prone country like Japan. It is, therefore, necessary to save the key lessons and apply them in preparedness for the next disaster. The authors looked into the changes and improvements that were made on the issues focused on in the Six-month report, regarding both the preparedness and the management of future disasters.

RISK COMMUNICATION

Sendai Framework for Disaster Risk Reduction or SFDRR's Priority 1 emphasizes that understanding disaster risk is essential for prevention and mitigation of a disaster, and it ensures proper preparedness and response measures. The Six-month report mentioned about the new developments on the low-lying areas near the rivers, and how the residents were not aware of the risk⁸. Hazard maps were distributed, but they were rarely carefully checked. Since the 2018 Western Japan flood, it has become clear that more than one-third of Mabi town is at risk of severe flooding. The new challenge now is to communicate with the residents about the risk that still remains. *Although the flood protection infrastructure has been made stronger, the rivers may still overflow if the water level is higher than what the levees were designed for.* As mentioned in the previous Chapter, the city of Kurashiki as well as the MLIT has taken this matter very seriously, and has been trying to communicate the

The image shows a checklist titled "Checklist for creating 'My Timeline'". It is divided into several sections:

- Check from Flood Hazard Map or Inundation Estimation Area Map:** This section asks "What is the estimated depth of inundation in your area?" and includes a diagram of a house with different levels of inundation. The diagram shows a house with a person inside, and a legend indicates four levels of inundation: >5m (red), 3~5m (orange), 0.5~3m (yellow), and <5m (green). A blue callout box says "Check here for Inundation Estimation Map".
- Kurashiki city Flood Landslide Hazard Map:** Includes a QR code.
- Okayama Flood Risk Display System:** Includes a QR code and a cartoon character pointing to it.
- Check family condition:** A checklist with checkboxes for "Car", "Pet", "Medicines", and "Family member needing help to evacuate (elderly, disabled, pregnant etc.)", each with "No" and "Yes" options.
- Check evacuation destination:** A checklist with checkboxes for "Emergency shelter mentioned in the Harard Map", "Relative/ Friend's house", and "Other (any place witout inundation risk)", each with a "Travel time: About min.()" field. A cartoon character points to this section, and a blue callout box says "Let's find out several options".

FIGURE 5: Checklist for understanding the risk and preparing "My Timeline" (source: MLIT website)

risk through their websites and printed materials. In addition to the hazard maps, the residents now have a one-page checklist that helps them understand the potential risk very easily (Figure 5). Some city officials, however, expressed concern about not being able to reach the residents who do not have access to websites. Some also worry that the residents may start forgetting the experience of 2018 with time and may not take the necessary precaution for future floods.

⁸ Das S. (2019): "Six Months Since Western Japan Flood: Lessons From Mabi"; page 8.

5-Level Warning System

Warning Level	Action to take	Information provided by local government	Weather alerts issued by JMA
5	People must take measures to protect lives	Disaster information	Emergency warning
4	All residents must evacuate	Evacuation order / instruction	Landslide alert information etc.
3	Elderly people must evacuate	Evacuation preparation information	Rain / flood / storm surge warnings etc.
2	You should check evacuation procedure	Advisories	Rain / flood / storm surge advisories etc.
1	You should stay on alert for disasters	Early warning information	-

FIGURE 6: The revised warning system

EARLY WARNING

As noted in the One-year report, about a year after the 2018 Western Japan flood, the warning levels were revised, and the new levels were put to effect (FIGURE 6). The new levels have better indication of what to do at which level, and thus has helped in reducing confusion.

In case of the 2018 flood in Mabi and the nearby areas, the audibility of the announcements was an issue many residents reported of. Over the last five years, the government has collaborated with more and more cell phone companies and social media services to send the warnings as push notifications on smart phones. This solved the problem to a great extent for people who

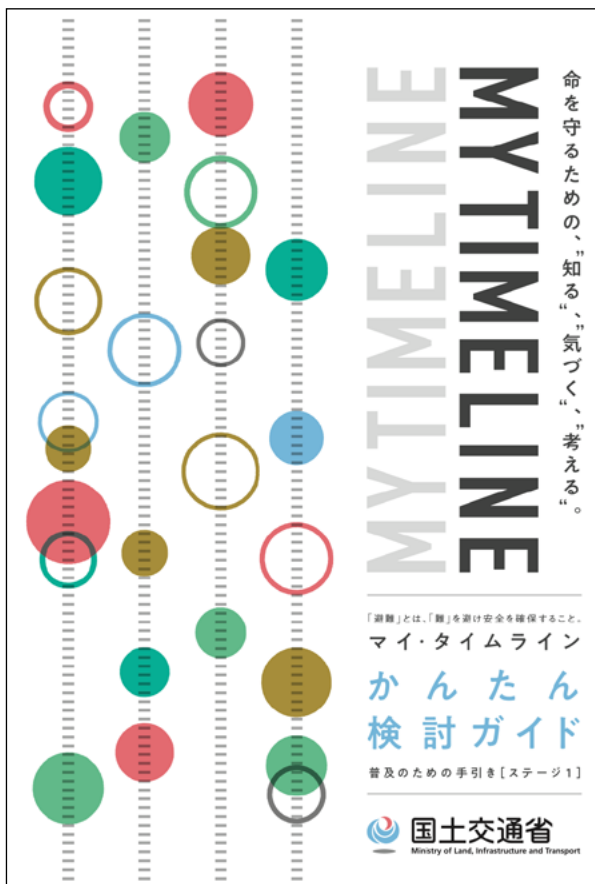
"We could not hear the warning because of the heavy rain. My husband, who was a member of the local residents' Board, took his small truck and the portable microphone to drive around the neighborhood and warn everybody about the upcoming danger. I think the announcements should reach practically to each door like this. The city's microphone announcements do not reach everywhere. And not everyone can check messages on smartphones."

- MS. EDAMATSU FUMIKO,
RESIDENT OF SOJA CITY

own and can operate smartphones. The issue still remains for people who do not have smartphones or other mobile devices, many of whom are elderly and persons with disabilities. Since hearing becomes difficult with age for many, and since houses are built with more sound insulation in the recent years, delivering the warnings to all the residents through microphone announcements during heavy rain will remain a challenge. The city officers mentioned that the number of microphone towers has been increased all over the town, although they recognize that this may not entirely solve this issue.

EVACUATION BEHAVIOR

The Six-month report listed some of the main reasons for people’s reluctance to evacuate, including physical inability of self or family member, underestimation of danger, not knowing where or how to go, worry for pets, and lack of emergency drills. Similar cases were observed in other parts of the country, including during typhoon Hagibis in 2019 and during the Kumamoto flood in 2020. Following some important steps taken by the government to help people understand the importance of early evacuation, the MLIT, in cooperation with the city of Kurashiki and Okayama



PICTURE 9: My Timeline Guide published by MLIT

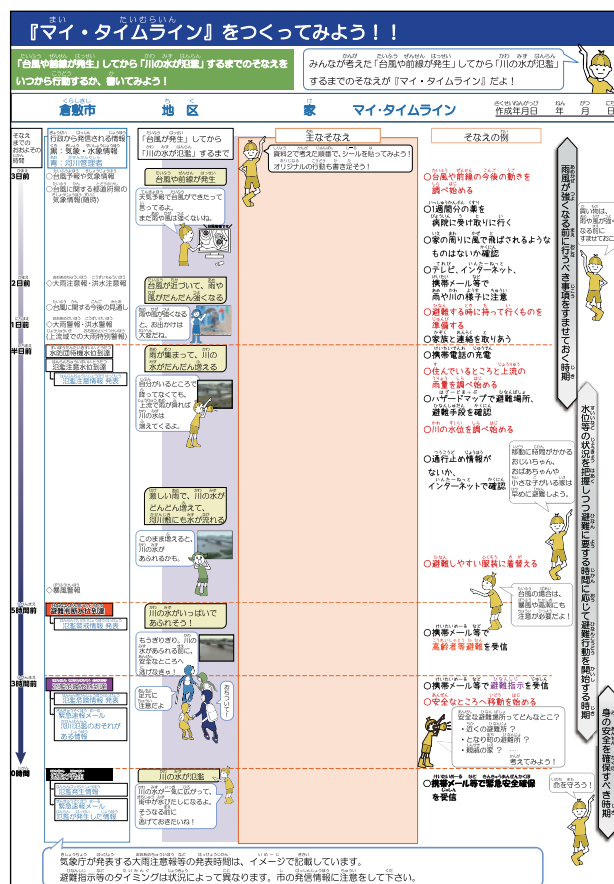


FIGURE 7: My Timeline Guide “Nigekid” published by MLIT Mabi Bureau

Prefectural Citizens Bureau, prepared a set of guidelines⁹ specifically for the residents living near the Takahashi and the Oda rivers. The guidelines, which were created based on evacuation preparation tools for elementary and junior high school students, focused on the following experiences from the 2018 flood in Mabi:

- What kind of problems the residents faced during evacuation – true experience of the affected residents was considered.
- Considering these problems, what kind of preparation the residents need to take.
- What kind of things they should bring with them while evacuating.

CREATING “MY TIMELINE”

“My Timeline” is a disaster prevention action plan recommended in Japan for each resident of a disaster-prone area in the event of a disaster, especially water-related disaster. When the water level of a river rises due to heavy rain, the standard disaster prevention actions taken by a resident or a household need to be arranged in a chronological order to help with evacuation actions in order to protect their own lives¹⁰. The concept originally came from the application of “Timeline” by the state of New Jersey in the United States when the country was preparing for Hurricane Sandy in 2012. The MLIT started preparing a

“I did not hear the warning. The rain was too heavy. But I saw from the balcony that the water was rising. It was too late to evacuate, so we somehow moved to the roof from our balcony. Many of our neighbors had also evacuated to their rooves. Our neighborhood was fully inundated by morning. My husband and I had to be rescued from our roof by the Self Defense Force (SDF) after several hours. First, we were taken to the Mabi Memorial Hospital, where we spent the night. We moved to a designated shelter the next day, where we spent three or four nights. We changed shelters a couple of more times before finding a “Minashi” house where we stayed for two years. We rebuilt our house during these two years. It was a difficult time for all of us.

Next time I see heavy or continuous rain, I will take early action. I know where to evacuate. I know exactly what to take with me.”

- MS. SUWA REIKO,
RESIDENT OF MABI TOWN

⁹ All the guidelines and tools are available online: <https://www.cgr.mlit.go.jp/takaoda/mytimeline/nigekid.html>

¹⁰ From MLIT website: <https://www.mlit.go.jp/river/bousai/main/saigai/tisiki/syozaiti/mytimeline/index.html>

guideline based on this concept a few years later, and in June 2020, two years after the 2018 Western Japan flood, a simple guideline to examine “My (one’s) Timeline” was published¹¹. Since then, cities and towns all over the country have adopted their own versions based on these guidelines. The MLIT website also provides guidelines on how to hold workshops to help residents prepare their “My Timeline”.

IMPORTANCE OF MUTUAL ASSISTANCE, LOCAL VOLUNTEERS AND ORGANIZATIONS

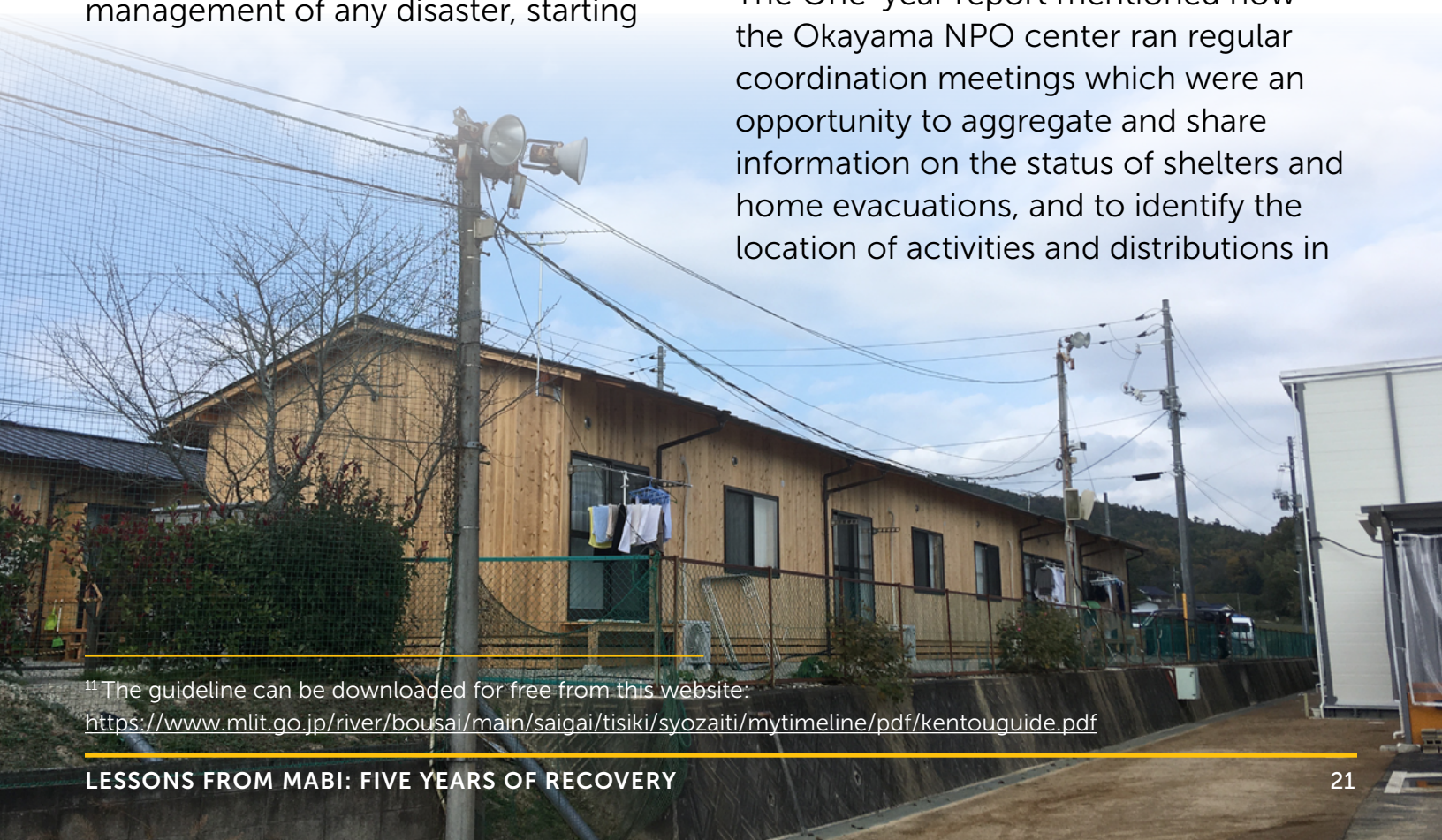
The role of fellow community members during a disaster in providing with immediate help and support is recognized globally. Local volunteers and NPOs play an important role in the management of any disaster, starting

from the early emergency response to the long-term recovery. Especially in Japan, a large part of the initial response is covered by spontaneous individual volunteers and local organizations, many of whom are residents of the affected communities. Some of these organizations already exist when the disaster occurs, some form during the early days of the emergency out of some specific need. They work closely with the residents and the government, side by side with the NGOs that come from other parts of the country. The authors were interested in seeing how these organizations’ activities have changed over the last five years.

MABI SHARE AND THE ROLE PLAYED BY OKAYAMA NPO CENTER

The One-year report mentioned how the Okayama NPO center ran regular coordination meetings which were an opportunity to aggregate and share information on the status of shelters and home evacuations, and to identify the location of activities and distributions in

¹¹ The guideline can be downloaded for free from this website:
<https://www.mlit.go.jp/river/bousai/main/saigai/tisiki/syozaiti/mytimeline/pdf/kentouguide.pdf>



the affected areas. They played an important role in providing and coordinating all kinds of emergency support during the first 10 months.

When the Volunteer Center was closed the following year after providing months of emergency support, the local organizations and volunteers needed a place where they could work and hold important meetings and events, as most of the community centers and commercial facilities were damaged by the flood. With the help and support from within and outside of the country, and in collaboration with Peace Boat Disaster Relief, Okayama NPO Center created a space called “Mabi Share” to support the long-term recovery process. Mabi Share, which was open from May 2019 to March 2021, provided this much needed space. In less than two years, this space was used for 260 meetings and workshops, and the volunteers were able to respond to over 1200 requests and inquiries¹². Okayama NPO Center decided to close this shared office when the commercial facilities and community centers were rebuilt and started functioning again. They, however, kept one person as a desk officer by borrowing space from one local organization called “*Otagaisama Mabi Labo*”.

NPO “SOUL VISITING NURSES”



PICTURE 10: SOUL Visiting Nurses (photo courtesy of Ms. Kataoka Natsuko)

Ms. Kataoka Natsuko, the founder of “SOUL Visiting Nurses”, who herself lost everything to the flood of July 2018, started reaching out to the residents and offering help from the emergency shelter where she was staying. With time, and

¹² Source: Website of Okayama NPO Center: <http://www.npokayama.org/>【ご報告】まび復興ボランティア団体・npoシェア/

with support from various agencies and foundations, SOUL not only resumed its services, but also started providing mental support by organizing community gatherings. These gatherings were organized once a week from 9 AM to 5 PM till 2020, after which they take place once a month for two hours. With a small participation fee of 100 yen, the residents share their personal experience of the recovery process over some drink and light snacks. Five years after the flood, SOUL and its activities have become broader, stronger. Ms. Kataoka has even written a book on how disaster nursing should be integrated in Town Planning.

FROM MABI CARE TO MACHI CARE AND BEYOND

“Mabi Care” was an initiative by nurses, healthcare practitioners and volunteers to map and share with residents the status of emergency assistance, pharmacies, restaurants, convenience stores, and restroom openings from the perspective of rebuilding lives and maintaining health in the affected areas. The Six-month report mentioned about this initiative set up as a website a week after the flood (Figure 8), and the important role it played in providing the vital information the residents needed at the time of emergency. In 2019, after typhoon Hagibis, a similar website was set up for the affected cities of Tateyama in Chiba prefecture, Nagano and Sendai, and it took the name “Machi Care”. In 2020, Machi Care provided similar information for the flood-affected towns of Kumamoto.



FIGURE 8: How information was collected for Mabi Care

As a next step towards helping disaster affected communities with information, Machi Care now plans to come up as a physical space, where residents, especially children, can come and learn about disaster preparedness and safety. Plans are

underway to establish Machi Care as a social business, which aims to eventually spread all over Japan.

Apart from organizations and initiatives mentioned or above, there were cases like *Kanbara Gofukuten*, a community store located on a higher land, who opened their space to house the numerous relief goods coming from all over the country. They also provided accommodation for two families who lost their houses. The families had stayed there for almost a month. The remaining relief goods were moved to the nearest emergency shelter after almost two months since the flood, as the evacuees started moving into temporary shelters. Asked whether they considered starting an NPO after this experience, the owners replied they were happy providing an informal space during the following years, where the residents could simply come over and talk about their problems.

HEALTHCARE MANAGEMENT – IMPORTANCE OF DATA CONNECTIVITY

One of the biggest challenges in providing healthcare to the affected families was that most of them were living in *Minashi* shelters¹³, which basically means houses and apartments rented with government subsidy. Over 3,300 families were living in these temporary shelters that were scattered

over several towns in and around Mabi. While the city kept record of these families and their locations, they could not ensure the healthcare and support all of them needed. On the other hand, healthcare professionals and volunteers wanted to access these families to offer help, but they did not have access to their whereabouts. The city could not open the data because of Personal Information Protection Law, even though the law suggests that the information can be shared in case of emergency. This compelled the local organizations and healthcare volunteers prepare a separate map with assistance from private companies. Some kind of link with the data protected by the city office could have ensured much better and quicker healthcare for the affected residents, some of whom were under treatment of chronic conditions. According to a local NPO, the number of disaster related deaths among the residents of Mabi crossed 20 within the first year after the disaster.

Since most of the affected families have returned to the town, it may be an opportunity to do a detailed survey and list down the challenges they had faced living in the *Minashi* houses, including the healthcare challenges. It is also important for the city authorities to recognize the vital role healthcare volunteers play in providing healthcare support during both the early and

¹³ “*Minashi* Shelters” refer to houses and apartments rented with government subsidy. They are usually allocated by the government upon application.

the recovery stages, and thus create pathways within the provision of the law to help them with the necessary data and information.

IMPORTANCE OF KEEPING A HEALTHCARE LOGBOOK DURING THE EMERGENCY

The Six-month report mentioned how keeping a logbook helped the residents keep track of their health conditions while they were forced to live away from their homes¹⁴. The concept of “*Ima-kara*” diaries or logbooks was an important innovation that came out of the need to reduce “*assessment fatigue*”¹⁵ of the people staying in the emergency shelters. Developed by Prof. Sakiko Kanbara, the then Professor of University of Kochi, and designed by a team of Tama Art University’s Product Design Department, the logbooks helped the survivors adapt to uncertain health risks by recording their health status after the disaster. The diaries also provided responsive knowledge based on the seasonal and the disaster’s characteristics. CWS Japan supported the printing and distribution of these logbooks. A 2023 study conducted on the people who used the *Ima-kara* diaries suggests that writing and reflecting in these logbooks assisted the survivors restore their lives and helped

them avoid secondary damage to their health¹⁶.



PICTURE 11: Cover of “*Ima-kara*” diary

Since the 2018 Western Japan floods, “*Ima-kara*” diaries were distributed at emergency shelters after several other disasters, including the 2018 earthquake in Hokkaido, and the 2019 super typhoon “Hagibis” that caused heavy rain and damages in a large part of the country. “*Ima-kara*” diaries can be downloaded for free from this website: <https://mabi-care.com/uploads/files/imakaratecho.pdf>

¹⁴ Das S. (2019): “Six Months Since Western Japan Flood: Lessons From Mabi”; page 21.

¹⁵ “*Assessment Fatigue*” refers to a kind of fatigue caused by answering repeatedly to similar questions during interviews by various healthcare services.

¹⁶ Miyamoto J., Hatakeyama N., Kanbara S. (2023): “Communication for self-care and the role of a logbook on health risk during a flood disaster”.

OVERALL GOVERNANCE

Managing disaster risk and response requires strong governance, including coordination and cooperation within and across sectors, as well as participation of relevant stakeholders. The SFDRR's Priority 2 recognizes the need for the public and private sectors and civil society organizations to work more closely together and to create opportunities for collaboration. The One-year report talked about the importance of strengthening the "citizen interface" for better coordination during emergency management. Efforts need to be made, especially on the public side, to create a stronger link to ensure a healthy two-way exchange. The previous reports pointed out that this link was very weak, even if it existed. It did not appear that there was much improvement in this area. Strong collaboration between the government and the NPOs need to be systematized *prior to the disaster*, to ensure a more community driven disaster response and recovery process.

Since 2018, government offices across the country have widely adopted the use of websites and social media platforms to send across important messages including those related to disaster preparedness. As discussed in section 3.2, the early warnings are now issued mostly through platforms like LINE and Twitter. It is true that the number of users of these platforms is increasing, although it will take some time before all the residents can comfortably use these tools. It is also important to create a pathway for the residents to send inputs from their side. During disasters like heavy rain and floods, they can provide important information for the government to take quick action.



WAY FORWARD

Climate Change projections indicate that crises like the 2018 Western Japan floods can be expected with greater intensity and more frequency, not only in Japan, but globally. Due to the 2018 disaster, the general awareness of people was elevated in and around Mabi, and there is a change of mindset when it comes to the need to prepare for disasters. The government offices have also introduced new tools to help preparedness. To what extent they will lead to action among the residents during the next emergency, is

something that remains to be seen. The restored flood protection infrastructure has been a source of sense of security, but at the same time, it has also created a concern of overreliance. It is extremely crucial to continue conveying the importance of personal evacuation plans and periodic drills. It is also important to create opportunities for various sectors to work closely together at times of emergency.



To summarize, the five years of recovery process of Mabi has taught us many significant lessons, including the following:

In governance and infrastructure management, progress has been made to use infrastructure recovery as a risk communication tool with the residents. A more proactive and participatory decision-making process has been gradually implemented, keeping in mind the advancement of technology. Inclusive recovery has become the key to the future sustainability.

In terms of technology and innovation, citizen-based approach has been incorporated, both from the government side and the civic tech group side, thanks to their strong leadership. Innovation in data management, data processing and gradually bringing the concept of the open data and open governance will be the key focus in this regard. Co-ownership and shared ownership of data is the new evolution in this matter.

In terms of awareness, capacity and social capital enhancement, Mabi's recovery has set a new example and benchmark. In case of Voluntarism (both internal and external, specialized and non-specialized volunteers) several important lessons were learnt, which are in the process of being recorded as institutional memories. Strong social bonding and bridging, as a part of building social capital, was the essence of community-based recovery of Mabi.

The *Lessons from Mabi* are still fresh in people's memory. It is, therefore, the best time to put these lessons into action. In a disaster-prone country like Japan, the end of a recovery process should really be seen as the beginning of preparation for the next disaster.



PICTURE 12: Image of the planned Recovery and Disaster Prevention Park
(source: [KSB news article](#))

PERSONS CONSULTED

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 - (ii) My Timeline guide: <https://www.mlit.go.jp/river/bousai/main/saigai/tisiki/syozaiti/mytimeline/pdf/kentouguide.pdf>
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This knowledge sharing document was written with a view to capturing the key lessons from the early response to the long-term recovery of Mabi town. CWS Japan hopes that these lessons will be helpful for professionals, practitioners, and the civil society around the world.



たった一人のためにでも、世界をつなげたい。

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