A Study on the Gathering Spaces in the Process of Community Recovery in GEJET-2011 Affected Areas

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東日本大震災の被災地でのコミュニティ復興における
集合スペースに関する研究

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Abstract

This study concerns the long-term outcomes of gathering space recovery in the communities affected by the Great East Japan Earthquake and Tsunami 2011, by contributing to the literature by combining different criteria of research related to space production (planning and administration, spatial configuration, users` experience), relations to social engagement factors, and levels of justly functioning recovered gathering spaces.

After the Great East Japan Earthquake and Tsunami 2011, the necessity of community recovery and facilitating the production of gathering spaces were emphasized by national and local governments and different approaches were taken to address the issue. The concern towards impact of recovered gathering spaces were raised after the Hanshin Awaji earthquake in 1995, in which the recovery methods and lack of gathering spaces resulted in lonely deaths in some of the relocated communities. These issues had been learnt and tried to be addressed in post Great East Japan Earthquake and Tsunami 2011 recovery process by different sections of the recovery. This disaster by its characteristics and various recovery attempts is an intricate archive of data for disaster recovery plans and needs to be studied from the community recovery perspective as well.

This study, by focusing on relationships between community recovery and gathering spaces, tries to compare how the post-recovery of Great East Japan Earthquake and Tsunami 2011 has addressed the community level issues from the disaster in different case studies. The research aims to determine how community and gathering space recovery varies in selected case studies in Miyagi and Iwate Prefectures of Japan based on qualitative research relying on documents, site visits, semi-structured interviews, and questionnaire surveys. The research studies the community and gathering spaces in three different timelines: before disaster, life during temporary housing, and life after moving to permanent housing. The study covers and combines four field of research to evaluate the long-term results of the recovery: production of gathering spaces, relevancies to social engagement factors of community, and level of justice in benefiting from gathering spaces, and establishes models to evaluate each case study for their gathering space and community recovery. And lastly propose models for better recovery of gathering spaces and the communities based on findings of this research.

Application of the evaluation model, combination of research fields and temporal investigation, evaluation, and comparison help oversee the changes in each case study

independently. Despite the concerns of scholars in the field of community recovery, practical attempts have been made to produce quick recoveries, without considering the specific characteristics of the community. These problems indicate the necessity of research on this topic, because the effectiveness of social spatial platforms such as public and gathering spaces and provided services activities, as well as their impact upon and relations to social engagement factors (e.g., residents' gender, age, and dwelling type), have not been studied enough by other scholars or addressed by stakeholders after disasters.

The data for this research was obtained based on the documents issued by municipalities and scholars and through interview and questionnaire surveys conducted by the author. For the interview surveys, multiple places were visited in March, May, July, and October 2019 and March 2020; in each visit, community leaders were interviewed. Due to Covid-19 Pandemic in 2020 and 2021, the rest of interviews were conducted remotely and through Zoom application. The selection of case studies for the interviews was based on covering different types of gathering spaces and different approaches of community recovery. Group interviews were conducted to attain more perspectives and a better understanding of the town, community, disaster experience, and gathering space in the different phases of the disaster (before the disaster, temporary housing, and after moving to permanent housing). Each interview took about two hours, and an attempt was made to hear the opinions and thoughts of all participants.

Questionnaire surveys were conducted in March and July 2020. Ten years had passed since the disaster, and it was predicted that the questionnaire survey return ratio would not be high. To address this issue, it was decided that the distributions will not be based on random selection but instead cover all the households in each recovered area. eight severely damaged areas were selected: Aoi-Higashimatsushima City, Tamauranishi-Iwanuma City, Sakamoto-Yamamoto Town, and Shishiori-Kesennuma City, in Miyagi, and Machikata-Otsuchi Town, Akahama-Otsuchi Town, Massaki area in Offunato City, and central area of Yamada Town in Iwate Prefectures of the Tohoku region. The case studies were selected based on their reputation as successful and community-driven approaches and similarities in their characteristics.

The study combines seven different chapters; the first chapter introduces the hypothesis and objectives, and illustrates the significance of the research.

The second chapter reviews the literature and background theories and find similarities and gaps in the existing literature, also, reviews the documents published by the local government and communities to learn about the situation of disaster and recovery attempts. More than 400 documents consist of research studys, academic

books, and recovery frameworks in the fields of space production, importance of gathering spaces, social capital and community recovery, community-based planning and Machizukuri , social engagement and sub-population, and justice in urban studies and built environment had been reviewed and a selection have been cited. The result showed that different scholars identified the importance of community-based planning in recovery processes, and sub-population factors such as age, gender and dwelling, injustice occurring by the disaster and recovery plans, and gathering spaces on community recovery separately. Though the majority of the background research have focused on infrastructure, housing and economy related themes, many scholars in different fields of architecture, sociology, humanitarian studies have emphasized the importance of gathering spaces in social capital strengthening and community recovery. The production of space (planning and administration, spatial configuration, users` experience) and its outcomes have mostly been studied in established urban areas and lack contribution in the field of post-disaster recovery cases. Also, there have been great contributions in the field of social capital and community recovery, and community-based participation in the field of disaster. Regarding the disaster justice field many scholars had identified the importance of the field but few scholars have made connections to the post-disaster spatial justice. Considering the fact that production of space is the building blocks of the spatial justice, the background research brings the discussion and suggestions for the multi-disciplinary research on the mentioned fields but there is gaps in the body of research towards contribution to evaluating the long-term identification and combination of such factors.

The third chapter describes the methodology, case studies and surveys of the research and introduces case studies based on their environment and boundaries before and after disaster, as well as the located gathering spaces in detail.

The fourth chapter attempts to study how gathering spaces have been produced in case studies with different recovery scenarios (government-led, community-driven) after Great East Japan Earthquake and Tsunami-2011 and tries to identify different recovery scenarios and production of gathering spaces based on two main background theories: Henri Lefebvre's production of space triad and Arnstein's ladder of citizen participation respectively. This chapter aims to study gathering spaces from spatial configuration and diversification perspective and connect this field to the recovery planning level field. The triad of space production have been represented and in the case of gathering spaces, the spatial practices (perceived spaces) are the planning level of space by different initiatives, the representation of spaces (conceived space) are the constructed spaces such as building, rooms, and Hiroba(open spaces) and the

representational spaces (lived spaces) are the experience of the resident in the way they use those spaces. The spatial practice level categorized case studies into community-driven and government-led recovery initiated and discussed the outcome of each approach in recovery of gathering spaces to achieve recovery. Based on the studies in this chapter, only recovery scenarios with a higher level of participation in the citizen power stage of participation were considered community-driven projects; the other cases are still government-led projects. The results show that the production of gathering spaces may be associated with recovery scenario in each case study. In community-driven case studies, the main gathering spaces have the most diversity in activity and accessibility, evenly allocated smaller gathering space are at good level of proving services and being accessible, and being in a synced network with the main gathering spaces. In government-led cases, whilst there are multiple gathering spaces but they lack connection. The main gathering space is centralized near public housing site and has the most accessibility and quality service provision, gives service to residents from outside of the community, and is closer to the concept of public space by providing largescale open space (Hiroba) together with the building.

The fifth chapter emphasizes the importance of community recovery and aims to determine the effectiveness of gathering spaces and recovery activities upon the recovery of communities during different stages after a disaster. Chapter asks the following question: What are the relationships between communities, gathering spaces, and gathering activities? And attempts to (i) investigate the effectiveness of gathering spaces and activities in GEJET-2011 affected areas, (ii) contribute to the research field of community recovery from a long-term perspective, and (iii) analyze spaces and activities' relationships to social factors. It is assumed that the long-term recovery state of the social interactions and community bonds of affected people is impacted by the early-stage provision of gathering spaces and activities designed to assist community recovery in temporary housing sites. The results of the community recovery in Shishiori-Kesennuma show that whilst the main recovery approach was government-led, community recovery was undertaken by neighborhood associations; furthermore, the gathering spaces and open spaces provided for events were located in the public housing site, which improved outcomes compared to other government-led cases. The tendencies of gathering spaces had changed from formal gathering spaces (e.g., schools and gymnasiums) to less formal gathering spaces (e.g., community centers and meeting rooms). Moreover, the type of gathering activities changed toward more informal activities than formal ones in the selected case studies. Therefore, in the reviewed case studies, the effectiveness of gathering spaces and activities on community recovery may vary according to the gender, dwelling type, and age of the respondents. The results of associations among different factors, are aligned with the theories of gender-based

social interactions, and Japanese case studies are no different from global cases. The rural areas in Japan are known as culturally gendered environments and men have a leading role in the communities. Considering this fact might explain the differences between tendencies of female and male respondents of this research.

The sixth chapter aims to identify what criteria of justice (procedural, distributive, interactional) vary in different gathering spaces through different authorizations and introduces an evaluation model to achieve just gathering spaces and examines each authorization section in that regard. It was seen that after the Great East Japan Earthquake and Tsunami in 2011, three different types of authorization sectors were active in recovery of communities and gathering spaces in affected areas: residents' associations(grassroot), non-profit organizations(mediator), and local governments(top-down), and each targeted the respective communities differently toward residents` empowerment, gathering spaces and activities. The chapter also explores the criteria of enhancing justice in the recovery of gathering spaces, the impact of different levels of authorization sectors, and benefit for community members and their perception towards different authorizations and ownership of gathering spaces. By investigating the case studies and reviewing the literature, three criteria of justice have been identified: procedural, distributive, and interactional justice. Procedural justice describes the process of establishment, planning, and administration; distributive justice defines spatial configurations such as accessibility and spatial possibilities; and interactional justice represents providing services and activities for individuals, groups, and minorities.

The chapter found that among the studied case studies, different authorizations targeted communities differently, residents` associations and non-profit organizations resulted better than local governments in justice criteria evaluation. These communities were empowered for the authorization, provided by well-connected multiple gathering spaces, and balanced ratio of social, optional, and necessary gathering activities. In contrast, local governments provided centralized large-scale gathering space with minimum connection to other gathering spaces, were combined of different functions, and did not authorize the community members for administration. It is concluded that procedural justice may be the important key and result better in empowered authorization of communities, and enhance distributive and interactional justice to help freedom of choice and considering multiple gathering spaces that are distributed evenly in the recovered area, maximum accessibility, and useability of such spaces.

And lastly, the seventh chapter tries to combine the different approaches and details in each chapter and makes conclusion on the hypothesis and surveys` results.

This chapter makes suggestions for future preparedness and recovery plans to achieve community recovery through recovery of gathering spaces. The results of the study showed that the production of gathering spaces (planning and administration, spatial configuration, users` experience) had followed multiple approaches and resulted in different realization of configuration and diversification of spaces in chapter four. Indeed, this result emphasized the concern of scholars in the field and the impact of different processes in production of the so-called same spaces. In chapter five, the associations found between social engagement, sub-population factors in studied communities and gathering spaces and activities were aligned with the concerns of the scholars of the background theories. Though in some cases the process of space production and recovery plans were able to overcome the negative impacts, resolve the situation and move in contrast with the concerns by achieving positive outcomes. The spatial justice evaluation method by applying the theories and adjusting them on the selected case studies, showed how the results of micro spaces such as gathering spaces can enhance the just experience of the beneficiaries. Chapter seven proposes models for better recovery of gathering spaces and communities with identifying the administration levels and establishing the gathering spaces with the help of local governments, NPOs and residents' associations. The residents' association led cases are identified as the most sustainable cases of this research and proposal is suggested based on these cases' achievements. For small communities, establishment of neighborhood level associations is proposed to help strengthen community ties, participation and autonomy toward decision makings. In cases where the residents' associations are not functional, intervention of NPOs is suggested. NPOs can be a catalyst for establishment of functional and active resident's associations by supporting and consulting the community members and encourage empowerment of the residents. In medium size central autonomy cases where local governments are supposed to provide services to the community and surrounding areas, the collaboration of local governments, NPOs and residents associations is proposed. In this term, local government are in charge of the macro services and have to lead the decisions based on collaboration with neighborhood level association and organizations. It is suggested to allocate equal residents associations for smaller district to encourage residents' participation and identify their needs and opinions. NPOs are suggested to collaborate as a consultant to identify inequalities, separations and minorities and to provide especial services for the community members.

In conclusion, to actualize a community recovery it is time for stakeholders in the field of town planning and disaster reconstruction to apply a community-driven approach authorizing community level associations into recovery plans as much as possible. Gathering spaces have been provided in recovery plans, but a gathering space achieved by the community-driven approach and residents' participation can lead to a

more resilience community recovery. This is because the recovery should not only happen more quickly, but also enhance the community resiliency by provision of welcoming spaces for its residents of different generations based on the characteristics and needs of the community. The studied cases were all among good examples of gathering space and community recovery, but with a more attentive investigation there still can be seen advantages of community-driven factors on the recovery.

It also can be suggested that learning from cases such as Aoi-Higashimatsushima, Iwanuma-Tamauranishi, by authorizing and empowering the residents to achieving more justly recovered gathering spaces and as a result providing better benefits and experiences for the residents and have been able to overcome exclusivity by answering the demands of different groups. The acceptance of such differences and providence of diverse gathering spaces and activities can increase accessibility and inclusivity regardless of age, gender, and dwelling and lead to achieve a better community cohesion recovery. Since local governments own the main financial and physical resources to establish comprehensive gathering spaces, community level organizations can effectively help empower residents and identify the mental and social resources. As part of the affected communities, residents' associations can directly contribute to recovery planning of community and gathering spaces. Also, NPOs' interventions based on their expertise and experience in recovery of gathering spaces can be more responsive to community needs to speed up the recovery of community ties.

Whilst these three types of authorization sectors worked separately in the reviewed case studies, author suggest residents' associations supported by local government and advised by NPO experts may have better results for achieving just recovery of their gathering spaces. Collaboration among these three authorization sectors is important for building justice through community gathering spaces. whilst this research emphasis considering diversified gathering activities and spaces and increasing inclusivity and accessibility in such services, farther research is needed to emphasize on spatial configuration, justice, age, and gender on recovery of community, gathering spaces and activities participations based on a longitudinal method.

Keywords: Gathering space, Hiroba, Community-driven recovery, Government-led recovery, production of space, gathering activity, environmental justice, empowered communities.

Preface

This dissertation is original, unpublished, independent work by the author, Yegane Ghezelloo.

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Chapter One: Introduction

1.1 Introduction

As disasters increase worldwide, stakeholders become more aware of reconstruction strategies, evaluating previous recoveries, and preparing for future disasters. Considering the long-term community recovery under different recovery scenarios is as important as examining such aspects as infrastructure, housing, and high-pace reconstruction. It should be in mind that disasters not only damage the built environment and economies, but also the social capital of communities. This damage brings the need to consider community recovery in the plans through societal platforms and address the injustice benefiting of spatial recovery in the planning and benefiting time-lines. Scholars and planners have identified gathering and public spaces as fundamental platforms to shape and enhance community relation during the normal life of the residents. They have suggested that gathering spaces can provide an ideal possibility for recovering social capital and bringing communities closer towards resiliency in disaster affected communities as well.

Reviewing the recovery plans from the perspective of community and gathering space recovery provides a better understanding of the performance of recovery plans toward resilience long-term recovery. It affords opportunities for stakeholders to choose among different recovery approaches to prepare for and reconstruct after future disasters.

After the Great East Japan Earthquake and Tsunami 2011, the necessity of community recovery and facilitating the production of gathering spaces were emphasized by national and local governments and different approaches were taken to address the issue. The concern towards impact of recovered gathering spaces were raised after the Hanshin Awaji earthquake in 1995, in which the recovery methods and lack of gathering spaces resulted in lonely deaths in some of the relocated communities. These issues had been learnt and tried to be addressed in post Great East Japan Earthquake and Tsunami 2011 recovery process by different sections of the recovery (Tatsuki 2003, [1] Tatsuki and Hayashi 2000). The damage resulting from the GEJE and

subsequent tsunami demanded a large recovery plan for the affected areas. Also, different decisions were taken based on the amount of damage and hazard maps, and hazardous district levels. In the post-disaster recovery of GEJE affected areas, different categories of municipalities had different approaches to reconstruction:

1. Land readjustment oriented: municipalities with heavily damaged downtown areas that require big land readjustment projects
2. Group relocation oriented: municipalities with some damaged fishing villages that require small relocation projects.
3. Complex: municipalities that fall between the first two types.
4. Public housing oriented: municipalities that require minimal rearrangement and relocation and some public housing projects.
5. Large city: municipalities with big urban areas that have comparatively affluent resources and can afford large reconstruction projects. (Onoda et al. 2018)

Also, people from affected areas, have experienced different living condition formations and were supposed to get adapted to a new environment and accept a new lifestyle, such as:

1. First period after GEJE, staying in emergency shelters
2. Moving to primary temporary housing
3. Moving to secondary or tertiary temporary housing
4. Relocating to permanent housing in the same living area
5. Relocating to permanent housing in an area other than the living area (ibid)

This study, by focusing on relationships between community recovery and gathering spaces, tries to compare how the post-recovery of Great East Japan Earthquake and Tsunami 2011 has addressed the community level issues from the disaster in different case studies. The research aims to determine how community and gathering space recovery varies in selected case studies in Miyagi and Iwate Prefectures of Japan based on qualitative research relying on documents, site visits, semi-structured interviews, and questionnaire surveys.

The research studies the community and gathering spaces in three different timelines (figure 1): before disaster, life during temporary housing, and life after moving to permanent housing.

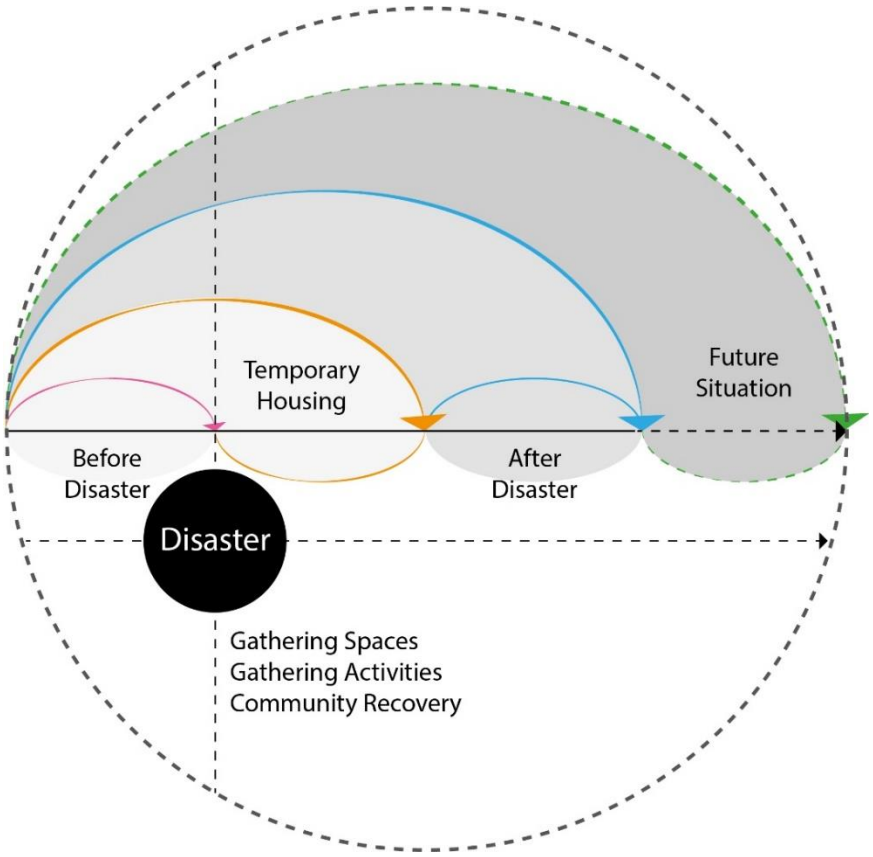


Figure 1 different disaster stages of affected

The study covers and combines four field of research to evaluate the long-term results of the recovery: production of gathering spaces, relevancies to social engagement factors of community, and level of justice in benefiting from gathering spaces, and establishes models to evaluate each case study for their gathering space and community recovery. Figure 2 shows the overlapping research fields covered by this research.

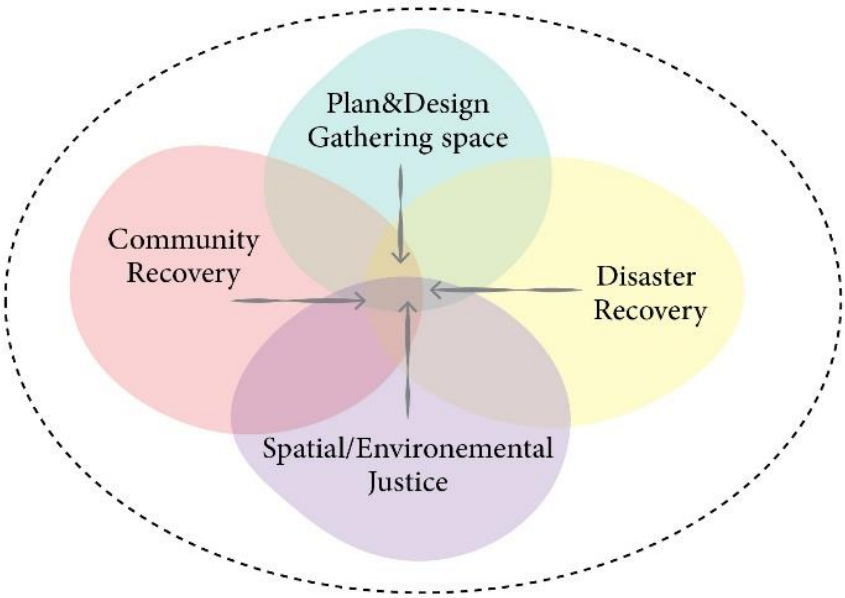


Figure 2 overlapping research fields of the study

1.2 Significance and importance of research

This study concerns the long-term outcomes of gathering space recovery in the communities affected by the Great East Japan Earthquake and Tsunami 2011, by contributing to the literature by combining different criteria of research related to space production (planning and administration, spatial configuration, users` experience), relations to social engagement factors, and levels of justly functioning recovered gathering spaces. Figure 3 shows the timeline of ultimate gathering spaces regarding disasters.

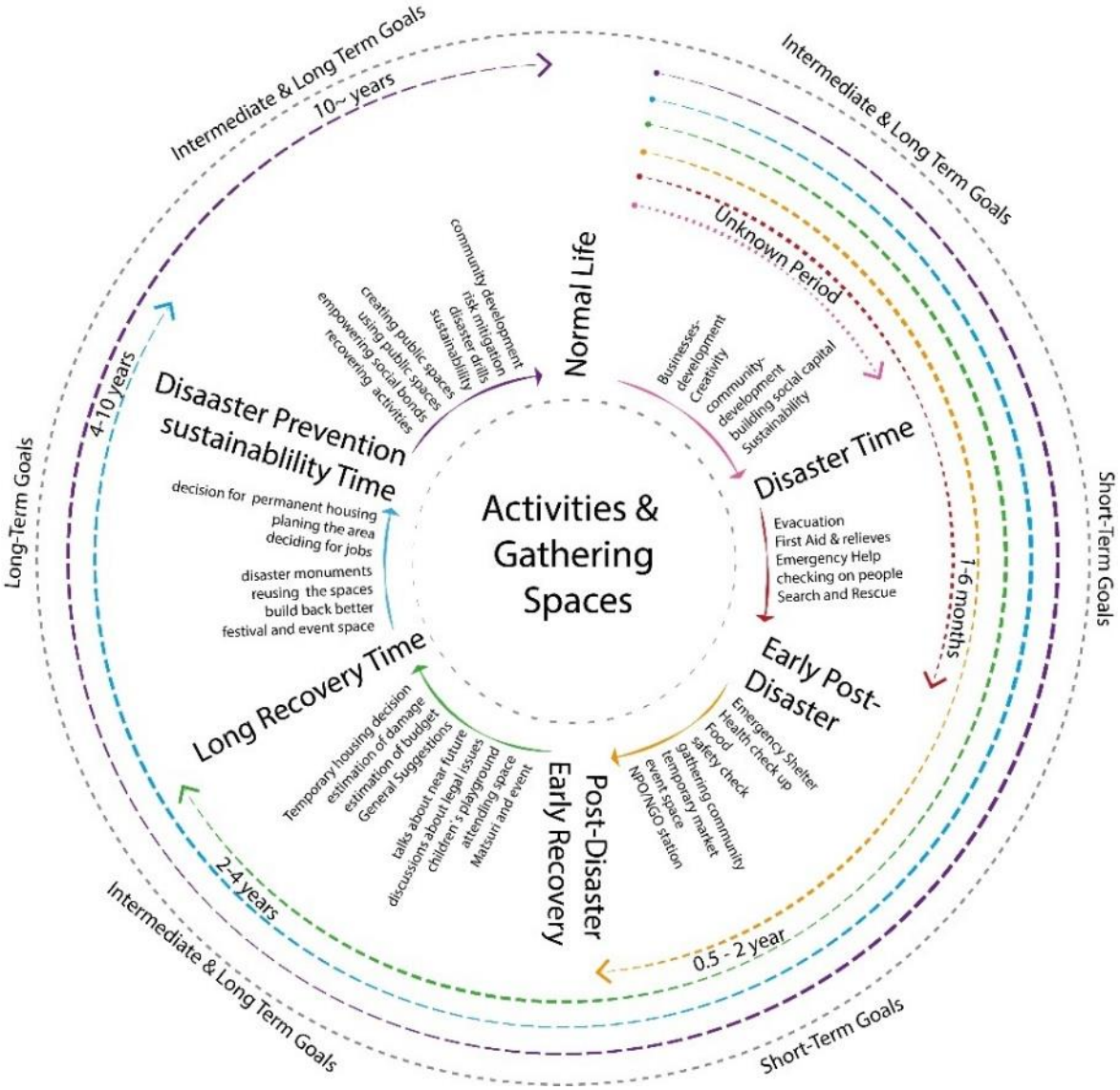


Figure 3 timeline of ultimate gathering spaces regarding disasters

Application of the evaluation model, combination of research fields and temporal investigation, evaluation, and comparison help oversee the changes in each case study independently. Despite the concerns of scholars in the field of community recovery,

practical attempts have been made to produce quick recoveries, without considering the specific characteristics of the community. These problems indicate the necessity of research on this topic, because the effectiveness of social spatial platforms such as public and gathering spaces and provided services activities, as well as their impact upon and relations to social engagement factors (e.g., residents' gender, age, and dwelling type), have not been studied enough by other scholars or addressed by stakeholders after disasters.

This study contributes to research by conducting a comparative review of the recovery scenarios and community and gathering space recovery, and disaster spatial justice with a mixed-method approach in different case studies. As mentioned in the introduction, there are other studies emphasizing the importance of gathering space, community recovery, and a community-driven approach using a similar method of measuring the participation level or reviewing the recovery frameworks, sub-population characteristics in selection of gathering activities and spaces, or emphasizing disaster justice, but these studies are either non-comparative studies or only focus on the plans issued instead of the actual implementation and do not cover the multiple disciplines that this research is concerned about. Figure 4 shows how different fields of studies, disaster timelines and recovery approaches contribute to the recovery of gathering spaces and community as well as enhancing justice in affected communities.

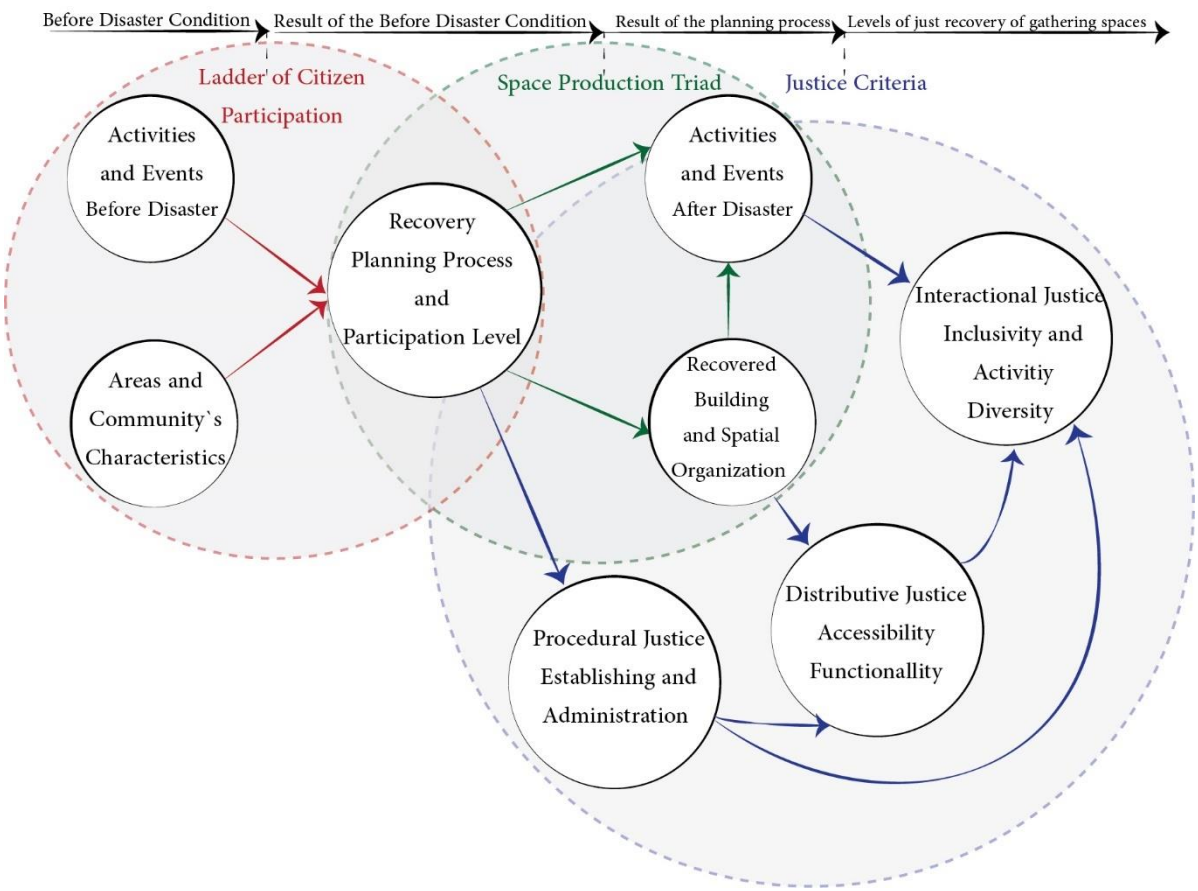


Figure 4 fields of studies, disaster timelines and recovery approaches contributing on recovery of gathering spaces and communities

1.3 Aims, Focuses, and Benefits

This study contributes to research field by conducting a comparative review of the recovery scenarios and community and gathering space recovery with a mixed-method approach in different case studies. There are other studies emphasizing the importance of gathering space, community recovery, and a community-driven approach using a similar method of measuring the participation level or reviewing the recovery frameworks, but these studies are either non-comparative studies or only focus on the plans issued by governments instead of examining the actual implementation.

1.4 Objectives

This study aims to:

- Identify the production of gathering spaces in post-disaster recovery scenarios,
- find the relevant factors on gathering space and community recovery,
- evaluate the spatial disaster justice regarding gathering spaces,
- combine the background studies by establishing evaluating model,

- and compare the selected GEJET-2011 affected communities regarding the above objectives.

- propose methods to enhance community and gathering space recovery based on findings of this research

1.5 Limitations

A long time has passed since GEJET-2011, and many residents did not wish to participate in the surveys. In addition, studying cases that did not consider gathering space in their recovery plan can provide better results regarding the hypothesis of this research because this study only reviewed cases that successfully provided gathering spaces in the recovery plan.

The result cannot conclude whether the gender-basics of participating in activities have become less biased after disaster or not, but it can imply that the gender-based tendencies have changed after disaster. While this research emphasis considering diversified gathering activities and spaces and increasing inclusivity and accessibility in such services, farther research is needed to emphasize on gender on community and gathering activities participations based on a longitudinal method.

Also, in Japanese societies, shrines are one of the important spaces for traditional events and ceremonies during the year regardless of religions, but recovery of shrines is not part of the recovery framework and the only private religious institutes attempt to provide recovery of shrines after disaster. But this construction can be very costly and will make it impossible to recover such spaces. Lack of shrines can have impact on recovery of traditional and cultural gatherings and ceremonies in such affected areas. This research does not focus on recovery of shrines and temples but such a research is needed to clarify the situation. The result of this survey might be impacted by the age of the respondents which are mostly 50 years and older. To clarify the better situation and need for the gathering spaces in the affected communities there is a need to conduct the research among younger individuals as well.

Also, due to Covid-19 Pandemic and travel restrictions, the surveys of this research have face difficulties for visiting case studies and conducting further site visits and interviews. Where the technology related infrastructures were possible the interviews were conducted remotely through Zoom application, but in some rural areas, the infrastructure and knowledge of the community members and leaders were not sufficient for conducting such interviews.

1.6 Structure of the Dissertation and timeline

The study combines seven different chapters; the first chapter introduces the study and illustrates the objectives of the research. The second chapter reviews the literature and background theories and find similarities and gaps in the existing literature, as well as the documents published by the local government and communities to learn about the situation of disaster and recovery attempts. The third chapter describes the methodology, case studies and surveys of the research. The fourth chapter attempts to determine the production of gathering space in different recovery scenarios on gathering space recovery by relying on the background theory of triad of social space production and measuring the level of community participation based on Arnstein's ladder of citizen participation after GEJET-2011 in each case study. This section categorized case studies into community-driven and government-led recovery initiated and discussed the different configuration and diversification of gathering spaces, and as an outcome, the experiences of residents of each approach in recovery of gathering spaces. The fifth chapter aims to find how community recovery have been impacted different stages after the disaster by reviewing details of gathering spaces and activities. This chapter aims to consider the major and minor facts that might impact or be impacted by the recovery of communities such as gender, situation of communities during life in temporary housing, type of dwelling, types of gathering spaces and activities and compares the current cases with the global situation. The sixth chapter by making comparison among different category of authorizations (residents` association, NPO, local governments) and establishing a model for disaster spatial justice, finds out how different criteria of justice have been served based on attempts and results of different governing authorizations. And finally, the seventh chapter tries to combine the different approaches and details in each chapter and makes conclusion on the hypothesis and surveys` results. This chapter makes suggestions for future preparedness and recovery plans to achieve community recovery through recovery of gathering spaces. As explained, first 3 chapters present the hypothesis, library research, and surveys and chapter 4 to 7 are the combination of the different research fields. Figure 5 demonstrates the structure of dissertation regarding research field distribution and impacting factors (figure 2 and 4) and figure 6 presents model of the research.

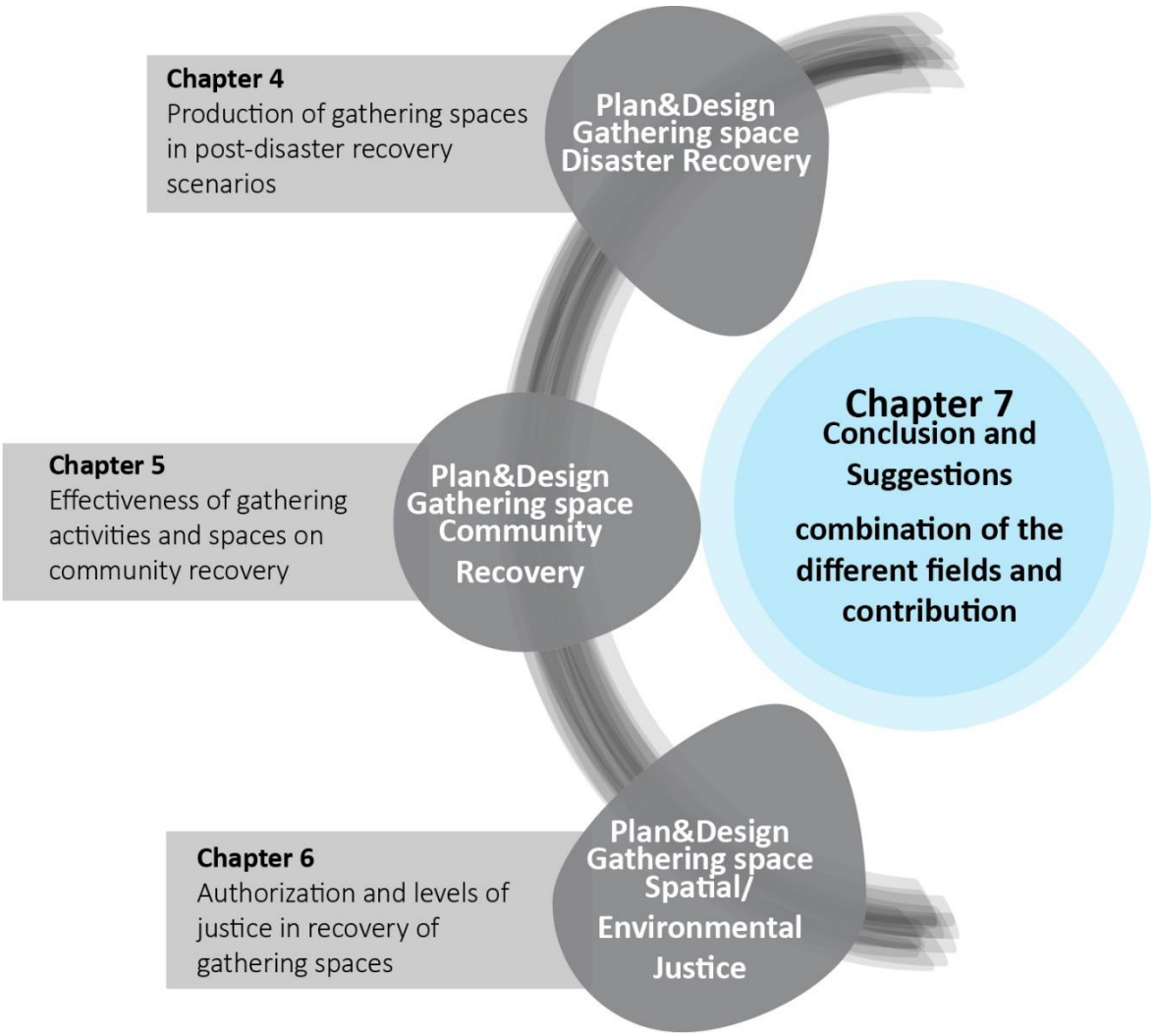


Figure 5 structure of dissertation

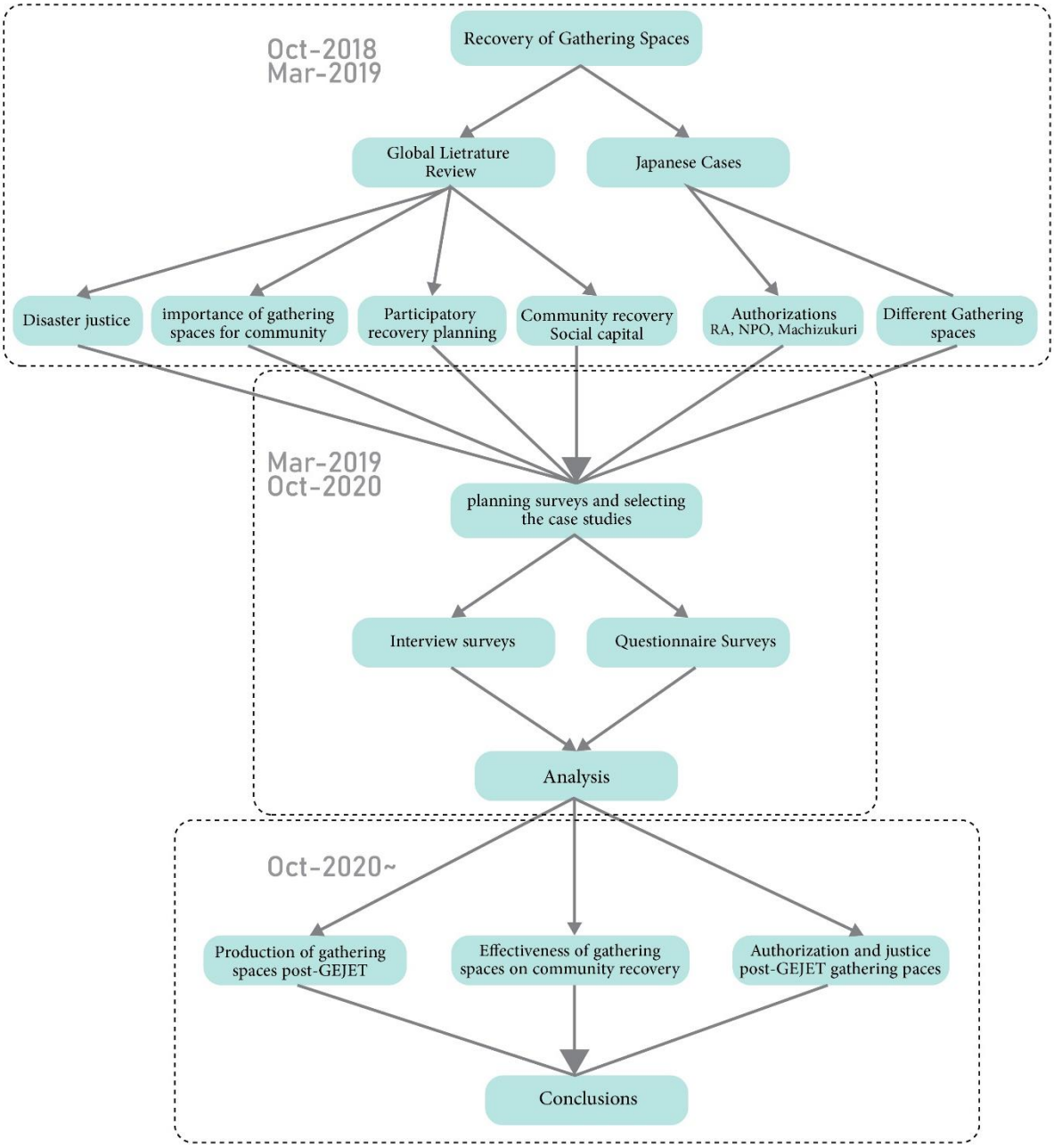


Figure 6 model of research

Chapter Two: Library Research

2.1 Literature review and back ground theories

This study, by focusing on relationships between community recovery and gathering spaces, tries to compare how the post-recovery of Great East Japan Earthquake and Tsunami 2011 tries to address the community level issues from the disaster in different case studies. The study covers and combines four field of research to evaluate the long-term results of the recovery: production of gathering spaces, relevancies to social engagement factors of community, and level of justice in benefiting from gathering spaces, and establishes models to evaluate each case study for their gathering space and community recovery. This study concerns the long-term outcomes of gathering space recovery in the communities affected by the Great East Japan Earthquake and Tsunami 2011, by contributing to the literature and combining different criteria of research related to space production (planning and administration, spatial configuration, users` experience), relations to social engagement factors, and levels of justly functioning recovered gathering spaces.

This chapter will first define public space and gathering space from global and Japanese perspectives. Secondly, the production of space theory and related researches. In the next section, the chapter reviews the background studies on recovery, social capital, community and social engagement, community participation and Machizkuri. Also, the social engagement and sub-population factors on community cohesion and community recovery will be reviewed. As the disaster environmental justice field is an important part of this study, the chapter reviews the theory and studies in the field. And lastly, an overview of similar studies, their contribution for this hypothesis and the gap in existing knowledge in the research field will be demonstrated and discussed.

2.2 Definitions and terminologies

To clarify the hypothesis of the research, this section tries to define the terminologies and important realms of the theory, look at existing literature and find the crosses with the field.

2.2.1 Gathering spaces

The terminology defines public spaces as spaces that physical and intellectually open to everyone, and there is no advantage for using the space for anyone (Holub 1991). while in Japanese societies, the concept of public space environment is different from common knowledge (Dimmer 2012), the term “gathering space” is used instead of “public space” to avoid misinterpretation as referring only to government-owned/organized places. What is referred to in this research as gathering spaces follows Habermas’s definition of public spaces: Platforms/spaces/places that are accessible to everyone, no one enters them with an advantage over another, and they have a potential foundation for a critique of society based on democratic principles.

Many scholars define gathering spaces (schools, gymnasiums, meeting rooms, community centers, parks, playgrounds, and neighborhood spaces) in residential areas ad the pillars of the social life of communities. Places that act as a shared resource in which experiences and value are created through participation and communication. Encouraging people to extend their knowledge and familiarity with their locality through facilitating creative activities in gathering spaces and developing accessibility could create a wider sense of attachment and discovery (Worpole 2007). The use of public spaces varies according to the time of day and day of the week, and is affected by what is on offer in a particular place at a particular time and there are distinct rhythms and patterns to the use of public spaces, by time of day, day of week and even season. These spaces are known as infrastructures for social life of the residents in which when robust, it fosters contact, mutual support, and collaboration among friends and neighbours; when degraded, it inhibits social activity, leaving families and individuals to fend for themselves. Also, a public space is refered to an area or place that is open and accessible to all peoples, regardless of gender, race, ethnicity, age or socio-economic level. These are public gathering spaces such as plazas, squares and parks. Connecting spaces, such as sidewalks and streets, are also public spaces. In the 21st century, some even consider the virtual spaces available through the internet as a new type of public space that develops interaction and social mixing (Unesco 2019, Klinenberg 2018, Abu-Ghazzeh 1996).

They can be called in different names during normal life situation, the summary Is in the table 1 shows different categories of owning and functioning which bring different spaces:

Table 1, Different category of spaces based on functionality (from Klinenberg, 2018, edited by author)

Public institutions	*Inviting realms*	*Community Organizations*	*Commercial establishments*
Libraries	Sidewalks	Churches	cafes
Schools	Community yards	Shrines	Diners
Playgrounds	Community	Temples	Barbershops
Parks	gardens	Scheduled markets	Bookstores
Athletic fields	Green Spaces	(food, art, clothing,etc.)	Izakayas
Swimming pools	Open Spaces	Community centres	
Onsens		NGO	
gymnasiums		NPO	

The everyday use of public space has been changing – from necessary uses to optional, recreational uses. This changing role increases the need for appropriate, well-designed places in which people choose to spend time, and that provides a place for people to relax, socialize and be part of urban life (Jan Gehl and Anne Matan 2009).Gehl categorizes gathering activities to necessary (based on the needs of the communities), optional (based on choice of the communities), and social activities (the final level of activities which enhances community ties) in gathering spaces. He emphasizes that social activities might not be enabled directly but as outcome of good combination of necessary and optional activities in welcoming gathering spaces (Gehl and Svarre 2013, Gehl institute 2018).

Different scholars have long discussed the role of public and gathering spaces on community well-being. These spaces can help improve community cohesion and strengthen social capital by bringing inclusive and accessible means for encounters and sharing to users from different groups. In disaster-affected communities, the existence of such spaces helps the affected communities to have a mutual place to gather, share their sorrow, and plan for the provision and distribution of emergency aids (Monteil et al. 2020). As a result of gathering possibilities after a disaster, the affected social capital can be healed and recovered. Affected communities can move forward to establish short-, mid-, and long-term recovery goals and work toward community recovery. (Roque et al. 2020, Haeffele and Craig 2020)

As for Japan, many still hold the notion that so-called public activities are the exclusive domain of the government. On the other hand, spaces and activities carried out by communities, NPOs, and companies are called “New Public Commons,” which aim to rebuild society. Public spaces and activities implemented by the government sector are called “public-public,” such as schools and gymnasiums, while new public spaces and activities handled by the private sector are referred to as “private-public” community centers, with different spatial possibilities, and meeting places with fewer and smaller spaces [3]. In global understanding, open spaces might be also considered

as public space (parks, plazas) and pubic spheres (street, roads, pedestrian paths), but in Japanese urban planning only two kinds of open spaces are recognized. These spaces are managed by authorities, primarily for post-disaster evacuation and other emergencies, and the rest are almost entirely privately owned, including streets, lanes, and other kind of open spaces. The first type is called Hiroba or wide-open area referring to the physical condition rather than any social or formal property of the actual space. In the other hand, there are gathering spaces which are considered as social spaces for residents` participation and gatherings and are usually within closed boundaries and territorial buildings (Kuma and Jinnai 2015, Okabe 2017, Fuchs 2019).

As mentioned, author has chosen the terminology of gathering spaces for selected Japanese case studies instead of public spaces since the ownership, authorization, spatial configuration, and activities in such spaces are different from globally defined public spaces. While performance of these gathering spaces follow similar purposes of achieving democracy through residents` participation and education for the general public, they could be labeled differently based on the ownership and authorizations they fall into different provision of budget, maintenance, and fee of use.

Meeting places (Shuukaijo): provided by different organizations, local governments, and municipalities, authorized by residents' associations, neighborhood associations, and community organizations. The purpose of these places is the informal gatherings of residents based on their preferences. Meeting places are often a combination of a meeting place and meeting equipment for community gatherings, utility kitchens, service units, and small open spaces. Meeting places, community centers, and public halls are similar in small communities, but have different performances in larger areas.

Community Learning Centers (Kominkan): Provided by social education laws and local governments. Depending on the community, these spaces are authorized by local governments (in this case, there are paid staff in charge of front and maintenance of the space) or community-level associations (in which community leaders oversee administration). These spaces purpose the informal social education of residents and work as local governments' branch gathering spaces. These spaces are a combination of areas for meeting and educational purposes (MEXT 2008).

Community centers: provided by local governments and, as semi-informal places compared to Kominkans, of which more was provided in Miyagi Prefecture than in Iwate Prefecture after the GEJET-2011, to increase citizen participation involving community-level associations or local governments could authorize. Usually, different types of spaces are combined for different purposes, such as meeting places, classrooms, workshops, Japanese-style rooms, playrooms for children, libraries, lounges, etc. (Iwate Prefecture 2021).

Public halls (Kokaido): These spaces have a long history in Japan and are known as the beginning of Japanese social democracy. Services are very similar to meeting places and community centers but authorized directly from town offices or local governments. Depending on the size of the community, these spaces can be on a small or large scale for larger gatherings and larger circumstances in a community (Tanken 2021).

Kaikan (merchandise frontiers): private organizations provided gathering spaces, such as companies, industries, chambers, etc. combination of small meeting room, lounges, and service units. Very common recently. Assembly places, purpose for office of their organization and base for activity of the organization. Very commonly used nowadays. Base for organization in community. Npo bases could be kaikan and could be named differently based on area. Coming from china and mainly for merchandize (building for chamber of commerce) industry. Both organization and facility are called kaikan in old (100yrs ago) China.

2.2.2 Production of spaces

Lefebvre defines the space and social spaces as a product of decisions of stakeholders and experience of the users based on a triad model. This model provides a framework to recognize the three elements of producing space (Fuchs 2019). Lefebvre's production of space refers to the spatial triad framework and consists of spatial practices (perceived space), representations of space (conceived space), and representational space (lived space). He defines social spaces (gathering spaces, public spaces, Hiroba) consist of the spatial practices (perceived spaces) and the planning level of space by different initiatives, the representation of spaces (conceived space) and the constructed spaces such as building, rooms, and Hiroba(open spaces) and the representational spaces (lived spaces) and the experience of the resident in the way they use those spaces (Gregory 1992). Fig.6 shows the representation of social spaces` triad on gathering spaces.

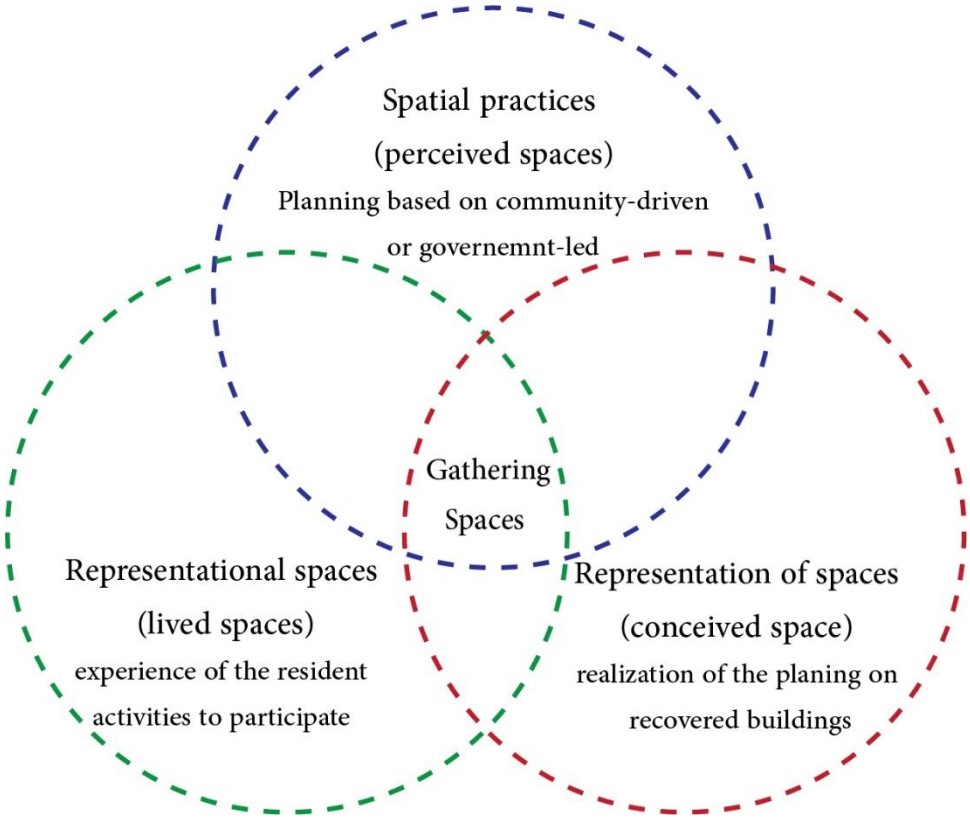


Figure 7 triad of production of gathering spaces, author

2.2.3 Recovery and GEJET-2011

Recovery is an urban intervention, which uses images of former city and plans series of long-term and short-term acts to reconstruct the city and community. Urban intervention is to work at super-micro scale and super-macro scale (T.Amemiya et al,

2017). During the recovery process, leading a long-term approach (macro vision) will make the short-term (micro vision) acts more efficient and sustainable for the future of the damaged area.

Regarding the post-disaster recovery studies, the number of previous studies related to global disasters and Japanese disasters has been reviewed. The result is there are 5 main approaches for the disaster recovery:

1. Framework and guideline plans
2. Urban development plans
3. Land readjustment plans
4. Housing recovery
5. Suggestions for community-based acts

Johnson and Olshansky, review the post-disaster recovery of city spaces and community, in global cases and Japanese cases (Kobe and Tohoku) and give a good comparison of such recovery actions in urban development planning in different post-disaster situations around the world (Johnson and Olshansky 2013).

Also, Japan International Cooperation Agency (JICA) in their report of situation of reconstruction programs in three affected areas, reviews the rural and urban level reconstruction plans and also differentiate the sections where government should only implement the projects and section that can have assistants` help and be led by communities as well (JICA 2015).

Asian Development Bank, in the book Reducing Disaster Risk by Managing Urban Land Use: Guidance Notes for Planners, gives a good framework of post-disaster land use planning, but not focusing on spaces by themselves (Asian Development Bank 2016).

And most importantly, natural hazards bring up the chance of building back better. As Aoki demonstrates Natural hazards can be a catalyst for progressive democratic change in damaged areas (Aoki 2018). But there is no suggestion that in which ways “building back better” can be achieved in different disasters.

To find out about GEJE recovery, Onoda, Tsukuda and Suzuki, reviewed the reconstruction strategies and relocation plans after GEJE and refer some to the community-friendly housing design and some examples of city recovery such as Kamaishi City in Iwate Prefecture (Onoda et al. 2018).

Iuchi and Olshansky studied the recovery from the policy aspects and mainly housing recovery programs in three affected prefectures *(Iuchi and Olshansky 2018).*

Ubaura studied on the classification of land use and recovery categories in affected areas such as onsite recovery, relocated the residential area, and disaster hazard areas by focusing on density and shrinking cities (Ubaura 2014). He also focuses

on land use planning after the disaster and relocation program in Ishinomaki city as an example of the recovery development plan (Ubaura 2018).

Also, Iuchi found that areas being redeveloped based on the concept of hazard-considered land use must also incorporate the idea of better mobility and mixed land use for better living (Iuchi 2016).

Ubaura in his research about urban planning and reconstruction after GEJE, mentions 4 different stages of urban recovery, 1- relocated projects, 2- low-lying areas, 3- built-up or resettled areas, 4- self built spaces, which refers different methods in recovery of housing as a government-oriented development or scattered development of urban areas and also lighten up the same process for public space recovery (Ubaura 2016).

Regarding the housing recovery, scholars have studied on temporary and permanent housing.

Kondo reviewed the recovery process through planning and redevelopment of the housing recovery in different categories (mentioned in first of this literature review) and situation of vacant lots in coastal relocated areas *(T.Kondo 2018).* Shiozaki had researched housing recovery in different methods and stages as well (Shiozaki 2018). Maly also researched on housing recovery and displacement from Fukushima and from a policy point of the view (Maly 2018)

Saito compared temporary housing before and after GEJE in affected areas and studied the rule of communities in temporary housing reconstruction and society recovery but not spatially and a field survey on Sendai City (Saito 2015). Based on a field survey by Ueda and others, urban sprawl is happening due to delays of recovery in Rikuzentakata city and wish of people to recover faster for housing and jobs pushed many people to start self-build housing or moving out after disaster regarding the same issue and are not very likely to be back to the area (Ueda et al. 2016).

Fukuo Akimoto made research on the plan-making and reconstruction plan after GEJE, he found out a lack of coordination between coastal – levee plans and Machizukuri in the recovery process. Also, he mentioned problems in cooperation of national and local governments during disaster reconstruction (Akimoto. 2018).

Oda, in his research on recovery of educational spaces after GEJE, studied on school recovery with the help of community, local and international volunteers in the Tohoku area (Oda 2015). This is a good example of attempts through recovering public spaces.

Temporary Housing

While gathering spaces in general promote the community cohesion, community level gathering spaces also act as organizations, helping people learn new skills and

move on into work or education. This happens by using volunteer staffs and members at such places and offering paid work when it becomes available (Holland 2020). Schumann and Nelan by studying the estate of gathering places during short term recovery after hurricane Harvey, found out that the placement of such places in familiar public spaces similar to before disaster strike will help the survivors to reach for mental, emotional and material helps that are provided in such places more easily. They also emphasized the importance of existing of such places from a very early stage of disaster to facilitate mental recovery of communities (Schumann and Nelan 2018). Johnson(2007) mentions the pre-disaster strategic planning of the temporary housing sites in order to avoid difficulties for the communities after the occurrence of the disaster and trying to address the former issues of the experienced temporary houses in the under-plan sites. Also, enabling residents to maintain the same social ties as pre-disaster situation such as giving options to choose communities they move to, maintaining the same neighborhood proximities and providing social spaces.

Different scholars have studied Japanese communities regarding the temporary housing life and its impacts on community recovery from different points of view. Ueda and Shaw (2016) by reviewing the issue in Kesennuma city after GEJET-2011, found out that not only providing the social spaces and maintaining community bonds are important, but also, the challenges of community management in temporary housing such as leadership, ownership, and participation could be addressed by hiring social organizations to help maintaining neighborhood associations for increasing the participations and strengthening the community bonds. In addition, Ishikawa(2015), and Bris and Bendito (2019) by reviewing the Japanese cases in separated studies, concluded that reflecting the pre-disaster neighborhood situation into the temporary housing and permanent housing based on community members` opinion can make a more resilience post disaster environment and community. They described that responding to affected people`s needs such as providing meeting rooms, open spaces, play grounds can help with the mental health of the affected people and the new temporary housing planning should learn from issues and mistakes in the previous temporary housing sites planning.

Iwasa and others (2012) by reviewing the temporary housing in post Chuetsu flood and earthquake 2004 in Japan, found out that not all the needs of the communities resided in those sites were met by the providers and there was a need for modifying the residential units by individuals. Also, this modification act was spread among neighbors but not over the sites and this poor communication was happening due to lack of meeting spaces for the residents. The community environments were helped after meeting places named “temporary open cafés were provided in quiet space outside of the temporary housing sites and gave possibilities to meet, exchange and discuss over

issues to the residents. Gagne by studying the psychological impacts of GEJET-2011 disaster and its impacts on the residents, found out that by permanent dislocation in affected areas, previous lifestyles of relocated residents which largely relied on strong social networks and relations in the previous regions had not been recovered and had become more difficult especially for elder residents and residents of public housing (Gagné 2020).

2.2.4 Social capital, community, social engagement

Yamaguchi et.al found out the roles of the three types of social capital (bond, bridge, link) are an important consideration of disaster research. As a resource, social capital can diminish the negative impacts of disasters, but at the same time, it can also be negatively affected by a disaster (Yamaguchi et.al. 2017).

Social capital is defined by the OECD as “networks together with shared norms, values and understandings that facilitate co-operation within or among groups”. In this definition, we can think of networks as real-world links between groups or individuals. Think of networks of friends, family networks, networks of former colleagues, and so on.

broadly speaking, social capital is a set of shared values that allows any group of people to work together effectively to achieve a common purpose, such as post disaster recovery of the community (Bhandari et al. 2009)

There is little agreement about the nature of "community", or whether it is synonymous with "neighbourhood" (Barnes et al. 2006, Katz 2007). While almost all people live in neighbourhoods (unless they live in isolated rural housing), they may not necessarily all be part of the neighbourhood in the sense of taking any active role in local affairs or having any social interactions with neighbours (Barnes et al. 2006). Moreover, a community is not limited to a geographic neighbourhood group, and an individual may belong to multiple communities (ibid, Doherty and Beaton 2000).

The word "community" suggests a unified, collective actor, but this does not reflect on-the-ground experiences. Many initiatives focus on administrative boundaries such as postcodes or local government areas, but these are not always recognized as neighborhoods by local residents (Katz 2007). People living in the same locality do not necessarily view or value that locality in the same way. What ultimately determines what a person's community is, depends upon that person's perceptions. As Fegan and Bowes (2004) pointed out, what matters is not what size a community is, or what connections exist between members, but how people perceive their relationship to the community:

If families perceive their local area as a community of which they are a part, despite distance from neighbors or lack of facilities, then they will behave as if it is a community. This perception will lead to behavior that has benefits for the families and the children within it. Parents and children will be more likely to believe that they have something to contribute to the community themselves.

In this sense, people's sense of community is not based on where they live but, on the relationships, they have with the people where they live, and on their sense of belonging (Block 2008).

For the purposes of this chapter, we define community both in terms of geography and relationships. A community refers to a group of people who reside in a specific location, and to the relationships between them. It may also involve people who do not reside in the area, but have a common interest in it, such as people who work or grew up in the area. As we shall see, effective community engagement depends upon the relational bonds between members of the community, and therefore strengthening these bonds may be an important focus.

It is important to note that the difference between engaging *individuals* and engaging *communities* is more than just an economy of scale. A community is *more* than simply a group of individuals. We engage communities in order to improve outcomes *for communities* and we seek improved outcomes for communities not only as a means of improving outcomes for individuals, but also to bring about change in the community itself: to improve the social fabric that provides us with a sense of belonging and connection.

Not all forms of social capital development are beneficial for the long-term recovery process. In a diversifying society, bonding social capital may have perverse effect while bridging and linking social capital may be key for building social cohesion, a key contributor to sustainable development. (Monteil et all 2020)

Previous studies have found the pattern and strength of social engagement and participation may vary by the sub-populations such as gender. They suggest that social engagement and participation in diverse activities protects older people especially women who are at a greater risk for cognitive issues (Lee et al. 2019). But it is said that different genders tend to participate in different gathering activities and places. Ridgeway demonstrates that in When organizational activities are gendered, the background gender frame becomes more powerfully relevant for actors, and the biases it introduces affects how people carry out those activities and how they fill in the details. Selection of activities that different group of people tend to participate in such environments might be impacted by the culture of gender hierarchy (Ridgeway 2009).

Gender segregation can happen due to build-environment, differences in social skills and social interaction. In general, women are considered as the main controllers in

social interactions, whereas men are seen as less socially active. while women develop intimate social contacts in smaller groups and tend to have discussions around personal issues, men are more likely to connect based on mutual interests with larger groups (Fehr 1996). Ben Noon and Ayalon (2018) by studying the interactions of older adults in public spaces based on gender found significant gender differences regarding type of social activities that men and women engaged in. Men were more likely to participate in what appeared to be pre-planned, table games, women were more likely to engage in spontaneous conversations. Also, most interactions of several older adults were gender-homogeneous, composed of only men or only women.

2.2.5 Community participation- Machizukuri

Numerous studies have highlighted the crucial impact of social capital in developing a successful recovery and in building community resilience, and social cohesion to future disasters (Aldrich 2012, NRC 2015, Aldrich and Meyer 2015). Social cohesion refers to the extent of connectedness and solidarity among groups in society. It identifies two main dimensions: the sense of belonging of a community and the relationships among members within the community itself(Manca 2014). Social cohesion can also involve feelings of trust, belonging, acceptance, and connectedness which often relate to positive social interactions (Jennings and Bamkole 2019).

There is no commonly agreed definition of community engagement (Butteriss 2014), and the term is often used interchangeably with a number of other concepts - such as consultation, participation, collaboration and empowerment - all of which are related to community engagement but do not capture all aspects of the concept (Cornwall 2008).

Sorensen and Funck (Sorensen and Funck 2007) studied about living cities in Japan and reviewed the concept and attempts of Machizukuri , before and after Hanshin Awaji earthquake-1995. They also made a comparison between Machizukuri and Machi-Sodate and review the process of them in Japanese cities, such as Yokohama and Kobe City. Their study helps to have a better understanding of the concept of Machizukuri and the expectations during the GEJE post-disaster recovery process. L.Mamula-Seadon and others, reviewed the Practice of Machizukuri in Kobe City recovery process as well form architectural and placemaking aspects, but not in the Tohoku area (Mamula-Seadon et al. 2015).

For the Tamarack Institute in Canada (http://tamarackcommunity.ca), community engagement means "people working collaboratively, through inspired action and learning, to create and realize bold visions for their common future". For Cavaye (2004), community engagement is "mutual communication and deliberation that occurs between government and citizens that allows citizens and government to participate mutually in the formulation of policy and the provision of government

services". This necessarily means participation with a community of people, rather than an individual citizen, and needs to incorporate the diversity and dynamics of communities.

According to the USDHHS (2011), community engagement is "the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people".

The field of participatory governance is well identified and debated by several contributors, and definitions have been established for this topic. Public participation level can vary widely, starting from informing the locals, consulting with them, involving them, collaborating with them, and empowering them. The ladder of participation by Arnstein and her definitions of levels of involvement in the decision-making process are from the lowest level (manipulation–non-participation) to the highest (citizen control–citizen power). She also describes citizen power as comprising partnership, delegated power, and citizen control levels; in this way, citizen power could be achieved in the decision-making process (Arnstein 1969, Fung 2015, IAP2 2020).

Figure 8 shows the ladder of citizen participation by Arnstein in combination with the recovery scenarios expressed in this research. The government-led and community-driven recovery scenarios come from the results of observations of case studies by the authors.

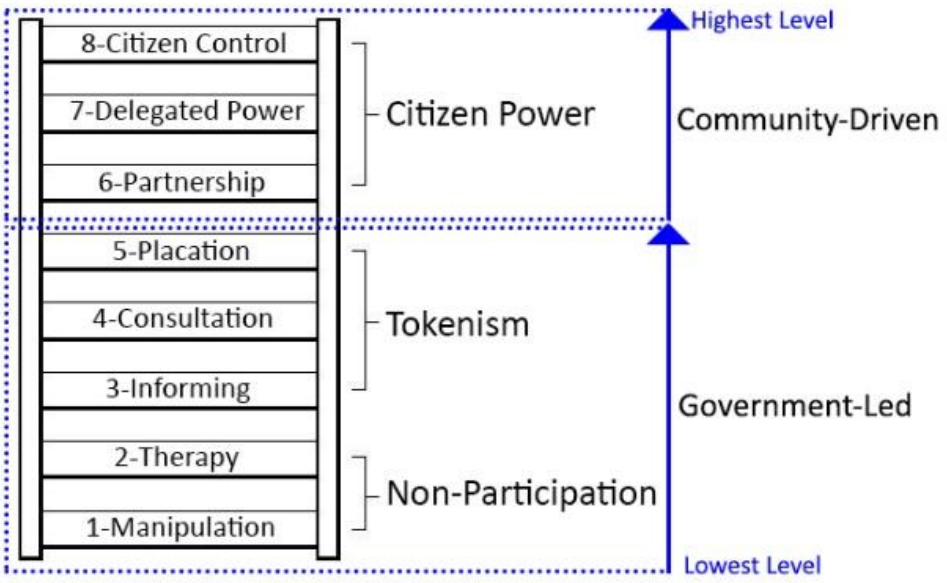


Figure 8 Ladder of citizen participation by Arnstein, revised based on authors' observations.

One key point to note about this continuum is where the power lies at each of the five levels in the IAP2's (2020) Public Participation Spectrum. In the first three levels, the final decisions rest with the professionals, while in the fifth level power has been

transferred completely to the consumers or citizens. Only at the fourth level is there a genuine sharing of power. The use of the word "empower" for the fifth level is misleading, as it implies that this is the only level at which empowerment occurs. However, the collaborative partnerships established at the fourth level also entail empowerment: for community members and groups to act as true partners with professionals necessarily involves power-sharing and capacity-building. (Table 2)

One question to be addressed is whether these different forms of participation can all be regarded as forms of community engagement, or whether we should reserve that term for one or more of the different levels. "Informing" and "consulting" are sometimes viewed as forms of community engagement, but informing and consulting with a community are not the same as ensuring that they are meaningfully involved in the decision-making process. The fourth level on the participation continuum - full collaborative partnerships between service systems and communities - can be seen as incorporating all the practices described at the previous three levels - informing, consulting and involving. These lower-level forms of participation can be regarded as necessary but not sufficient to constitute full community engagement.

Table 2 IAP2's Public Participation Spectrum

	Inform	Consult	Involve	Collaborate	Empower
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions	To obtain public feedback on analysis, alternatives or decisions	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution	To place final decision-making in the hands of the public
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced that decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decision to the maximum extent possible.	We will implement what you decide.

Although the first three levels might not qualify as community engagement according to our definition, they may be appropriate strategies to use for some purposes. Also, participatory governance is playing a new role among urban planning, budgeting, maintaining and implementing urban/town projects. In terms of participatory government, many researchers have talked about community recovery after disasters acts and those efforts must address renewal of a wide range of social, institutional, cultural and economic activities within the disaster-affected locality and across the disaster-affected population to rebuild the community. In the name of a speedy recovery, however, these elements of community development are often overshadowed by reliance on expertise in physical recovery. (Okada et al. 2018).

In Japan, with its long history of disaster and reconstruction experience, aside from government-led processes for recovering housing, infrastructure, industries, and transportation, residents have their own share of decision-making and partnership in the process. It is also highly recommended that consideration be paid to the recovery of gathering spaces during life in temporary housing and in recovered areas as one of the most important places to make community recovery tangible. The act of community-driven town planning and decision making in Japan is called Machizukuri and carries the same terminology during recovery processes, but the implementation level of Machizukuri differs from one municipality to another.

It has been years that scholars and urban developers are trying to talk about community involvement in the actions and developments. The equivalent of community-based town planning and development is called Machizukuri in japan. MACHIZUKURI can be most readily translated as community (*machi*) building/making (*zukuri*), but there is no single English term that fully encompasses its meaning. … to refer to and encompass a wide range of concepts and activities, with an equally wide range of goals, actors and processes. These can include (but far from exclusively) community involvement in planning and the work of citizens' environmental and social movements in a diverse range of community, social, economic, environmental, and urban change issues (Woodend 2013).

It is mentioned that public participation is necessary to help and speed up community recovery, to reach more sustainable post-disaster-communities letting people participate and communicate for the process is very important (Fung 2015). And it is suggested to have a system for this participation. Strategic communication (here interpreted as two-way communication between people and stakeholders) builds trust, consensus, and active participation, key factors for positive outcomes in development programs. It promotes credibility, transparency, legitimacy, and ownership for the project and ensures that the right messages are reaching all relevant stakeholders. Particularly in a post-disaster situation, good communication is the

foundation for acceptance, sustainability, and mutual understanding when rebuilding people's lives (Abhas 2010).

Indeed, community-based, Machizukuri or participatory government can help to reach a betterment in recovery. To achieve a better city recovery for residents, there is still a critical demand to bridge the gap between a demonstration pilot project and people as an equitable approach to disaster reconstruction at the scale that can benefit all survivors (Maly 2018).

2.2.6 Disaster environmental justice

Scholars (Hegtvedt and Johnson 2000) have suggested studying the impacts of two sources of support endorsement and authorization on justice evaluations and emotional, cognitive, and behavioral reactions to injustice. Grijalva (2011) concerns the role of authorizations and organizations in avoiding inclusion and providing environmental justice for minority groups of communities. Holifield et al. (2009) reviewed studies related to environmental justice and found the impact of governments on the shaping of justice/injustice on the public, spatial surroundings, and social communications. They have also emphasized the role of NPOs and NGOs in building connections with communities and governments and developing environmental justice based on identifying special needs regarding social and minority problems as well as demanding spaces and activities.

Post-disaster and facing different priorities for achieving recovery, the importance and performance of such places in the community might be far from academic expectations. Urban studies scholars have considered justice in gathering spaces in different scenarios. Low expresses distributive justice based on equity to ensure that the gathering space is available to everyone, with everyone having some degree of access. She explains that fairness can be considered by three kinds of justice: distributive justice, indicating the equal designation of gathering spaces and resources for everyone; procedural justice referring to the way process of negotiation and decision-making influences perceived fairness by individuals; and interactional justice, referring to the quality of interpersonal interactions in specific situations and space (Low 2013). Similarly, Sezer and Niksic (2017) identify indicators of justice in gathering spaces as access (both in terms of transportation and distribution of spaces in the community), degree of participation in management and activities, and physical design and aesthetics that are inviting regardless of the population's social and economic profile. In addition, Schumann and Nelan (2018) found that the placement and distribution of such places from a very early stage of disaster will help survivors reach mental, emotional, and material help provided by different organizations.

Community members with different backgrounds tend to participate in different gathering spaces and choose different activities. Ridgeway demonstrates that biased

organizational activities introduce separation among people in newly carried out activities and instructions related to such activities. The culture of hierarchy may impact participation in activities selected by different groups of people in such environments (Ridgeway 2009). Lee and Wei-Jun (2019) found that patterns and strength of social engagement and participation may vary by sub-population, such as gender and age. Built environmental factors can cause gender segregation, and disasters can increase differences in social skills and social interactions. Scholars have demonstrated that, in general, women tend to develop intimate contacts, whereas men are less socially active and more likely to participate in pre-planned activities (Lee et al. 2019, Fehr 1996, Ben Noon et al. 2018). Gehl categorizes gathering activities as necessary (based on the needs of the communities), optional (based on the choice of the communities), and social activities (the final level of activities that enhances community ties) in gathering spaces. He emphasizes that social activities might not be enabled directly but as an outcome of a good combination of necessary and optional activities in welcoming gathering spaces (Gehl et al. 2013, Gehl Institute 2018).

Different scholars have emphasized the importance of both physical and temporal accessibility to gathering spaces and the role of enhancing communities (Yilmaz 2018, Libertun et al. 2021, Giordano et al. 2019). Carmona and Gehl separately have focused on the impacts of the built environments, public spaces, and gathering spaces on the quality of community members. They pointed out main factors such as distance to the gathering spaces from the houses, dimension of the spaces, and benefiting services that each of these gathering spaces can offer to the users (Gehl et al. 2013, Gehl Institute 2018, Carmona 2010).

(Arnstein 1969, Fung 2015, IAP2 2020) Gehl (2013), Akhar (2021) and Zou (2019) emphasize citizen participation in planning and decision-making together with government bodies and show that a low level of involvement can cause manipulation. In contrast, a high level can lead to the empowerment of the citizens, and each of these can serve the justice criteria differently. Gehl and Svarre (2018), Akkar (2021), and Zhou (2019) have reviewed the impact of inclusivity in the planning process and benefiting from the built environments. They expressed that social, racial, age, and gender inclusivity will bring more equity and justice to the gathering spaces. Other scholars mention the impacts of activity diversity in bringing out community members' interest in participating more often, providing services inclusively for more population, and increasing the bonds by providing gathering services for all users (Ridgeway 2009, Lee et al. 2019, Fehr 1996, Ben Noon et al. 2018).

Gathering spaces as the main places for social interactions may help prevent or cause such segregation and injustice in communities recovering from disasters. Disaster-affected populations may benefit from well-managed gathering spaces that

embody distributive, procedural, and interactional justice, in turn strengthening the community (Anderson 2016).

2.3 Prior studies

As for global studies on post-disaster recovery, Stechmann reviewed the community reconstruction after disasters in the USA as a strategy in both communal spaces and housing recovery by the rule of community in recovery after hurricanes, and mostly on architectural aspects of the recovery process (Stechmann 2015).

Based on research conducted by Juan and others (2017) on restoration of urban spaces and focusing on the potential impacts of interaction between landscape and users, cities can be potentially restorative and justify relevance of the urban design and offer psychological benefits to urban citizens.

Wesener and Risse (2015) reviewed the use of temporary open spaces and public spaces by communities after New Zealand`s earthquakes as the key of community recovery after Christchurch earthquake in 2011 by the involvement of locals and community members and the main route towards successful social recovery.

Seattle office of emergency management (2017) published a framework of the recovery process for future disaster, by considering the common roles of community, government, and stakeholders in recovery plan of neighbourhoods and public spaces for short- and long-term reconstruction. This is a good example of a framework of recovery by seeing community involvement in the planning level.

Landau by focusing on community resilient recovery found out that public spaces have a very important rule to recover communities faster and more resilient for future disasters in different temporal terms, by bringing opportunities for attendance and gatherings (Landau 2017).

There has been significant research proving that connection to place and neighbourhood contributes to increased civic participation, better social bonds, and higher Gross Domestic Product (Johnston 2015- taken from Landua 2017). And it is important to remember that r*ecovery happens when the community build itself as a functioning system.* (Johnson and Olshansky 2017)

Among Japanese scholars, Aoki (2018) reviews residents' participation in the reconstruction of Onagawa City in the Tohoku area of Japan by measuring the level of participation based on Arnstein's ladder of participation. In addition, Ishikawa(2015) described and reviewed the community-driven recovery process of Tamauranishi-Iwanuma City after GEJET-2011. Goto and others (2020) conducted a comparative study on the recovery plans after GEJET-2011 and the Kumakoto Earthquake of 2016 and reviewed different considerations of community recovery and gathering space recovery in the documents issued by municipal governments. These studies are good

examples of community-driven recovery reviews, but they were not comparative studies and did not focus on the importance of gathering spaces in implemented community recoveries.

The importance of community recovery and community-driven approach has been discussed by different scholars in global studies as well as post-GEJET-2011 in recent years. Roque and others (2020) emphasize the importance of considering community and social capital in recovery plans and mention the role of gathering spaces as supportive spaces for community members during and after disasters, by reviewing case studies in Puerto Rico. Monteil (2020) reviewed the recovery approaches after the 1995 volcanic eruption in the Caribbean by focusing on the role of social capital in homogenous and diversified communities, demonstrating that empowering community members will lead to a more sustainable development of the community. They also mention the role of gathering spaces, such as churches and schools, in making community bonds. In addition, Haeffele and others (2020) argue about the need for commercial social spaces to help community recovery during the recovery process in post-hurricane Katrina. They mention the use of commercial-entrepreneurship-related spaces as gathering spaces to empower affected people.

In the field of community recovery, scholars have mentioned different aspects that impact to enhance the goals of community recovery. Many researchers have discussed community recovery after disasters; however, the elements of community development are often overshadowed by reliance on expertise in physical recovery in the name of speedy recovery (Okada 2018). Song and others (2018) by conducting research in Jangsu village of Korea, found out that any community leadership and activity provision towards effort should be reflective, resourceful, and inclusive for the members to reach community resilience to prepare for future risks.

Many theories exist as to how aspects of the built environments impact social interaction and, in turn, overall community resilience. While many conceptual models of these relationships are offered, there is consensus that socially engaged communities are most resilient and that an underlying urban design that includes well connected streets and spaces encourages social engagement. (Carpenter 2012)

Alipour et.al conducted a survey in Iranian communities after different disasters to find out about the importance of social capital in recovery and found an important aspect in disaster recovery and return to normalcy is that survivors need to be active participants in the process. Self-efficacy is important in psychological health, but when people are not included in their recovery; their sense of self-efficacy can be substantially undermined (Alipour et al. 2015).

Sakurai and Sato, researched about community resilience through Sendai-shi-Chiiki Bousai Leader and on community activity developments (Sakurai and Sato 2018).

Also, Koizumi and Tsuji studied on community design after the disaster and in different stages of housing process and community involved recovery plan of the temporary community in Haita Park as an example of public space recovery by the help of the community (Koizumi and Tsuji 2018).

As Kondo and Karatani say in their research, there is a lack of public space recovery by itself and it is mostly dependent on housing reconstructions. (Kondo and Karatani 2016)

Kobayashi and others (2015) review the recovery planning design of Ishinomaki city and efforts of the community-based recovery process of the city as a good example of recovering of housing and built environment together by the involvement of community.

Also, Ubaura and others(2016) in another research on Ishinomaki area, review the land use planning and developments after the GEJE by comparing the new and old situation of the city, but only on architectural level and not the rule of the community. Another example of Machizukuri attempt after GEJE had been one during recovery of Miyako City by Ubaura and Akiyama (2016). They observed meetings between local government, stakeholders and local and community people to make decisions for the recovery of the city, which could succeed a good connection and understanding between locals and stakeholders.

Research conducted on Christchurch after the 2011 earthquake studying on public meetings toward recovery, reveals that participants in the research noted a number of official participation processes left them feeling excluded and disempowered within the recovery. The majority of people who participated in the e-interviews expressed feelings of exclusion, disempowerment and marginalization in the wider process of recovery and government led recovery was described as dictatorial, autocratic, bullying, disempowering, domineering, exclusive and deceptive (Cretney 2018).

2.4 summary of the literature review

This chapter defined public space and gathering space from global and Japanese perspectives and described different possibilities of the gathering spaces in Japanese communities. Secondly, the production of space theory and related researches was demonstrated. In the next section, the chapter reviewed the background studies on recovery, social capital, community and social engagement, community participation and Machizkuri. Also, the social engagement and sub-population factors on community cohesion and community recovery were reviewed. As the disaster environmental justice field is an important part of this study, the chapter reviewed the theory and studies in

the field. And lastly, an overview of similar studies, their contribution and perspectives were described, table shows the summary of the literature review.

Table 3 summary of literature

Area of the study	*scholars*	*Summary*
Gathering spaces and production of space	Abu-Ghazzeh- 1996,Unesco-2019, Gehl and Matan-2009,E. Klinenberg-2018 R.Stechmann-2015, Holub-1991,Aldrich-2017, Wesener et al-2015, Seattle office of emergency management-2017, Landau-2017, L.A. Johnson and R.B. Olshansky-2017, Mehrotra et al-2013, Okayama university, Education for Sustainable Development and Kominkan-2013. Derek Gregory-1992, Christian Fuchs-2019	Scholars mentioned the importance of gathering spaces for community, and social capital rebounding and strengthening. Some scholars emphasized this importance for better community recovery, but there are not many independent researches on this topic. There is advisory framework for Japanese cases for recovery of public facilities and gathering spaces. Space production process have impacts on how gathering spaces are planned, constructed and used.
GEJET Recovery	L.Johnson, R.Olshansky-2016,JICA-2015,Asian Development Bank-2016, Aoki-2018,Onoda et al-2018,Iuchi and Olshansky-2018,baura-2014-2016-2018,Kondo-2018, Shiozaki-2018,Maly-2018, Saito-2015,Ueda et al-2016, Akimoto-2018,Oda-2015, Aota-2012, De Souza et al-2018, Neuman-2005, Kjæra°s-2020, Bibri-2020. Worpole, K., Knox, K. 2007, Schumann, R., Nelan, M. 2018, Johnson, C. 2007, Ueda, Y., Shaw, R-2016, Ishikawa, M. 2015, Bris P, Bendito F. 2019, Iwasa, A., Hasegawa, T., Shinkai, Sh., Shinozaki, M., Yasutake, A. & Kobayashi, K. 2012	Differences and similarities between global cases. The approach in the literature and frameworks are different from implemented projects. Scholars and stakeholders, mostly emphasize the infrastructure, business and housing recovery. Japanese cases are a leading load for the existing literature. Relocation, readjustment and compact city design are main approaches for the reconstruction that have been taken in different levels existing of gathering places from a very early stage of disaster to facilitate mental recovery of communities. pre-disaster strategic planning of the temporary housing sites in order to avoid difficulties for the communities after the occurrence of the disaster and trying to address the former issues of the experienced temporary houses in the under-plan sites. Also, enabling residents to maintain the same social ties as pre-disaster situation such as giving options to choose communities they move to, maintaining the same neighborhood proximities and providing social spaces
Social capital, community, social engagement factors	Lee, Y., Jean Yeung, W.J 2019, Ridgeway, CL. 2009, Fehr, B. 1996, Ben Noon, R., Ayalon, L, 2018	social engagement and participation in diverse activities protects older people especially women who are at a greater risk for cognitive issues. in When organizational activities are gendered, the background gender frame becomes more powerfully relevant for actors, and the biases it introduces affects how people carry out those activities and how they fill in the details. Selection of activities that different group of people tend to participate in such environments might be impacted by the

		culture of gender hierarchy. Men are more likely to participate in pre-planned activities, and women are more likely to engage in spontaneous conversations. Also, most interactions of several older adults were gender-homogeneous.
Community participation, Machizukuri	Woodend-2013, Sorensen and Funck-2007,Mamula-Seadon et al-2015,Okada et al-2018,Fung-2015,Abhas K. Jha-2010, Maly-2018, Aldrich-2012,Yamaguchi et.al-2017,Harada-2012,Alipour et al- 2015, Sakurai et al-2018,Koizumi et al-2018, Egawa et al-2018, Kondo et al-2016, Kobayashi et al-2015, Ubaura et al-2016, Wisner et al-2004, Folland et al-2018.	Community- driven recovery approaches have been advised many times by different scholars and governments and stakeholders. the attempt have been done in different levels and different aspects of the recovery. The need is known and there are suggestions to consider as a main recovery approach.
Disaster environmental justice	Rawls, J -2001, Holub, R. C. -2002, Worpole, K., Knox, K. -2007, Anderson, C. -2016, Low, Setha. -2013, Sezer, Ceren & Niksic, Matej. (2017, Schumann, R., Nelan, M. (2018, Ridgeway, CL. -2009, Lee, Y., Jean Yeung, W.J -2019, Fehr, B. (1996, Ben Noon, R., Ayalon, L, -2018, Yılmaz, Meltem. -2018, Libertun de Duren, Nora Ruth, -2021, Emanuele Giordano, Gabriele Manella, Tommaso Rimondi et Dominique Crozat-2019.	Considering justice in the environmental studies, means giving similar access, beneficiating, and participation rights and possibilities to most of the residents, regardless of gender, age, ethnicity, or economic back ground. Disaster environmental justice can be discussed in three criteria: procedural or planning level, distributive or building and accessibility level, and interactional or possible experiences of the users, inclusivity and diversity
Similar studies	Delilah Roque et al-2020, Monteil et al-2020, Haeffele et al-2020, Aoki- 2018, Ishikawa-2015, Goto et al-2020.	there are other studies emphasizing the importance of gathering space, community recovery, and community-driven approach by using similar method of measuring the participation level, or reviewing the recovery frameworks, but those studies are either a non-comparative study or only focusing the issued plans instead of actual implementations. Not evaluating cases based on the level of just recovery they have achieved. Four fields of studies have not been combined and connected.

Chapter Three: Field Surveys

3.1 Methodology

This research is a qualitative research based on library documents, interview surveys and questionnaire surveys. Numerous site visits, group interview and questionnaire surveys were conducted to gather the data for the research.

3.2 Plot Area

The focusing plot area for this research, is Tohoku region of Japan, that was damaged by the great east Japan earthquake and tsunami in 2011, Miyagi and Iwate Prefectures. Fukushima Prefecture was excluded from cases due to complexities in disaster occurrence and recovery approaches.

In the early afternoon of 11 March 2011, Japan was rocked by a 9.0-magnitude earthquake that caused widespread damage to the country's eastern coastal region. The tsunami that followed devastated the coastal areas of Tohoku and southern Hokkaido. Following the massive earthquake and tsunami, an accident at the Fukushima nuclear power plant was reported as a potential Public Health Emergency of International Concern. In time, the International Nuclear Event Scale was raised to Level 7, the highest level. (jma.go.jp)

Figure 9 illustrates the epicenter of the disaster and line of the tsunami inundated areas.

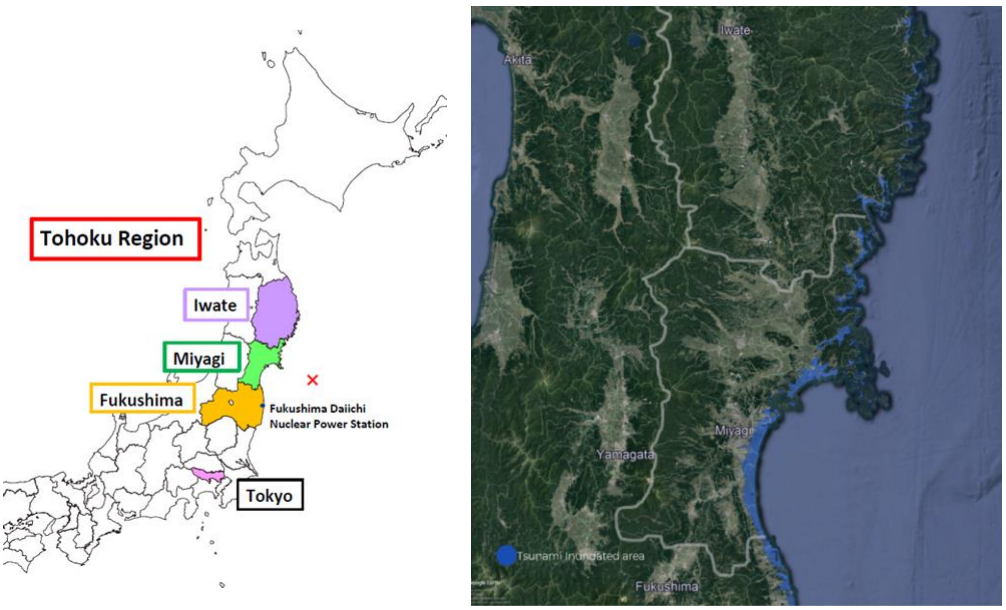


Figure 9 tsunami inundated area, https://www.jma.go.jp/jma/

As a result of the disaster, which caused the triple tragedy of the earthquake, tsunami and nuclear accident, approximately 20,000 people lost their lives and over 2,500 are still officially reported as missing, while a further 6,000 suffered injuries. In total, over 470,000 people were evacuated from their homes. As of April 2021, the number of evacuees decreased to approximately 40,000, among which around 2,000 people are still in temporary housing.

Communities across northeastern Japan (Tohoku Region) suffered extensive and severe structural damage as a result of the earthquake and tsunami, including heavy damage to roads, railways, and airports, as well as many homes being left without electricity, gas and water. In total, approximately 122,000 buildings were completely destroyed, about 283,000 suffered severe damage, and another approximately 748,000 were partially damaged. (https://www.reconstruction.go.jp/english/topics/GEJE/)

3.3 surveys

The tsunami devastated these coastal communities, but they recovered well from the damage. These cases took different recovery approaches of community relocation to a new area, land readjustment and land elevation of the affected area, and a combination of both methods. However, in all selected cases, disaster public housing, private housing, gathering spaces, and recovery of communities were part of the recovery plans and processes. To implement the surveys, conducting both semi-structured interviews and questionnaire surveys were necessary:

1) identifying characteristics of the recovery and organizations involved in the recovery of affected communities based on the administration levels by interview surveys,

2) understanding the experiences of affected residents regarding involvement in the recovery process, perceptions regarding activities and gathering spaces before and after the disaster, and individuals' suggestions for the development of the community in the future by questionnaire surveys, and

3) generating evaluations based on the established model in the selected case studies,

4) comparing the cases and identifying the effective factors on the just recovery of gathering spaces.

For the semi-structured interview surveys, multiple places were visited in March, May, July, and October 2019, and March 2020 in the form of site visits and in-person interviews. From March 2020 to September 2021, the COVID-19 and suspension of the traveling interviews were conducted remotely and through the Zoom application. Group interviews with participation of different bodies, such as government officers, community leaders, administrative staff, and NPO representatives were held and the information gathered. Discussions were held related to the following characteristics to understand the situation: the areas before and after the disaster, the timeline of the disaster and reconstruction, recovery approaches, authorization sectors and organizations in charge of the gathering space recovery, and types of gathering spaces and activities performed. Each interview took about two hours, and an attempt was made to hear the opinions and thoughts of all participants.

For the questionnaire surveys, all the households in the selected cases had received the questionnaire chapter kits in their mailboxes and returned the questionnaires through the provided pre-paid envelopes. Considering the ten years after the disaster, it was predicted that the questionnaire survey return ratio would not be high. To address this issue, it was decided that the distributions will not be based on random selection but would cover all households regardless of disaster public housing and private housing in each recovered area.

3.3.1 Interview surveys

Group interviews were conducted in 24 case studies. It was attempted to cover case studies with different recovery approaches, different types of gathering spaces and activities and different authorities. Community leaders were asked questions about these topics in different life phases:

- Livelihood of the area (jobs, age ratio, social groups)

  - Community`s relationships and social capital
  - The situation of life and involvement during temporary housing period
- Situation of gathering spaces (quantity, spatial design, ownership)
- Experiences of recovery participation
- Diversity and frequency of activities related to gathering spaces
- The spatial design of gathering space

And also questions regarding post GEJET recovery:

- Experiences of other disasters and recovery
- Outsider helps for recovery
- Suggestions for future of the recovery

Each interview lasted about 2 hours, and it was tried to hear the opinion and experiences of all the participants in the meeting. Figure 10 shows a snapshot of the interview meetings.

Figure 10 interview surveys

The figure 11 shows the location and name of each interview case study.

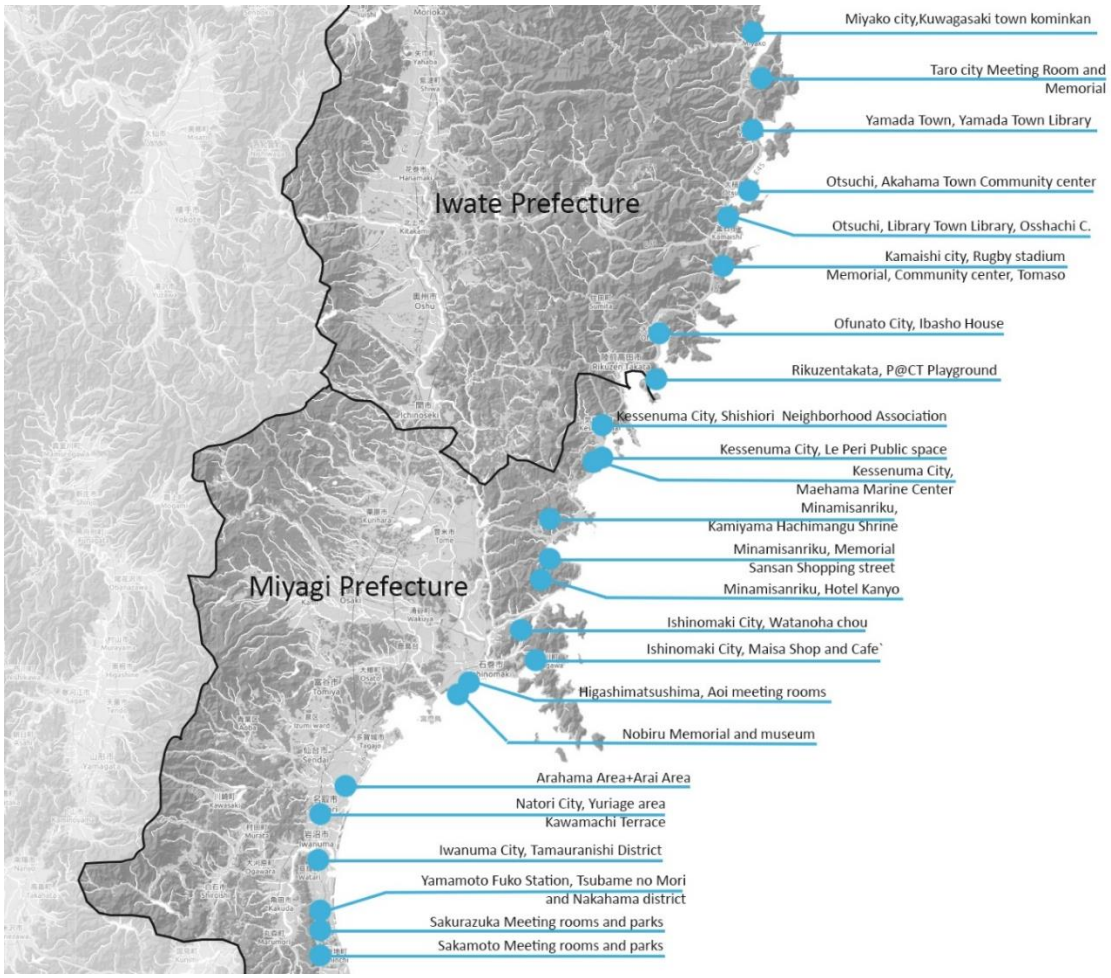


Figure 11 location of interviewed case studies

3.4 Questionnaire Case studies

To conduct the questionnaire surveys, six severely damaged communities were selected based on their reputation for successful recovery. the figure 12 shows the location of cases.

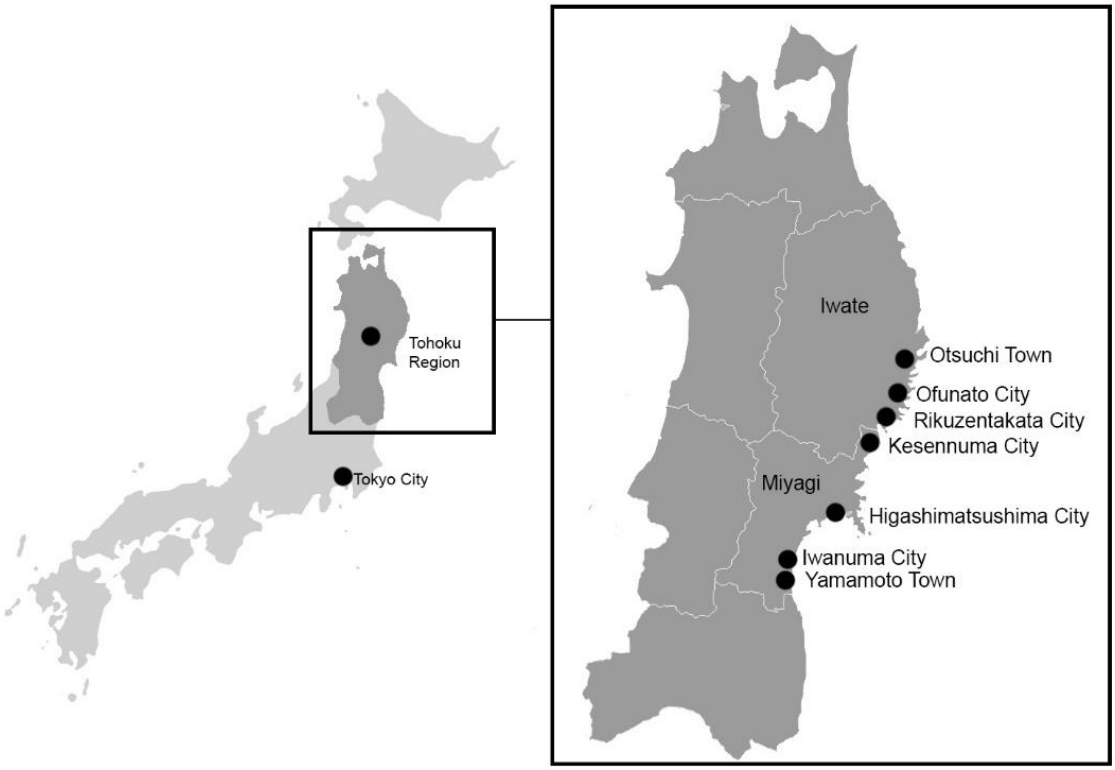


Figure 12 location of interviewed case studies

3.4.1 Case study one: Aoi-Higashimastsushima

Aoi, located in Miyagi prefecture, is a relocation site in the Omagari area, a coastal town in Higashimatsushima (private housing: 250, public housing detached style: 220, public housing-reinforced concrete: 150). In 2005, after experiencing a non-destructive earthquake, the town committee started to prepare the town for future disasters and to prevent extra damage to the infrastructures and especially to human lives. To achieve an empowered community, they held different gathering activities and regular encounters, such as conducting disaster drills and decision-making meetings for town planning among the residents. In addition, a financial resource was reserved by the town for emergency use in the town after disasters, without relying on governmental aid only.

After GEJET-2011, affected people were moved to a site of temporary housing and began to hold community meetings similar to those before the disaster. Temporary meeting rooms were provided for small gatherings, and civic centers and public halls for larger events. Because of their strong community bonds, they were able to make decisions regarding the relocation and construction of the community. The relocation site was planned based on compact city design, and even though the size of houses was smaller than the houses before the disaster, the detached style was very similar. In addition, the density of the neighborhoods in the relocation site was greater than in the previous area, and there were fewer open spaces than before the disaster.

Planning of the new location, Aoi District, is inspired by compact city design and contains disaster public housing reinforced concrete apartment style and detached style, private housing, and community buildings. In addition, there are two solar panel farms in the area to produce electricity sold to the government, serving to produce income for the community. In the recovery plan, the recovery of jobs was not considered, but there were many agreements on details for the planning that brought a familiar coherence to the area, such as town regulations in building codes, pedestrian paths, and festive parks. The design of public housing is very similar to private housing, and it is not felt at first glance that the ownership of the houses is different. In apartment-style public housing, there is a meeting room where the residents can meet and have their own gatherings by reservation in advance, and only its residents can access it independently.

As part of the community-driven planning decisions of the residents, three small buildings were added to the area: a neighborhood association as a core for community meetings and events, a small library, and a community center. The distribution of the gathering spaces was a result of community members' understanding of the need to provide maximum physical accessibility and the possibility of holding various events in

different gathering spaces. In addition, a civic center and a gymnasium were built on the north side of the area. Due to the strong role of the neighborhood association, the maximum effort was put into empowering the community. Residents decided to keep part of the former land to voluntarily produce sweet potatoes and support the neighborhood association by the proceeds from selling them. This area was famous for its air bases and recreational jet performance, and this was used to entertain the affected people and maintain community bonds. Currently, the area has different events, such as traditional events, community meetings, children's events, craft making, sweet potato harvesting, and jet performances, and the main public transportation means in the area are a train line located in the southern part of the area that is accessible from Aoi Station.

Figures 13 shows the community activities on recovery of community in gathering spaces, figure 14 shows the diagrammatic planning of the gathering space and figure 15 shows the map of the affected and recovered areas.

Figure 13 activities in Aoi-Higashimatsushima

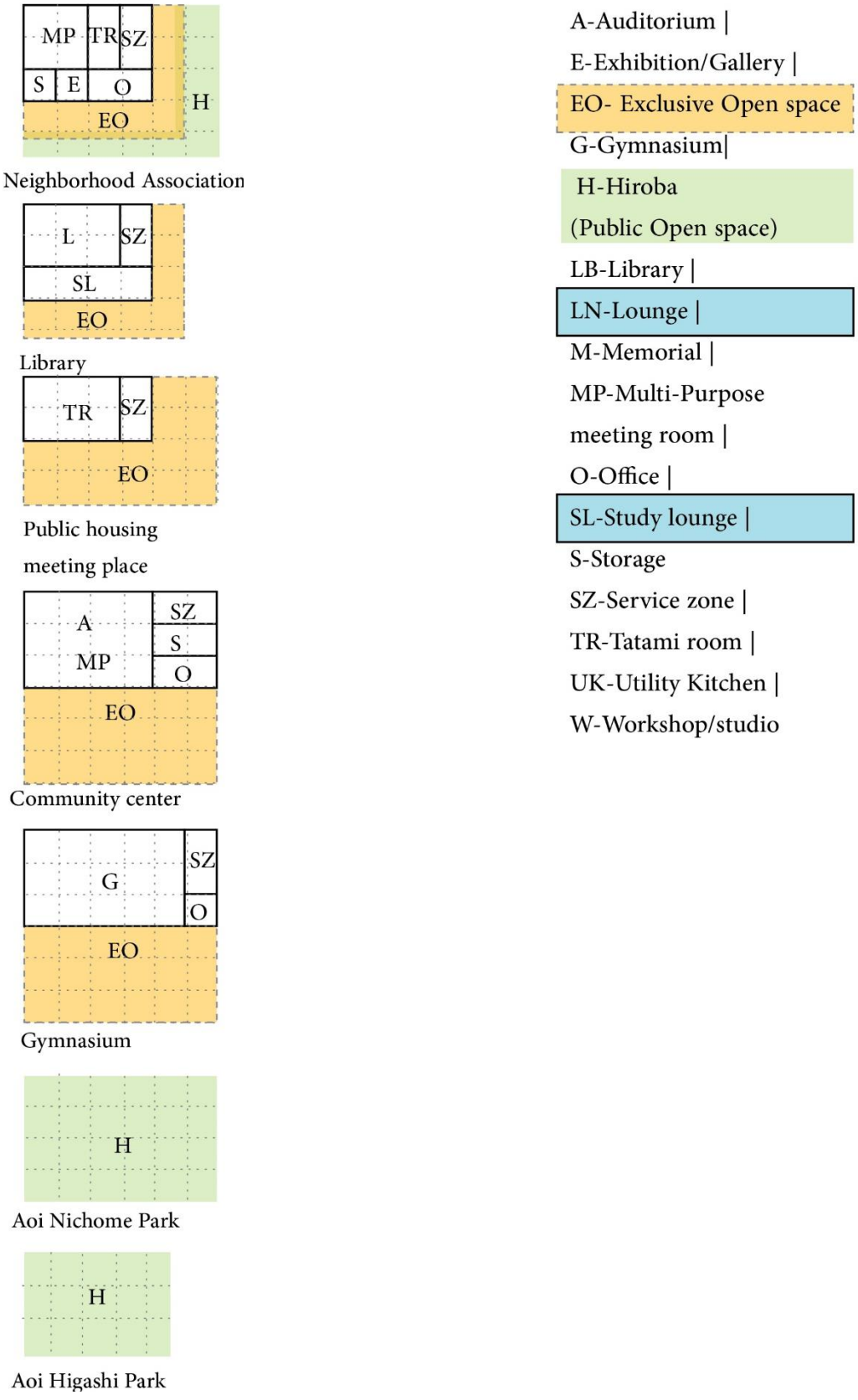


Figure 14 Spatial planning of Aoi, Neighborhood association

Figure 15 Higashimatsushima before (right) and after (left) maps

3.4.2 Case study two: Tamauranishi-Iwanuma

The Tamaura-nishi District is the relocation site of the coastal area of Iwanuma City (detached-style public housing: 210, detached and self-built housing: approximately 340). The area's recovery was achieved through public meetings attended by local government, consultants, and citizens, and based on the concept of a compact neighborhood that joins the existing Tamaura District of Iwanuma City as a western extension. There were numerous meetings between the citizens and stakeholders, and the planning reflected the opinion and partnership of the residents very well. The relocation and reconstruction process of Tamaura-nishi was completed in 2015.

The planning of the town is based on compact city design and contains detached-style private and public housing, three parks and three meeting rooms, a post office, and a large supermarket. Apart from these new buildings, the residents of Tamaura-nishi use public facilities such as hospitals, schools, and government offices from the surrounding neighborhood that remained after the disaster. However, places of employment and business were not considered at the relocation site. The main gathering spaces of the area are meeting rooms and parks that were decided and planned based on the opinions of the local people, and the budget was provided by the national government. Surrounding parks can be used anytime, but meeting places have limited access time; there are no front counter staff, but residents can reserve a place and receive the keys to hold indoor events. Even though the number of meeting rooms is half the number before the disaster, it still helped them hold various meetings in various locations that are accessible to each district. In addition, there is a civic center, shared with the remaining area on the east side, for larger gatherings, whose location and situation were an outcome of the participatory meetings. The major changes in the new planning compared to the previous planning are the size of the housing, land lots, and town structure. The town structure is completely different from before the disaster, and the density has increased about five times. Because of changes in structure and density, the interaction of residents between different neighborhoods has increased as well. The types of gathering spaces are the same as before the disaster situation, but they are fewer and support fewer activities as well.

Figures 16 shows the community activities on recovery of community in gathering spaces, figure 17 shows the diagrammatic planning of the gathering space and figure 18 shows the map of the affected and recovered areas.

Figure 16 Activities in Tamauranishi-Iwanuma

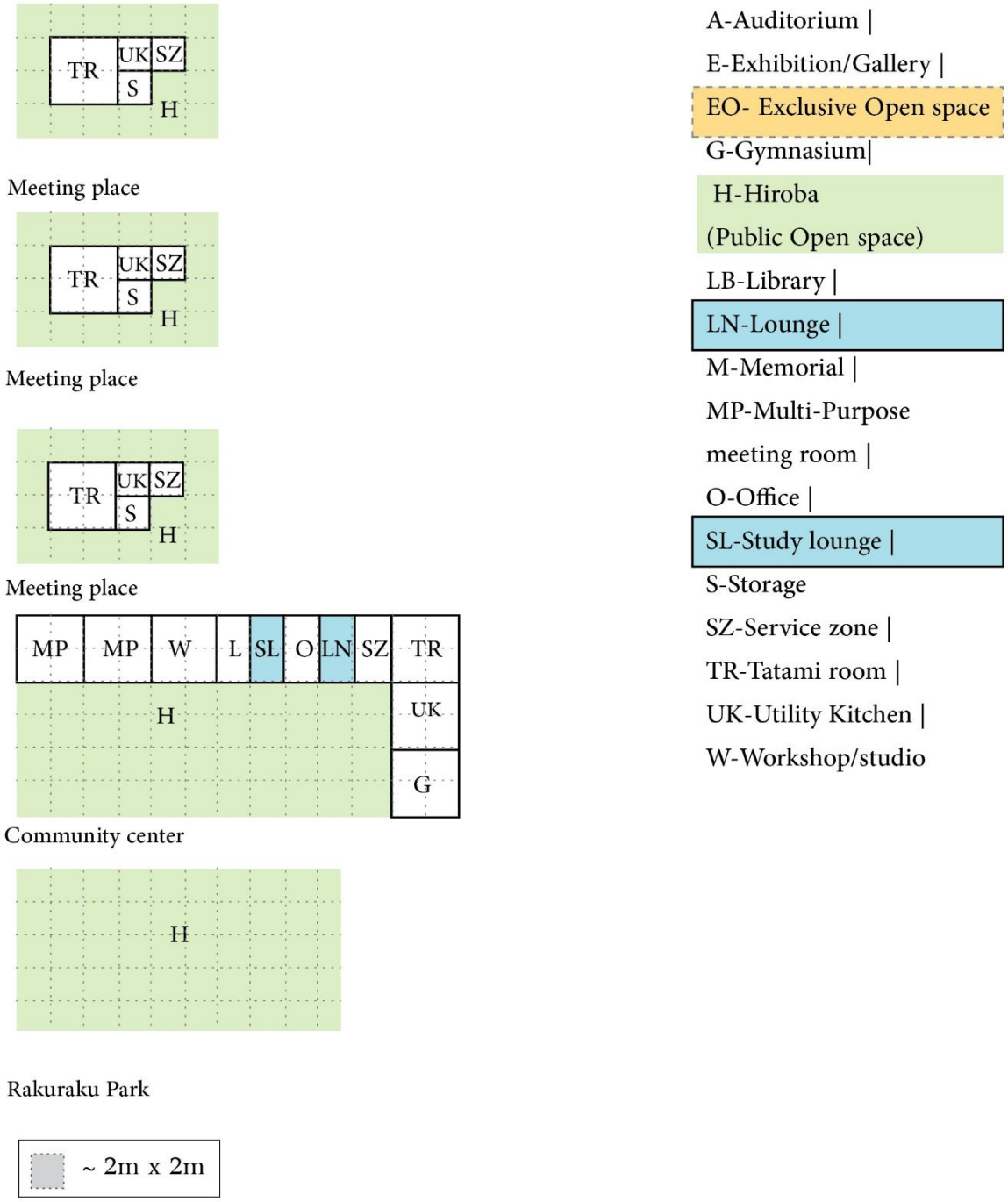


Figure 17 Spatial planning of gathering spaces in Tamauranishi

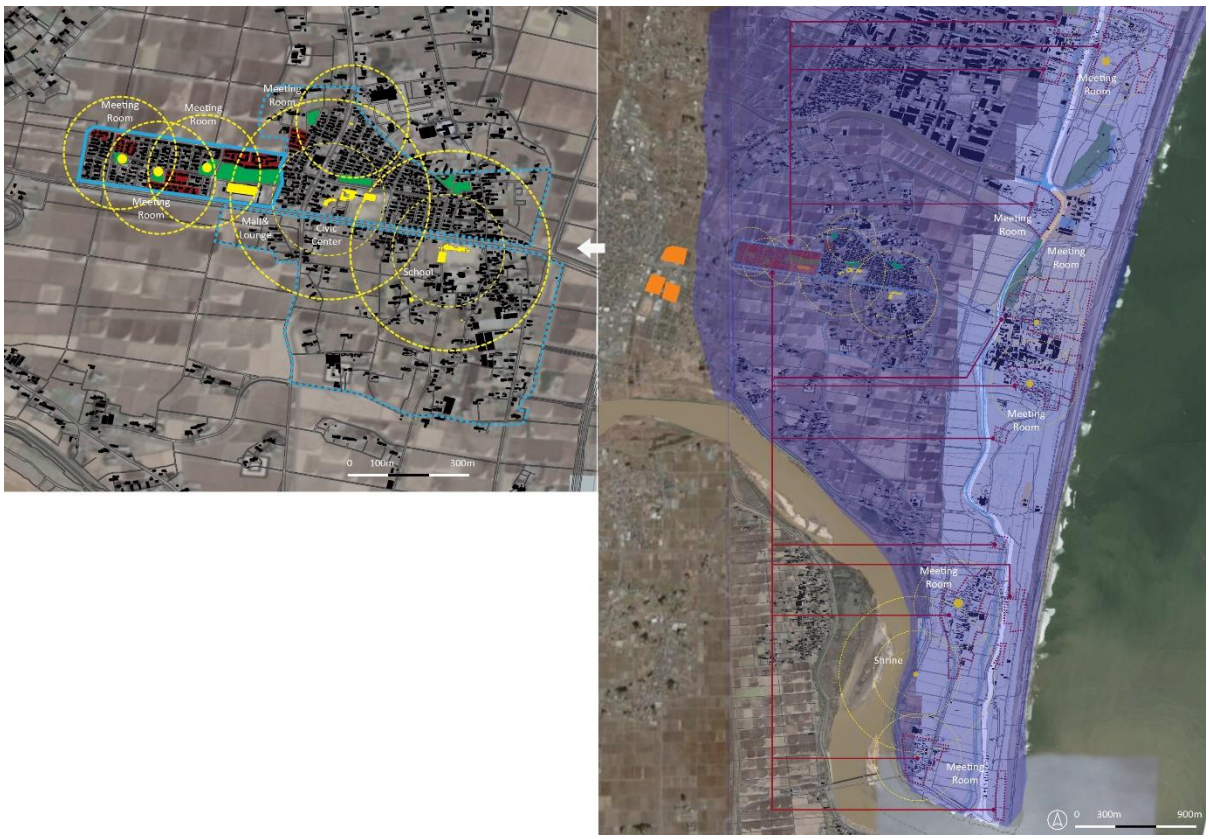


Figure 18 before and after map

3.4.3 Case study three: Machikata-Otsuchi

Machikata is located in the central part of Otsuchi Town north of Iwate Prefecture (public housing: 420 apartment style in three zones, 90 detached style in two zones, private housing: 230) The disaster heavily hit this area and resulted in a major loss of houses, residents, the town office, and many members of the local government staff. As a result, the area was left with not enough municipal office workers able to guide the recovery plan, and the local government was in charge of planning and reconstructing the district. The recovery plan restricted the construction of residential areas on the coastal and river sides of the town and provided elevated private lands for individual rebuilt and five different sites of public housing to address housing issues. Two reinforced concrete apartment-style public housing and three other sites located in the northern part in a semi-detached style and apartment-style. At each site of public housing, there is a meeting room that is accessible only to residents of the same public housing site. “Oshacchi,” a public complex consisting of the town library, community center, and a disaster memorial room, was completed in 2018, consisting of a notable three-story building with wide rooms in modern and Japanese styles, and more than hundred free parking spaces. The complex faces Oshacchi Park, which it is named after, which survived the disaster and was kept during the recovery as a memorial fountain. This place was planned and designed based on three public workshops. The first workshop was held in the town office based on flyer advertisements and the Internet, the second workshop was at high school with students, and the third was in the main supermarket that remained undamaged after the disaster. The building serves as a public library, together with a community center of multiple rooms, kitchens, tatami rooms, music-dance rooms, and free Wi-Fi zones with maximum temporal accessibility. Rooms can be reserved at a low price by people for events and can be used from the early morning until 10:00 pm. This building occasionally hosts local markets in the parking lot for handicrafts, farmers, and food stalls. Compared to before the disaster, smaller gathering spaces have been replaced by this complex, and there are fewer activities conducted in the area. Due to residents moving away, there is a lower density in the neighborhoods than before the disaster.

The public library provides some services to surrounding towns such as Akahama and Kirikiri and lends books to the residents of such remote areas. The connection between the Oshacchi Complex and Akahama brought us to visit the other area to examine their recovery and gathering spaces.

Figures 19 shows the community activities on recovery of community in gathering spaces, figure 20 shows the diagrammatic planning of the gathering space and figure 21 shows the map of the affected and recovered areas.

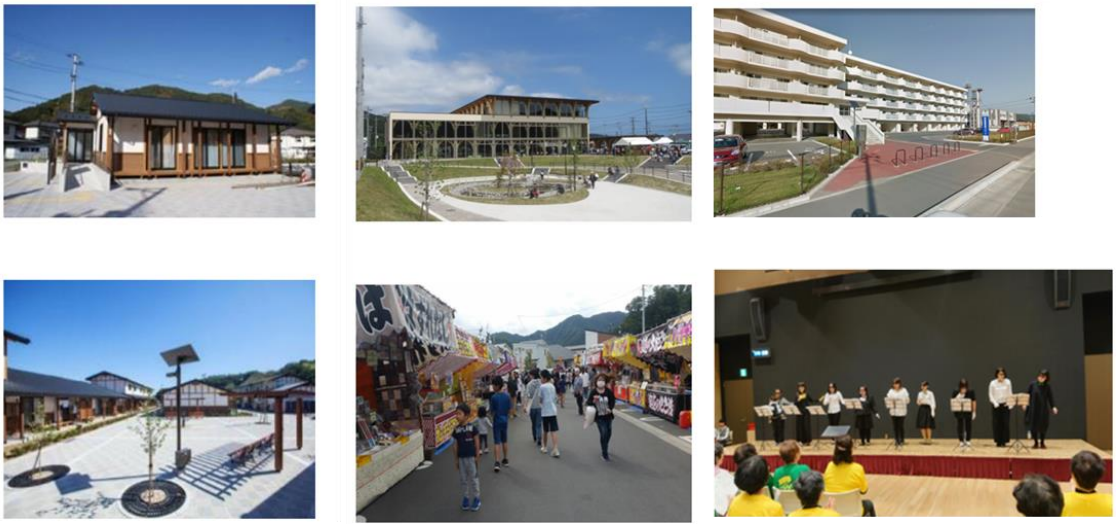
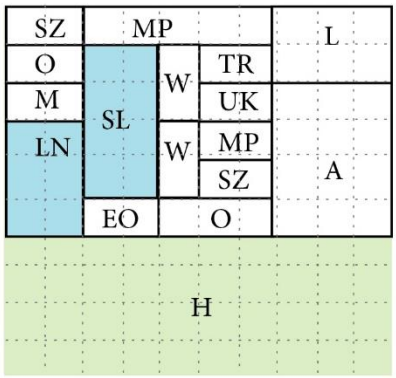
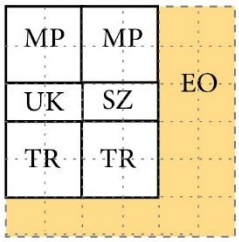


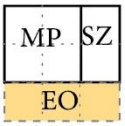
Figure 19 Activities and scapes in Machikata-Otsuchi



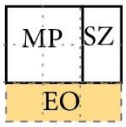
Community center



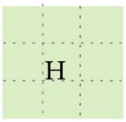
Community center



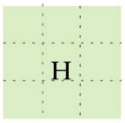
Public housing meeting place



Public housing meeting place



pocket Park



pocket Park

A-Auditorium |
E-Exhibition/Gallery |
EO- Exclusive Open space
G-Gymnasium|
H-Hiroba
(Public Open space)
LB-Library |
LN-Lounge |
M-Memorial |
MP-Multi-Purpose
meeting room |
O-Office |
SL-Study lounge |
S-Storage
SZ-Service zone |
TR-Tatami room |
UK-Utility Kitchen |
W-Workshop/studio

Figure 20 Spatial planning of gathering spaces in Machikata-Otsuchi

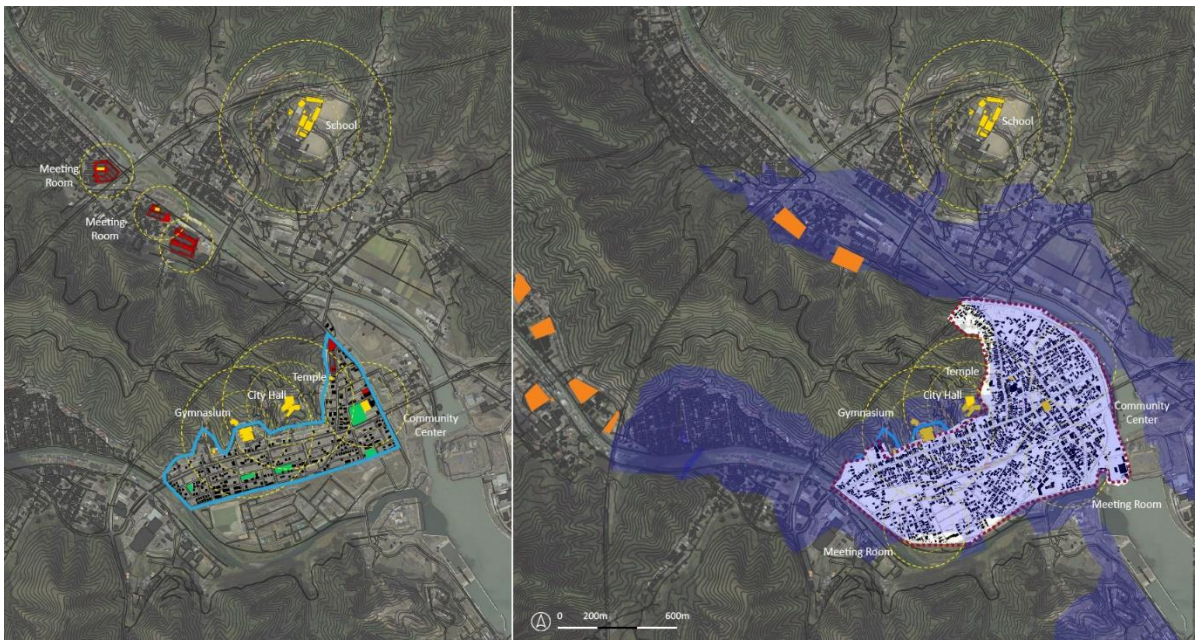


Figure 21 Otsuchi Machikata Before (right) and after (left) maps

3.4.4 Case study four: Akahama-Otsuchi

Akahama District of Otsuchi town is a small fishery area (detached style public housing: 60, self-built and pre-existing housing: 180) on readjusted and relocated land lots. Originally the houses were located near the shore as one community, but the tsunami washed the houses away. After the disaster, residents housed in five different temporary housing sites maintained their connections by holding meetings in a temporary community center with similar gatherings and events and tried hard to participate in the recovery plan and represent their opinions. For the small gatherings, a meeting room in each temporary housing site was provided, and one of them remained in Akahama as the main meeting room. For the larger gatherings that residents of different temporary housing sites intended to attend, the gymnasium of the elementary school was used. Unfortunately, the elementary school had to be shut down after the disaster because of the amount of damage and the small number of students. Even though construction of a high seawall was mandatory in this area, residents refused to build a high seawall so as to keep the fishery.

Based on numerous meetings between the stakeholders and residents, the town was planned as a unified compact community around a main road that serves as an emergency evacuation road with mixes of privately built and public houses at one site. Based on the planning, the everyday use of the main (evacuation) road could help the residents' actions during the time of the disaster. To keep the community connections in the permanent housing, they planned a close composition of houses and avoided separating neighbors; however, the accessibility of new houses is not as easy as it is supposed to be. The temporary community center served residents until March 2020, when the construction of a new community center combined with voluntary fire brigade was completed. Since the new building is not fully functional, the interviewees talked about the temporary community building and its performance since the disaster until 2020. This new community center was decided and planned through a partnership with the residents. The temporary community center building has two rooms; in the main room, there are chairs and tables and a whiteboard for gatherings and two massage chairs. Figures 22 shows the community activities on recovery of community in gathering spaces, figure 23 shows the diagrammatic planning of the gathering space and figure 24 shows the map of the affected and recovered areas.

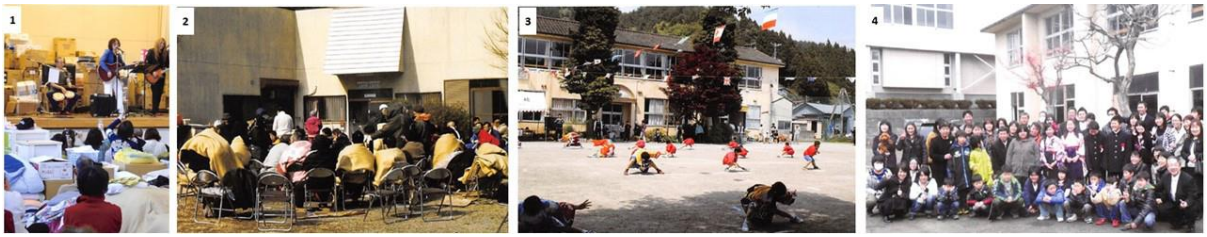
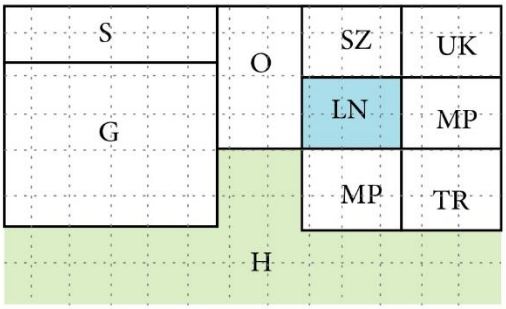
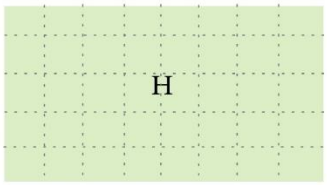


Figure 22 Activities in Akahama-Otsuchi



Community center



Mikazuki Park

A-Auditorium |
E-Exhibition/Gallery |
EO- Exclusive Open space
G-Gymnasium|
H-Hiroba
(Public Open space)
LB-Library |
LN-Lounge |
M-Memorial |
MP-Multi-Purpose
meeting room |
O-Office |
SL-Study lounge |
S-Storage
SZ-Service zone |
TR-Tatami room |
UK-Utility Kitchen |
W-Workshop/studio

Figure 23 spatial planning of gathering spaces

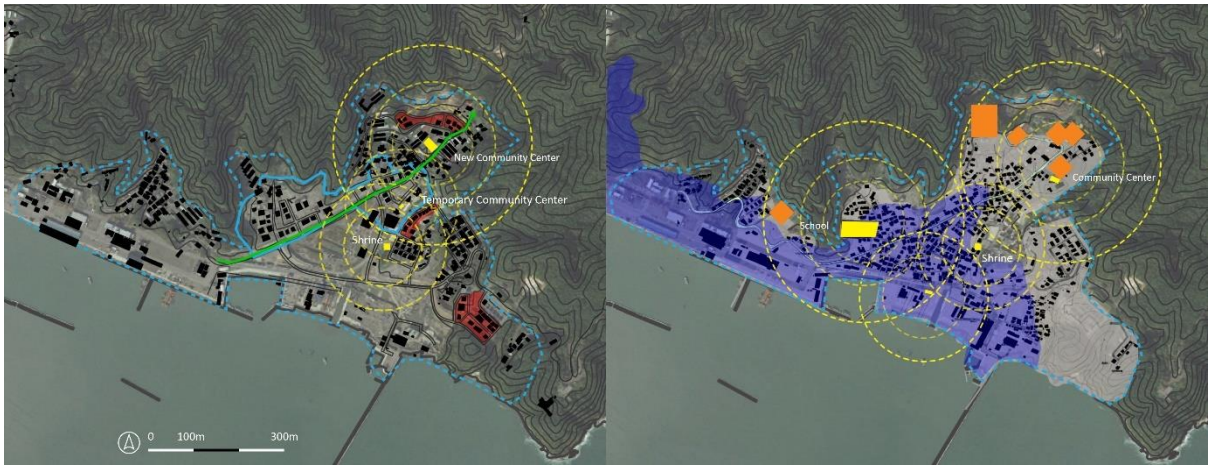


Figure 24 Akahama Otsuchi, beforev(right), after (left) maps

3.4.5 Case study five: Sakamoto-Yamamoto

Sakamoto is located in Yamamoto Town, in the southern part of Miyagi Prefecture. This area has become home to the relocation houses of the coastal Sakamoto area (public housing: 80 detached style, self-built housing: about 55). After the disaster, when affected people started living in temporary housing community meetings were held to decide the reconstruction of a new neighborhood by providing public housing and private housing merged with the existing area. The current Sakamoto area was not greatly affected and only 0.5 m of tsunami reached some of the houses.

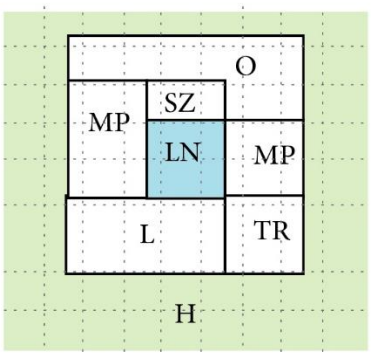
Sakamoto's community was based on a neighborhood association named the Elderly Meeting Room that regularly held community meetings and provided a small gathering space for the members to have their favorite gatherings based on reservations. The organization that helped the government to recover oversaw Machizukuri in two other areas of Yamamoto Town as well, and this practice was part of the triple recovery plans. This organization also had consultants and inspiration from the Kobe City Machizukuri Council. (This chapter does not cover other cases.)

To achieve a good consolidation of old-new communities, people were introduced to each other in community meetings in the Elderly Meeting Room with neighborhood associations. Affected people were oriented toward the existing regulations of Sakamoto Town, such as garbage disposal and recycling rules and community events. In addition, people used schools as another gathering space for larger activities and gatherings. There are two schools in this area, but due to population decrease, one school is planned to be abandoned and replaced by another school located a little farther than the Sakamoto Area. Mostly elderly people reside in public housing units, and their participation in community events and gatherings is very low.

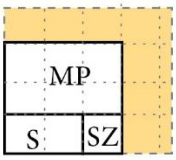
Through recovery, a new ward office building was constructed in the area to help with reconstruction issues. The building was combined with a library and community center, and the location was decided based on both current residents and relocated residents' opinions and partnerships. The community center has multiple event rooms and provides different events and spaces for people, such as music halls and dance rooms, as well as a kitchen and tatami rooms. This building is mostly used as a leisure gathering space, and more formal events regarding the town decision-making events are held in the old elderly meeting room. The recovery plan also provided for a post office, bank branch, and supermarket in the attached area, but job recovery was not included. The main public transportation in the area is the train station located on the west side and named after Sakamoto, able to transport people to Sendai City and other areas by one train line. There are fewer activities conducted in the area than before the disaster, but there are more gathering spaces and spatial possibilities than before.

Figures 25 shows the community activities on recovery of community in gathering spaces, figure 26 shows the diagrammatic planning of the gathering space and figure 27 shows the map of the affected and recovered areas.

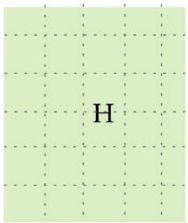
Figure 25 Activities in Sakamoto-Yamamoto



Public houisng community center



Elderly`s Meeting Place



Machihigashi Park

A-Auditorium |
E-Exhibition/Gallery |
EO- Exclusive Open space
G-Gymnasium|
H-Hiroba
(Public Open space)
LB-Library |
LN-Lounge |
M-Memorial |
MP-Multi-Purpose
meeting room |
O-Office |
SL-Study lounge |
S-Storage
SZ-Service zone |
TR-Tatami room |
UK-Utility Kitchen |
W-Workshop/studio

Figure 26 spatial planning of gathering spaces

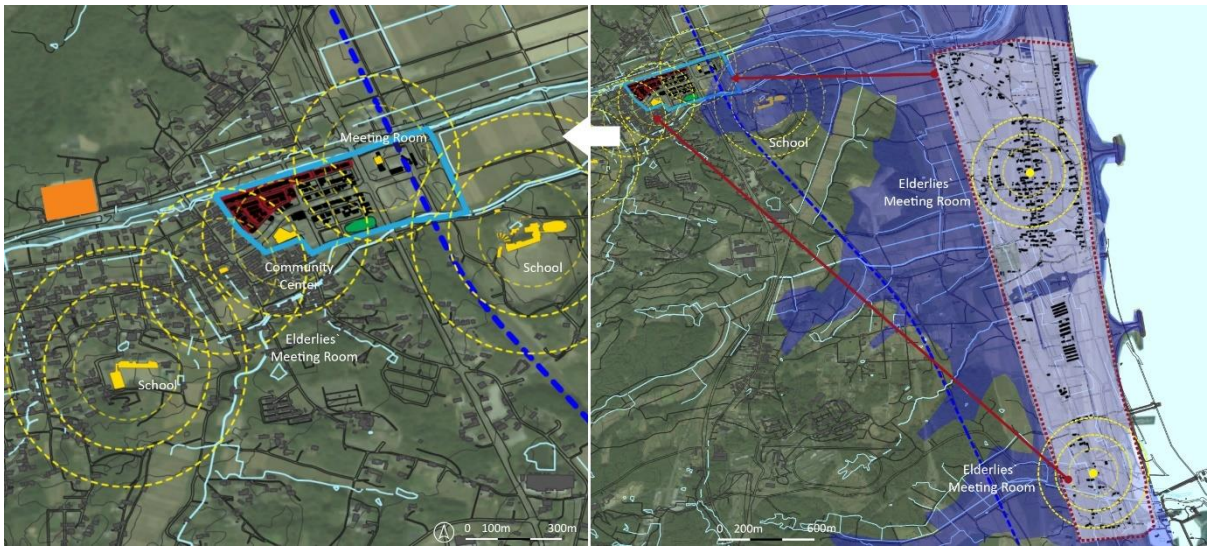


Figure 27 Yamamoto Sakamoto before (right) after (left) maps

3.4.6 Case study six: Shishiori-Kesennuma

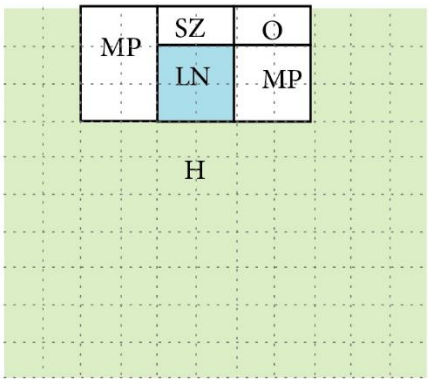
Shishiori neighborhood is located in Kesennuma City of Miyagi Prefecture and is famous for its fishery and fish processing industry (apartment-style public housing: 284, self-built housing: about 100, pre-existing houses: 132). The area was a combination of industry, fisheries, houses, and local businesses that were mainly destroyed by the tsunami. Due to the prohibition of reconstructing houses in coastal areas, the land was elevated to prevent future disasters, and only industries were permitted to stay on the coast. The reconstruction and land readjustment process of the area was completed in 2016.

The local government decided and led the recovery plan, and there was little public participation in planning decisions. However, there were minor meetings regarding the planning of a park in the northern part and the recovery of public activities and gatherings by the locals and within the neighborhood association. The recovery scenario was a combination of land readjustment and relocation. The new characteristic of the area is a mix of detached self-built housing, company dormitories, and apartment-style public disaster housing, together with the replacement of the train line with a BRT line as local public transport. The main event space of the recovered area is the open space of public housing areas next to civic centers, which hosts most of the public activities and festivals.

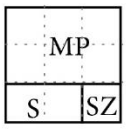
The structure of Shishiori has not changed after the disaster, but due to empty lots and numerous move-outs from the city, the density has decreased drastically. This decrease could be due in great part to the seven densely reinforced concrete apartments of public housing. The reconstruction process of Shishiori was completed in 2017. There are more gathering spaces compared to the situation before the disaster, but due to depopulation, fewer activities are conducted in the area. The questionnaire distribution area of the Shishiori area only covered the land readjustment area (blue boundary) and the closest remaining houses that were directly impacted by the recovery plan (blue dotted boundary).

Figures 28 shows the community activities on recovery of community in gathering spaces, figure 29 shows the diagrammatic planning of the gathering space and figure 30 shows the map of the affected and recovered areas.

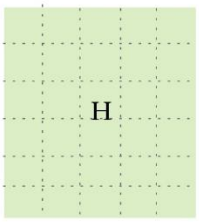
Figure 28 Activities in Shishiori-Kesennuma



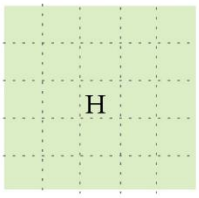
Public houisng community center



Neighborhood Association



Playground



Higashi-minato Park

A-Auditorium |
E-Exhibition/Gallery |
EO- Exclusive Open space
G-Gymnasium|
H-Hiroba
(Public Open space)
LB-Library |
LN-Lounge |
M-Memorial |
MP-Multi-Purpose
meeting room |
O-Office |
SL-Study lounge |
S-Storage
SZ-Service zone |
TR-Tatami room |
UK-Utility Kitchen |
W-Workshop/studio

Figure 29 spatial planning of gathering spaces

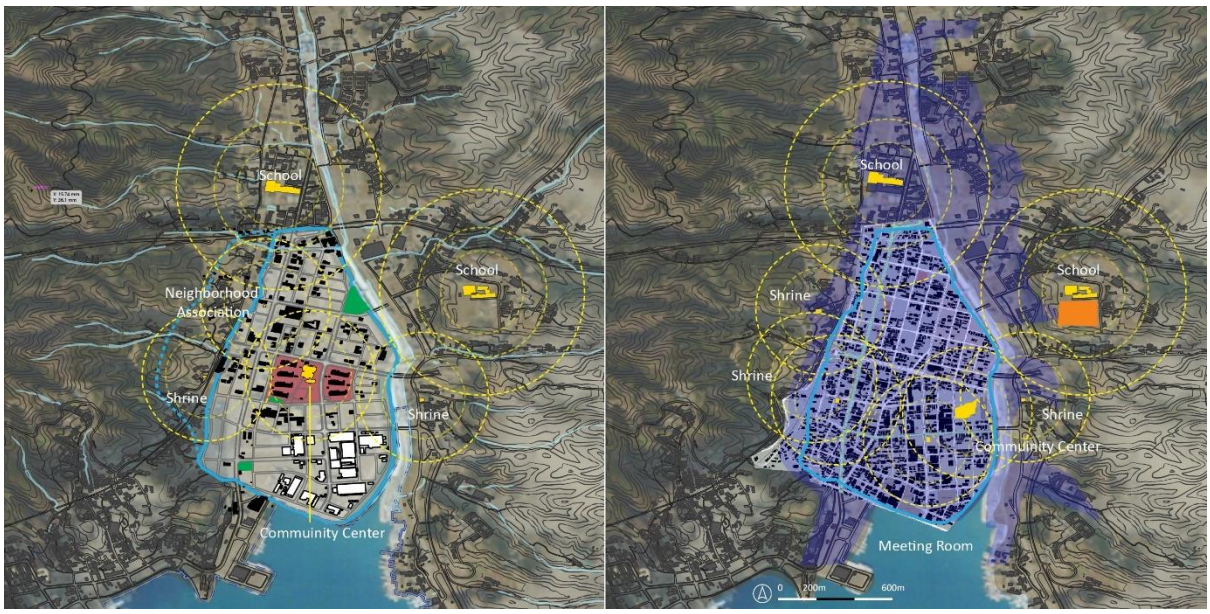


Figure 30 Shishiori Kesennuma, Before(right), after (left)

3.4.7 Case study seven: Central Yamada Town

Central Yamda town is located in the north of Iwate prefecture. Since before disaster the community benefited from strong social capital and functioning gathering spaces such as Kominkans and community centers for their daily and social life. By the occurrence of the disaster the majority of the area was demolished and there weren't many places left. This library is a combination of library and cultural exchange center was funded by Suntory company financially and supported by Save the Children association for consultation. During the affected people`s life in temporary housing, both companies asked for the all generations to participate and reflect their opinion on recovery of a gathering space, especially children and junior high school students. There were joint events held together and Panasonic and save children tried to furnish the library. While they were planning to build the library, they met children in the train station and also community center of the city. But now there is no contact between library and community center. In library they have collections of different media, books, movies, comic related to tsunami and earthquake and disaster awareness. They have overall of 38000 books and sometimes provide book reading events for schools. As this place is located near train station and bus station, it is easy to commute from inside and outside the car, there are also shuttle buses that help commute school children directly to library after the school. They have limited connection to other libraries, that is mostly regarding borrowing special books for the need of members or sending the book to other libraries. Kentitsu, mostly in Iwate Prefecture. Staffs are local people and did not work as librarians before and only one has worked in library in past who worked in Saitama as a librarian. For example, Mr Sawaki (the representative) was a city officer before tsunami and after retirement was suggested to get this position. Here in library, they think that outcome of tsunami is a good place like this library because there was nothing similar before that in the Yamada Town and children did not have a third space to go.

Library and exchange center function as a third place for elementary and high school students. After compilation of the building and administration, the library`s management was transferred from the NPO to local government and residents` association and now these two authorizations run the place and activities.

The library consists of book storages, study lounges, tatami room, media room, kid friendly reading environment, service zone, paid staff office area, and two court yards that inclusively works for the library.

Figures 31 shows the community activities on recovery of community in gathering spaces, figure 32 shows the diagrammatic planning of the gathering space and figure 33 shows the map of the affected and recovered areas.

Figure 31 meetings with NPO and children to plan library/community center

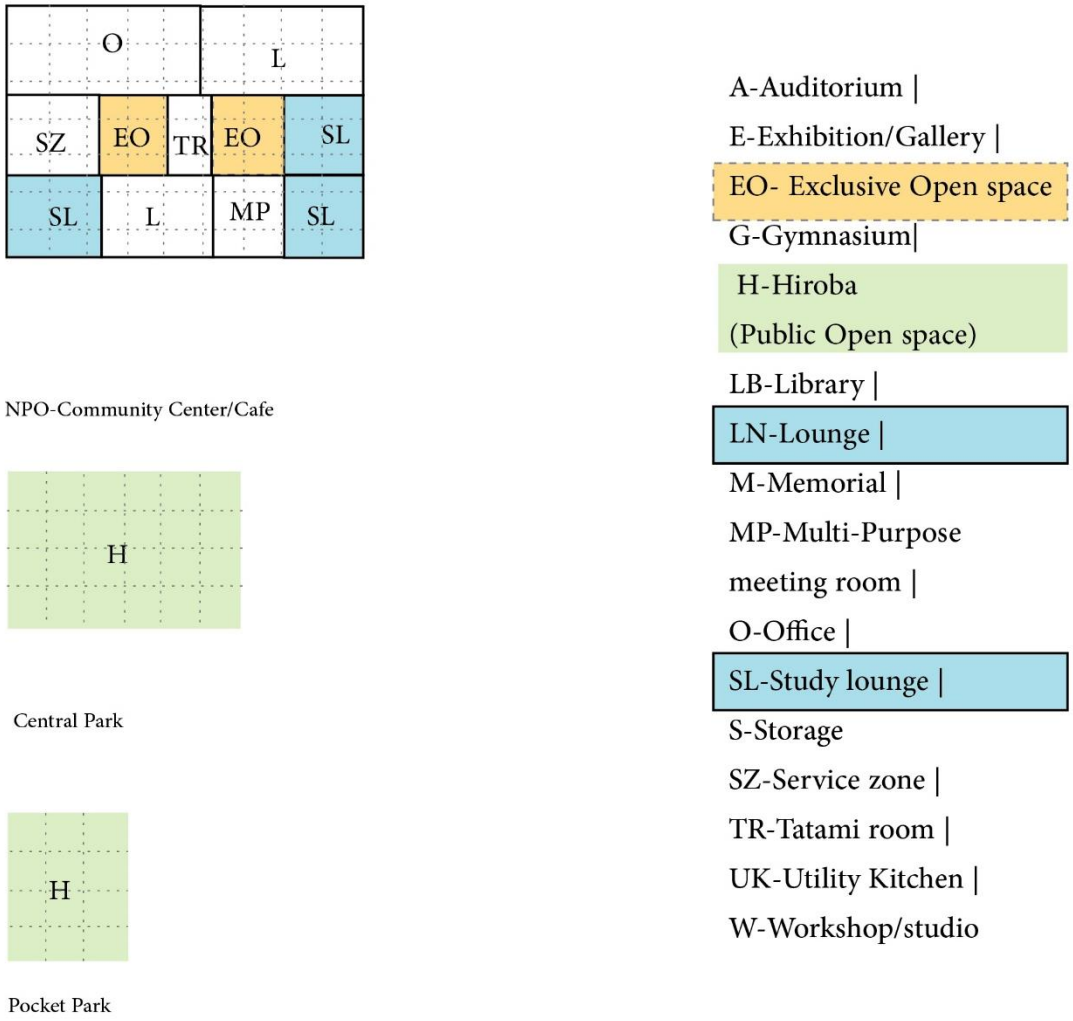


Figure 32 spatial planning of gathering spaces

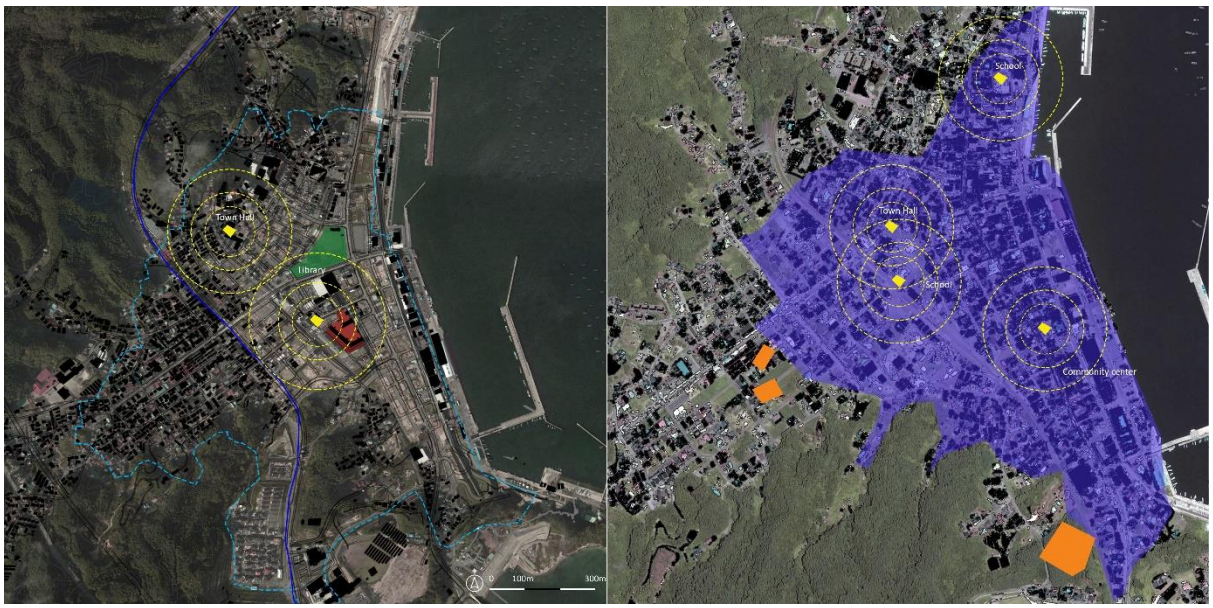


Figure 33 Yamada town, before right, after left

3.4.8 Case study eight: Massaki-Ofunato

The Massaki offunato town is located in the south part of Iwate prefecture, and was severely affected by the disaster.

Before disaster, the community was not so close and they mostly met through the Kominkan that existed in this area. In this area, after 550 family moved to 5 different temporary housing. In 2016, 35 families moved to highland with bousaishobodan project. 55 families moved to public housing, 170 families came here, and now 400 households are living.

After the disaster, affected people started meeting each other in the temporary housing and the bonds started to become stronger. The existing Kominkan was recovered by the local government but there was not enough accessibility and connection to that place. To solve the problem, the NPO Ibasho, a Japanese NPO resided in the USA joined the affected people by the purpose of empowering elderly members of the community.

The NPO held multiple meetings with the residents and encouraged their participation for the decision making regarding a new community center and planning strategies to empower elderly people and learn from their experiences and skills. The meetings covered topics regarding location, planning, administration and activities of the center.

The building was donated, and still supported by elderlies' other areas to keep the activities alive. most of the residents relocated in 6 years and mostly are living in permanent housing now. And some houses are still under construction. Public housing is different and is steel structure. People feel some isolation, because there are few occasions they go out and they need to be cared. In this community center, they have some activities, such as morning market, restaurants, hand craft shop, holding festivals and handcraft making classes, music classes, they opened Saturday market as well, because the shops decreased here. elderlies are doing part time job as volunteers. They have activities for children too, walking with children, exercises, watching out children when needed and retired teachers make cultural classes for children. Also holding psychological workshop to help people to recover mentally and suffer less the depression.

Figures 34 shows the community activities on recovery of community in gathering spaces, figure 35 shows the diagrammatic planning of the gathering space and figure 36 shows the map of the affected and recovered areas.

Figure 34 meeting between NPO and residents to plan the Ibasho and current activities

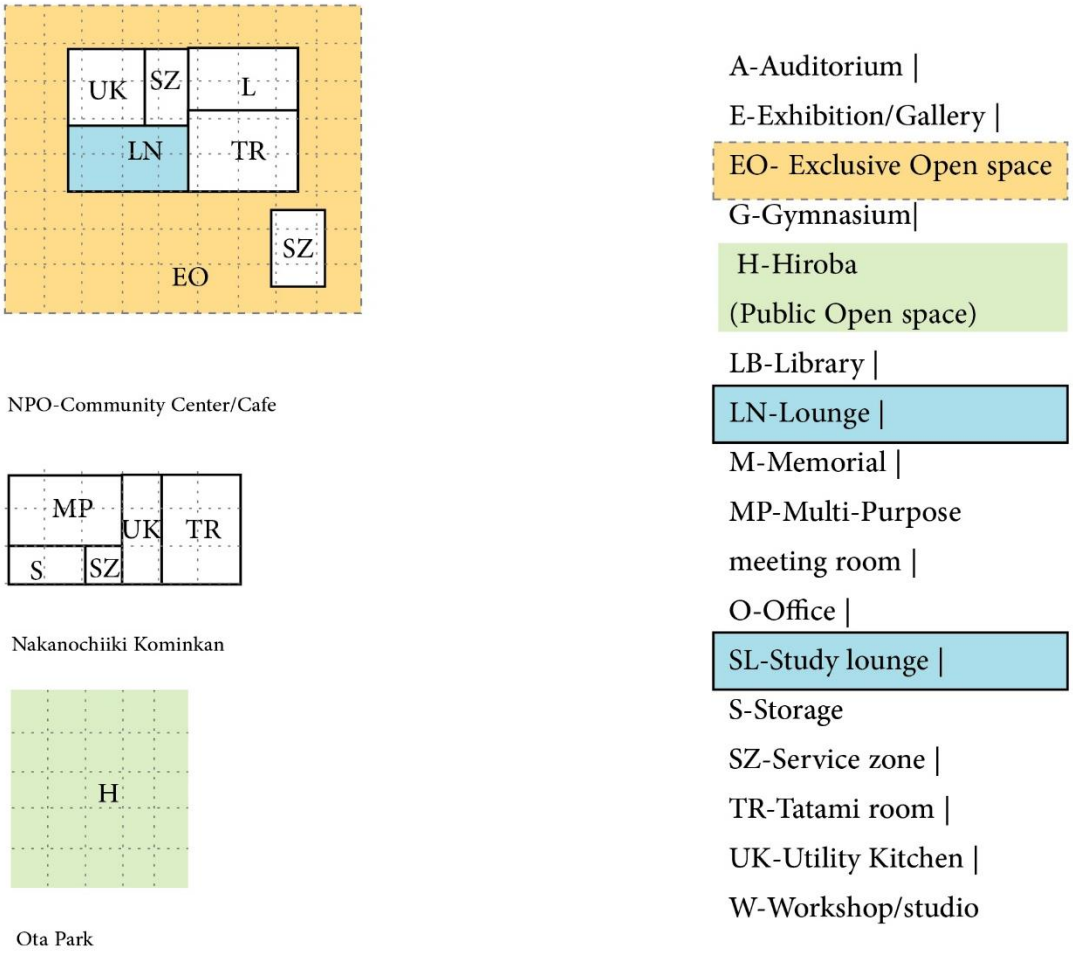


Figure 35 spatial planning of gathering space

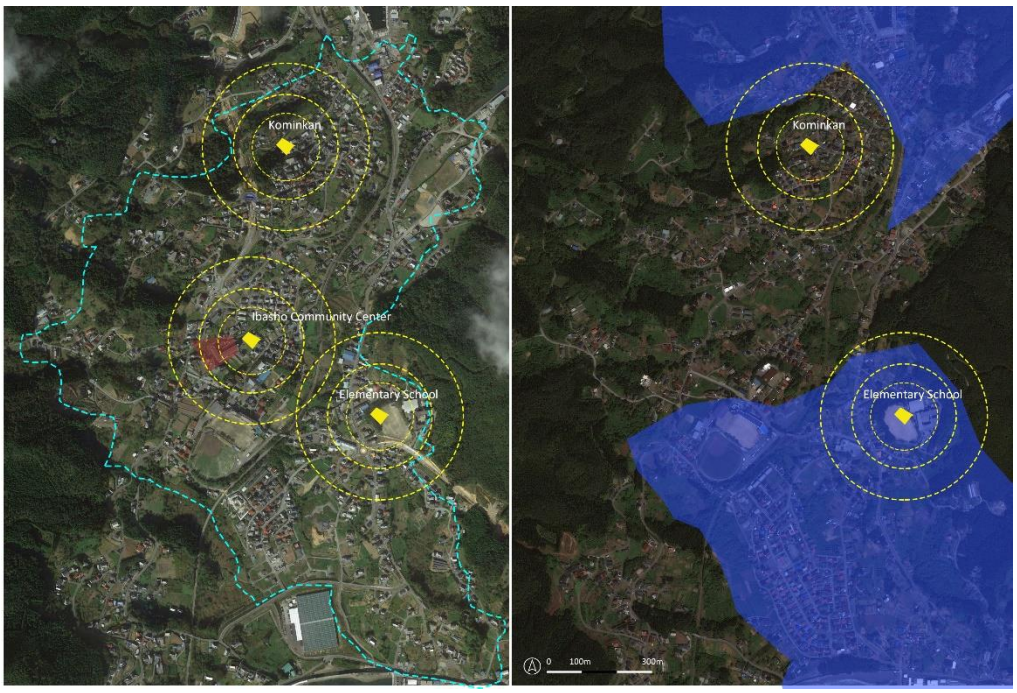


Figure 36 massaki ofunato, right before, left after maps

3.4.5 overview of questionnaire survey

The questionnaire surveys, conducted on March 2020, covered all the households of the recovered areas in the selected cities.

In Tamauranishi, Iwanuma, about 360 questionnaires were distributed and 103 them was returned(30% return) and in Shishiori, Kesennuma about 500 questionnaires were distributed and 79 of them were returned(15%), in Mchikata district of Otsuchi town 656 distributed and 86 return (13%), Akahama in Otsuchi Town, 233 distributed, 48 returned(21%), Aoi in Higashimatsushima, 542 distributed, 99 returned, in Massaki Ofunato 391 questionnaire were distributed and 40 returned (10%) in Central Yamada 621 questionnaires were distributed and 74 returned (12%), and in Sakamoto town in Yamamoto, 132 were distributed and 32 of the questionnaires were returned(23%). In total, 3433 questionnaires were distributed, and 562 questionnaires were returned (18%). Table 4 represents the distribution and return ratio of the questionnaires.

Table 4 distribution and return ratio

Area	*number of distributions*	*number of returned*	*return ratio*
Aoi-Higashimatsushima	542	99	18%
Tamauranishi-Iwanuma	354	104	29%
Akahama-Otsuchi	233	48	21%
Sakamoto-Yamamoto	138	32	23%
Shishiori-Kesennuma	516	78	15%
Machikata- Otsuchi	656	87	13%
Massaki Ofunato	391	40	10%
Central Yamada	621	74	12%
Total	3433	562	18%

Table 5 shows the detail of respondents.

Table 5 details of the respondents

			City								
			Aoi-Higashimatsushima	Tamauranishi-Iwanuma	Akahama-Otsuchi	Sakamoto-Yamamoto	Shishiori-Kesennuma	Machikata-Otsuchi	Central Yamada	Massaki-Offunato	*Total*
Age_part	under 65	N	48	35	22	12	29	35	0	0	181
		%	49%	34%	46%	38%	37%	42%	0%	0%	35 %
	over 65	N	48	64	25	20	49	46	48	27	327
		%	49%	62%	52%	63%	63%	55%	100%	100%	63 %
	999	N	1	4	1	0	0	3	0	0	9
		%	1%	4%	2%	0%	0%	4%	0%	0%	2%
	Total	N	97	103	48	32	78	84	48	27	517
Gender	male	N	49	58	17	12	43	41	37	19	276
		%	51%	57%	36%	38%	55%	49%	49%	46%	50 %
	female	N	47	43	30	20	35	42	38	22	277
		%	49%	43%	64%	63%	45%	51%	51%	54%	50 %
	Total	N	96	101	47	32	78	83	75	41	553
Dwelling	Type of :	N	53	64	36	21	34	35	50	34	327
		%	55%	62%	75%	66%	44%	42%	67%	83%	59 %
	Public housi	N	44	39	12	11	44	49	25	7	231
		%	45%	38%	25%	34%	56%	58%	33%	17%	41 %
	Total	N	97	103	48	32	78	84	75	41	558
Residency Duration	less than 3	N	26	11	28	4	49	47	36	0	201
		%	28%	11%	61%	14%	70%	61%	49%	0%	38 %
	3-5 years	N	59	63	4	12	11	25	26	7	207
		%	63%	64%	9%	41%	16%	32%	36%	18%	39 %
	5-10 years	N	8	22	2	2	3	2	2	11	52
		%	9%	22%	4%	7%	4%	3%	3%	29%	10 %
	than 10	N	0	3	12	11	7	3	9	20	65
		%	0%	3%	26%	38%	10%	4%	12%	53%	12 %
	Total	N	93	99	46	29	70	77	73	38	525

Chapter Four: Production of gathering spaces in post-disaster recovery scenarios

Summary:

Gathering and public spaces along with infrastructure and houses are demolished due to disasters, resulting in the weakening of community ties. Different approaches to recovery toward government-led and community-driven initiatives initiated the recovery of gathering and public spaces, and the long-term impact of each recovery initiative on community recovery may not be overseen.

This study aims to determine how gathering spaces have been produced in case studies with different recovery scenarios (government-led, community-driven) after the Great East Japan Earthquake and Tsunami-2011. Based on interviews and questionnaire surveys, this study attempts to identify different recovery scenarios and production of gathering spaces based on two main background theories: Arnstein's ladder of citizen participation and Henri Lefebvre's production of space triad.

The results show that the production of gathering spaces may be associated with the recovery scenario in each case study. In community-driven case studies, the main gathering spaces have the greatest diversity in activity and accessibility, and evenly allocated smaller gathering spaces are at a good level of proving services and are accessible and are in a synced network with the main gathering spaces. In government-led cases, there are multiple gathering spaces, but they lack connection. The main gathering space is centralized near public housing sites and has the most accessibility and quality service provision, provides services to residents from outside the community, and is closer to the concept of public space by providing a large-scale open space (Hiroba) together with the building.

1. Introduction

Many scholars in the disaster recovery field are concerned with recovery approaches and residents' participation level, gathering space, and public space studies' emphasis on the importance of these spaces in communities. This study attempts to combine these two fields to address the issues regarding communities after the

recovery of gathering spaces. This study aims to determine how gathering spaces have been produced in case studies with different recovery scenarios (government-led, community-driven) after the Great East Japan Earthquake and Tsunami 2011 (hereinafter GEJET-2011; based on interviews and questionnaire surveys, this study tries to identify different recovery scenarios and production of gathering spaces based on two main background theories: Arnstein's ladder of citizen participation and Henri Lefebvre's production of space triad in selected case studies from the Tohoku region of Japan. Henri Lefebvre's production of space triad emphasizes the experiences of space production, and differences in the spatial practices and users' experiences are the outcomes of the initial planning and decision making. This concept mainly focused on during postmodern acts of urban planning and is a novel concept for disaster recovery processes.

2. Hypothesis and Methodology

The hypothesis identifies situation of activities and events and area's characteristics before the disaster may have impacts on recovery planning and participation level during the recovery; activities and events after disaster and the recovered buildings and spatial organizations are results of the after-disaster recovery planning and participation levels; also, the recovered gathering spaces themselves can have impact on the activities and events after the disaster. Figure 37 shows this hypothesis.

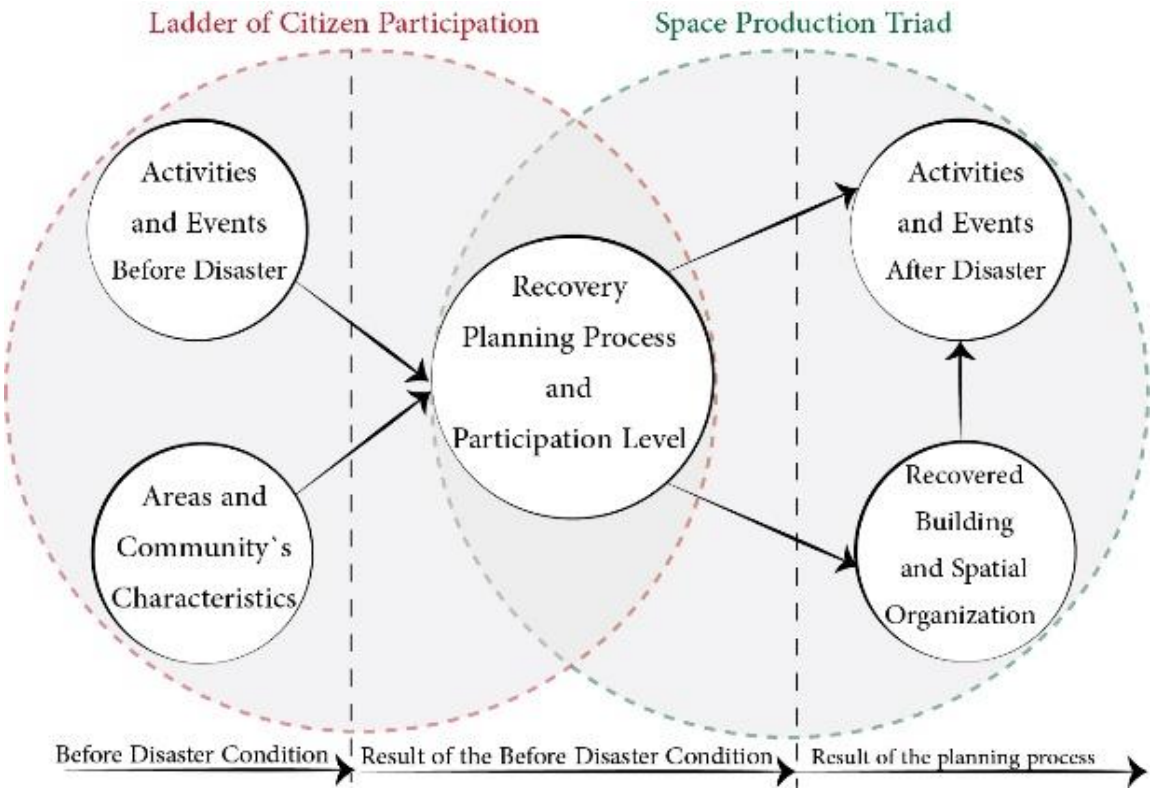


Figure 37 Hypothesis of the gathering space production in cross-section with Ladder of Citizen Participation and Space Production Triad

Based on interviews and questionnaire surveys, this study attempts to identify different recovery scenarios and production of gathering spaces based on two main background theories: Arnstein's ladder of citizen participation and Henri Lefebvre's production of space triad in selected case studies from the Tohoku region of Japan. The first oar of the survey draws the results of site visits and interviews by interviewing the cases and gathering spaces. This section will investigate two first factors of produced spaces, then categorize them based on their recovery scenarios for spatial practices and the situation of gathering spaces for representation of spaces. The second part presents the results of the questionnaire surveys and draws the factor of representational spaces for the case studies by gathering data from residents.

2.1. Surveys

To understand the hypotheses and methodology of this research, it is necessary to clarify the state of each case study before and during the recovery process. This information was obtained based on the documents issued by municipalities and scholars and through interview surveys conducted by the author of this chapter. For the interview surveys, multiple places were visited in March, May, July, and October 2019 and March 2020; in each visit, community leaders were interviewed. Group interviews were conducted to gain more perspectives and a better understanding of the town, community, disaster experience, recovery scenarios, and gathering space. Each

interview took about two hours, and an attempt was made to hear the opinions and thoughts of all participants. Questionnaire surveys were conducted in March and July 2020 and covered all households in the selected areas for distribution.

2.2. Introduction of case studies

For this chapter, four severely damaged areas were selected: Aoi-Higashimatsushima City, Tamauranishi-Iwanuma City, Machikata-Otsuchi City, and Shishiori-Kesennuma City, in Miyagi and Iwate Prefectures in the Tohoku region.

2.3. Questionnaire survey

The questionnaire surveys were conducted in March and July 2020. Ten years had passed since the disaster, and it was predicted that the questionnaire survey return ratio would not be high. To address this issue, it was decided that the distributions will not be based on random selection but would cover all households regardless of disaster public housing and private housing in each recovered area. The questionnaire surveys faced the initial lock-down of COVID-19 but were not significantly affected by the situation. Table 6 shows the distribution and return ratios of questionnaire surveys.

Table 6 Distribution and return ratio of questionnaire surveys

		Aoi-Higashi matsushima	*Tamauranishi-Iwanuma*	*Kesennuma Shishiori*	*Otsuchi Machikata*
Disaster-Public housing	Distributed	307	145	246	359
	returned	44	39	44	49
Other Type	Distributed	235	209	270	297
	returned	53	64	34	35
Total	Distributed	542	354	516	656
	returned	97	103	78	84
	Return ratio	18%	29%	15%	13%

In total 2076 questionnaires were distributed and 362 (18%) questionnaires were completed. The results of the questionnaire showed that most respondents were over 65 years old, and the gender of the respondents showed equal distributions among all cases. The dwelling situation distribution showed that the number of respondents who lived in private dwellings in Tamauranishi-Iwanuma and Aoi-Higashimatsushima were more than other cases. Table 7 presents the demographic results of the questionnaire distribution.

Table 7 Summary of demographic results of the questionnaire survey results.

			City				*Total*
			Higashimatsushima-Aoi	Iwanuma-Tamauranishi	Kesennuma-Shishiori	Otsuchi-Machikata	
Age ratio	under 65	N	48	35	29	35	147
		%	50%	35%	37%	43%	42%
	over 65	N	48	64	49	46	207
		%	50%	65%	63%	57%	59%
	Total	N	96	99	78	81	354
Gender	male	N	49	58	43	41	191
		%	51%	57%	55%	49%	53%
	female	N	47	43	35	42	167
		%	49%	43%	45%	51%	47%
	Total	N	96	101	78	83	358
Dwelling	Private housing	N	53	64	34	35	186
		%	55%	62%	44%	42%	51%
	Public housing	N	44	39	44	49	176
		%	45%	38%	56%	58%	49%
Total		N	97	103	78	84	362

2.3.1. Results

The results follow the three features of the triad of gathering space production defined in the introduction part of the study.

Spatial practices (perceived spaces)

Case studies were summarized and compared using several different approaches. In addition, an indicator was used to measure the level of participation in the recovery process based on Arnstein's ladder of participation. Recovery scenarios refer to recovery planning and administration of affected areas as well as gathering spaces based on collaborations of different sectors, and in this part are identified as government-led or community-driven recovery scenarios (Figure 2).

All the cases have at least the consultation level of participation in their recovery plans, which is common among global cases. Aoi-Higashimatsushima has the highest level of participation because it provides citizens with empowering and decision-making controls. Tamauranishi-Iwanuma, reflecting the partnership of the citizens in the recovery plan, is in the second stage. Shishiori-Kesennuma and Machikata-Otsuchi, being at the level of consultation and informing the residents, were at the lowest level among all the cases. Based on these measurements and observations, the case studies were divided into two groups: community-driven and government-led recovery scenarios. Case studies with higher levels of participation at the citizen power level are considered community-driven, while case studies with lower levels are considered government-led projects. Table 8 summarizes the reconstruction and recovery details for each case study. The next section will examine each case study based on the aforementioned factors and the results of the questionnaire surveys.

Table 8 Summary of the recovery initiatives of the case studies- spatial practices

Area	*Reconstruction Type*	*Participation process*	*LOP**	*Recovery Initiative*
Aoi-Higashimatushima	relocation, compact city, no business provided	constant meeting with residents, decisions made and executed by residents, before disaster preparation. Gathering spaces opened on 2015 after completion of housings	8	Community-Driven
Tamauranishi-Iwanuma	relocation, compact city, no business provided	constant meeting with residents, decisions based on residents` opinion and partnership. Gathering spaces opened on 2015 after completion of housings	6	Community-Driven
Shishiori-Kesennuma	land readjustment, relocation, small retails provided	decisions based on government's perspective. Consultation and informing with the residents for some details. Gathering spaces opened on 2017 after completion of housings	4	Government-Led
Machikata-Otsuchi	land readjustment, relocation, small retail provided	decisions based on government's perspective. Consultation and informing with the residents for some details. Gathering spaces opened on 2018 after completion of housings	4	Government-Led

**Level Of Participation: Based on participation based on Arnstein's ladder of participation non-Participation ((1) Manipulation and (2) Therapy), Tokenism (-(3) Informing, (4) Consultation and (5) Placation), Citizen Power ((6) Partnership, (7) Delegated Power and (8) Citizen Control)*

Figure 38 shows the media mean that was used by initiatives to announce services and activities and the organizations that oversee gathering activities in gathering spaces. In all the areas, circular boards and PR magazines were the main means of media to announce the services, and Tamauranishi-Iwanuma and Otsuchi machikata wifi broadcasts were chosen. In community-driven cases, the selection of neighborhood association is the highest, and in government-led cases, the selection of community associations is the highest. The selection of PTA is higher in government-led cases.

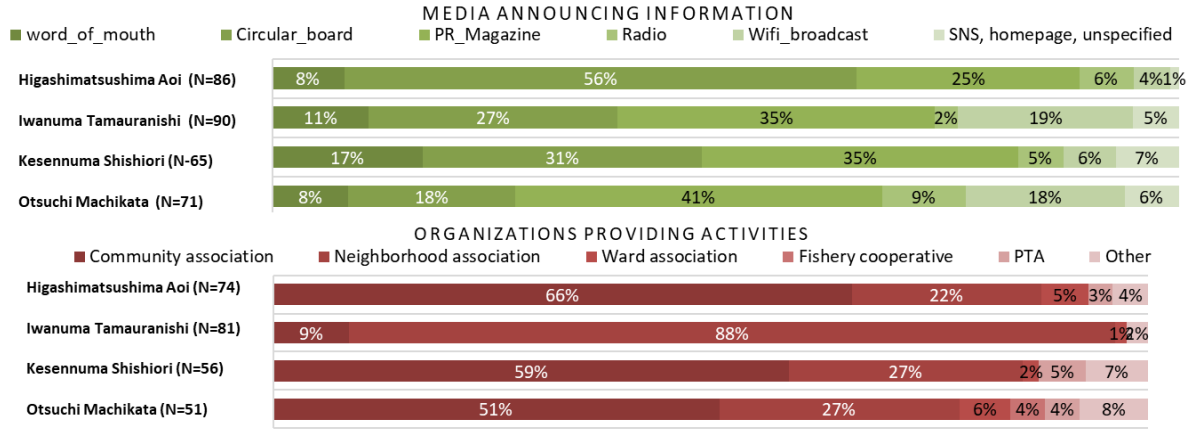


Figure 38 Type of media announcing activities and organization that carried out the gathering activities.

Representation of spaces (conceived space)

Figure 39 shows the results of gathering space choices by the respondents before and after the disaster based on multiple answer questions. The results showed that the selection of schools and gymnasiums decreased after the disaster in all areas. In addition, selection of meeting places (small gathering spaces) had increased in community-driven cases (Aoi-Higashimatsushima, Tamauranishi-Iwanuma), while selection of community centers had increased in other cases.

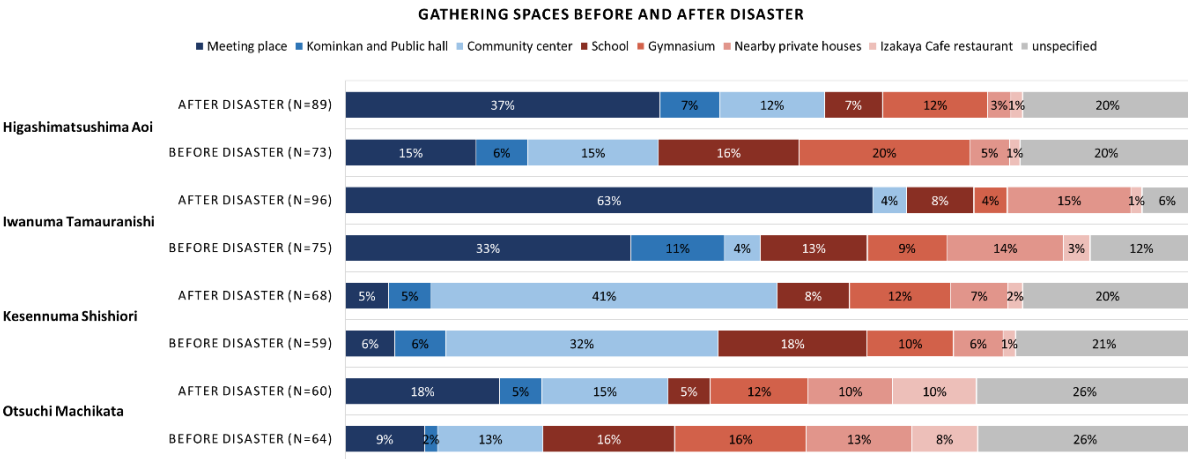


Figure 39 different gathering spaces that respondents go to before and after disaster, multiple choice.

Details of the gathering spaces of each case study were documented based on field visits and to show the spatial configuration and diversity. The observations showed that community-driven cases provided evenly allocated gathering spaces and Hiroba with similar accessibility to different users in housing blocks. In these cases, gathering spaces are in a good administrative connection with another. In contrast, in government-led cases, even though several gathering spaces are provided, the main gathering space is centralized and not in a well-connected administration with other gathering spaces. Furthermore, the main gathering space provides large-scale Hiroba along with gathering spaces, providing services to outside communities, and the

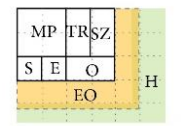
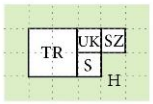
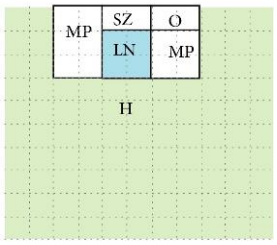
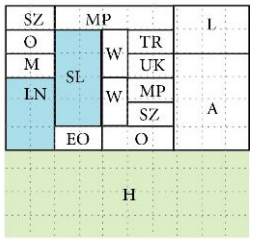
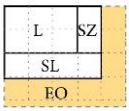
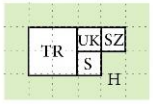
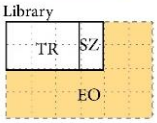
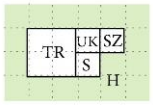
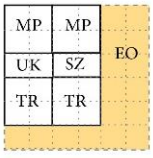
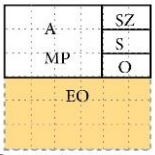
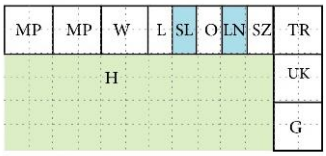
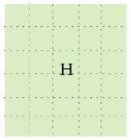
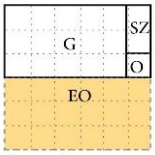
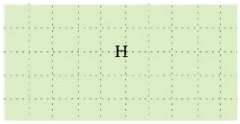
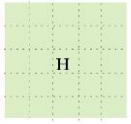
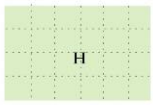
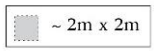
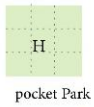
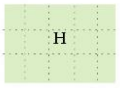
representation of gathering space is closer to globally known public spaces. Table 9shows the diagrammatic details of accessibility and gathering space allocation in each case study.

Table 9 summary of production of gathering spaces in case studies.

Table 10 shows the details of the spatial configuration and diversity of the gathering spaces. In community-driven cases, the number of gathering spaces is higher than in government-led cases, and spaces are provided for different functions for planned activities and active participation. These cases provide exclusive open spaces and some Hiroba, but the configuration of such spaces is mostly at the pocket-size level. In government-led cases, the number of gathering spaces is limited, and spaces are

diversified for both planned activities and passive participation, such as lounges and Hiroba (inclusive open spaces).

Table 10 Situation of gathering spaces in each case study representation of spaces based on observations and field visits.

Area	*Aoi-Higashimatsushima*	*Tamauranishi-Iwanuma*	*Shishiori-Kesennuma*	*Machikata- Otsuchi*
# Gathering spaces	5+2	4+2	2+2	4+1
	 Neighborhood Association	 Meeting place	 Public houisng community center	 Community center
	 Library	 Meeting place		
	 Public housing meeting place	 Meeting place	 Neighborhood Association	 Community center
	 Community center	 Community center	 Playground	 Public housing meeting place
	 Gymnasium	 Rakuraku Park	 Higashi-minato Park	 Public housing meeting place
	 Aoi Nichome Park			 pocket Park
	 Aoi Higashi Park			 pocket Park
Note	A-Auditorium | E-Exhibition/Gallery | G-Gymnasium| LB-Library | M-Memorial | MP-Multi-Purpose meeting room |O-Office S-Storage | SZ-Service zone | TR-Tatami room | UK-Utility Kitchen | W-Workshop/studio			
	EO- Exclusive Open space	H-Hiroba (Inclusive Open space)		LN-Lounge | SL-Study lounge

Representational spaces (lived spaces)

Figure 40 shows the circumstances of gathering activities, frequency of participation, and distances of gathering spaces from homes. In community-driven

cases, the neighborhood block has the highest number, while in government-led cases, there is a similar distribution between neighborhood blocks and several neighbors. These cases also selected a range of middle school districts more than community-driven cases. Regarding the frequency of participation in gathering activities, while there is a similar distribution among cases, community-driven cases participate more than government-led cases. While there is very similar distribution among both categories, community-driven cases' respondents live closer to gathering spaces.

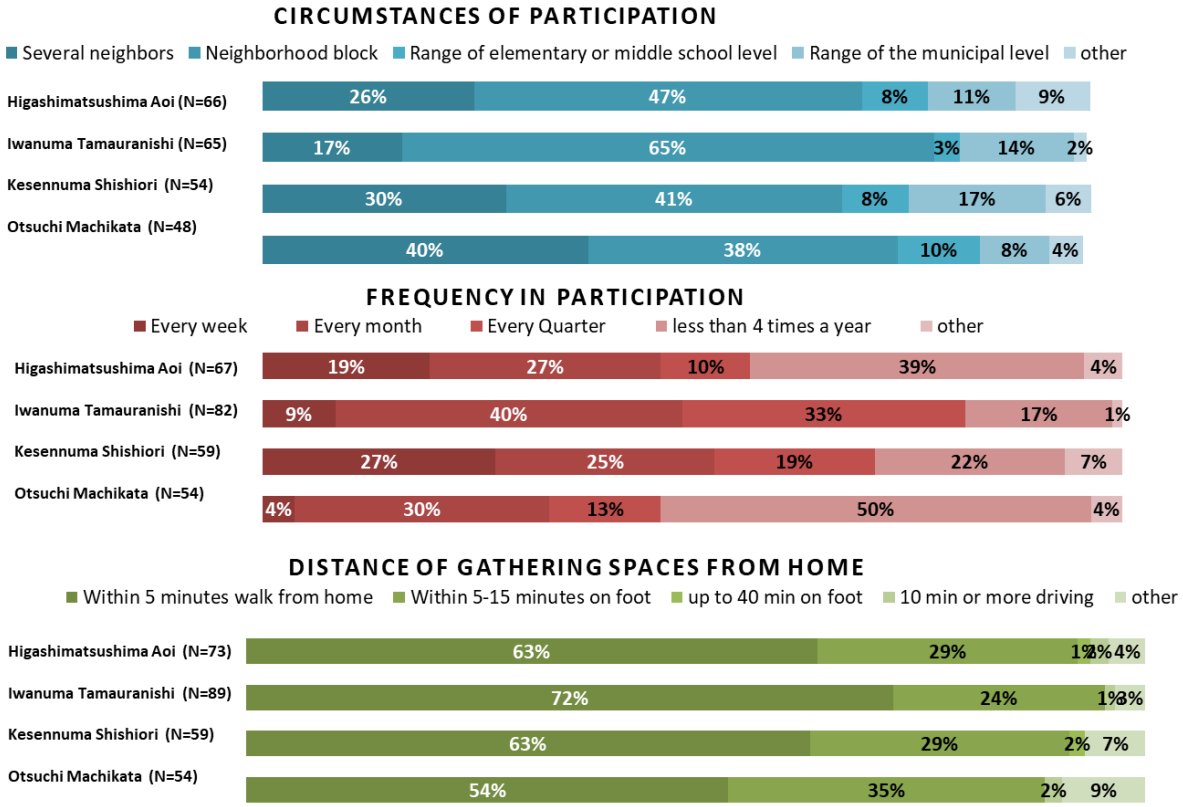


Figure 40 Range of activity circumstances, frequency in participation, and distances of gathering spaces from homes.

Figure 41 shows the selection of gathering activities provided by organizations. The results show that the main gathering activities provided by organizations are environmental cleaning and traditional events. The results show that while respondents chose similar gathering activities being provided before and after the disaster, the selection of community development activities increased after the disaster. In community-driven cases, the provision of security and circle activities increased after the disaster.

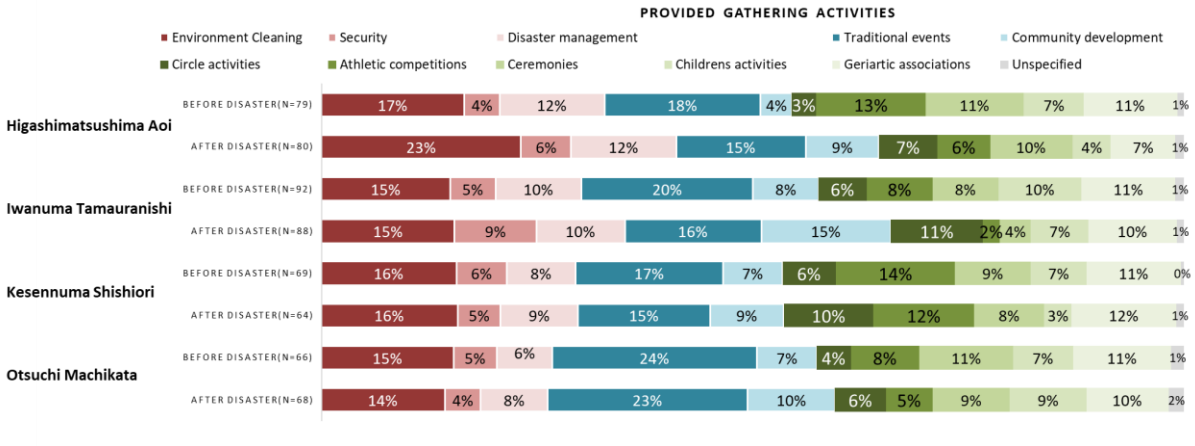


Figure 41 provided gathering activities by organizations, multiple choice.

Figure 42 shows the selection of gathering activities chosen for participation by the respondents. The selection of traditional events decreased after the disaster in all areas, and environmental cleaning activities were chosen as the main activities to participate. In addition, the selection of community development and circle activities increased after the disaster.

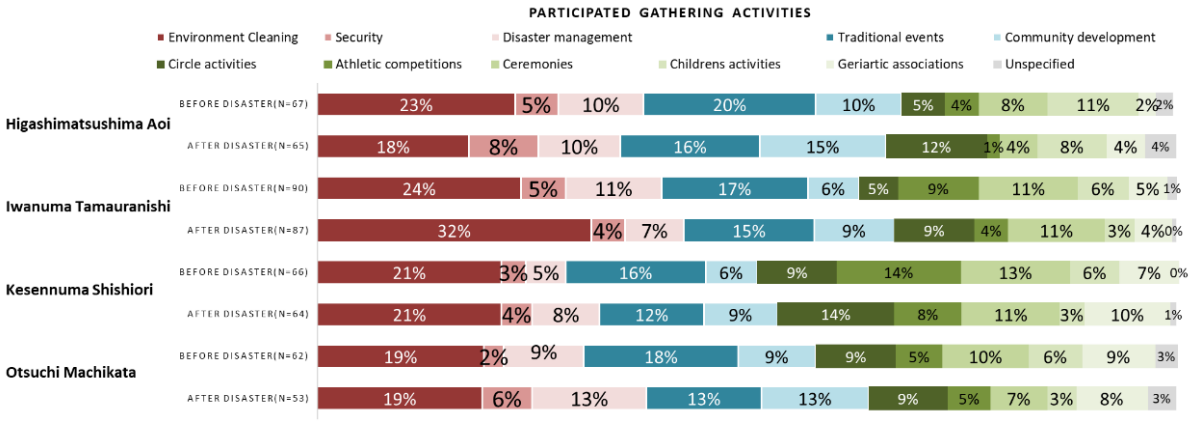


Figure 42 gathering activities chosen to participate, multiple choice.

3. Findings and discussion

Since the questionnaire surveys were conducted almost ten years after the disaster, the return ratio of the effective questionnaires was 18%. This ratio might have been impacted by this long time passed after the disaster, a lower level of interest in participating in the surveys, and the early occurrence of COVID-19 in the selected communities. Gradual reconstruction of the selected communities and gathering spaces in ten years may affect the results and performance of the gathering spaces, and activities may have changed in different timelines. In some areas, due to the recovery scenario and reconstruction method, the introduction of gathering facilities took longer than in other areas.

The results indicate that in terms of recovery scenarios, Aoi-Higashimatsushima and Tamauranishi-Iwanuma have adopted a community-driven approach, while

Shishiori-Kesennuma and Machikata- Otsuchi have taken a government-led approach for their recovery plans (Table 8).

In community-driven cases, the selection of neighborhood association is higher, and in government-led cases, the selection of community associations is the highest. The selection of PTA is higher in government-led cases. In community-driven cases, the neighborhood block has the highest number, while in government-led cases, there is a similar distribution between neighborhood blocks and several neighbors. These cases also selected a range of middle school districts more than community-driven cases. This shows that community-driven cases participate more than government-led cases in gathering activities. As a result of larger number of gathering spaces and more active and accessible spaces, community-driven cases' respondents are living closer to gathering spaces. Table 4 and Figure 9 show the impact of the allocation of gathering spaces and open spaces in each community; community-driven cases have more accessible gathering spaces and government-led cases are closer to the global concept of public spaces.

In both categories of cases, gathering spaces are combined with a main large-scale gathering space that provides more of the gathering services for the community and smaller gathering spaces, but the connections between and accesses to different gathering spaces are different (Figure 40, Tables 9 and 10).

In cases with community-driven recovery initiatives, the number of gathering spaces is evenly allocated along the community, providing pocket size open spaces around them and independent open spaces. Furthermore, they have constant connections with the main gathering space. The territory of providing services for community-driven cases is mostly within the boundaries of the community and for their own community members. In government-led cases, the main gathering space is the most active and accessible gathering space, provides large public open spaces in connection with the building, and provides services to visitors from outside the community as well. In contrast, smaller gathering spaces in government-led cases are not as active and accessible as the main gathering space and are not in a good managerial and activity connection with one another (Figure 40, Tables 9 and 10).

In terms of representational spaces, respondents from different communities had similar selections of gathering activities before and after the disaster, but chose different activities to participate from one another. The selection of traditional events decreased after the disaster in all areas, and environmental cleaning activities were chosen as the main activities to participate. In addition, the selection of community development and circle activities increased after the disaster. It should be mentioned that in government-led cases, the main gathering spaces provided spaces for passive participation and free of choice activities as well as planned active participation spaces,

such as lounges and Hiroba (inclusive open space), which affect the experience of the respondents in using the gathering spaces.

Finally, it could be discussed that in the reviewed cases, the situation of activities and events and the area's characteristics before the disaster impacted recovery planning and participation level during the recovery process of communities. Moreover, activities and events after disaster and the recovered buildings and spatial organizations resulted from each community's post-disaster recovery planning and participation levels, and the recovered gathering spaces themselves had an impact on the activities and events in communities after the disaster. (Figure 37)

4. Conclusion

This chapter aims to study the production of gathering spaces after GEJET-2011 in different case studies. The results of the surveys regarding the triad of space in the case of gathering spaces, the spatial practices (perceived spaces) are the planning level of space by different initiatives, the representation of spaces (conceived space) are the constructed spaces, such as buildings, rooms, and Hiroba (inclusive open spaces) and the representational spaces (lived spaces) are the experiences of residents in the way they use those spaces. As scholars define, gathering and public spaces are important spaces to embody community ties and help enhance residents' participation. In the studied cases, all the cases already provided functional gathering spaces and are among good examples of global cases. In Japan with the recent experience of results Hanshin-Awaji earthquake 1995's recovery, and tried to avoid the negative impacts of lacking gathering spaces and community contacts.

According to the introduced hypothesis and Figure 37, many factors can impact the production of gathering spaces through recovery. First, the characteristics of the community and the area before the disaster together with the level of gathering activities and events can lead to the planning and administration process after the disaster and determine the participation level of the residents. These planning and participation results can contribute to the building and spatial organization of gathering spaces, as well as the upcoming activities and events provided to the residents.

At the level of spatial practice (perceived spaces), the gathering spaces cases followed two approaches of government-led and community-driven initiatives toward the recovery of communities.

The representation of spaces (conceived space) may have been impacted by the spatial practice feature and resulted in different buildings in the recovered communities. The representation of spaces in community-led cases follows a semi-equal allocation of gathering spaces with pocket-size open spaces, while in government-led cases, there are centralized gathering spaces surrounded by large-scale open spaces.

The combination of gathering spaces and open spaces brings the practice and experience of residents closer to globally known public spaces.

At the representational space (lived spaces) level of the triad, while community-driven cases' residents might receive equal access and spatial configuration and diversified gathering space, live closer, and participate more in gathering activities; residents of government-led cases have different levels of access to the main centralized gathering space, and have less frequent participation in the activities. Furthermore, government-led cases' residents' benefit from spaces aiming to accept passive participation, such as lounges and largescale Hiroba.

This chapter concludes that the process of gathering space production after GEJET-2011 may have an impact on the long-term and short-term experiences of the affected communities in planning participation, accessing gathering spaces, and benefiting from different spatial configurations and diversification.

Collaboration of residents' associations and a community-driven approach may be a better administration recommendation to achieve community recovery through gathering spaces. Gathering spaces in these cases have been recovered closer to the residents' opinions and may answer the mid-term needs of the community members in terms of proximity, accessibility, and activity diversity more thoroughly than government-led cases with central authorization and administrative situations for the community and surroundings.

Chapter Five: Effectiveness of gathering activities and spaces for community recovery

Summary:

Natural disasters are becoming more frequent around the world; as a result, more citizens are losing their homes, and community bonds are becoming weaker. To address this issue, scholars have emphasized the importance of providing diverse gathering spaces and activities within shelters, temporary housing sites, and permanent housing areas, to help rebuild communities. Providing such services helps to strengthen social bonds between different genders and groups, and it can facilitate the recovery of both the built environment and community cohesion. During the Great East Japan Earthquake and Tsunami 2011, many communities lost their settlements and were forced to relocate to new areas or reconstruct the old ones. Based on a series of site visits, interviews, and questionnaire surveys conducted for selected case studies, this chapter aims to determine the effectiveness of gathering spaces and recovery activities on the rebuilding of communities at different stages after the disaster. Different factors (e.g., gender and dwelling type) are found to be potentially effective at improving the benefits of such services; however, an inclusive approach providing diversified gathering spaces and activities is found to best help reduce bias between the beneficiaries and residents of gathering services and restore the community after a disaster.

1. Introduction

Alongside its damage to the built environment, the Great East Japan Earthquake and Tsunami 2011 (hereafter referred to as GEJET-2011) was found to damage communities and social structures. National and local governments tried to provide shelters and immediate temporary housing sites to settle affected people and to provide different services to address their needs. Security, food, medical aid, and spaces were provided alongside social support and recovery meetings for the affected areas and communities. Stakeholders and community associations sought to provide support to

maintain a social cohesion similar to that before the disaster, by establishing platforms for holding community gatherings and participatory recovery meetings, to reflect residents 'opinions in recovery plans.

This research emphasizes the importance of community recovery and aims to determine the effectiveness of gathering spaces and recovery activities upon the recovery of communities during different stages after a disaster. We ask the following question: What are the relationships between communities, gathering spaces, and gathering activities? It is assumed that the long-term recovery state of the social interactions and community bonds of affected people is impacted by the early-stage provision of gathering spaces and activities designed to assist community recovery in temporary housing sites. Despite the concerns of scholars in the field of community recovery, practical attempts have been made to produce quick recoveries, without considering the specific characteristics of the community. These problems indicate the necessity of research on this topic, because the effectiveness of gathering spaces and activities, as well as their impact upon and relations to social engagement factors (e.g., residents' gender, age, and dwelling type), have been studied by other scholars or addressed by stakeholders after disasters. To clarify the aims of this chapter, we review the background literature in the field of community recovery.

2. Methods and surveys

The methodology was planned according to the hypotheses; it was assumed that the long-term recovery state of affected people's social interactions and community bonds were influenced by the initial establishment of gathering spaces and activities during the temporary housing period. Furthermore, we assumed that this recovery may be impacted by diversity in the type of housing, gathering spaces, and activities. To gain a better insight into community recovery and the impacts of gathering spaces and activities thereupon, we conducted a series of interviews and questionnaire surveys for selected case studies from the Miyagi and Iwate Prefectures. Interviews with community leaders were undertaken in the form of small group meetings, in which the opinions and knowledge of all attendees were listened to, recorded as notes, scanned, and translated to English from Japanese with the help of interpreters. The questionnaire surveys aimed to collect the experiences and opinions of residents in each affected area. To avoid a low return ratio (owing to the length of time elapsed since the disaster), no random selection method was used, and all households in the selected districts received a questionnaire.

2.1 Case studies

For this chapter, five severely damaged areas in the Miyagi and Iwate Prefectures (Tohoku region) were selected: Aoi-Higashimatsushima City, Tamauranishi-Iwanuma

City, Akahama-Otsuchi City, Sakamoto-Yamamoto City, and Shishiori-Kesennuma City. The case studies were selected based on their reputation for successful community recovery and similarities in their characteristics, authority organizations, gathering spaces, and gathering activities. Figure 1 shows the locations of the case studies.

Table 11 presents the affected communities, gathering spaces, and recovered areas in terms of the housing and recovered gathering spaces.

Table 11 summary of interview insurveys and documents issued by local governments

		Aoi-Higashimatsushima	*Tamauranishi-Iwanuma*	*Akahama-Otsuchi*	*Sakamoto-Yamamoto*	*Shishiori-Kesennuma*
During Temporary housing	# of	1, similar to old neighborhoods	3, based on old districts	5	1 for two communities	2
	Gathering space	Temporary meeting room	Temporary meeting room	Temporary meeting room	Elderly`s meeting Room	Temporary meeting room
		Gymnasium	Civic Center	Gymnasium		Neighborhood Association
	Community's connection	very close	very close, new encounters	very close	not very close	close, new commers
Recovery Initiative		Community-Driven	Community-Driven	Community-Driven	Community & Government-Led	Government-Led
After recovery: housing	Private	250	340	180	155	100
	Public single	220	210	60	80	0
	Public mass	150	0	0	0	284
After recovery: gathering space	# of spaces	5	5	2	2	2
	Type of spaces	Neighborhood association 	Meeting room 	Kominkan 	Elderly`s meeting room 	Neighborhood association 
		Library 	Meeting Room 	Civic Center 	Community center 	Civic Center 
		Meeting Room 	Meeting Room 			
		Civic Center 	Civic Center 			
		Gymnasium 	Gymnasium 			
# of Open space		4 parks	4 parks	4 parks	1 open space	1 park
Gathering service Providing		Inclusive	Inclusive	Partly Inclusive	Exclusive	Inclusive
Scale:	small medium  large 			# of spaces: up to 3  4-6 rooms  + 		

The questionnaire was divided into two sections: the primary questions pertained to demographic information such as age, gender, and dwelling type; the secondary questions focused on the details of population recovery, the organizations conducting activities and meetings, activity circumstances, activity participation levels, distances to gathering spaces, number of gathering spaces, number and types of gathering activity before and after the disaster, and future suggestions.

2.2 Primary results

Because the lifestyles of community members change before and after retirement in Japanese society, we decided to classify the respondents according to these age groups. The questionnaire results (Table 12) showed that most respondents were over 65 years old (above retirement age: 58.5%). The respondents showed equal gender distributions, except for Akahama-Otsuchi and Sakamoto-Yamamoto, where most respondents were female (64% and 63%, respectively). Regarding dwelling types, except for Shishiori-Kesennuma, most respondents lived in private housing. In Aoi-Higashimatsushima, public housing consisted of a combination of reinforced concrete and detached-style public housing; in other areas, only one type of public housing was provided.

Table 12 summary of general demographics from questionnaire survey

			Higashimatsushima-Aoi	*Iwanuma-Tamauranishi*	*Otsuchi-Akahama*	*Yamamoto-Sakamoto*	*Kesennuma-Shishiori*	*Total*
Age Ratio	under 65	N	48	35	22	12	29	146
		%	50%	35.4%	46.8%	37.5%	37.2%	41.5%
	Over 65	N	48	64	25	20	49	206
		%	50%	64.6%	53.2%	62.5%	62.8%	58.5%
	Total	N	96	99	47	32	78	352
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gender	Male	N	49	58	17	12	43	179
		%	51.0%	57.4%	36.2%	37.5%	55.1%	50.6%
	Female	N	47	43	30	20	35	175
		%	49.0%	42.6%	63.8%	62.5%	44.9%	49.4%
	Total	N	96	101	47	32	78	354
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Dwelling	Public housing	N	44	39	14	21	44	162
		%	45.4%	37.9%	29.2%	65.6%	56.4%	45.2%
	Private housing	N	53	64	34	11	34	196
		%	54.6%	62.1%	70.8%	34.4%	43.6%	54.7%
	Total	N	97	103	48	32	78	358
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

2.3 Secondary results

Secondary analysis shows the results of the questionnaire regarding recovery initiatives, gathering spaces, and gathering activities. It should be noted that information regarding life in temporary housing was identified through interviews rather than questionnaire surveys. In all areas, the primary authorities that conducted reconstruction meetings with the respondents were neighbors and regional leaders. The recovery processes of Aoi-Higashimatsushima, Tamauranishi-Iwanuma, and Akahama-Otsuchi were based on a community-driven approach, those in Sakamoto-Yamamoto were a mix of community-driven and government-led approaches, and those in Shishiori-Kesennuma were government-led. The primary organizations that provided activities before the disaster, during the temporary housing stage, and after the disaster were neighborhood associations, community associations (including major organizations and local governments), and ward associations, with non-government organization (NGO) consultants as secondary providers. In addition, for all areas, there was a decrease in the role of parent teacher associations (PTAs) as activity providers after the disaster. (Figure 43)

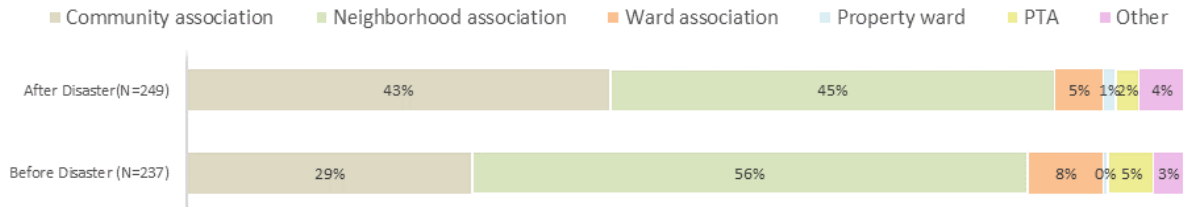


Figure 43 main organizations that carried out activities before and after disaster

The scale of participated activity provision was identified as mostly one of neighborhood blocks and of several neighbors, followed by community blocks, middle school districts, and temporary housing blocks (during temporary housing). A tendency toward smaller-scale activities after the disaster was noted for all areas. (Figure 44)

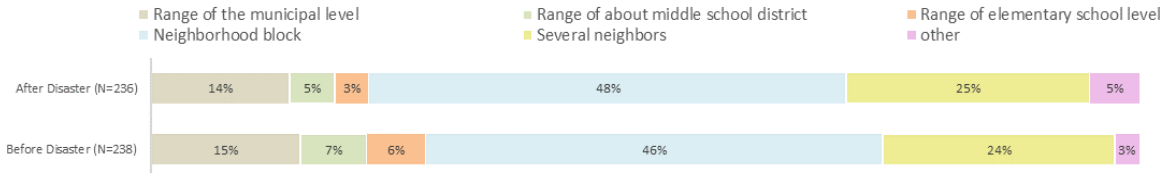


Figure 44 circumstances of participating in gathering activities and places

Regarding the frequency of gathering activities, tendencies toward more frequent participation after the disaster were noted (Figure 45). In addition, the distances from respondents' houses to the gathering spaces were mostly between 5 and 15 min (by foot), and they decreased after the disaster (Figure 46).

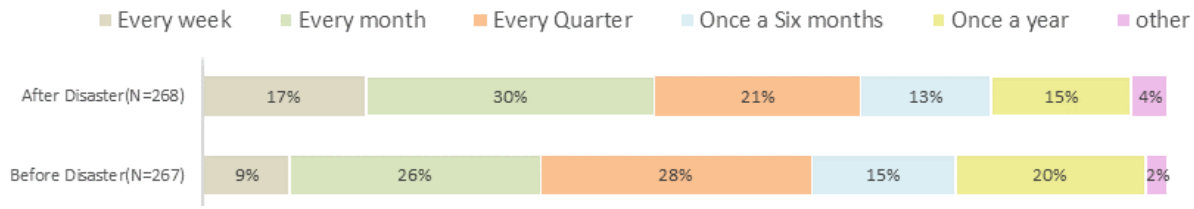


Figure 45 frequency in participation in gathering activities

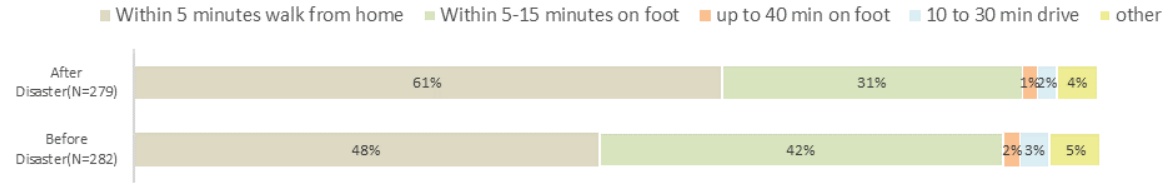


Figure 46 distances from houses to gathering spaces

Regarding the type of gathering spaces, the main gathering spaces before and after the disaster were community centers (large-scale buildings) and meeting rooms (small-scale buildings), with schools and gymnasiums as secondary. After the disaster, the main gathering spaces were meeting rooms and community centers, and fewer schools and gymnasiums were used. Nearby private houses in Tamauranishi-Iwanuma and open spaces in Shishiori-Kesennuma were mentioned as the key post-disaster gathering spaces. (Figure 47)

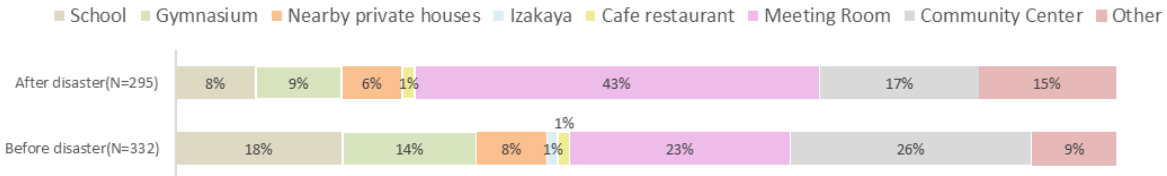


Figure 47 type of gathering spaces before and after disaster, multiple answer question

The gathering carried out activities before the disaster were mostly large gatherings, including traditional events, environmental cleaning, and athletic competitions; smaller gatherings such as ceremonies, circle activities, and children's activities were conducted to a lesser extent. After the disaster, the number of carried out activities generally decreased, though an increase in circle activities and community development was noted. Smaller decreases were noted in environmental cleaning activities, Bosai activities, and security activities. In terms of gathering activities that respondents chose to participate in before and after the disaster, participatory activities comprised ~50% of the activities offered, in all areas. Meanwhile, for most activities, participation after the disaster decreased by 50%, though participation in circle activities and community development activities increased. In addition, participation in environmental cleaning activities and geriatric associations decreased less than in other activities. Regarding suggestions for improvement in gathering activities, traditional events, environmental cleaning, Bosai activities, and community development activities were most frequently selected (Figure 48).

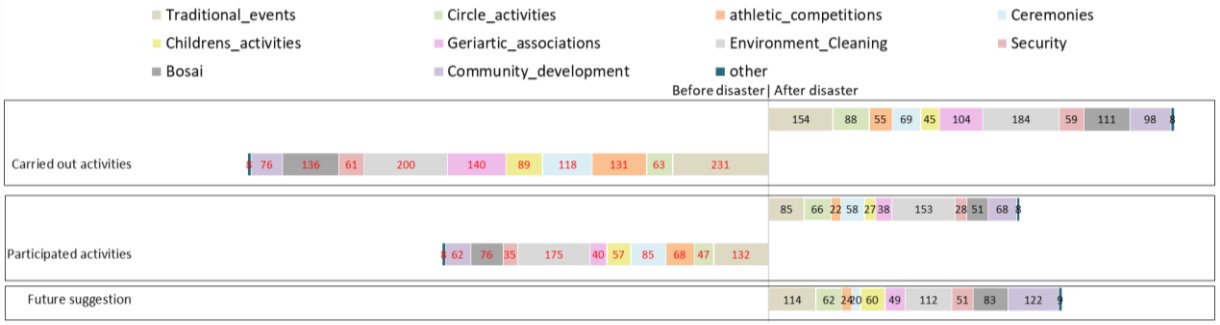


Figure 48 gathering activities, carried out, participated before and after disaster and suggested for future, multiple answer (N=352)

Table 13 shows the cross-tabulation between total activity participation and type of gathering space before the disaster. Before the disaster, most activities took place in meeting rooms, community centers, and schools; after the disaster, they took place in meeting rooms and community centers. Before the disaster, children's activities were mostly held in schools and meeting rooms; after the disaster, meeting rooms were the key gathering space for these activities.

Table 13 crosstabulation between gathering spaces and participated gathering activities before and after disaster

		School		*Gymnasium*		*Nearby private houses*		*Izakaya*		*Cafe restaurant*		*Meeting Room*		*Community Center*		*Other*		*Total*
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
Traditional events	BD	28	24%	21	18%	16	14%	3	2.5%	0	0.0%	38	32%	38	32%	15	13%	118
	AD	9	12%	7	9%	7	9%	0	0%	0	0%	44	57%	17	22%	8	10%	77
Circle activities	BD	8	20%	10	24%	2	4.9%	0	0.0%	2	4.9%	15	37%	13	32%	4	9.8%	41
	AD	3	5%	7	11%	7	11%	0	0%	4	6%	35	56%	15	24%	9	14%	63
athletic competitions	BD	22	35%	10	16%	10	16%	1	1.6%	1	1.6%	25	40%	14	22%	8	13%	63
	AD	6	29%	4	19%	4	19%	0	0%	1	5%	8	38%	4	19%	5	24%	21
Ceremonies	BD	14	19%	16	21%	11	15%	3	4.0%	2	2.7%	26	35%	24	32%	10	13%	75
	AD	4	8%	6	12%	6	12%	0	0%	1	2%	29	57%	13	25%	8	16%	51
Children's activities	BD	26	49%	15	28%	6	11%	2	3.8%	0	0.0%	16	30%	12	23%	5	9.4%	53
	AD	9	36%	8	32%	3	12%	0	0%	0	0%	16	64%	1	4%	1	4%	25
Geriatric associations	BD	6	20%	6	20%	5	17%	1	3.3%	2	6.7%	10	33%	8	27%	5	17%	30
	AD	1	3%	1	3%	3	10%	0	0%	2	7%	10	33%	12	40%	7	23%	30
Environment Cleaning	BD	30	20%	25	17%	17	12%	4	2.7%	2	1.4%	55	37%	46	31%	17	12%	147
	AD	8	6%	11	9%	9	7%	0	0%	1	1%	72	57%	26	20%	22	17%	127
Security	BD	11	38%	6	21%	7	24%	1	3.4%	0	0.0%	10	34%	6	21%	5	17%	29

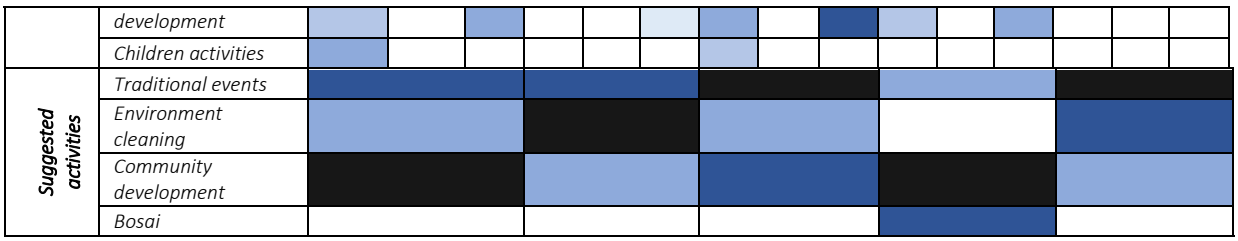
	AD	2	9%	3	13%	3	13%	0	0%	0	0%	14	61%	3	13%	4	17%	23
Bosai	BD	15	22%	11	16%	4	5.9%	0	0.0%	1	1.5%	30	44%	23	34%	5	7.4%	68
	AD	3	7%	3	7%	4	9%	0	0%	1	2%	26	58%	12	27%	5	11%	45
Community	BD	14	25%	16	29%	8	14%	1	1.8%	0	0.0%	16	29%	16	29%	10	18%	56
development	AD	10	15%	9	14%	9	14%	0	0%	0	0%	41	63%	8	12%	11	17%	65
other	BD	1	20%	1	20%	1	20%	0	0.0%	0	0.0%	2	40%	0	0.0%	3	60%	5
	AD	1	20%	0	0%	0	0%	0	0%	0	0%	0	0%	1	20%	4	80%	5
Total	BD	50		42		23		4		3		73		76		27		235
	AD	21		22		19				4		118		46		35		226

BD: Before Disaster, AD: After Disaster

Table 14 summarizes the responses to the factors mentioned in the questionnaires and interview surveys.

Table 14 summary of the most selected gathering spaces and activities before disaster, during temporary houisng and after diaster in each area.

City		Aoi-Higashimatsushima n=99			Tamauranishi-Iwanuma n=104			Akahama-Otsuchi n=48			Sakamoto-Yamamoto n=32			Shishiori-Kesennuma n=78		
period		*B.D*	*T.H*	*A.D*	*B.D*	*T.H*	*A.D*	*B.D*	*T.H*	*A.D*	*B.D*	*T.H*	*A.D*	*B.D*	*T.H*	*A.D*
gathering space	*School*															
	Gymnasium															
	Civic center															
	Community center															
	Meeting room															
	Temporary meeting room															
	Nearby private houses															
	Open space															
Carried activities	*Traditional events*															
	Environment cleaning															
	Geriatric association															
	Bosai															
	Ceremonies															
	Circle activities															
	Athletic competitions															
	Community development															
	Children activities															
Participating Activities	*Traditional events*															
	Environment cleaning															
	Geriatric association															
	Bosai															
	Ceremonies															
	Circle activities															
	Athletic competitions															
	Community															



Notes:

B.D= Before Disaster, T.H= Temporary housing, A.D= After Disaster.	*Scoring order most to least:*	*1st*	*2nd*	*3rd*	*4th*	*5th*	*not selected majorly*

The information regarding before and after disaster is gathered from questionnaire surveys. Scoring order is based on the most selected activities and gathering spaces by the respondents based on multiple choice questions. The scoring referrers to selection of each activity and gathering space by respondents(1st :more than 60%, 2nd:40-60%, 3rd :30-40%, 4th : 20-30%, 5th : 10-20%, not selected majorly : less than 10%)
The information regarding temporary housing period is gathered from interview survey based on the most frequent used gathering spaces and carried out activities during life in temporary housing.

Cross tabulations

Chi-2 tests were conducted between different cases to determine the associations between different factors relevant to the hypothesis.

In Aoi-Higashimatsushima before the disaster, male respondents chose to participate in traditional events more than female respondents ($\alpha = 0.020$). Female respondents chose circle activities more than male respondents after the disaster ($\alpha = 0.014$). Male respondents participated more in community development activities than female respondents ($\alpha = 0.016$). After the disaster, respondents living in private housing chose schools as the main gathering spaces more than other groups ($\alpha = 0.039$). Respondents living in public housing chose to participate in circle activities more than others ($\alpha = 0.001$). Respondents living in private housing chose to participate in children's activities more than other groups ($\alpha = 0.019$). Respondents who participated in two or more activities before the disaster participated in traditional events and environmental cleaning activities more than others. Respondents who participated in two or more activities after the disaster participated in traditional events more than others ($\alpha = 0.002$). Respondents who participated in three or more activities after the disaster participated in ceremonies more than others ($\alpha = 0.018$).

In Tamauranishi-Iwanuma, male respondents participated in more activities than female ones before the disaster ($\alpha = 0.030$). Male respondents participated in security activities more than female respondents before the disaster ($\alpha = 0.015$). Respondents living in private housing chose to participate in activities more frequently than those living in public housing ($\alpha = 0.023$). Respondents from private housing chose meeting rooms as their main gathering space more often than other respondents ($\alpha = 0.036$). Respondents who participated in two or more activities before the disaster participated in traditional events and environmental cleaning activities more than others ($\alpha = 0.000$). Respondents who participated in two or more activities after a disaster participated in traditional events and circle activities more than others. Respondents

who participated in three or more activities after the disaster participated in ceremonies more than others (α = 0.000).

In Akahama-Otsuchi, female respondents participated in activities more frequently than male respondents (α = 0.015). Before the disaster, female respondents chose schools as the main gathering spaces more often than male ones (α = 0.012). After the disaster, female respondents chose to participate in ceremonies more than male respondents (α = 0.032). Female respondents participated in children's activities more often than male ones before the disaster (α = 0.011). Respondents living in private housing participated in more activities than those living in public housing (α = 0.039). Respondents living in public housing chose to participate in circle activities more than other groups (α = 0.001). Respondents who participated in two or more activities before the disaster participated in more traditional events than others (α = 0.016). Respondents who participated in three or more activities after the disaster participated in ceremonies more than other groups (α = 0.002).

In Sakamoto-Yamamoto, female respondents chose closer activities before the disaster (α = 0.015). Male respondents chose more carried out activities than female respondents before (α = 0.010) and after (α = 0.015) the disaster, and they chose to participate in traditional events more than female respondents. Before the disaster, female respondents chose to participate in ceremonies more than male respondents (α = 0.023). Male respondents were more likely to suggest community building activities for future development than female respondents (α = 0.008). Respondents who participated in three or more activities after the disaster participated in ceremonies more than others (α = 0.029).

In Shishiori-Kesennuma, female respondents chose to participate in ceremonies more than male respondents before the disaster (α = 0.000). Male respondents participated in security activities more than female ones during this time (α = 0.039). Respondents living in private housing chose larger-scale activities, and people living in public housing chose those on a scale of several neighbors (α = 0.015). Respondents living in public housing travelled less to access the main gathering spaces than respondents living in private housing (α = 0.028). After the disaster, respondents living in private housing chose schools as the main gathering spaces more than others (α = 0.041). Respondents living in private housing chose to participate in athletic competitions more than other groups (α = 0.012). Respondents living in public housing chose to participate in environmental cleaning activities more than others (α = 0.015). Respondents who participated in two or more activities before the disaster participated in traditional events and environmental cleaning activities more than others (α = 0.003). Respondents who participated in two or more activities after the disaster participated in traditional events and circle activities more than others (α = 0.001).

After the disaster, respondents who participated in three or more activities participated in ceremonies more than others (α = 0.001).

Figures 49 and 50 show the distribution of carried out and participated gathering activities before and after the disaster, as well as future suggestions regarding the gender distribution of respondents. The results show that female respondents 'participation in intimate social activities fell less than that of male respondents.

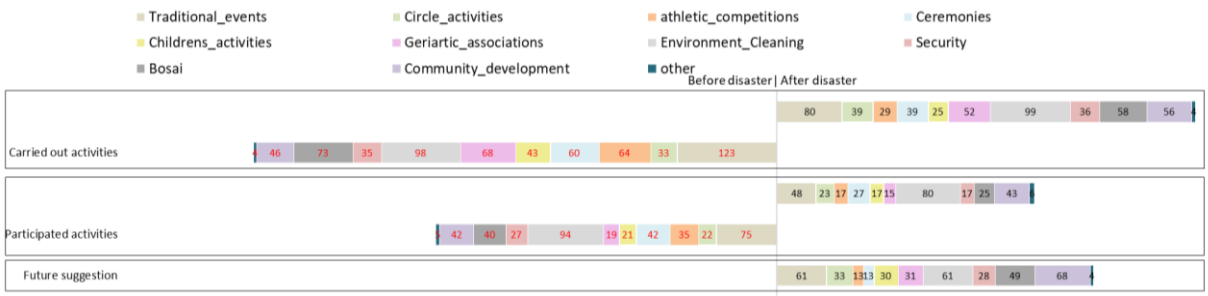


Figure 49 Male respondents (N=179) multiple answer question

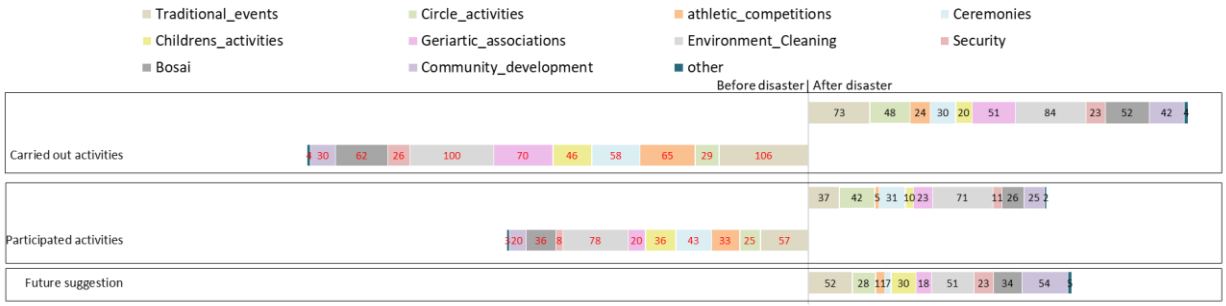


Figure 50 Female respondents (N=175) multiple answer question

Figure 51 shows the distribution of carried out and participated gathering activities after the disaster, as well as future suggestions regarding the distribution of dwelling types. Respondents living in public housing chose fewer large-scale activities (e.g., traditional events), opting for smaller-scale activities (e.g., circle activities) more often than respondents living in private housing.

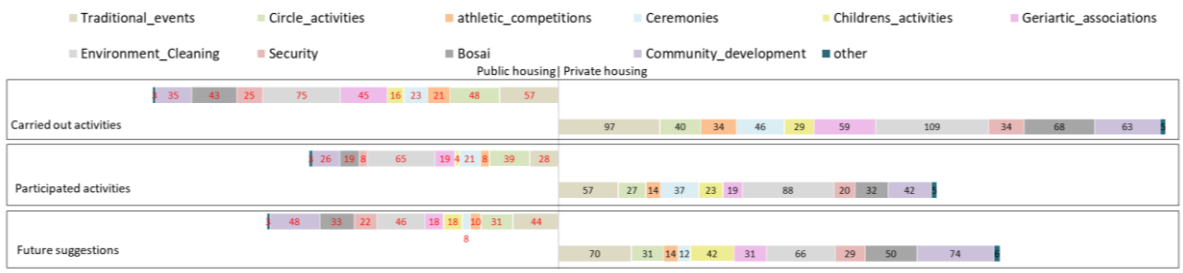


Figure 51 Respondents based public housing (N=162) and Private housing (N=196) multiple answer question

Figure 52 shows the cross-tabulated distribution of gathering activities with respect to age [under 65 years old (before retirement) and 65+ years old (after

retirement)] and gender after the disaster. Male respondents 65 and over participated in the greatest number of activities, particularly in carried out activities, participated activities, and future suggestions.

Male respondents over 65 years old selected more carried out activities than other respondents, primarily selecting traditional events, environmental cleaning, and community development activities. Female respondents over 65 years old mentioned traditional events, circle activities, ceremonies, geriatric activities, and environment cleaning activities as their primary carried out activities. Both groups suggested environmental cleaning, traditional events, Bosai, and community development activities for future development. In addition, female and male respondents under 65 years old mentioned traditional events and environmental activities that were offered and participated in. Both groups suggested traditional events and community development for future development; however, female respondents under 65 requested children's activities more than all other groups.

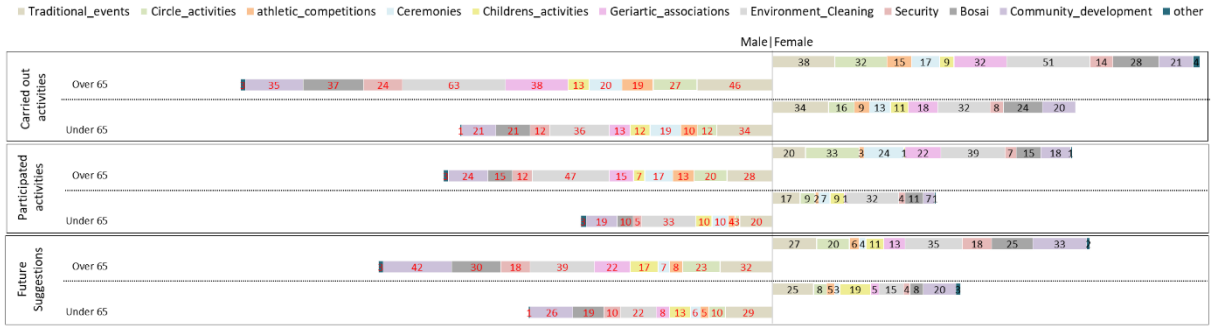


Figure 52 Respondents based gathering activities under 65yrs. old (M. N=72, F. N=73) and above 65 yrs. old (M.N=105,F.N=100) multiple answer question

Figure 53 shows the distribution of gathering spaces cross-tabulated by gender and respondent age [under 65 years old (before retirement) and 65+ years old (after retirement)] after the disaster. In general, all groups exhibited similar tendencies toward the selection of gathering spaces. Male respondent of 65 years and over and female ones less than 65 years old mentioned cafés and restaurants as gathering spaces. However, the under-65 male respondents chose community centers less often as the main gathering spaces.

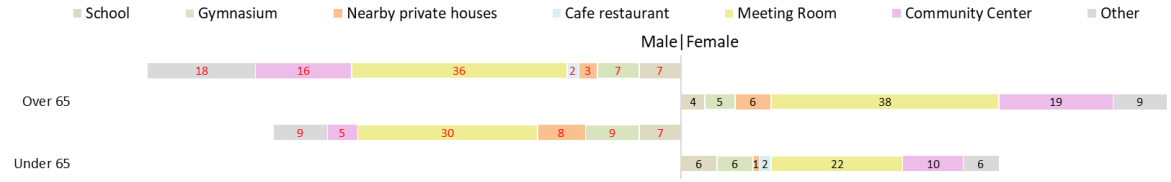


Figure 53 Respondents based gathering spaces under 65yrs. old (M. N=72, F. N=73) and above 65 yrs. old (M.N=105,F.N=100) multiple answer question

Table 15 shows the gathering activities of respondents living in public housing with respect to area. In Aoi-Higashimatsushima, Tamauranishi-Iwanuma, and Shishiori-

Kesennuma, respondents living in public housing chose mandatory and voluntary gathering activities with similar distributions. In other areas, the selection was primarily based on large gathering activities and mandatory activities.

Table 15 situation of gathering activities among respondents living in public housing after disaster

		Aoi-Higashimatsushima			*Tamauranishi-Iwanuma*			*Akahama-Otsuchi*			*Sakamoto-Yamamoto*			*Shishiori-Kesennuma*		
		C.O.A	P.A	S.A	C.O.A	P.A	S.A	C.O.A	P.A	S.A	C.O.A	P.A	S.A	C.O.A	P.A	S.A
Traditional events	N	15	6	11	11	9	11	4	1	3	10	3	5	17	9	14
	%	43%	22%	37%	38%	29%	42%	44%	20%	43%	91%	30%	56%	44%	23%	39%
Circle activities	N	17	12	10	6	7	4	3	4	1	7	1	3	15	15	13
	%	49%	44%	33%	21%	23%	15%	33%	80%	14%	64%	10%	33%	38%	38%	36%
athletic competitions	N	3	1	1	4	4	2	1	0	2	3	0	2	10	3	3
	%	9%	4%	3%	14%	13%	8%	11%	0%	29%	27%	0%	22%	26%	8%	8%
Ceremonies	N	2	3	1	6	5	2	3	2	1	5	4	2	7	7	2
	%	6%	11%	3%	21%	16%	8%	33%	40%	14%	45%	40%	22%	18%	18%	6%
Childrens activities	N	5	1	6	5	1	5	1	0	1	3	1	4	2	1	2
	%	14%	4%	20%	17%	3%	19%	11%	0%	14%	27%	10%	44%	5%	3%	6%
Geriartic associations	N	9	2	5	8	2	3	4	3	2	9	3	3	15	9	5
	%	26%	7%	17%	28%	6%	12%	44%	60%	29%	82%	30%	33%	38%	23%	14%
Environment Cleaning	N	17	10	8	19	23	15	7	3	3	10	6	4	22	23	16
	%	49%	37%	27%	66%	74%	58%	78%	60%	43%	91%	60%	44%	56%	59%	44%
Security	N	10	4	9	7	2	4	2	1	4	2	0	2	4	1	3
	%	29%	15%	30%	24%	6%	15%	22%	20%	57%	18%	0%	22%	10%	3%	8%
Bosai	N	8	4	9	11	4	5	4	2	3	7	3	5	13	6	11
	%	23%	15%	30%	38%	13%	19%	44%	40%	43%	64%	30%	56%	33%	15%	31%
Community development	N	14	8	13	9	7	13	0	3	4	3	3	8	9	5	10
	%	40%	30%	43%	31%	23%	50%	0%	60%	57%	27%	30%	89%	23%	13%	28%
other	N	1	2	1	1	0	0	0	0	0	0	1	0	1	0	2
	%	3%	7%	3%	3%	0%	0%	0%	0%	0%	0%	10%	0%	3%	0%	6%
Total	N	35	27	30	29	31	26	9	5	7	11	10	9	39	39	36

C.O.A: Carried out activities by organizations, P.A Participated activities, S.A: Suggested Activities

3-Findings and Discussions

The analysis identified the recovery approach, gender, age, and type of dwelling as possible factors determining the effectiveness of recovery gathering activities and spaces upon communities.

Recovery approach: A review of the documents and interview surveys shows that different case studies implemented different approaches toward recovery. Aoi-Higashimatsushima, Tamauranishi-Iwanuma, and Akahama-Otsuchi adopted a community-driven approach for recovery, Sakamoto-Yamamoto took a two-fold

approach consisting of community-driven and government-led initiatives, and Shishiori-Kesennuma adopted a government-led approach for neighborhood recovery (Table 1). Cases exhibiting community-driven approaches implemented a greater number and more diversified range of activities compared to those involving a government-led recovery approach (Figures 43–47). It should be mentioned that the community connections in community-driven cases were strong before the disaster, which may have impacted the recovery approach coordination (Table 9). These results are aligned with the literature and emphasize the concerns of other scholars in the field of recovery and community participation toward rebuilding community cohesion.

Governing associations: The primary results (Figures 48 and 49) indicate that smaller-scale organizations (e.g., neighborhood and community associations) oversaw conducting gathering services after the disaster; however, the role of PTAs decreased as well. The establishment of gathering spaces and activities for recovery began during the temporary housing period and continued thereafter in most cases. This continuation was more evolved among cases with a community-driven recovery approach (Table 9). In Japan, many schools are closing because of depopulation; this affects the quality and quantity of activities offered in these important gathering spaces. It is assumed that the weakened role of the PTA after the disaster was attributable to this shutting down of schools; it should be mentioned that children's activities also decreased after the disaster (Figures 49 and 54, Table 13). PTA organizations and meetings serve as a fundamental communication channel between community members regarding children's social lives, and this can improve community recovery for both families and children.

Gathering spaces: The distance to the main gathering space was shortened after the disaster; these places were mostly located within a 5-minute walk from the respondents' houses (Figure 52). The main gathering spaces after the disaster were community centers and meeting rooms (more intimate, smaller gathering spaces); furthermore, schools and gymnasiums (less intimate, larger gathering spaces) became less significant as primary gathering spaces after the disaster (Figure 53, Table 14). This replacement relocated children's activities into meeting rooms and community centers (Table 13). In addition, the size of gathering space became smaller after the disaster. In cases with community-driven recovery approaches, many small, intimate social gathering spaces were provided, accompanied by several small parks; meanwhile, government-led recovery approach cases offered gathering spaces in a single building with a limited number of parks (open spaces) (Table 15). In Shishiori-Kesennuma, the park (open space) and gathering spaces were located in public housing areas. Hence, the relations between gathering spaces and recovery approaches corroborate the literature findings in the field of gathering spaces and the recovery of such spaces; however, the

act of increasing gathering spaces and the diversity and intimacy of activities may improve the community-driven approaches, according to the background research.

Gathering activities: In most cases, gathering activities were administered immediately after the disaster and in the shelters and temporary housing sites, and community development and Bosai activities were among them (Table 9). In general, both before and after the disaster, numerous gathering activities were offered, though respondents' participation fell by 50% after the disaster; furthermore, they suggested carried out activities more than others (Figure 53). Therefore, the number of participated activities was higher in cases exhibiting community-driven approaches. When the number of participated activities was lower, the respondents mostly mentioned environmental cleaning activities; these are mandatory schedule-based activities conducted by members of Japanese communities, and they cannot be considered as a activity to selectively participate in. When the number of participated activities is higher, more voluntary activities (e.g., traditional events, ceremonies, and circle activities) are chosen (Table 14).

A difference was observed between the number of carried out activities, participated activities, and suggested activities: when the number of carried out activities was high, the participation was lower, and suggestions for future developments remained constant. This may be attributable to unsuitable welcoming situations and the scheduling of such activities for the residents. Respondents with a total activity participation of two or more before the disaster participated in traditional events and environmental cleaning activities more than others. Respondents who participated in two or more activities after the disaster participated in traditional events and circle activities more than others. Meanwhile, respondents who participated in a total of three or more activities after the disaster participated in ceremonies more than others. Cross-tabulation of the gathering spaces and activities (Table 13) shows that before the disaster, most activities were hosted in meeting rooms, community centers, and schools; after the disaster, these were held in meeting rooms and community centers. Before the disaster, children's activities mostly took place in schools and meeting rooms; after the disaster, meeting rooms were the main gathering space for children's activities. The analysis results of gathering activities align with the reviewed literature, and they indicate the importance of conducting such activities during the early stages following a disaster, to promote community recovery.

Gender: According to the cross-tabulations, female respondents tended to choose smaller-scale activities, though they participated more frequently than male respondents. They chose to participate in more intimate social gathering activities (e.g., ceremonies, children's activities, and circle activities). Male respondents chose larger-scale activities, and they were more aware of the different activities offered. Male

respondents also participated in mutual-interest activities (e.g., traditional events, community development activities, and security activities) more than female respondents. Most of the gender cross-tabulation associations were identified in Sakamoto-Yamamoto; here, male respondents chose a greater number and variety of activities and were more involved in the recovery process and gathering communications; these results reflect the concerns of the scholars in this field . This area exhibited a gender-biased environment and events schedule before the disaster (Figures 51 and 52).

Age: Most of the respondents were retired (65+ years old, Table 3); however, the results of gender and age cross-tabulation show that male respondents over 65 years old selected the greatest number and variety of activities. In addition, regardless of gender, respondents over 65 years old and under 65 years old expressed different interests in the selection of gathering activities. Female respondents aged 65 years and under chose children's activities more than others in their future suggestions. All groups chose similar types of gathering spaces as their main locations for activities. (Figures 49-53) In the local-government documents and interview surveys, a very similar ratio was found for activity participation and the choice of gathering space for residents of different ages; however, the analysis results and evidence issued by local governments show differences. In Aoi-Higashimatsushima and Shishiori-Kesennuma, the activities differed according to age, and attempts were made to connect the different age groups. (Figures 44 and 48)

Type of dwelling: A similar distribution was observed in respondents' dwelling types (54% private housing, 46% public housing; Table 12); however, from the cross-tabulations and Figure 57, several differences were found. Respondents living in private housing chose larger-scale activities, participated more frequently in gathering activities, chose a greater number of activities to participate in, choose schools and meeting rooms as main gathering spaces more frequently, and participated in athletic activities and children's activities more than respondents living in public housing. The results from Aoi-Higashimatsushima, Tamauranishi-Iwanuma, and Shishiori-Kessennuma for respondents living in public housing and private housing differed from those in other areas. In this area, public housing respondents participated in mandatory, large-scale, and intimate social activities, very similar to those living in private housing (Table 6). The recovery approaches in these areas differed (Aoi-Higashimatsushima and Tamauranishi-Iwanuma, community-driven; Shishiori-Kesennuma, government-led). Similarities were also observed in the location of gathering spaces and parks, as well as the welcoming environment of the activities (Figures 43, 44, and 49; Table 15).

Effectiveness: By reviewing the recovery approaches involving gathering spaces and activities as well as their effectiveness on community recovery in the case studies,

we suggest that the recovery should not only consider the physical presence of such spaces but also the social aspects of each community. In fact, the recovery derived from such spaces and activities may have been more effective in cases involving community-driven recovery approaches, community/neighborhood association authorities, and the establishment of open spaces and parks alongside closed spaces. These cases, by providing numerous intimate social gathering spaces and diverse activities, as well as by welcoming residents of different genders, ages, and dwelling types, may have helped strengthen community cohesion. Paying attention to scholars'concerns regarding community recovery, and considering their suggestions in the recovery process, may be beneficial. Community-driven approaches, undertaken by community and neighborhood associations through identifying community needs and providing residents' suggestions throughout the recovery period, could also assist the recovery of the community. The author suggests learning from cases such as Aoi-Higashimatsushima, Iwanuma-Tamauranishi, and Shishiori-Kesennuma, which were able to repair their disaster-affected communities by addressing the demands of different groups of residents. The recovery approaches in these cases differed; however, the community and gathering space recoveries of these case studies were considered from similar perspectives.

Among cases of this level of association, the gathering spaces and activities were provided according to the diverse characteristics of the residents; different groups of people became involved in the recovery process and established activities and spaces. This type of establishment might improve the effectiveness of gathering spaces and communities, thereby facilitating the better community recovery of the residents, regardless of their gender, dwelling-type, age, or interests. Diversification of gathering activities and spaces will have a positive effect on the sense of belonging and community among residents, despite their differences. Table 16 presents a summary of the findings.

Table 16 summary of the findings regarding social engagement factors

Recovery approaches		*Community-driven, government-led, mixed approach*
Activity organizations		Smaller organization, PTA has become weaker after disaster
Gathering spaces		Smaller size gathering spaces, Community centers and meeting rooms instead of schools and gymnasiums, open spaces are considered in some
Gender factor	female	smaller circumstances. More frequently participation. Chose intimate social activities
	male	wider circumstances. Less intimate social activities, larger scale, more scheduled activities.
Type of dwelling	Public	Smaller circumstances. participate less frequently, smaller number of activities to participate.
	Private	wider circumstances. More frequently participation, greater number of activities. Schools and meeting rooms
Number of activities		Greater number of activities participate in recreational volunteer activities as well as mandatory activities
Age	65>	Less diverse activities, smaller numbers, less recreational volunteer activities
	65<	More diverse activities, greater number, mandatory activities
Effectiveness		In case studies with community-driven, grass-root level organizations gathering spaces were more involving, activities were more diverse and different social factors were more considered

4-Conclusion

This chapter aimed to determine the effectiveness of gathering spaces and activities on the recovery of communities in different stages after the GEJET-2011. By emphasizing long-term community recovery, we tried to determine the relationships between communities, gathering spaces, and gathering activities, via case studies and a literature review. This research can be briefly summarized as follows: the increased role of community and neighborhood associations was primarily a result of community-driven recovery approaches and may have had positive impacts on community recovery. The results of the community recovery in Shishiori-Kesennuma show that whilst the main recovery approach was government-led, community recovery was undertaken by neighborhood associations; furthermore, the gathering spaces and open spaces provided for events were located in the public housing site, which improved outcomes compared to other government-led cases. The tendencies of gathering spaces had changed from formal gathering spaces (e.g., schools and gymnasiums) to less formal gathering spaces (e.g., community centers and meeting rooms). Moreover, the type of gathering activities changed toward more informal activities than formal ones in the selected case studies. Therefore, in the reviewed case studies, the effectiveness of gathering spaces and activities on community recovery may vary according to the gender, dwelling type, and age of the respondents.

Scholars have emphasized the importance of initiating community recovery with maximum resident participation from the shelter and temporary housing stages onwards, and recreating pre-disaster social bonds and modularity can help achieve a resilient community cohesion recovery. The results of this chapter agree with the literature. In areas with community-driven recovery approaches and in which community recovery measures are established during the shelter and temporary housing stages, fewer differences were observed between the benefits derived by different respondent groups from the gathering spaces and activities. In addition, it can be assumed that the potentially significant role of the community and neighborhood associations, as well as their importance in establishing gathering spaces and activities, may impact the success of the community recovery process. These associations, by identifying community level needs regarding the recovery of such spaces, sought to establish multiple intimate social gathering spaces and diversify their activities according to the different resident groups.

Background studies have warned stakeholders about possible exclusion and separation between public and private housing residents in terms of communities and social interactions; however, contrasting results were identified in the case studies of this research. Similar tendencies were identified in the selection of gathering spaces and activities among both groups, especially among respondents of community-driven recovery approach cases. In such cases, during the temporary housing stage, diverse inclusive gathering activities were offered by authorities in these areas. This also refers to the crucial role of community level recovery directions from the onset of the disaster, to help residents connect with the residents of other types of housing and to increase trust and a sense of belonging. Hence, the results of dwelling-type factors may differ from the scholars‘expectations, and no significant difference was found between the benefits derived by respondents living in different types of dwelling. While the trends of gathering activities changed after the disaster, a smaller number of activities were mandatory (e.g., environmental cleaning), and higher numbers were associated with the selection of recreational voluntary activities.

The results of gender-based cross-tabulation analysis were similar to expectations, and they may accord with background theories regarding gender-based differences and the importance of diversified gathering activities. However, gender-based issues were discussed and addressed in the community-driven approach cases. The results cannot determine whether the gender and age factors regarding activity participation became less biased after the disaster; however, they suggest that the gender-based tendencies changed after the disaster. The results of the gender-based analysis of Sakamoto-Yamamoto may raise concerns about the ongoing gender biases in similar communities, and it indicates the importance of other scholars‘ concern

regarding inclusivity in the provision of activities and spaces, to address existing social issues and to help community recovery following future disasters.

Differences were found between different age groups (before and after retirement age) in terms of the selection of activities, which could be attributable to different lifestyles; however, similarities were observed in the selection of gathering spaces in both age groups. Male respondents over the age of 65 (after retirement) selected a larger number of activities for participation and making suggestions. Rural areas in Japan are known to be culturally gendered and age-separated environments, and elderly men occupy roles of authority in these communities. This may explain the differences between different gender and age groups amongst the respondents of this research, as well as the types of gathering activities offered.

The study can briefly conclude that in cases with smaller scale governing associations, the gathering spaces and activities were provided according to the diverse characteristics of the residents; different groups of people became involved in the recovery process and established activities and spaces. This type of establishment might improve the effectiveness of gathering spaces and communities, thereby facilitating the better community recovery of the residents, regardless of their gender, dwelling-type, age, or interests. Diversification of gathering activities and spaces will have a positive effect on the sense of belonging and community among residents, despite their differences.

This chapter attempted to (i) investigate the effectiveness of gathering spaces and activities in GEJET-2011 affected areas, (ii) contribute to the research field of community recovery from a long-term perspective, and (iii) analyze spaces' and activities' relationships to social factors. Therefore, additional research that considers other types of gathering spaces (e.g., shrines and temples, which are fundamental for Japanese communities and their cohesion but form part of a government-led recovery framework) might be beneficial. Because the results present the different possible functions of neighborhood associations and government bodies in the recovery of gathering spaces, we recommend further research focusing on the role of different levels of governing authorities in establishing gathering spaces after disasters.

In contrast with the background research, the results of associations among different factors are here aligned with theories of gender-and age-based social interactions, and these Japanese case studies may reflect more global characteristics. We suggest that stakeholders can contribute towards more resilient future recoveries by considering scholars' concerns from the perspective of community recovery; residents' participation; grass-roots associations; gathering spaces and activities; and gender, age, and social engagement differences in their recovery plans.

Chapter Six: Authorization and levels of justice in recovery of gathering spaces

Summary:

Public meeting spaces can enhance justice in communities by providing a suitable platform where all community members can attend events, meet others, and express themselves freely. Many homes and gathering spaces were destroyed by the Great East Japan Earthquake and Tsunami in 2011, and as a result, important platforms where communities could gather had vanished. Even though different types of organizations restored gathering spaces, in terms of enhancing justice, the recovered spaces served the affected people differently. This study aims to identify how different aspects of justice (procedural, distributive, and interactional) vary in gathering spaces that were created through different authorizations. For this study, cases from communities in Miyagi and Iwate Prefectures of Japan were selected based on a process-oriented approach combined with literature review, field visits, semi-structured interviews, questionnaire surveys, and an evaluation of justice criteria in different cases. The research found that among the studied cases, different organizations targeted communities differently. According to the justice criteria evaluation, gathering spaces created by residents' associations and non-profit organizations had better results than those created by local governments. These communities were empowered to administer the spaces, which were provided with well-connected multiple gathering spaces and a balanced ratio of social, optional, and necessary gathering activities. In contrast, local governments offered centralized large-scale gathering spaces with minimum connections to other gathering spaces, spaces were combined with different functions and did not authorize community members to be involved in their administration. It was concluded that procedural justice is an important key, as it results in the empowered authorization of communities, enhances distributive and interactional justice, and leads to increased freedom of choice. It also

leads to consideration of multiple gathering spaces, evenly distributed in the recovered area, and maximizes the accessibility and useability of such spaces.

1. Introduction

How can the recovered gathering spaces provided by different types of organizations be understood as a manifestation of various levels of justice? What are the different outcomes among organizations' approaches toward utilizing communities through recovered gathering spaces?

Disasters take lives, destroying the built environment, gathering spaces, and community ties. Various stakeholders are concerned with the affected gathering spaces, and the state of communities and these places in disaster recovery processes. Different scholars have long discussed the role of public and gathering spaces and their impact on community well-being. These spaces can help improve community cohesion and strengthen social capital by fostering inclusive and accessible means for encounters and sharing to users from different groups. In disaster-affected communities, the existence of such spaces helps affected communities to have a mutual place to gather, share their sorrow, and plan for the provision and distribution of emergency aid (Monteil et al. 2020). As a result of possibilities of gathering after a disaster, the affected social capital can be healed and recovered. Affected communities can move forward to establish short-, mid-, and long-term recovery goals and work toward community recovery (Roque et al. 2020, Haeffele and Craig 2020).

After the Great East Japan Earthquake and Tsunami in 2011 (hereafter GEJET-2011), three different types of organizations were active in the recovery of communities and gathering spaces in affected areas: residents' associations (grassroots), non-profit organizations (mediators), and local governments (top-down). Each targeted residents' empowerment, gathering spaces, and activities differently in the respective communities. This paper explores the criteria for enhancing justice in the recovery of gathering spaces, the impact of management by different levels of organizations, and benefits for community members and their perception toward different authorizations and ownership of gathering spaces. As a result, it was found that residents' association and NPO authorizations had the best results from the evaluation model, as they. They could cover procedural, distributive, and interactional levels of justice to a greater degree than the case studies that were administered by local governments.

Many scholars have tried to define gathering/public spaces using general terminology, but one definition might not describe the nature of such spaces across different communities. Regarding terminology, this research uses "spaces" instead of "public spaces," since the concept of public spaces is not as clearly referred to in Japan compared to other countries. Gathering spaces are open to the public, but since they are

buildings with boundaries, there are more limitations over the use and access than places commonly understood as public spaces. Gathering spaces, defined as places verifying equal access, self-expression, and benefits for all members, may help strengthen community ties. These roles for gathering spaces show how gathering spaces may embody the principles of justice.

This paper aims to identify how different aspects of justice vary in recovered gathering spaces are created and managed through different types of authorization. This study reviews and evaluates six selected case studies (Aoi-Higashimatsushima, Tamauranishi-Iwanuma, Central Yamada, Massaki-Ofunato, Kesennuma-Shishiori, and Machikata-Otsuchi) and the gathering spaces in their administrative districts which were created as part of the post-GEJET-2011 recovery. It covers the period before the disaster, at the time of the disaster, and until the present, and reflects on distributive, procedural, and interactional levels of justice in post-GEJET-2011 affected areas. Based on an evaluation of case studies on the just repair of gathering places and categorized by different authorizations, suggestions are made for improving the collaboration of different recovery organizations so that the re-establishment of gathering spaces justly reaches all recovering communities.

Different studies have been conducted on disaster social and environmental justice. Low primarily mentions the three important criteria impacting spatial justice: procedure, distributive and interactional. Hegtvedt and Johnson (2000), Grijalva (2011), and Holifield et al. (2009) have separately endorsed the importance of establishing procedure of spaces on the served level of justice for the recipient. Sezer and Niksic (2017) and Nelan (2018) identified important factors of allocation, and configuration of gathering spaces on the just benefit of such spaces. Ridgeway (2009) and Fehr (1996) have studied the socioeconomic characteristics of different community members and specified the significance of existing socioeconomic injustice on bringing inequalities to the the future development stages of the communities.

This study focuses on the role of gathering space recovery and establishes a model to evaluate just outcomes of different cases studies regarding authorization and administration, authorizations spatial planning, and provided gathering services for affected people. The field of disaster spatial justice has not been addressed enough by the prior scholars and a complete review of administrative, spatial and interactional justice, specially regarding gathering spaces recovery have not been taken into consideration enough. This study may help contribute to the existing knowledge.

The paper 1) reviews the prior studies related to the disaster spatial justice, 2) illustrates the evaluation model of the just gathering spaces and 3) apply the model into the investigated case studies.

2. Evaluation model of Justice in Gathering Spaces

After reviewing the existing literature and theories, it was found that only a selected number of scholars had mentioned the need for evaluation of spatial justice and specifically of gathering spaces (Sezer et al. 2017). Until now, no research has focused on establishing an evaluation model to consider justice in gathering spaces. To fill this gap, the authors decided to generate a model to evaluate justice in restoring gathering spaces based on prior studies, modified and applied to a select number of gathering spaces. By reviewing the literature authors decided to identify three primary criteria of justice as pillars of evaluation model: procedural, distributive, and interactional justice, later applied the model to the investigations from the case studies. Procedural justice describes the process of establishment, planning, and administration; distributive justice defines spatial configurations such as accessibility and spatial possibilities; and interactional justice represents providing services and activities for individuals, groups, and minorities. Each aspect measures the level of achievement in each justice criterion according to a scale of five levels: 1 being the lowest level of achievement and 5 being the highest.

To establish the model, the authors drew from prior scholars' work and existing literature and concerns in the field. Also, levels of evaluation of justice in gathering spaces are modified based on the characteristics of cases regarding the existing participation level of residents for initial decision making and management, number and types of the rooms offered in the recovered gathering spaces, and existing social inclusivity factors as well as types of gathering activities offered to the users. Scholars have identified two key factors in achieving procedural justice. The first factor is the process of decision-making in the provision of meeting spaces between the residents and authorizations (Arnstein 1969, Aoki 2018). The second factor is administration inclusivity, which administers the current management process and hierarchy of such places in terms of community, organization, or government (Akkar 2021, Zhou 2019, Duivenvoorden et al. 2021). These aspects focus on both the provisioning process and the current managerial status of the gathering spaces.

Based on the criteria, the focus of evaluation is on the measurement of two factors of special concern to scholars: accessibility by investigating physical and temporal access of residents to the gathering spaces based on distance, operation time, and walkability (Yılmaz and Meltem 2018, Gehl 2018, Duren and Ruth 2021, Giordano et al. 2019) and the spatial possibility to investigate what types of spaces such as multi-purposed spaces, fixed rooms, auditoriums, open spaces, and so on (Sezer and Niksic 2017, Cruz et al 2018, Pan et al. 2021).. Evaluation levels measure physical and temporal accessibility as well as spatial configurations, as observed in the case studies. An important factor on physical accessibility mentioned by Giordano et al (2019) and

Carmona (2010) concerns the functional allocation of gathering spaces within 10 minutes of walking from houses, and an increase accessibility and walkability in the communities.

Lastly, the interactional justice criterion focuses on social diversity to evaluate the inclusivity of spaces and administrations in welcoming different members in regards to age, gender, and community status such as insider, outsider, or newcomer (Ridgeway 2009, Lee et al. 2019, Fehr 1996, Noon and Ayalon 2018), and activity vitiations evaluate the provision of different activities (necessary, social, recreational) and events related to social diversity factors as well as members' various interests and demands (Carmona 2010, Gehl 2013).

Table 17 shows the connections between literature and evaluation model.

Table 17spatial justice of gathering spaces evaluation indicators and scoring levels

	Commenting scholars	*Evaluation level*	*1*	*2*	*3*	*4*	*5*
Procedural justice	Arnstein (1969) Aoki (2018)	Establishing Participation	1.Informing	2.Consulting	3.Involving	4.Collaborating	5.Empowering
	Akkar (2021) Zhou (2019) Duivenvoorden et al. (2021)	Administration inclusivity	1.Government	2.government & NPO	3.NPO	4.NPO & residents	5.Residents
Distributive justice	Yılmaz and Meltem (2018) Gehl (2018) Duren and Ruth (2021) Giordano et al. (2019)	Accessibility	1.Limited physical and temporal access	2.Physical access and limited temporal access	3.Unlimited Physical and temporal access based on reservations	4.Unlimited physical and temporal access	5.Unlimited physical, temporal access
	Sezer and Niksic (2017) Cruz et al (2018) Pan et al. (2021)	Spatial Possibility	1. meeting room & service area	2. Meeting room, service area & open space	3. several meeting rooms, service area, open space, cafe	4. several meeting rooms, open space, performing space, and café	5. several meeting room, open space, café/restaurant, lounge
Interactional justice	Ridgeway (2009) Lee et al. (2019) Fehr (1996) Noon and Ayalon (2018)	Social Diversity	1.Male elderly	2.All genders elderly	3.All genders and children	4.All genders and generation	5.gender, generation, community member situation
	Carmona (2010) Gehl (2013)	Activity Variation	1.Mandatory activities	2.Mandatory activities once a week	3.Mandatory activities and one volunteer activity	4.Mandatory, volunteer, and recreational once a week	5.Diverse activities planned during a week.

To understand the results, it is necessary to review the evaluation model. Figure 54 shows the modified evaluation model based on the discussed literature, investigations in case studies and indicators in table 17.

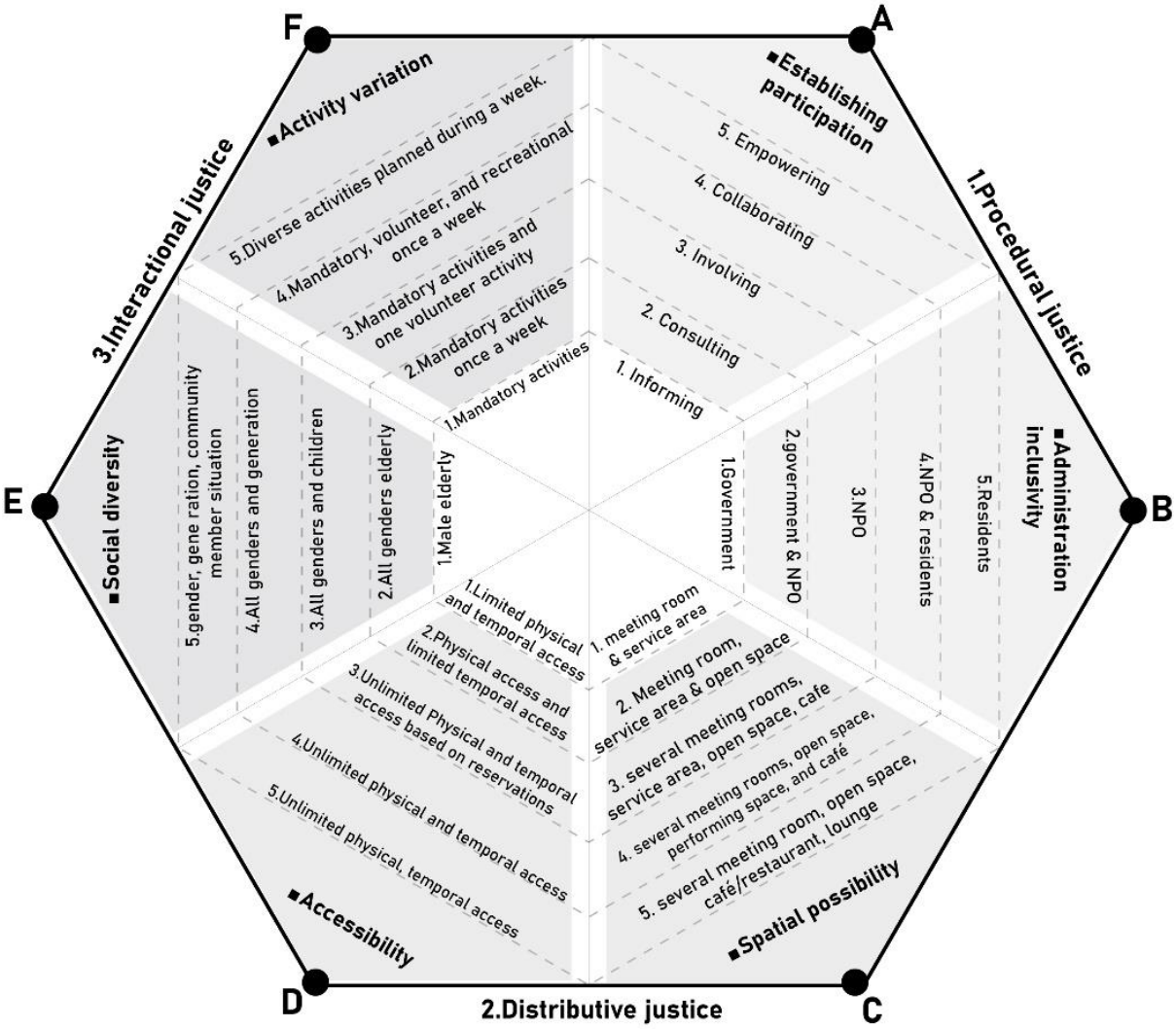


Figure 54 model for evaluation of justice criteria in gathering spaces, Authors. 1 is the lowest and 5 is the highest

3. Research methodology and surveys

This paper aims to identify how different aspects of justice vary in recovered gathering spaces are created and managed through different types of authorization. To find out, authors aimed to understand the situation of three main criteria of justice (procedural, distributive, interactional) from the evaluation model in the case studies and attempts to:

1) Identify characteristics of the recovery and organizations involved in the recovery of affected communities and gathering spaces,

2) Understand the process of recovery in terms of community participation level and collaboration between organizations and residents,

3) Illustrate the allocation and spatial characteristic of gathering spaces,

4) Draw the accessibility and walkability of the spaces for different groups of the residents,

5) Understand the perception of the residents regarding ownership of the spaces and preferred primary gathering spaces.

6) understand the experiences of affected residents regarding gathering spaces and gathering activities before and after the disaster, and individuals' suggestions for the development of the community in the future by questionnaire surveys,

7) apply the introduced evaluation model (figure 1) into the case studies,

8) compare the results of the evaluation model in different case studies and identify impacting factors.

3.1 Case studies

To implement the implement the research, six GEJET-2011-affected communities in Miyagi and Iwate Prefectures were selected, and site visits, interviews and questionnaire surveys were conducted with local residents and stakeholders. The Case studies fall within three categories of administrative districts based on the sector that managed the reconstruction within each municipality: residents' associations (Aoi-Higashimatsushima, Tamauranishi-Iwanuma), non-profit organizations (Massaki-Ofunato, Central Yamada Town), and local governments (Machikata-Otsuchi, Shishiori-Kesennuma).

Table 17 shows the connections between literature and evaluation model.

Table 18spatial justice of gathering spaces evaluation indicators and scoring levels

	Commenting scholars	*Evaluation level*	*1*	*2*	*3*	*4*	*5*
Procedural justice	Arnstein (1969) Aoki (2018)	Establishing Participation	1.Informing	2.Consulting	3.Involving	4.Collaborating	5.Empowering
	Akkar (2021) Zhou (2019) Duivenvoorden et al. (2021)	Administration inclusivity	1.Government	2.government & NPO	3.NPO	4.NPO & residents	5.Residents
Distributive justice	Yılmaz and Meltem (2018) Gehl (2018) Duren and Ruth (2021) Giordano et al. (2019)	Accessibility	1.Limited physical and temporal access	2.Physical access and limited temporal access	3.Unlimited Physical and temporal access based on reservations	4.Unlimited physical and temporal access	5.Unlimited physical, temporal access
	Sezer and Niksic (2017) Cruz et al (2018) Pan et al. (2021)	Spatial Possibility	1. meeting room & service area	2. Meeting room, service area & open space	3. several meeting rooms, service area, open space, cafe	4. several meeting rooms, open space, performing space, and café	5. several meeting room, open space, café/restaurant, lounge

Interactional justice	Ridgeway (2009) Lee et al. (2019) Fehr (1996) Noon and Ayalon (2018)	Social Diversity	1.Male elderly	2.All genders elderly	3.All genders and children	4.All genders and generation	5.gender, gene ration, community member situation
	Carmona (2010) Gehl (2013)	Activity Variation	1.Mandatory activities	2.Mandatory activities once a week	3.Mandatory activities and one volunteer activity	4.Mandatory, volunteer, and recreational once a week	5.Diverse activities planned during a week.

To understand the results, it is necessary to review the evaluation model. Figure 54 shows the modified evaluation model based on the discussed literature, investigations in case studies and indicators in table 17.

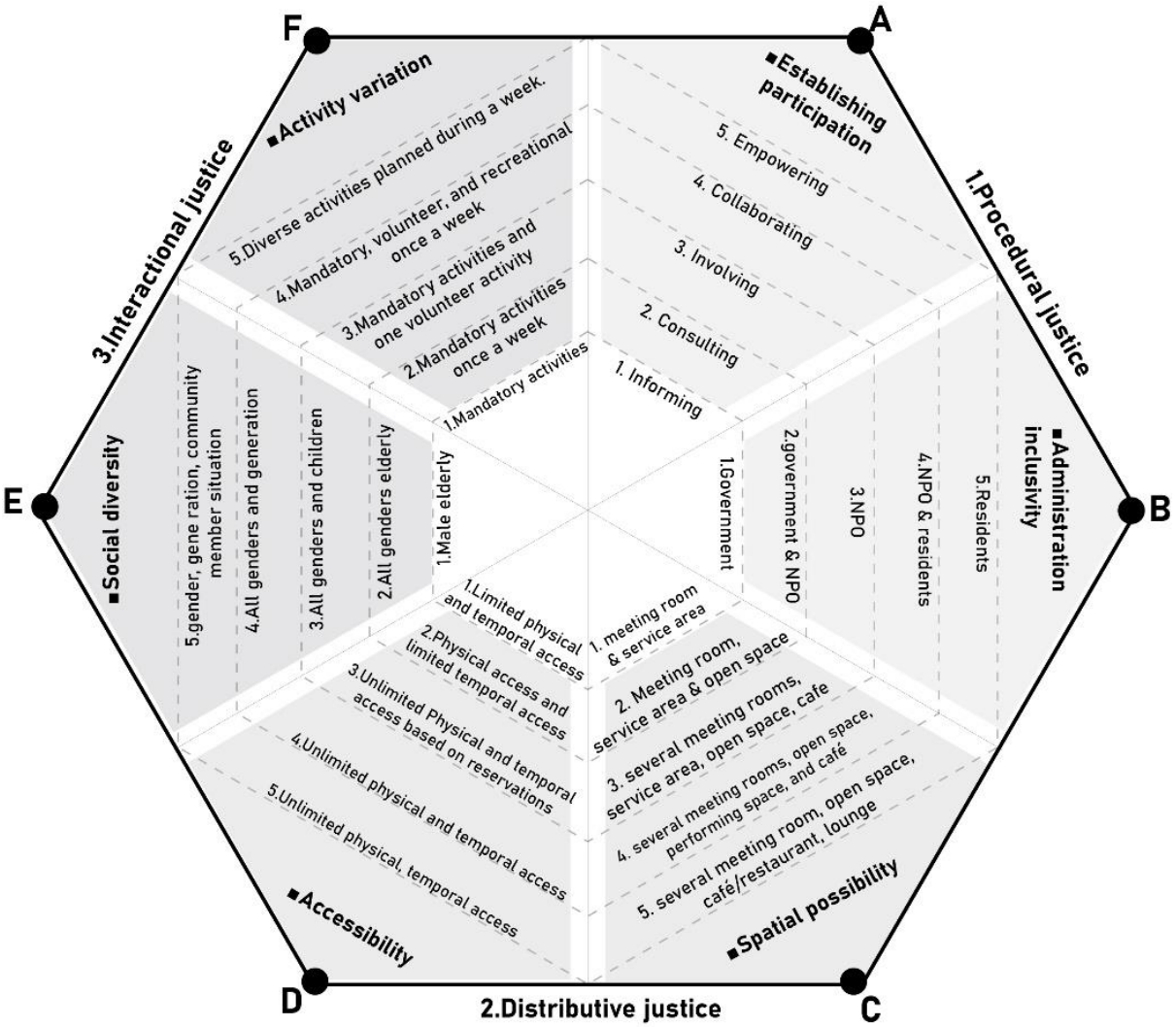


Figure 55 model for evaluation of justice criteria in gathering spaces, Authors. 1 is the lowest and 5 is the highest

3.2 Interview survey results

As mentioned, semi-structured interviews were conducted from March 2019 to September 2021 through in-person and remotely conducted surveys. Authorization and administration bodies were interviewed, such as government officers, community

leaders, residents' representatives, administrative staff, and NPO representatives. Information regarding the characteristics of the areas and communities before and after the disaster, the timeline of the disaster and reconstruction, recovery approaches, authorization sectors and organizations in charge of the gathering space recovery, and types of gathering spaces and activities were gathered. Table18 shows the case studies and the administration, organizations, and gathering space provision recovery timeline.

Table 19 Summary of case studies and their recovery timeline (RA: Residents' association, LG: Local government, NPO: non- profit organizations).

Time line	*Before Disaster*	*Temporary Housing 2011*	*After move to Permanent housing*	*Present- 2020*
area				
Aoi Higashi Matsushima *Independent district* *Town level*	One community, RA started empowering the community after the 2005 disaster to be prepared for future	Different gathering spaces for meetings between RA & residents, decisions of planning & gathering spaces based on both groups' opinion	2015- RA receives budget from LG & provides residents free of charge gathering spaces with services, administration, events, & overseeing the community needs. LG pays for the maintenance.	The LG will start controlling the budget, RA will oversee maintenance. Gathering spaces might become monetary & charge residents for the use.Residents may be charged in future for using gathering spaces
Tamauranishi-Iwanuma *Independent district* *Town level*	6 different communities with independent RA & meeting places	RA of six neighborhoods combine & plan the new community based on residents' opinion & consultant of academics.	2015-RA collaborate & share gathering spaces. Main events in the LG provided community center. Budget provided by local governments, use free of charge.	RA became less active than early years after disaster.
Massaki Ofunato *Independent district* *Town level*	Community with RA	LG oversees the planning & recovery, provides gathering spaces. NPO collaborate with RA & elderly residents to provide lacking services & Kominkan.	2013-NPO oversees the acts & supervise the administration of locals. Budget provided by NPO, local government, & membership fee of the users. Transpiration for vulnerable people	same
Central Yamada *Town center* *In charge of surrounding towns*	RA & LG in charge of gathering spaces	LG, RA, NPO, children & residents for consultation & planning. Budget by Suntory. Library- community center	2016-Administration provided by NPO & leaves. LG, RA & oversee the performance & services, also for outsiders.	Same
Machikata Otsuchi *Town center* *In charge of surrounding towns*	LG in charge of entire community & surrounding neighborhoods	LG decides on a central gathering space & gathers opinion of residents by 3 minor workshops	2017-LG provides budget, maintenance, services, planning & construction. Events by LG & NPO. Providing services to residents & outsiders. Kominkan & public housing meeting places in the area, not well connected	LG transfers the administration to NPO & provides some budget. NPO provides services & events & maintain the space
Shishiori Kesennuma *Town center* *In charge of surrounding towns*	LG in charge of community & spaces	LG plans the recovery & has minimal discussions with NPO from Kobe City. As a result, RA is established.	2017-LG provides gathering spaces. RA provides Minor collaboration between residents & LG for recovery. Central gathering space with large open space, meeting place & kominkan.	All RAs combined to one RA. High collaboration of RA & LG for providing budget & services for inclusive gathering activities.

3.3 Questionnaire Survey results

As mentioned, after the distribution of 3080 questionnaire kits, 478 questionnaires were returned effectively (16% of the total number). In all the areas, most of the respondents were over 65 years old, and there was a normal distribution between female and male respondents (49% male, 51% female). In Shishiori-Kesennuama and Machikata-Otsuchi, the ratio of respondents living in disaster public housing was higher than that of respondents from other types of dwellings. Regarding the duration of residency, most of the respondents lived in their current houses for 1–5 years. Table 9 presents the results of the descriptive demographics of the returned questionnaires per area.

Table 20 Summary of demographics of the respondents

	items		*Aoi-Higashimatsushima*	*Tamauranishi-Iwanuma*	*Ofunato Massaki*	*Central Yamada*	*Kesennuma Shishiori*	*Otsuchi Machikata*
age Ratio	under 65	N	48	35	14	28	29	35
		%	50%	35%	35%	37%	37%	43%
	over 65	N	48	64	26	47	49	46
		%	50%	65%	65%	63%	63%	57%
	Total	N	96	99	40	75	78	81
Gender	male	N	49	58	19	37	43	41
		%	51%	57%	46%	49%	55%	49%
	female	N	47	43	22	38	35	42
		%	49%	43%	54%	51%	45%	51%
	Total	N	96	101	41	75	78	83
Dwelling	Other Type	N	53	64	34	50	34	35
		%	55%	62%	83%	67%	44%	42%
	Disaster Public housing	N	44	39	7	25	44	49
		%	45%	38%	17%	33%	56%	58%
	Total	N	97	103	41	75	78	84
Residency Duration	less than 3 years	N	26	11	0	36	49	47
		%	28%	11%	0%	49%	70%	61%
	3-5 years	N	59	63	7	26	11	25
		%	63%	64%	18%	36%	16%	32%
	5-10 years	N	8	22	11	2	3	2
		%	9%	22%	29%	3%	4%	3%
	more than 10 years	N	0	3	20	9	7	3
		%	0%	3%	53%	12%	10%	4%
	Total	N	93	99	38	73	70	77

Figure 55 shows the results of respondents' perceptions of the ownership of gathering spaces, such as community centers meeting places, kominkans, public halls, and outdoors, by different authorities. In general, in all areas, the ratio of community-owned gathering spaces had decreased from before the disaster compared to the present (Aoi-higashimatsushima 27%->25%, Tamauranishi-Iwanuma 35%->33%, Ofunato-Massaki 43%-> 31%, Kesennuma-Shishiori 26%->10%, Otsuchi-Machikata 16%->13%) except in Central Yamada 26%->33%. Non-community-owned gathering spaces also increased after the disaster (Aoi-higashimatsushima 31%->52%, Tamauranishi-Iwanuma 26%->39%, Ofunato-Massaki 31%->41%, central Yamada 43%->56%, Kesennuma-Shishiori 38%->61%, Otsuchi-Machikata 33%->50%). The selection of other types of facilities (schools, gymnasiums, nearby houses, cafés, restaurants, and Izakaya) dropped in most of the areas (Aoi-higashimatsushima 42%->23%, Tamauranishi-Iwanuma 39%->28%, central Yamada 30%->10%, Kesennuma-Shishiori 35%->29%, Otsuchi-Machikata 52%->37%).

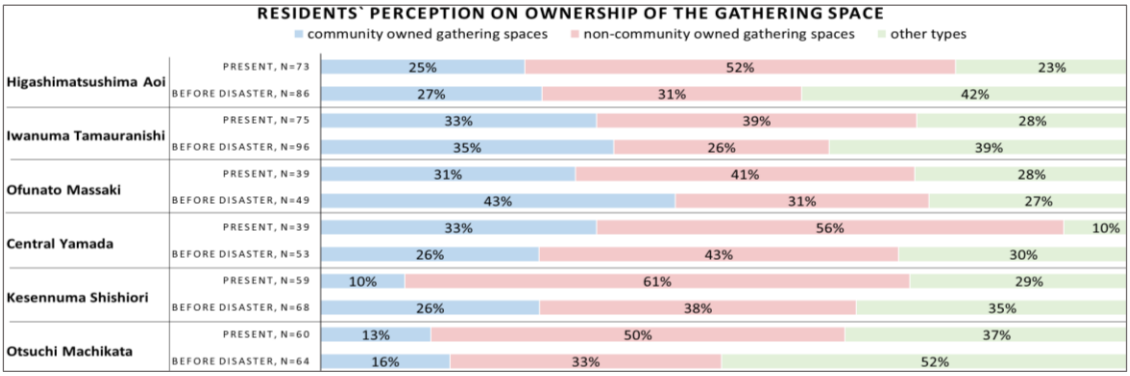


Figure 56 Respondents ' perception on ownership of the gathering spaces, multiple choice question

Figure 56 shows the breakdowns of types of gathering spaces (defined in Section 3.1) based on respondents' perceived ownership of such spaces' community-owned spaces, non-community-owned spaces, and other types of facilities. The results show a decrease in the total number of gathering spaces in all areas from before the disaster to the latest disaster (Aoi-higashimatsushima N=89->N=73, Tamauranishi-Iwanuma N=86->N=75, Ofunato-Massaki N=49->N=39, central Yamada N=53->N=39, Kesennuma-Shishiori N=68->N=59, Otsuchi-Machikata N=64->N=50). Additionally, the selection ratio decreased more drastically in the selection of schools and gymnasiums from before the disaster to the present. Overall, the selection of meeting places in Tamauranishi-Iwanuma (19% and 15%->29% and 33%), Aoi-Higashimatsushima (5% and 10%->12% and 25%), and selection of community centers in Massaki-Ofunato (6% and 10%->21% and 15%), Shishiori-Kesennuma (12% and 21%->36% and 5%), Machikata-Otsuchi (3% and 9%->13% and 2%) had increased from before to the present. In addition, there were normal distributions among the selection of different gathering spaces and the perceived ownership in Tamauranishi-Iwanuma (33%, 39%, 28%) and Massaki-Ofunato (31%, 41%, 28%). In Shishiori-Kesennuma, Machikata-Otsuchi, the tendency toward non-community-owned gathering spaces was greater than in other types.

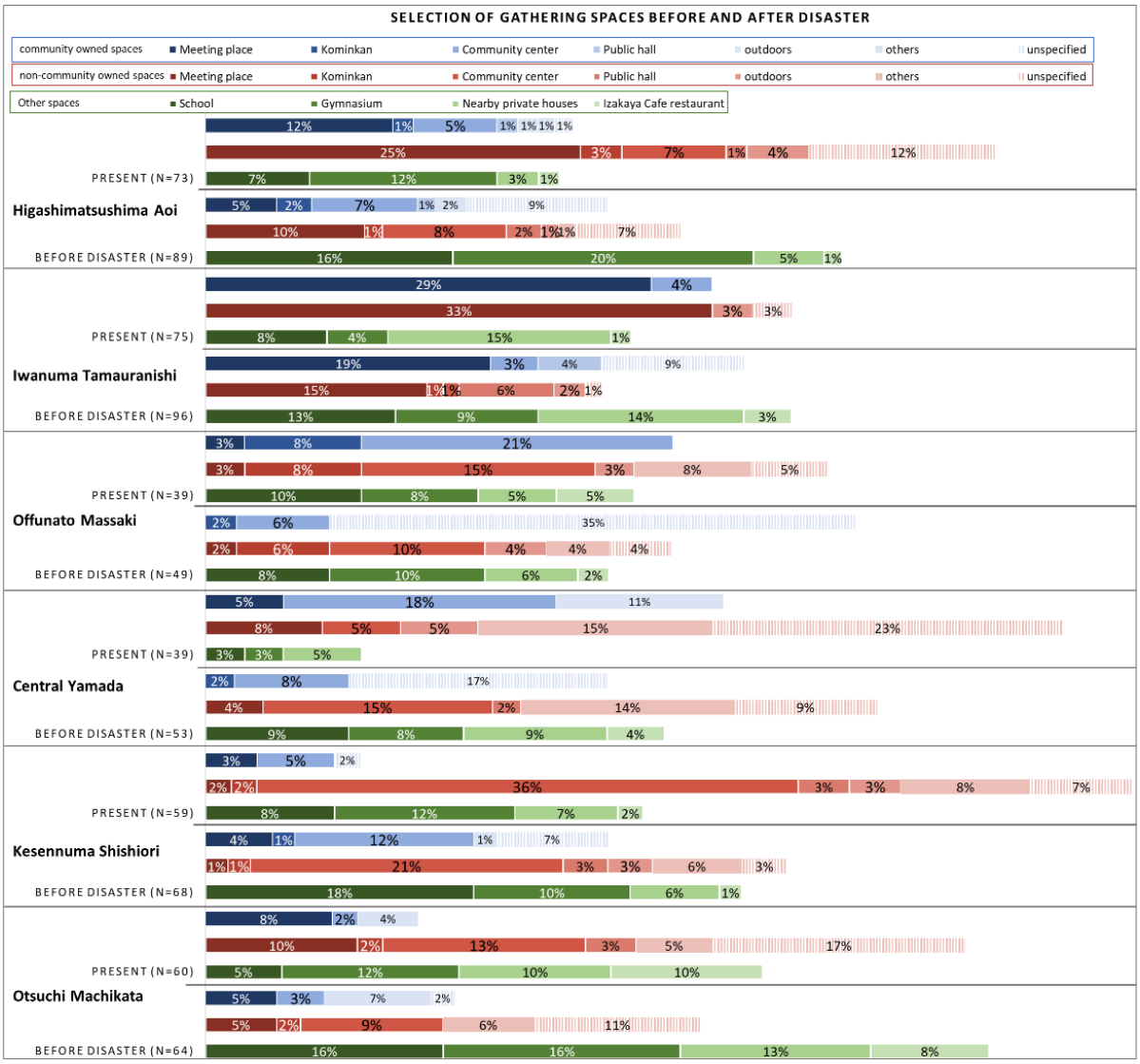


Figure 57 Types of gathering spaces identified by residents, multiple choice

Figure 57 (see below) presents the results of gathering activities in which respondents participated after a disaster based on necessary activities (environment, security, disaster), social activities (traditional and community development), optional (circle activities, athletic competitions, ceremonies, children's activities, geriatric associations, and unspecified). There was a normal distribution of optional and necessary activities in Aoi-Higashimatsushima (35%,31%,34%), Tamauranishi-Iwanuma (34%,25%,33%), Central Yamada (37%, 23%, 33%), Shishiori-Kesennuma (33%,21%,46%), and Machikata-Otsuchi (38%, 26%, 36%), except in Massaki-Ofunato (14%, 25%, 61%), where the ratio varied drastically. In Aoi-Higashimatsushima, the selection of social activities is higher than in other areas. In Massaki-Ofunato and Central Yamada, the selection of optional activities is higher than in other areas. In all areas except Massaki-Ofunato, environmental cleaning and traditional events were chosen as the main activities. In this area, circle activities had the highest ratio of selection.

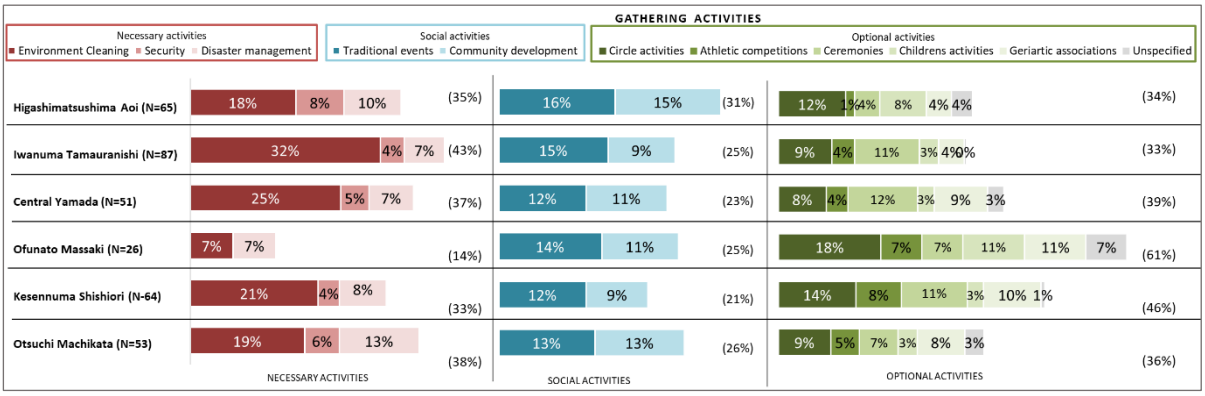


Figure 58 Gathering activities to participate after disaster, multiple choice

Respondents were asked about the circumstances, frequency, and distances to gathering spaces where they participated. Except in Central Yamada and Massaki-Ofunato, all other areas chose neighborhood blocks as the main circumstance according to their choice for gathering space and participation in gathering activities. In Aoi-Higashimatsushima and Tamauranishi-Iwanuma, respondents mainly chose the neighborhood block as the circumstance. In addition, the frequency of participation was higher in Aoi-Higashimatsushima, Tamauranishi-Iwanuma, and Shishiori-Kesennuma. Aoi-Higashimatsushima and Tamauranishi-Iwanuma selected the main gathering spaces based on the distance of up to five minutes' walk. The detailed results are presented in Figure 58.

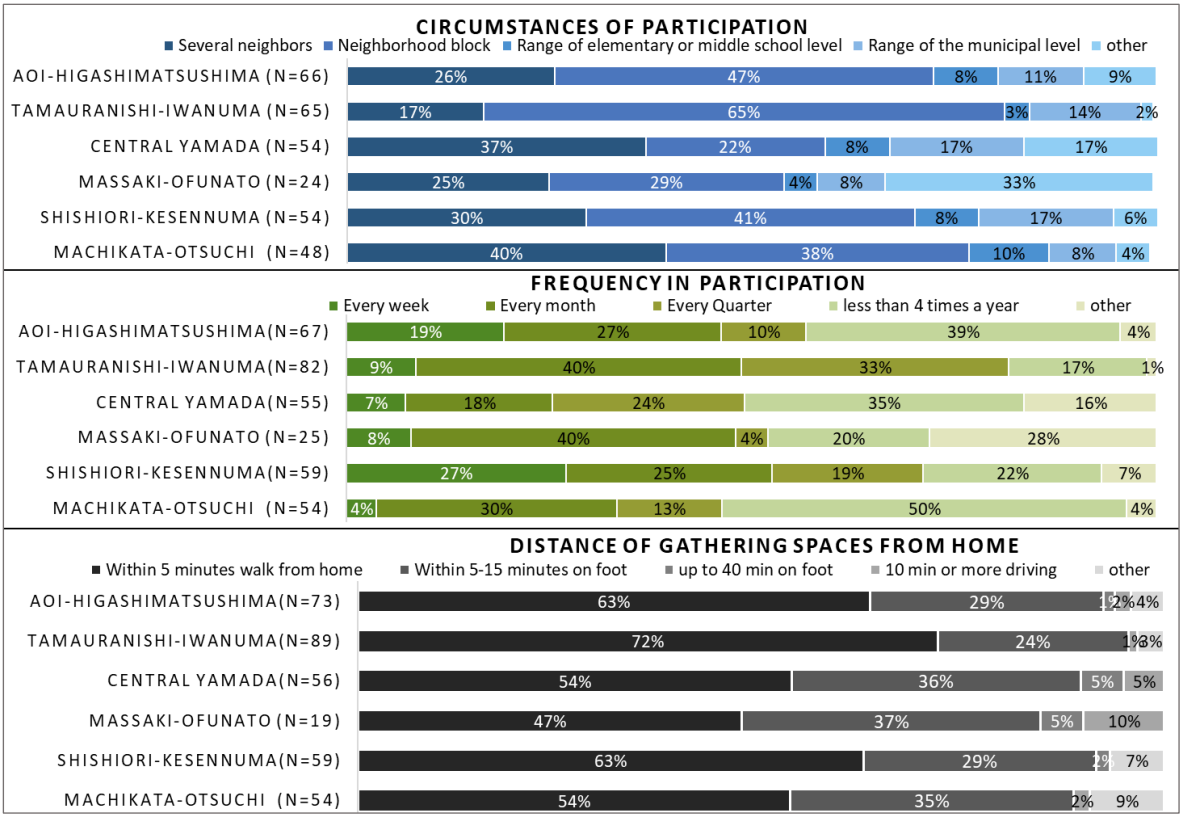


Figure 59 Circumstances, frequency, and distances to gathering spaces for participation, single item

3.4 Evaluation of the case studies

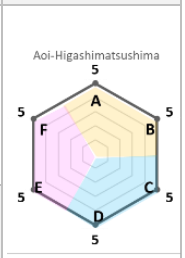
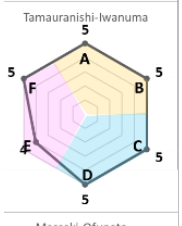
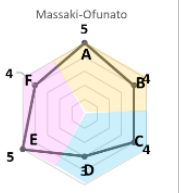
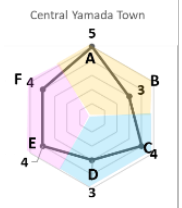
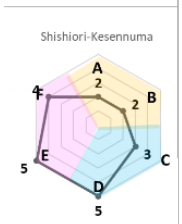
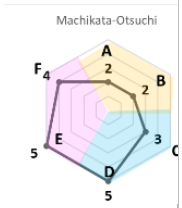
After modifying the evaluation of justice criteria in gathering spaces (figure 54), the model was applied to evaluate case studies through comparison of the background theory with the cases, details grasped based on observations, and results of the interview and questionnaire surveys (Tables 17 and 18, Figures 55–58). Table 20 presents the evaluation results of procedural, distributive, and interactional criteria of justice and each of their aspects. Among the case studies, only Aoi-Higashimatsushima and Tamauranishi-Iwanuma reached the maximum coverage of the justice criteria mentioned in the figure. In these cases, the residents` association authorized the recovery of gathering spaces and had the most collaboration and empowerment throughout the recovery process. In addition, the distribution and organization of spaces and provision of gathering spaces are reflections of residents' opinions on the constructed and administrated situation.

In Massaki-Ofunato and central Yamada, the recovery of gathering spaces was led by NPOs and had the maximum coverage of procedural and interactional justice by collaborating with and starting empowerment of the residents to establish spaces and provide services.

Shishiori-KEsennuma and Machikata-Otsuchi mostly covered the spatial possibility part of the distributive factor and factors related to the interactional justice of the model. These cases were led by local governments and benefited from resources to provide multi-story and functional gathering spaces that cover diverse activities for different groups.

Figure 59 illustrates the magnified version of the evaluation results.

Table 21 Justice levels' evaluation results for each case study- magnified version in the appendix

Justice criteria		PROCEDURAL JUSTICE		DISTRIBUTIVE JUSTICE		INTERACTIONAL JUSTICE		
		A: Establishing Participation	B: Administration inclusivity	C: Accessibility	D: Spatial Possibility	E: Social Diversity	F: Activity Variation	
Residents' association	Aoi Higashi matsushima	5-maximum participation, empowering residents	5- high level of autonomy to the residents	5-accessible by time, and distance	5-different buildings with different functions, indoor/outdoor	5-inlcuding all the members	5-different activities in different gathering spaces, leisure, and town planning events	
	Tamauranishi Iwanuma	5-maximum participation, empowering residents	4- autonomy to the residents for meeting places, and LG for the community center	4-high physical and limited temporal; access, reservation needed in some spaces	5-different buildings, one building different functions, indoor/outdoor	4- all the members, especially children and elderly people	4- most of the activities in community center, optional activities, and town planning events	
Non-profit organization	Massaki Ofunato	5-maximum participation, empowering residents	4- high level of autonomy to the residents. Support and consultation from NPO	4-accessible by time, and limited distance	3- flexible space but limited configurations	5-inlcuding all the members	4-diverse activities, based on schedules, substitute for daily life needs, town planning activities	
	Central Yamada Town	5-maximum participation, empowering residents	3- high level of autonomy between NPO, LG and residents.	4-accessible by time, and limited distance	3- mainly based on library spaces	4- including everyone, outsiders, but mostly children and elderly people	4-diverse quiet activities. Following library schedule, town planning related activities	
	Shishiori Kesennuma	2-consulting with residents, based on government plan, minimum meetings with residents	2-adminitsration moving from LG to RA.	3-accessible by time, limited physical accessibility for some districts and outsiders	5- some functions in one building, indoor/outdoor	5-inlcuding all the members, even new commers	4-diverse activities. Possibility of big gatherings, optional activities, no town planning activity	
	Machikata Otsuchi	2-consulting with residents, based on government plan, minimum meetings with residents	2- local government and partially being transferred to NPO	3-accessible by time, limited physical accessibility for some districts and outsiders	5-different spaces and functions in one building, indoor/outdoor	5-inlcuding all the members, from other towns	4-diverse activities. Possibility of big gatherings, optional activities, no town planning activity	

PROCEDURAL JUSTICE		DISTRIBUTIVE JUSTICE		INTERACTIONAL JUSTICE	
A: Establishing Participation	**B**: Administration inclusivity	**C**: Accessibility	**D**: Spatial Possibility	**E**: Social Diversity	**F**: Activity Variation

PROCEDURAL JUSTICE		DISTRIBUTIVE JUSTICE		INTERACTIONAL JUSTICE	
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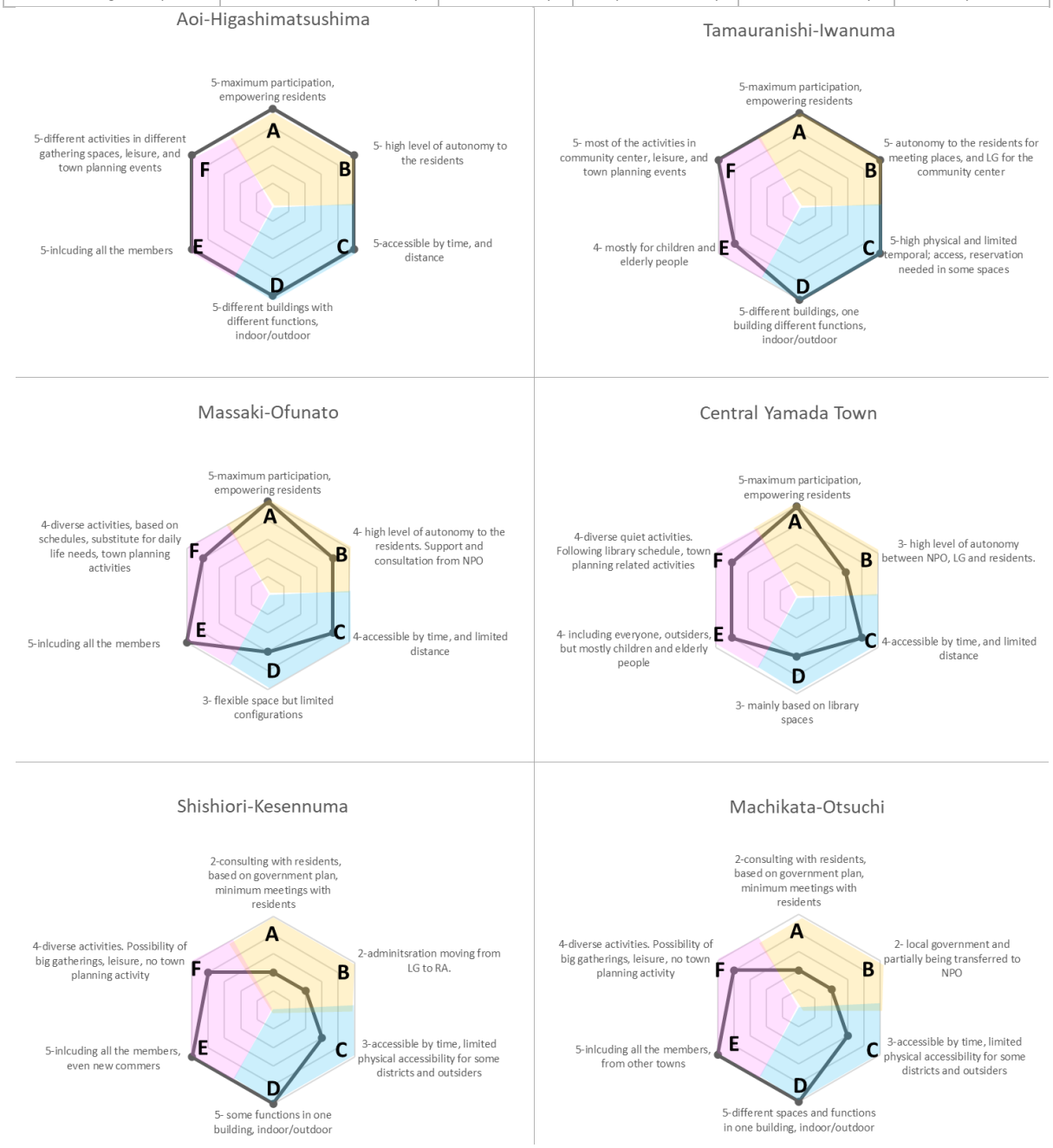

Figure 60 Magnified version of the evaluation model for each case study

4. Findings

Analysis of survey results and evaluation of justice criteria applied to the case studies (figures 54 and 55, tables 17 and 18) found that each organization (residents' associations, NPOs, local governments) targeted communities differently toward gathering spaces and activities. Communities with similar authorizations and organizations responded to procedural, distributive, and interactional criteria of justice similarly and had fallen into similar patterns for establishing gathering spaces. The surveys and evaluations show that the different procedural justice taken into cases also resulted in different achievements in other distributive and interactional justice criteria. To demonstrate this fact, we will first describe the findings regarding procedural justice, distributive justice, interactional justice, and cases with different authorization sectors: residents' associations, NPOs, and local governments.

4.1 Results of procedural justice: Residents' association-led case studies (Aoi-Higashimatsushima and Tamauranishi-Iwanuma) had the maximum number of attempts of procedural justice in the early stages of recovery and resulted in better performance of distributive and interactional justice. Residents' association-led communities worked with the residents during the recovery process. In these cases, there were similar tendencies in types of gathering spaces and perceived ownership by the respondents (figures 54 and 55), which could be a result of community-level authorization.

In NPO-led case studies, procedural justice and distributive justice had not been entirely implemented but worked as a starting point for community empowerment and successfully achieved the goals of interactional justice criterion from their activities.

In local government case studies, the least level of procedural justice had been implemented, and residents were mostly users of the spaces. Still, the existing resources increased the distributive and interactional justice possibilities and provided high-quality services (Table 19, Figure 58). In these case studies, respondents perceived the ownership of main spaces by non-community organizations (figure 55 and 56) and selected community centers as the main spaces.

4.2 Results in distributive justice: In the distributive justice criterion, physical accessibility was considered by different scholars. Giordano et al(2019) and Carmona (2010) considered the functional allocation of gathering spaces within 10 minutes of walking from houses to increase accessibility and walkability in the communities.

In this regard, residents' association cases (Aoi-Higashimatsushima and Tamauranishi-Iwanuma) had the maximum walkability results (figure 58), which might be a result of evenly distributed and well-connected gathering spaces in these case studies. Gathering spaces were established as decentralized and well-connected small

spaces evenly distributed in different areas. As a result, they are more easily accessible by walking, and holding simultaneous events is possible.

NPO-assisted cases (Massaki Ofunato, Central Yamada) were not as evenly distributed as residents' association-assisted cases. They had limited spatial possibilities but, by providing transportation and special services for minority and marginated groups of the respective communities, tried to increase accessibility and fill the gap between provided gathering spaces and demanded services.

In local government-assisted communities, primary gathering spaces were centralized and not in close contact with other gathering spaces in the areas, had less physical accessibility, provided multiple spaces and open spaces as extra functionality, and provided services to surrounding towns. Figure 60 shows the resulting diagram of distributive justice in different authorizations and cases.

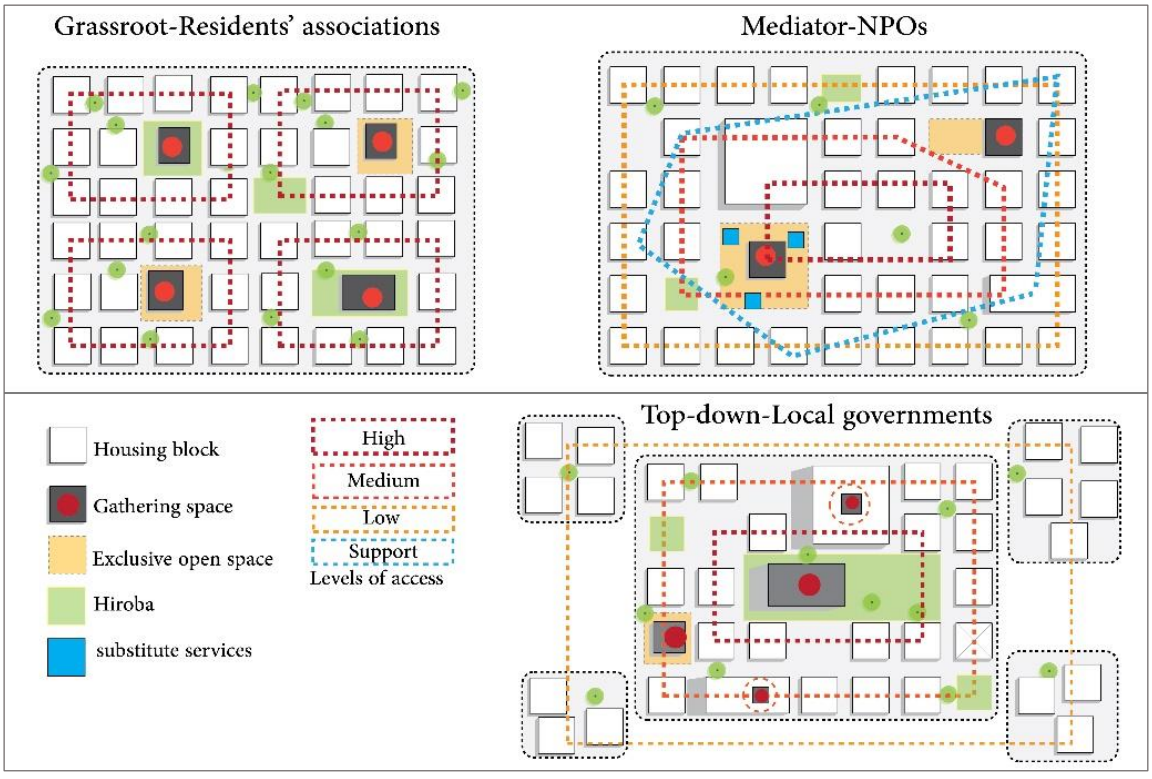

Figure 61 Diagram of distributive justice in gathering spaces provided by different authorization

4.3 Results in interactional justice: In residents' association-assisted case studies (Aoi-Higashimatsushima and Tamauranishi-Iwanuma), gathering spaces work as platforms for optional and necessary activities and provide social activities to strengthen community ties and community development among residents.

In communities with NPO-led recovery, gathering spaces are established with more consideration of community needs, including more diverse activities and flexibility in the use of spaces. These spaces provide interactional justice features responding to the community's gathering needs and compensating for residents'

unanswered demands, especially minorities (children, older residents) such as shopping spots, mental health care, and playgrounds. This provision resulted in more optional activities, especially circle activities such as hobbies and group selection gatherings (Figure 60). In local governments, the variety of activities is high; however, gathering spaces mainly provide optional activities, and community development activities are held mostly within local government bodies.

Table 21 demonstrates the summary of the findings.

Table 22 Summary of the findings, crosstabulation of criteria of justice and authorization sectors.

	Procedural justice	*Distributive justice*	*Interactional justice*
Grassroot Residents' associations	Empowered residents, maximum participation for planning and administration	multiple gathering spaces evenly distributed, good connection in between spaces, high accessibility, spaces work as a platform for optional activities and community planning	Diverse activities and high social diversity. Both community planning and optional activities
Mediator NPOs	Start of the resident's empowerment, catalyst for residents` administration	Multi-functional spaces, a substitute for the unanswered needs in the communities, spaces work as a platform for optional activities and town planning	Diverse activities and substitutes activities other than gathering purposes. Both community planning and optional activities
Top-down Local governments	Local Government in charge of most of the matters, residents mostly users	Centralized main building, high spatial possibility, and temporal accessibility, least connection with other gathering spaces, providing services to the outsiders. space working as a platform for optional activities	Providing a wide range of activities based on different needs. High social diversity for outsiders and new community members.

3. Conclusion

This paper aimed to identify how different aspects of justice vary in post-GEJET-2011 recovered gathering spaces through different types of authorization by generating a model to evaluate levels of justice criteria in gathering spaces. Also, the study reviewed selected administrative districts within municipalities and their gathering spaces as case studies to apply the evaluation model. It could be briefly concluded that the evaluation model (figure 54), findings, and implications of this paper, have relevance within a global perspective, and highlight the important factors toward the creation of post-disaster gathering places in other countries.

This chapter reviewed the case studies recovered from GEJET-2011 and evaluated the recovery of gathering spaces, but the evaluation model, findings, and implications could be reflected from a global perspective. Further, it contributes to the existing literature by establishing an evaluation model for evaluating the justice recovery of gathering spaces generated from different fields of study, such as disaster

recovery, spatial provision, community recovery, and the proposals of prior studies. Stakeholders must value the recovery of gathering spaces to achieve community recovery. Moreover, understanding the roles of different organizations in the recovery of such spaces may contribute to increased justice in disaster-affected communities. Gathering spaces might be defined as an efficient product, but this efficiency can be achieved through a long-term process of prior decision making, collaboration, participation, and spatial configurations.

The results of this study were aligned with the concerns of scholars on the importance of procedural justice and administration and organizations' impacts on achieving justice in the environments and affected communities (Hegtvedt and Johnson 2000, Grijalva 2011, Holifield et al. 2009).

The findings show that different procedural justice approaches taken into cases resulted in different degrees of distributive and interactional justice. Residents' associations reflected the residents' opinions by empowering small communities (Aoi-Higashimatsushima, Tamauranishi-Iwanuma) and could provide just gathering spaces in all three criteria. NPO-assisted cases (Massaki-Ofunato, Central Yamada), by interventions based on their expertise and experience in the recovery of gathering spaces, can be more responsive to community needs to speed up the recovery of community ties, and could provide just gathering spaces in the procedural and interactional criteria. Local government-led cases (Kesennuma-Shishiori, Machikata-Otsuchi), due to larger townships and central autonomy for their communities and surrounding areas, benefitted from systematic resources. Accordingly, these cases provided just gathering spaces with a weak achievement in procedural justice and high levels in the distributive (mainly spatial possibility) and interactional justice for insider and outsider users of the gathering spaces.

Chapter Seven: Conclusion

7.1 Conclusion

This chapter concerns the long-term outcomes of gathering space recovery in the communities affected by the Great East Japan Earthquake and Tsunami 2011, by contributing to the literature by combining different criteria of research related to space production (planning and administration, spatial configuration, users` experience), relations to social engagement factors, and levels of justly functioning recovered gathering spaces.

The results of the surveys and analysis of the research in previous chapters demonstrate that the outcomes of long-term recovery of gathering spaces after GEJET-2011 may have been more successful compared to outcomes of the long-term recovery of gathering spaces after Hanshin-Awaji earthquake in 1995. This success was achieved at the higher levels in the case studies with the active residents' association during and after the recovery process. It could be briefly suggested to consider community level authorizations such as residents' and neighborhood's association in the leading level of the recovery and benefit from their close connection with the affected people and community members.

Here is a brief report of each chapter to summarize this dissertation.

Chapter one disclosed problem and stated aims of research as:

- Identify the production of gathering spaces in post-disaster recovery scenarios,
- find the relevant factors on gathering space and community recovery,
- evaluate the spatial disaster justice regarding gathering spaces,
- combine the background studies by establishing evaluating model,
- and compare the selected GEJET-2011 affected communities regarding the above objectives.

Chapter two demonstrated the definitions and terminology used in this research and discussed thoroughly about:

1. Gathering spaces
2. Production of spaces
3. Recovery and GEJET-2011
4. Social capital, community, social engagement
5. Community participation- Machizukuri
6. Disaster environmental justice

After that, the chapter reviewed prior studies similar to this research and identified the gaps that need to be addressed.

Chapter three demonstrated the methodology, field surveys and described the situation of 8 case studies: Aoi-Higashimatsushima City, Tamauranishi-Iwanuma City, Sakamoto-Yamamoto Town, and Shishiori-Kesennuma City, in Miyagi, and Machikata-Otsuchi Town, Akahama-Otsuchi Town, Massaki-Ofunato Area, Central area of Yamada town in Iwate Prefectures of the Tohoku region. selected to be reviewed by this study.

Chapter four titled as Production of gathering spaces in post-disaster recovery scenarios, reviewed case studies from space production and citizen participation ladder point of view. Case studies were observed based on the involvement level of residents in the recovery of the area and gathering spaces and their spatial characteristics were investigated.

Chapter five, tried to complete the space-user hypothesis and thoroughly investigated the case studies based on socioeconomic characteristics. This chapter compared cases and made crosstabulations regarding age, gender, and dwelling type factors.

Chapter six, by introducing an evaluation model for just recovered gathering spaces examined cases based on their achievements in 3 criteria of justice: procedural, distributive, and interactional justice.

And finally, chapter seven (this chapter) reviews the results of each individual chapter, makes an overall conclusion, suggests for future studies and contribution to the fields of study of this dissertation.

Table 23 reviews the case studies and patterns of the recovery of gathering spaces in case studies for future suggestions of this dissertation based on the township level, recovery, and reconstruction methods, gathering spaces, gathering activities, and justice criteria.

Table 23 summary of the case studies, patterns of the recovery of gathering spaces in case studies

indicators		*Aoi Higashimatsushima/ Tamauranishi-Iwanuma*	*Shishiori-Kesennuma/ Machikata-Otsuchi*	*Central Yamada*	*Ofunato Massaki*	*Sakamoto-Yamamoto*	*Akahama-Otsuchi*
Township level		Small communities	Central town communities	Central town community	Intervention in existing community	Extension of the existing community	Independent rural community
recovery		Relocated areas to another area	Full land readjustment on the same area	Partial land readjustment	Selective relocation	Relocation merged to central part	Relocation and readjustment from seashore to mountain side
Governing		Residents' association supported by local governments	Local government Later intervention of residents's association	Local government, residents's association and Npo intervention	Mainly local government Later intervention of Npo	Mainly Local government Some intervention of NPO	Collaboration of local government and community association
Gathering space		Numerous small sizes gathering paces evenly allocated in forms of meeting places, library, and neighborhood association auhtorized, supported by the primary gathering spaces such as community centers	1-3 low functioning gathering spaces scattered in the area. One primary gathering space that provides services for both insiders and outsiders	Some small gathering spaces and a primary space community center/library supporting minorities and providing services especially for those groups	Non-functional gathering spaces provided by local government. NPO supported gathering spaces targeting elderly population and providing space for them	One existing gathering space – elderlies meeting room and a newly established community center with library and lounges	Temporary micro size kominkan and a newly built macro size gymnasium/ community center
Gathering activities		Even level of necessary, social, and optional activities for most of the members. As well as town development related activities	Mostly optional activities but giving gathering services for all ages, genders, insiders, and outsiders	Diverse activities mostly social and optional. Providing services mostly for children and elderly people	Necessary, social, and optional activities and mainly approaching empowering of elderly population.	Necessary and social activities happening in elderlies' meeting place and all other social and optional in the community center	Mostly necessary activities but social and optional activities are becoming more available in the new space
Justice criteria	Procedural	high level of procedural justice. Resident's highly empowered and in charge of gathering spaces	low level of participation and collaboration with the residents	contributing to the initial recovery participations and high level of procedural	contributing to the initial recovery participations and high level of procedural	cannot be determined since the spaces have not been investigated thoroughly	cannot be determined since the spaces have not been investigated thoroughly
	Distributive	evenly allocated and highly accessible. Smaller gathering spaces.	scattered gathering spaces. Primary gathering space provides most of the services	small spaces that are multi-functional, highly accessible	small spaces that are multi-functional providing transportation for minority groups		
	Interactional	diverse activities and high inclusion	high diversity in providing services for both insider and outsiders	highly inclusive and activities targeting minority groups	highly inclusive and activities targeting minority groups		
Overall results		best examples among case studies	not highly evaluated. Neglection of residents and their opinion	a good intervention method to provide substitutes for the oversaw demands	a good intervention method to provide substitutes for the oversaw demands		

The review of the background studies and existing literature shows the lack of coverage the scholars on this important topic. Especially when it comes to studying the

implemented case studies and learning from them. Starting the community recovery from early stages of disaster, not only improves the social capital but also the quality of recovery planning of built environments. Affected people by finding themselves in accepting, welcoming, and providing post-disaster communities, will participate more towards the recovery of the affected areas. Providing gathering spaces in shelters, temporary and permanent housing, and holding different activities, events, and meetings in such places could encourage resident's participation in building back the community.

The results may offer the conclusion that case studies with the grassroot level of governing authorization such as residents` associations and neighborhood associations which followed highest level of resident participation during recovery process may have resulted better in recovery of gathering spaces and community recovery. These cases provided the gathering spaces as a key platform for recovery since the temporary housing life period and encouraged maximum participation and empowerment of the residents in the planning of the community and gathering spaces (chapter 4). This result is aligned with the scholars' concern on the participatory recovery topic and adds emphasize on the role of grassroot level association for a successful community recovery.

The planning of gathering spaces also differed depending on the recovery initiatives. Grassroot and residents' association cases had followed the equal allocation of several small size spaces in the recovered areas with a good connection of administration with one another (chapter 4). In these cases, while the social engagement followed the gender and age tendencies of the background theory, but thanks to the high social engagement the negative aspects such as exclusion of the vulnerable members from spaces and activities were resolved (chapter 5). The final evaluation showed that in these cases, three criteria of justice (procedural, distributive, interactional) were covered in the maximum level. Residents in these case studies were empowered, engaged in administration of gathering spaces and activities and moved from the user level beneficiaries (chapter 6).

In case studies assisted by NPOs, the recovery approach had been done in collaboration between local governments, NPOs, and affected people. In these cases, minority groups of the residents that might not be seen by the initial recovery planning were paid attention to and provided gathering spaces. Based on the limited infrastructure and budget, allocation of gathering spaces in these cases followed single multi-functional building perspective but added to accessibility by being in center of the town, near main transportation hub, or providing transportation from far distances (chapter 4). Level of social engagement and effectiveness of gathering spaces and recovery on these cases, was high. Especially being in good contact with the residents of

public housing, and approaching vulnerable groups such as children, elderly population and women maximized chances of benefiting from such spaces. The final evaluation based on the justice model showed that these cases had a high level of procedural justice and could be start point of community empowerment. While the distributive justice did not have the best evaluation, it reflects the limited resources that NPOs have and increasing them could help the targeting groups. In the interactional justice, NPO assisted cases provided both gathering and non-gathering activities and services and worked as substitute for the unseen demands of the residents.

In the other hand, in cases studies with the top-down level of governing authorizations such as local government, affected people participated in the recovery process less effective and later than another group. In these cases, residents were mostly informed about the decision and did not reflect their opinion directly and effectively during planning process. In the recovered areas, gathering spaces were allocated less equally, and the main gathering spaces were centralized near public housing sites. These gathering spaces covered diversified spaces and were neighbored with large-scale open spaces (chapter 4). While social engagement in these cases fell into to background theory and the existing biases and separations between different groups were seen in the survey results. But the allocation of gathering spaces near public housing, these residents had a good level of accessibility to the spaces and activities and did not fall into negative aspects concerned by other scholars (chapter 5).

The results of the evaluation in justice criteria in these cases showed that a low level of coverage in the procedural justice, and higher level in distributive and interactional. But the low coverage of procedural justice in the planning process might have resulted in the authorizing residents as user of the spaces and not being empowered for administration, planning, decision making prepared for future calamities (chapter 6)

Based on the results from chapter 6 residents' associations are assisted case studies achieved the highest level of evaluation of justice in gathering space, while local government led cases had the lowest level of evaluation. Author suggest collaboration of different 3 organizations and authorization by considering the township level of such cases and the responsibility of local governments in providing services for both inner community members and surrounding communities and the results of distributive justice in the chapter 6.

Figure 61 demonstrates simplified findings and conclusion of the research based on different chapters.

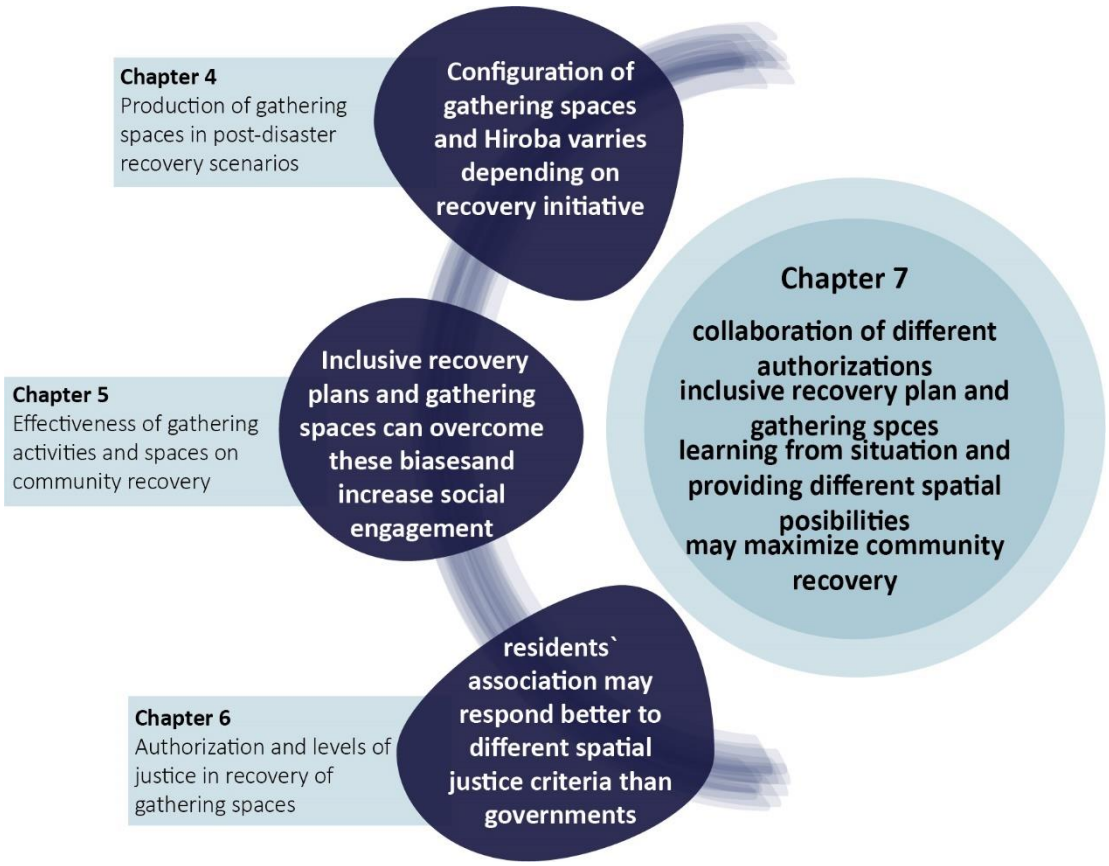

Figure 62 simplified findings and conclusion

7.1.2 Proposal for future gathering space and community recovery

Some key points could be pointed out after reviewing the results of the investigations through different chapters of this dissertation.

The results of gathering spaces in different communities, varied depending on the level of administration and authorization in each case study, but it as also impacted by the size of the communities.

In small size communities that had independent administration and active and more effective residents' associations, gathering spaces had better results in serving the members and helping community recovery.

In other medium size cases, where the resident's association or governments could not recover quickly after the disaster, or the affected people were neglected or unseen by the local governments or residents' associations the role of NPOs had an important impact on the recovery. In these cases, NPOs worked as a catalyzer to promote affected people and re-establish the residents' associations. These NPOs targeted the minority groups, helped recover the administration and worked as starting point for empowerment of the communities. Though, it should be mentioned that in local communities where the social capita and community ties are very close, entering an outsider NPO as the main autonomy might not be the easiest strategy to tackle the

problems. Instead, collaboration between NPOs and re-established residents' associations can speed up the process.

In medium to large scale communities, the local governments were the main body of administration and authorizations and gathering spaces were directly provided from local government's effort and resources. Also, residents' associations were not a significant autonomy for providing such services. In these cases, gathering spaces were provided as a functional building but did not serve the members and did not promote community recovery effectively.

Following, the suggestions for different size of communities and different administration levels are made.

Figure 62, shows the small communities with functional residents' associations. In these cases, the presence of residents' association and familiarity with the locals could help identify characteristics regarding geography, sociology and gathering activities that are related to the social capital. Also, this closeness between residents' association and community helps maximize the community participations for the recovery process.

As results of this high-level participation and reflection of opinions, the provision of gathering spaces will be highly effective, accessible and inclusive.

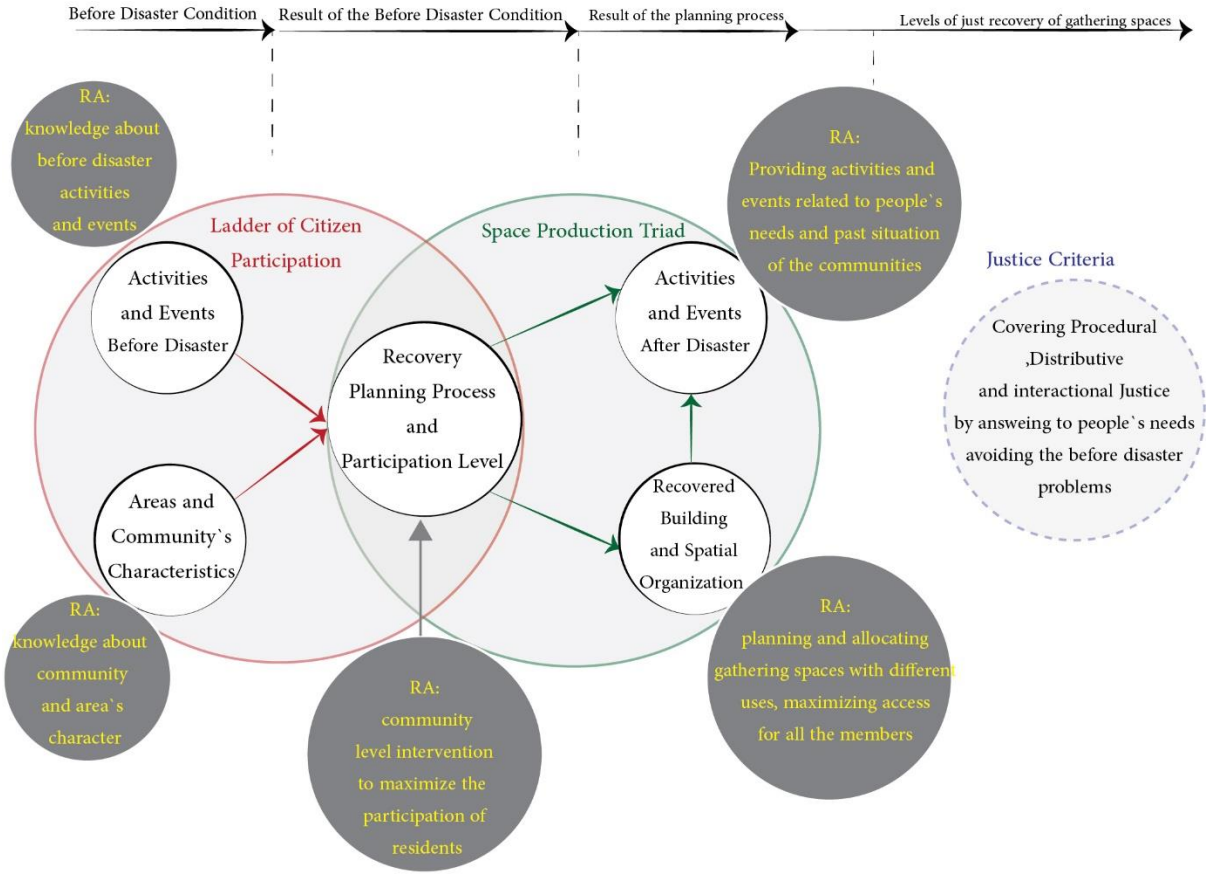

Figure 63 proposal for recovery of gathering spaces in small communities

On the other hands, in small or medium size communities that the residents' associations are not as effective or have been highly damaged by the disaster, the NPOs can be very helpful. Considering the tightness of social capital and exclusion of outsiders on such communities, it is suggested that NPOs do not intervene directly. In that case, NPOs can start helping the affected people by helping in micro issues, and just have a presence in the area. Next, NPOs can catalyze the community and help re-establishing the residents' associations and mostly work as consultant. Decision making regarding the provision of gathering spaces in this level should completely come from the community and NPOs can give only advices to develop the situation and points out the minority groups. After this level, the trust between community and NPO is built and now the NPO can have deeper intervention into the communities. Figure 63 shows this proposal.

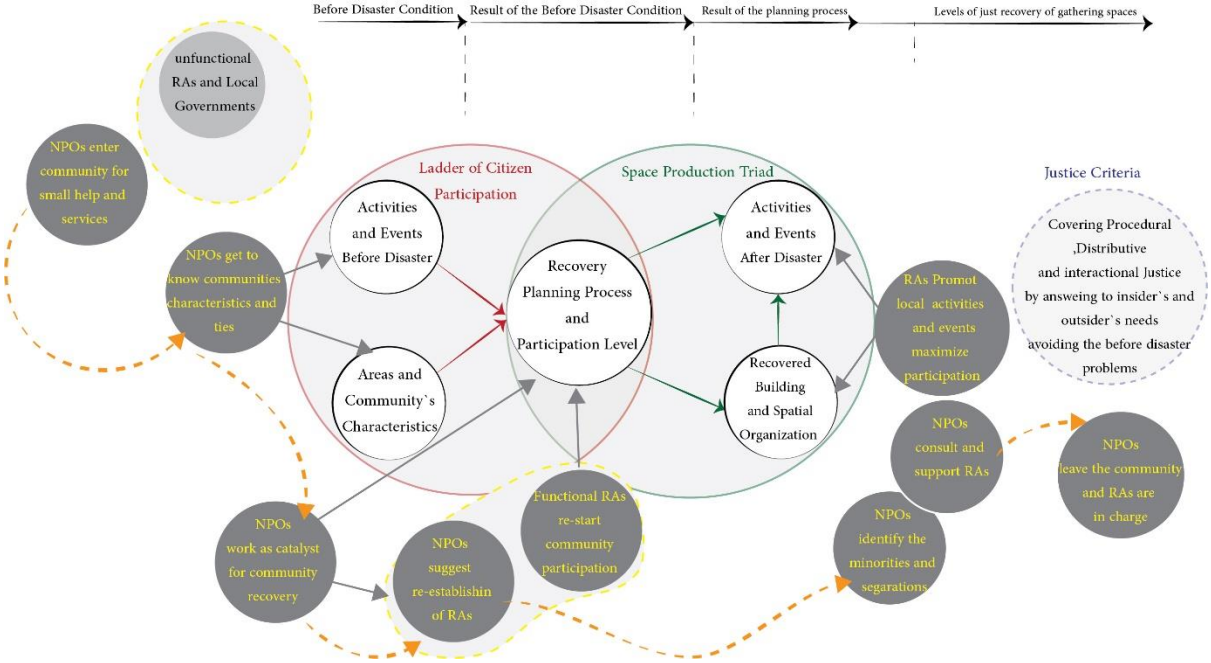

Figure 64 proposal for recovery of gathering spaces with help of NPOs

Last cases are medium size communities with central autonomy for community and surrounding communities. In these cases, the local governments are in charge of macro and micro services and it can affect the functionality of gathering spaces and services for the residents. These cases are suggested to allocate neighborhood level residents' associations distributed in the community and be in contact with them as well as surrounding communities' representatives.

This neighborhood level allocation of residents' associations helps to build connections between residents and the governments. In these cases, author recommend to provide small scale gathering spaces for each association regarding the community level meetings and participations and follow their demands for the small-scale

gathering spaces. NPOs can also enter the community, identify inequalities and separations in providing services and advice the representatives. For providing the centralized gathering space, local governments can collaborate with NPOs as consultant and residents' associations representatives to identify the needs and opinions. Provision of small-scale community gathering spaces working together with centralized gathering space promotes accessibility and inclusivity to gathering spaces. Figure shows the proposal.

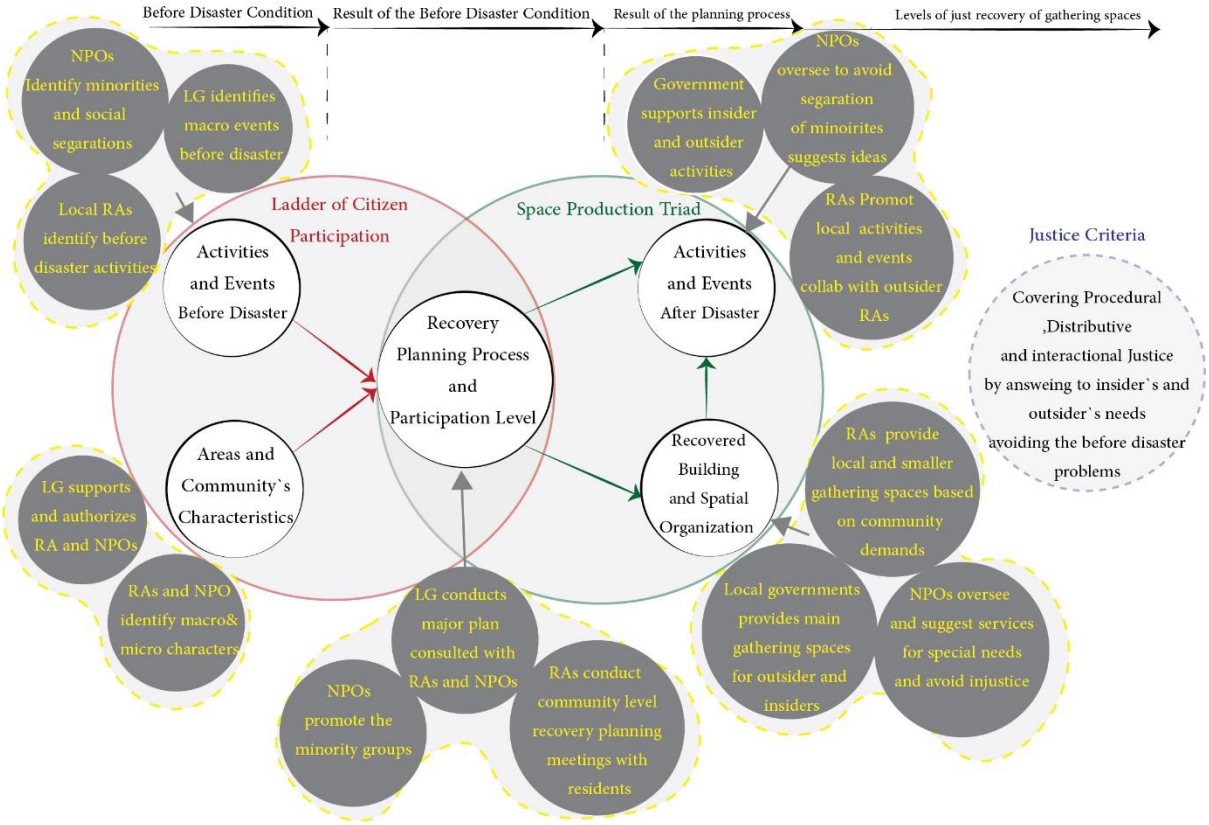

Figure 65 proposal for recovery of gathering spaces in central autonomy communities

7.2 contributions

This research by conducting a comparative study consisting of different case studies tries to fill the gap in the existing literature. Different scenarios of recovery and their special initiatives help to consider better approaches toward recovery plans in the future disaster situation. It could be concluded that pre-disaster preparation of communities for such events is the key to rebuild the social capital as soon and as strong as possible. Community-driven recovery approaches also have an important impact of strengthening community bonds and rebuilding a disaster affected community towards resiliency and empowerment. Avoidance of discrimination in any level and considering inclusive approaches toward recovery of built environment would

also lead to the inclusiveness in community and maximizing just benefits of such spaces for residents.

This research contributes to the field of disaster recovery by covering multiple fields of study in disaster recovery, community recovery and social engagement, planning and design process, and environmental justice and reflecting the hypothesis on the scenarios in a long-term examination of practiced case studies. This research successfully could identify different scenarios of disaster recovery among selected case studies from GEJET-2011 affected areas, review the recovery of gathering spaces and find connections with community recovery. This research by comparing spaces and their role in the cases studies could reflect the important of gathering spaces and the importance of the way gathering spaces are produced in affected communities. As a result, by evaluating cases regarding environmental justice and their connections to gathering spaces, the research successfully emphasized the concerns of the theories on the topic in the practiced cases.

7.3 suggestions

Diversity in providing gathering spaces, activities, and use of spaces, will increase the sense of belonging in communities, and pace of community recovery, decrease exclusion of different groups of people and neglection of minorities in the involvements and considerations. There are unavoidable differences and separations in societies, in Japan, similar to other traditional gender-based communities, female and male residents tend to behave differently in communities. This research does ignore the differences, but indeed attempts to accept the current differences, and in order to achieve an inclusive community suggest to provide special gathering possibilities as well as mutual spaces and possibilities for different groups to attend and get together.

Considering results of this study, the author suggests conduct of similar studies for the international cases to evaluate performance of different authorizations in enabling communities in gathering spaces. There is need for understanding the application of justice in global cases and establish a more accurate model of evaluation by examining different cases and establish a system for provision of just gathering spaces in affected communities.

7.4 limitations

A long time has passed since GEJET-2011, and many residents did not wish to participate in the surveys. In addition, studying cases that did not consider gathering space in their recovery plan can provide better results regarding the hypothesis of this research because this study only reviewed cases that successfully provided gathering spaces in the recovery plan.

The result cannot conclude whether the gender-basics of participating in activities have become less biased after disaster or not, but it can imply that the gender-based tendencies have changed after disaster. While this research emphasis considering diversified gathering activities and spaces and increasing inclusivity and accessibility in such services, farther research is needed to emphasize on gender on community and gathering activities participations based on a longitudinal method.

Also, in Japanese societies, shrines are one of the important spaces for traditional events and ceremonies during the year regardless of religions, but recovery of shrines is not part of the recovery framework and the only private religious institutes attempt to provide recovery of shrines after disaster. But this construction can be very costly and will make it impossible to recover such spaces. Lack of shrines can have impact on recovery of traditional and cultural gatherings and ceremonies in such affected areas. This research does not focus on recovery of shrines and temples but such a research is needed to clarify the situation. The result of this survey might be impacted by the age of the respondents which are mostly 50 years and older. To clarify the better situation and need for the gathering spaces in the affected communities there is a need to conduct the research among younger individuals as well.

Also, due to Covid-19 Pandemic and travel restrictions, the surveys of this research have face difficulties for visiting case studies and conducting further site visits and interviews. Where the technology related infrastructures were possible the interviews were conducted remotely through Zoom application, but in some rural areas, the infrastructure and knowledge of the community members and leaders were not sufficient for conducting such interviews.

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