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Translated Paper

Study on restoration and sharing method on town space in devastated area

The workshop with 1/500 restoration model of Machikata area in Otsuchi town, Iwate prefecture

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Abstract

After the tsunami of the Great East Japan Earthquake, various projects have been pushed forward for early restoration while they do not necessarily restore former townscapes which were entirely transformed. Some local people are worried about losing their memories of hometown in course of recovery. This essay examines, how they could retrieve and transmit memories of their lost towns to next generations through the workshops to build 1:500 restoration models on the central districts (Machikata area) at Otsuchi town in Iwate prefecture. The result enables us to explore memories of town space and means to share and utilize them.

Keywords

memory, restoration model, the Great East Japan Earthquake, workshop

1. Introduction

The purpose of this paper is to establish a method for reconstructing the regional space formed and shared by the people living in the land, including qualitative features, and revealing it as information on spatial resources for the regeneration of the local community, by collecting memories of the town before the disaster in an area where the area was severely damaged by the Great East Japan Earthquake and was forced to undergo a large-scale transformation. After we present a method of collecting memories of places from disaster victims using a restored model that reproduced the city before the disaster at a scale of 1/500, organize and classify the testimonies of memories about the pre-earthquake district obtained through the resident participation type WS held for Machikata district in Otsuchi town, Iwate Prefecture. By analyzing the testimonies together with the composition of the regional space, it is shown that the rich characteristics of the regional space

shared by the residents before the disaster can be visualized, and through this method, we could consider the reproducibility of the unique spatial foundation for inheriting the community in the situation where the city space is physically lost.

On March 11, 2011, many towns and villages along the coast of eastern Japan were severely damaged by the Great East Japan Earthquake. As broadcasted on TV and newspapers in those days, the tsunami wiped out houses, and many areas were completely devastated. However, it is not only the built environment lost due to the earthquake but the memory of towns closely related to the place and space is also being lost over time.

Immediately after the disaster, the authors called for wide-spread participation through the reconstruction support network <Archi-Aid> by architects and architectural design teachers nationwide, and have been continuously promoting the <“Lost Homes Project” model restoration project> to produce models restoring the pre-disaster cityscape of the heavily damaged



area at a scale of 1/500. In addition, we also developed a method to record the memory of the city in the memory of people on the model by conducting a coloring-interactive WS with the residents using the model we made.^{1,2} By December 2013, a total of 17 WSs were held in the disaster areas of Iwate, Miyagi, and Fukushima prefectures, and they have received a great deal of feedback in each region (Figure 1) [Note 1].

Through the community-based WS, it became clear that each of the residents who were forced to change their environment as a victim of the disaster has a memory of the local space where they have lived with attachment for many years. In WS, memories with places are evoked, and while pointing to the places in the model, we talk about memories of life, memories of landscapes, festivals and customs one after another, and sometimes there are memories that are evoked from memories between WS participants. Individual memories are sometimes considered to be trivial and ignored, but the location and distribution of a set of individual memories in the space on the model reveal the characteristics of that place. Some of these characteristics are not clearly stated, such as local performing arts and regional history, but we can see the unique spatiality shared by the inhabitants and the local community. We believe that these characteristics will be a very valuable spatial resource for the local community in order to revitalize the local community after buildings and towns were newly constructed in the area.

2. Related Literature and Studies

Several studies on community design and residents' participation in local cities exist. An action research evaluates the entire process of voluntary rule-making process community management.³ The effectiveness of image types is clarified for sharing the goal images of views in community design.⁴ In the context of the landscape formation workshop, 3D models are compared to VR (Virtual Reality) technology as image-sharing support tools.⁵ Nowadays, participatory development is much employed in town development and landscape planning. It seeks to engage residents and users in the plan to share various problems of the target area. One of the successful examples of the community participation is the Vision Santa Cruz, which is the reconstruction plan of the city center of Santa Cruz, a suburb of San Francisco, devastated by the 1989 Loma Prieta earthquake in California, USA.⁶ Known as "story restoration",



FIGURE 1. Workshop in Otsuchi town

the plan is noted that knowledge-based experiences of affected communities were well-integrated directly into the local reconstruction plan. The Community Vision was formulated through a process in which local residents and experts openly discussed and evaluated a future perspective. In Otsuchi town, the entire city center was damaged and there are few flat areas, so 4149 people, more than 1/4 of the total population of the town, are still living in 48 units of temporary housing, and it is not easy to share one vision for reconstruction.

In this paper, I think that the space of the city before the disaster may be one of the standards for each inhabitant, and reconstruct the detailed appearance of the local space as much as possible. The source is the memory of the inhabitants.

3. About Machikata District of Otsuchi Town

Otsuchi town, Iwate Prefecture, is located on the Sanriku coast facing the Pacific Ocean. A region rich in nature surrounded by mountains and the sea on all sides, it is expanded with the fishing industry, whose main port is Otsuchi fishing port facing Otsuchi Bay. Machikata district, the center of Otsuchi town with a population of 4483 people before the disaster, is on the alluvial plain around the mouths of the Otsuchigawa River and the Kozuchigawa River that flow around Shiroyama. Not only the residential area but the urban function of the town were centered in this area: municipal offices, schools, clinics, and shopping areas. At the time of the disaster, the tsunami wiped out most of this area and left devastating damage (Figure 2). The 3878 houses were completely destroyed and the urban amenities of the town were lost. Above all, the loss of the municipal office paralyzed administrative functions and delayed the restoration of the affected area. Currently, a reconstruction project is underway and urban functions are concentrated in an inland area. A huge seawall (14.5 m high) and a floodgate were constructed at the mouth of the river and levee heights were raised over the wide area of the plain. The foundations of houses and buildings were removed and the trace of the old cityscape are being lost.

4. Methodology

4.1 1:500 scale model

Before a series of workshops, we prepare a white 1:500 scale restoration model of local areas before the earthquake, using to maps and aerial photographs. In the case of Machikata district, we made a 3 × 3 m restoration model of entire Machikata district (Figures 3 and 4). The advantage of the 1:500 scale is that you can see the lost town as a whole. The model gives the



FIGURE 2. Machikata district after the earthquake



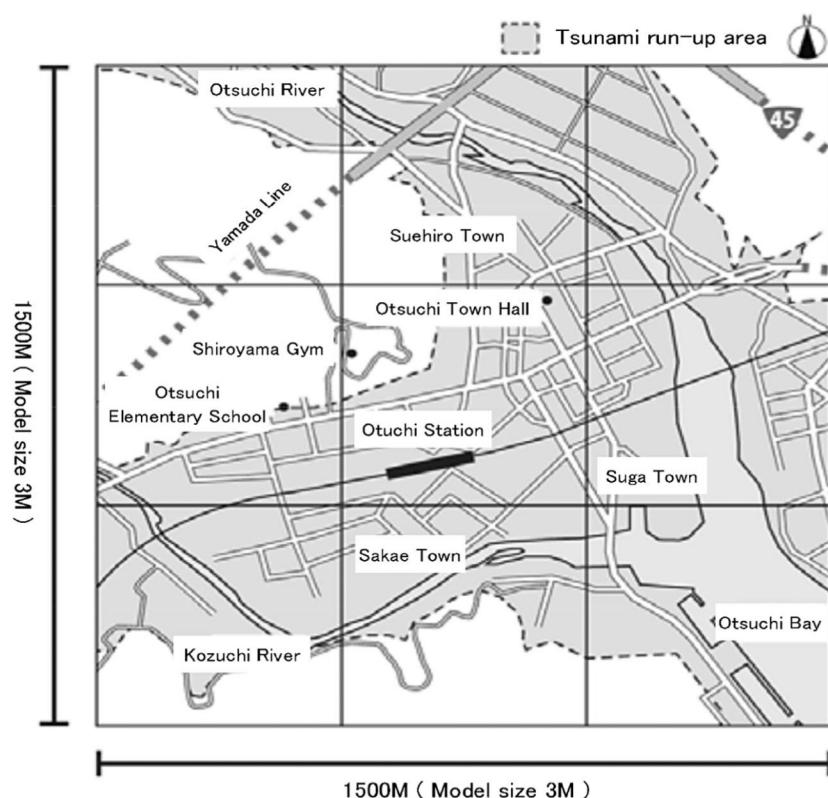


FIGURE 3. The area of model



FIGURE 4. 1:500 scale restoration model before a series of workshops

bird's-eye view of the lost town, and, at the same time, the "pedestrian's eye" into the street. The residents can recognize their lost houses and recall the townscape due to the size of houses [Note 2].

4.2 The workshop

The workshop focuses on collecting testimonies through coloring the white model and having a dialog with local people [Note 3]. We display the restoration model on a local venue for several days. The local residents who are interested in the workshop come to the venue and look at the model freely. We do not select the witnesses in advance. Members of the model-making group stand around the model at the venue and talk to the visitors to

make a casual dialog. The staff starts with simple questions such as "Where was your house on this model?" and "Please tell me your favorite place on the model" and encourages the visitors to talk freely and informally. When the visitors respond something, the staff writes down the words [Note 4].

During the workshop days, the visitors are invited to participate in painting the white model at the venue. More stories about the region and the disaster can be told at the time of collaborative activities (Figure 5) [Note 5].

Among the testimonies, the names of buildings and relatively short memories such as "there was a spring" are written on a small "flag". The visitors can put the flags as many as they want on the surface of the model (Figure 6). These flags reveal invisible memories of the lost town due to the disaster. Through the process, the visitors relate the restored model with their spatial experiences and memories [Note 6].

The more the visitors relate their memories with the model, the more they can recall their memories about the town and start to talk about their feelings after the disaster. We record their remarks on a special sheet called a "Tweet Sheet" (Figure 7). Their remarks are various and not treated as responses for a specified questionnaire suitable for objective evaluation. We regard these remarks as useful analysis targets in evaluating spatial memory in that they are made after the calibration of spatial cognition of each urban space on the same restoration model (Figure 8).

5. Result

5.1 Coloring workshop

We held a restoration model workshop "Memory Town Workshop in Otsuchi Town" in Otsuchi town from May 13 to 19,



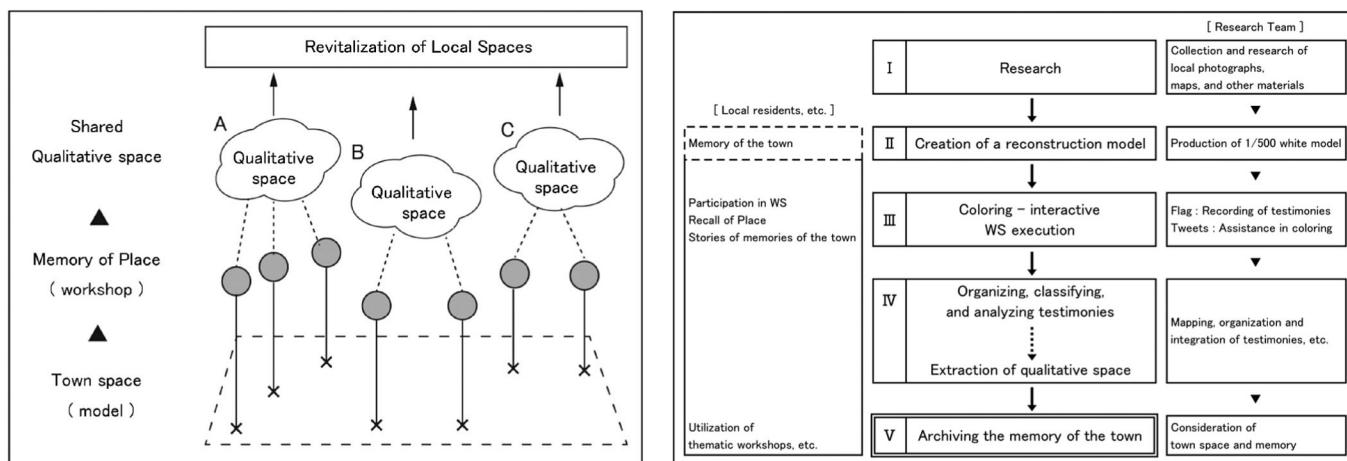


FIGURE 5. Image of community space regeneration through memory of place/flow of constructing a memory archive



FIGURE 6. The model and "Flag"

2013, and total of 810 individuals came during the period [Note 7]. It accounts for 18% of the population of 4483 people in Machikata district before the disaster [Note 8], though not all the visitors were native to the area. Table 1 shows the number of the visitors, tweet witnesses, and the staff members who received the visitors each day. The attributes of some visitors are unknown for they stayed a very short time at the venue. As a reference value, Table 1 indicates the number of tweets

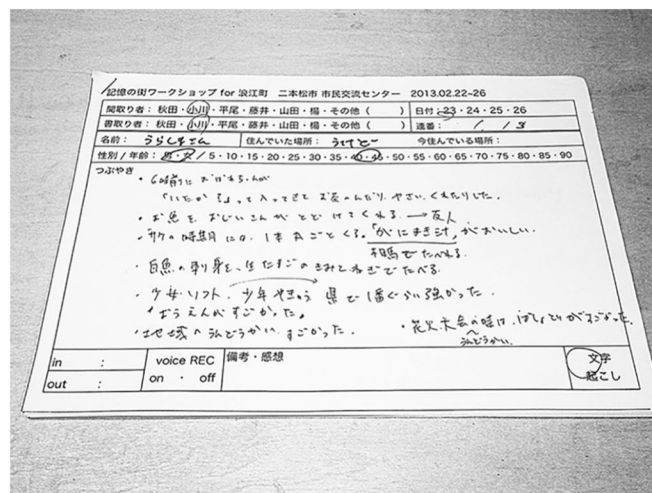


FIGURE 7. "Tweet Sheet"



FIGURE 8. 1:500 scale restoration model of local areas after a series of workshops

by age group and sex. 60% of the total was in their 50 and 80s and slightly more female visitors took part in the workshop than male visitors. 2171 pieces of flags were put on the

TABLE 1. Outline of restoration model WS in Otsuchi town

Date	The visitors	Tweet witnesses	Staff
May 13, 2013 (Mon)	41	25	13
May 14, 2013 (Tue)	74	44	13
May 15, 2013 (Wed)	84	29	13
May 16, 2013 (Thu)	101	21	13
May 17, 2013 (Fri)	152	58	8
May 18, 2013 (Sat)	154	28	9
May 19, 2013 (Sun)	204	36	9
Total	810	241	—

3 × 3 m model. Among the visitors, 241 individuals gave 611 testimonies (Figure 9).

5.2 Questionnaire survey

After the days of the workshop, we displayed the result of the workshop at the Otsuchi Town Central Community Center and total of 901 visitors came to the venue in three days. At that time, we conducted a questionnaire survey with the visitors:

1. What do you think about the scale of the restored model?
2. From which angle do you like to look at the model?
3. Which part of the model made you remember your memory?

Some visitors looked at the model “from a distance” for grasping the entire city (20 out of 49 individuals) and others “from the place where the letters written on the flag can be seen” (15 out of 49 individuals) (Table 2). There was a lot of reaction to looking at the townscape from different perspectives such as bird’s eye and the pedestrian’s eye (Tables 2 and 3).

6. Discussion

6.1 Mapping of flags

The visitors of the workshop are engaged in the process of the workshop: (1) ask the correction of the model, (2) put a flag on the model, (3) give testimonies, and (4) paint the model. During the workshop at Otsuchi town, most of the participants took part in (2).

Simple questions from the staff such as “Where is your house?” or “Please tell me your memorable place” often motivate the participants to concentrate their attention on the

TABLE 2. Questionnaire respondents and attributes

Gender									
Male	Female	No answer							
15	30	4							
Age									
Under 10s	10s	20s	30s	40s	50s	60s	70s and over	No answer	
0	1	5	9	6	5	14	8	1	

model. From the idea that the restored model is substitute for the lost town, we consider that to talk about the rich daily life before the disaster is meaningful as grief work and questions and answers are not controlled at any stage at the workshop. As a result, contents written on the flags become diverse. We

TABLE 3. Results of questionnaire responses

No.	Questionnaire response	Results
1. What do you think about the scale of the restored model?		
1	More extensive as the house can be smaller	24% (12/49)
2	Larger houses, one by one, in a smaller area	12% (8/49)
3	Just the right size for the model we have now	64% (31/49)
2. From which angle do you like to look at the model? (Multiple answers are acceptable)		
1	From a distance for grasping the entire city	41% (20/49)
2	From a little closer to the roof, where you can see the color of the roof	16% (8/49)
3	From the place where the letters written on the flap can be seen	31% (15/49)
4	Peek into the alley from the side	20% (10/49)
5	Others	0% (0/49)
3. Which part of the model made you remember your memory? (Multiple answers are acceptable)		
1	Shape of house	33% (16/49)
2	Color of roof	20% (10/49)
3	Road	39% (19/49)
4	Words on the flag	24% (12/49)
5	Station landmark	20% (10/49)
6	Scenes of festivals and other events	6% (3/49)
7	Mountains, oceans, rivers, and trees	16% (8/49)
8	The entire city	49% (24/49)
9	Other	8% (4/49)

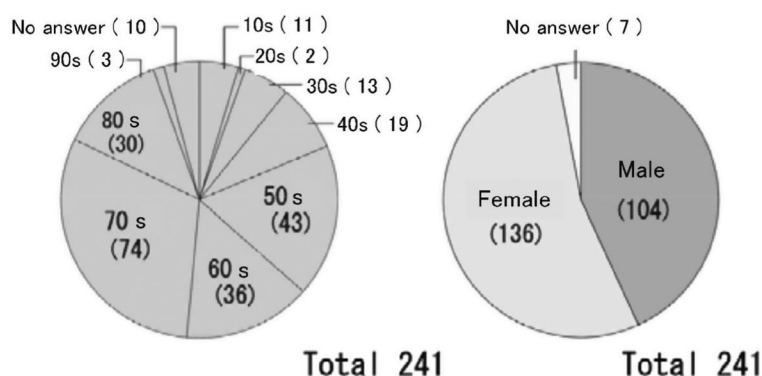
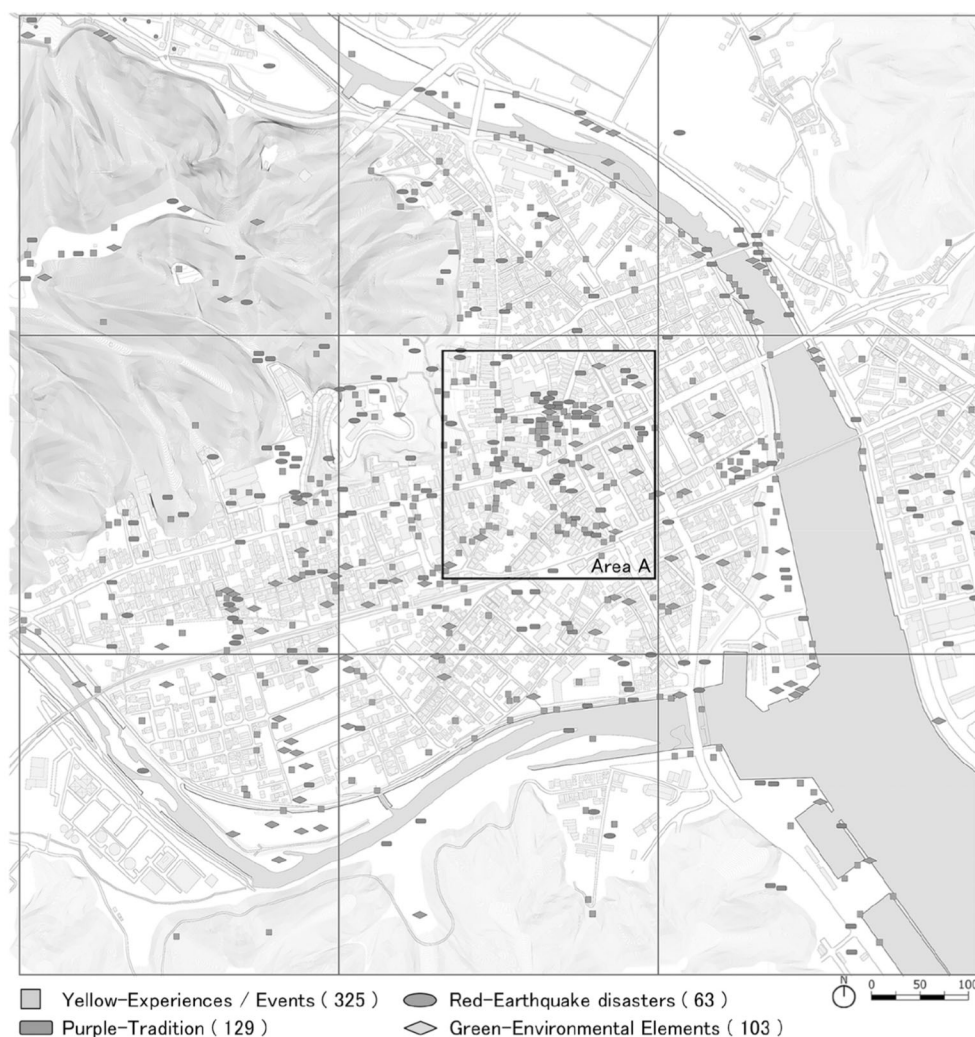
**FIGURE 9.** “Tweet” respondents and attributes (49 persons)

TABLE 4. Classification of “Flag”, examples of description, number of flags

Flag color and category	Type of description	Examples of descriptions	Pieces of flags
Blue-Name	Facility name, store name, company name, store name, residence, place name, etc.	<ul style="list-style-type: none"> Someone's House Nakazato Fresh Fish Store Otsuchi Bridge, etc. 	1551
Red-Earthquake disasters	Evacuation conditions at the time of a major tsunami attack, experiences during evacuation, etc.	<ul style="list-style-type: none"> The wave came here We took shelter in a community center Moved along the roof, etc. 	63
Yellow-Experiences/Events	Experiential descriptions and descriptions about the location, etc.	<ul style="list-style-type: none"> Stopping salmon with nets in the fall We had parties under the blue sky We went to pick stag beetles, etc. 	325
Purple-Tradition	Old local traditions, memories associated with the place, etc.	<ul style="list-style-type: none"> The portable shrine entered the water during the Ando Festival A road that has existed since the Edo period Once a castle town, etc. 	129
Green-Environmental Elements	Description of the natural environment, including local flora and fauna, topography and climate	<ul style="list-style-type: none"> There was spring water There were many creatures in the wetlands The young fish were going to the sea with their backs to the sea, etc. 	103
Total			2171

**FIGURE 10.** “Flag Red, Yellow, Purple, Green” distribution map

divided these contents into 5 colors at the time of the workshop (Table 4).

Among the 2171 pieces of flags in total, the majority was “Blue-Name” flags. 1551 pieces of the blue flags account for about 70% of the total. Since there were 1520 households in the 7 towns of the Machikata district before the earthquake, the 3×3 m model is almost filled up with the blue memory flags. Other flags include 325 pieces of “Yellow-Experiences/Events”, followed by “Purple-Tradition” and “Green-Environmental Elements”. We consider that there are relatively smaller number of “Red-Earthquake disasters” because of the model for old landscape and their strong attachment to their town. In other words, they had a lot of things to talk about their hometown.

Figure 10 shows the distribution diagram of 620 pieces of flags in 3 colors: Yellow, Green, and Red flags. We did not include Blue flags in the Figure because they were too many in number. These flags are omnipresent over the entire area. The most packed area is the city center from JR Otsuchi Station to Oshacchi area (Area A in the Figure). Near the Otsuchiobashi Bridge, the flags stand densely along the both banks of the Otsuchigawa river, which is the outer edge of the city.

Figure 12 is the distribution diagram of the Blue-Name flags. We find that the flags put on the spots where buildings were remembered to stand cover densely the town area on the model. If we change the scale of the model and the duration of the workshop, the number of flags will not naturally be the same. We assume that these flags show the memories of the townscape evenly plotted on the 1:500 model. In Figure 11, we sort out the Blue flags by building use and Table 5 shows the descriptive statistics for analytic sample by building use. Two-thirds of the blue flags have names of occupants before the disaster are indicated like a nameplate. Store names and public facility names are indicated in some of other blue flags. The number of blue flags which seamlessly covering the model shows that 810 individuals keep the spatial memory of entire Machikata district and the attachment to the old townscape which is being lost (Figure 12).

6.2 Mapping of the tweets

We begin our analysis by examining how the image of the town is reconstructed in a group of words spoken by individuals at the workshop when they are looking at a scale model and recalling the old space in their memories. The staff writes down the words which the individuals freely pronounce when they are putting the flags on the model. For we did not make any fixed questionnaire for the workshop, responses of the

TABLE 5. Breakdown detail of “Flag Blue”

Category	Name	Pieces of flags	Subtotal
Residential facility	Private house	993	1070
	Garden	3	
	Dog house	2	
	Apartment	61	
	House for rent	5	
	Empty house	6	
Business related facility	Store	233	325
	Hotel	8	
	Office	27	
	Factory	26	
	Warehouse	29	
	Animal shelter	2	
Public space	Schools	6	137
	Medical facilities	17	
	Temples, etc.	17	
	Public facilities	42	
	Parks, etc.	15	
	Parking lots	10	
	Public property	25	
	Road	5	
	Name of town/name of place	14	
Others	Uncategorized	5	19
	Total		1551

individuals become diverse. For instance, one simply says “It’s nostalgic!”, while other expresses his/her complaints about a reconstruction project, which is common among the residents living in temporary housing, or mourns for the deceased family. We examine all of their “tweets” and divide them according to places which they mentioned. We define “Group A” which does not have geographic specification and “Group B” which shows specific locations. Group A counts 139 tweets while Group B does 387 (Figure 13). We locate these 387 tweets in Group B on the map of the town. Specific locations can be the index when we search the memories of the city with the flags from the model. Some tweets in Group B indicate specific geographic points on the map while others indicate neighborhoods such as “Nokogiri Town” or roughly “this around.” Figure 14 shows the plot data of Group B on top of the geographic map.

7. Analysis of Memory of Place

7.1 Conditions of memory collected

Chapter 6 showed how to classify and organize the “flags” and “tweets” collected by the residents’ participation type WS. During the 7-day WS period, 810 visitors set up a total of 2171 “flags” on a 1.5 km square (225 ha) restoration model of the town area, and 611 “tweets” were spoken. Although it is a huge amount of testimonies, before analyzing the testimonies together with the space of the city, the conditions common to “flag” and “tweet” are listed below.

- [1] Each is a testimony that originates from the memory of each individual
- [2] What the WS staff has recorded
- [3] Being able to talk to WS staff

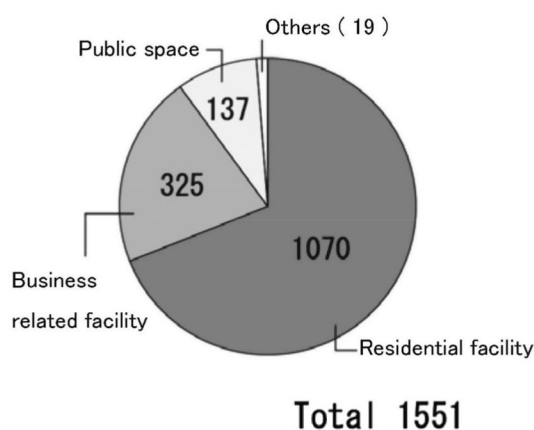


FIGURE 11. Breakdown of “Flag Blue”



FIGURE 12. "Flag Blue" distribution map

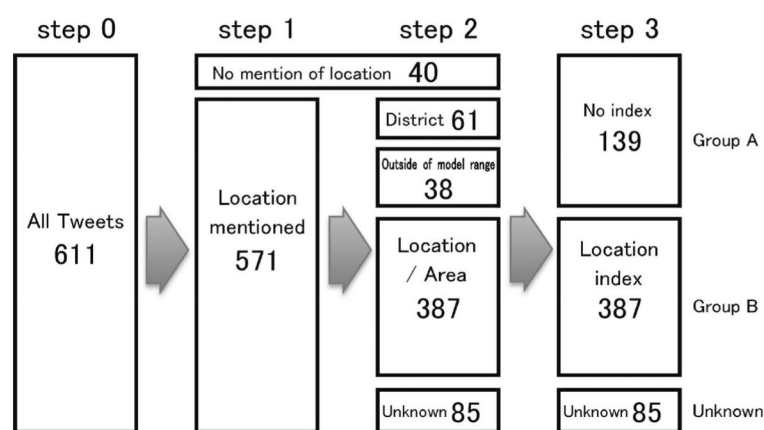


FIGURE 13. Classification of "Tweets" by location reference

[1] and [2] relate to the reliability of individual testimony data contents. As for the condition of [1], since the question items are not strictly determined except for the setting of listening to the story in front of the model, the content of the testimonies as a whole is not uniform. Moreover, since the

content is subjective, it cannot be said that it is suitable for directly totaling the content of testimonies. Similarly, the condition of [2] is that it is difficult to unify the accuracy of hearing among WS staff because multiple WS staff respond to visitors at the same time at the WS venue where the model



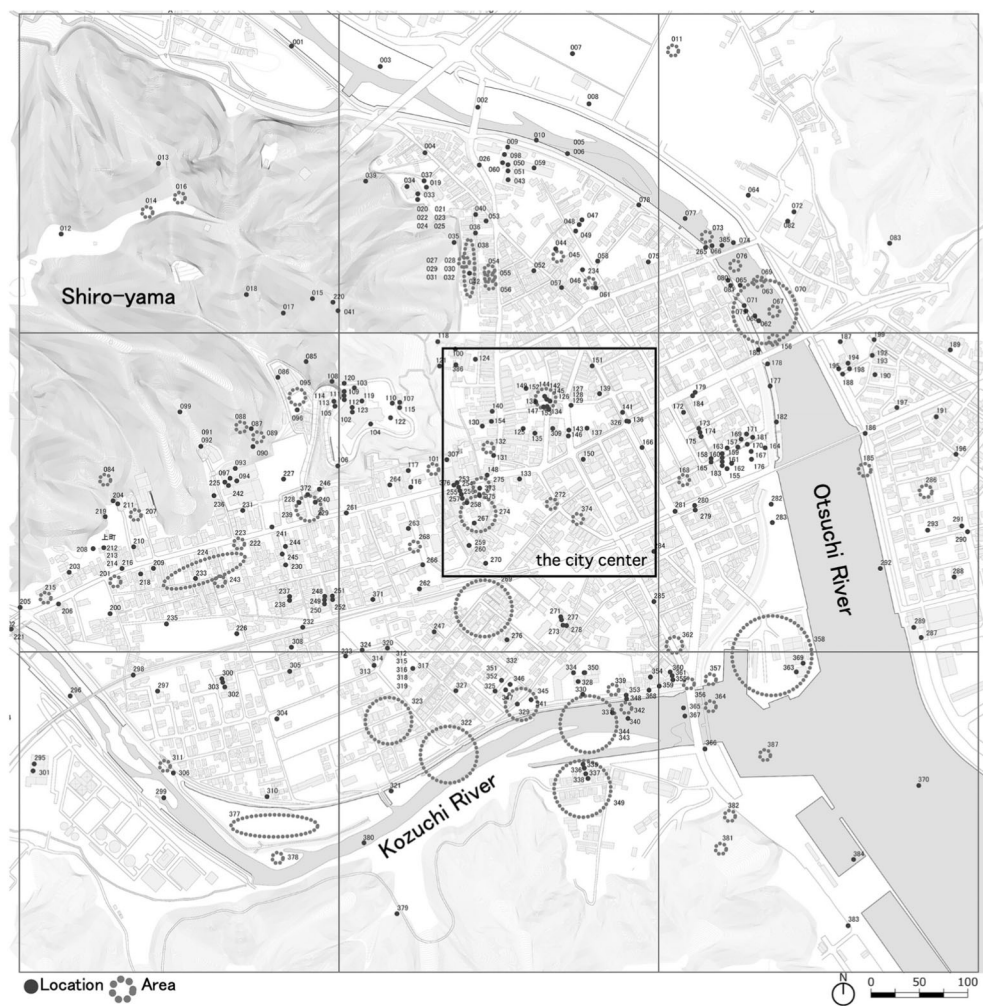


FIGURE 14. “Tweet” group B plot diagram

Area	Flag Color					Total	Tweets
	Blue	Red	Yellow	Purple	Green		
Whole area	1551	63	325	129	103	2171	611
The center of the town	341	12	80	30	16	479	55

FIGURE 15. The city center, “Flag” distribution map

was exhibited. Regarding the condition of [3], since WS has a form of coloring-interactive, the relationship between the residents who are visitors and the WS staff (students who made the restoration model) affects the content of the testimonies. The majority of the memories are “outward” that can be said. In addition, there is little evidence to directly compare and analyze individual contents.

On the other hand, adding the distribution of testimonies to the evaluation, noting that both the “flag” and the “tweet” (group B) are plotted at specific locations on the restored model, creates value for density and arrangement. It is different from the value of the testimony alone. In the simplest terms, where many “flags” and “tweets” are concentrated and where they are dense, it indicates that many people are talking about this place. From the collection of memories of the place,

it is easy to find the characteristics shared in the place. Therefore, taking the central city area where the testimonies are most concentrated among the restored models produced by WS this time as an example, the characteristics of the space are read from the relationship between the testimonies and the spatial arrangement. In the central city area (318 m east–west, 352 m north–south) shown in Figure 14, the number of “flags” is 22% of the total and the number of tweets is 9%. This place is where the “flags” are concentrated (Figure 15).

7.2 Springs and “Oshachi”

It is known that Machikata district is close to the sea while rich springs are formed in the alluvial fan at the foot of Shiroyama. Local people are familiar with spring and well water in their daily lives. We consider that the community created



around the springs leads a strong attachment to the town space (Figures 16 and 17), even if you look only at about 300 m square, and you can see the testimonies of “flag” and “tweet” about the springs (marked with a double circle in Tables 6 and 7). It is probable that the community created by the spring water had the function of creating a strong attachment to the space of the city. In particular, there is a fountain in the shape of a salmon in the pond of Oshachi Park, dancing Bon festival dance around it (Table 7: 128, 142) and memories of feeding carp (Table 7: 126). It can be seen that Oshachi Park had the function of a core open space in the central city area and that it was connected to daily life.

In addition to the depictions of ponds and springs (marked with a star in Tables 6 and 7), there are shopping streets with arcades on both sides (Table 7: 127), and the “Fureai Center” built on the site of the public hall was often used (Table 6: 091, Table 7: 152), confession spots (Table 6: 175), and tsunami monuments, etc., were set up, and you can see the appearance of the core-shared space in the town area.

7.3 “Omachi”

In the Omachi area (marked with a circle in Tables 6 and 7), the testimonies show that children were invited to the annual cherry blossom viewing party held throughout the town on the south side of Oshachi Park and north of the JR Yamada Line on May 5. According to the testimonies, there was a unique use of the space, where the national flags and the big catch flags were raised on the streets, and the banquets were held outdoors. Some “flags” stated that “on a banquet day, everyone sat under the blue sky” (Table 6: 547) and “even the elderly went outdoors on Children’s Day” (Table 6: 556).

7.4 “Honmachi”

•Honmachi (marked with rectangle in Tables 6 and 7) was situated along the road leading from JR Otsuchi Station to Oshachi Park and Suehirocho. The streets (Table 6: 385, 389) were as narrow as one car could barely pass through and surrounded by lots of shops on both sides. Some of the contents are as shown in the testimonies “Hanamaki-ya-san, shoes, bags and

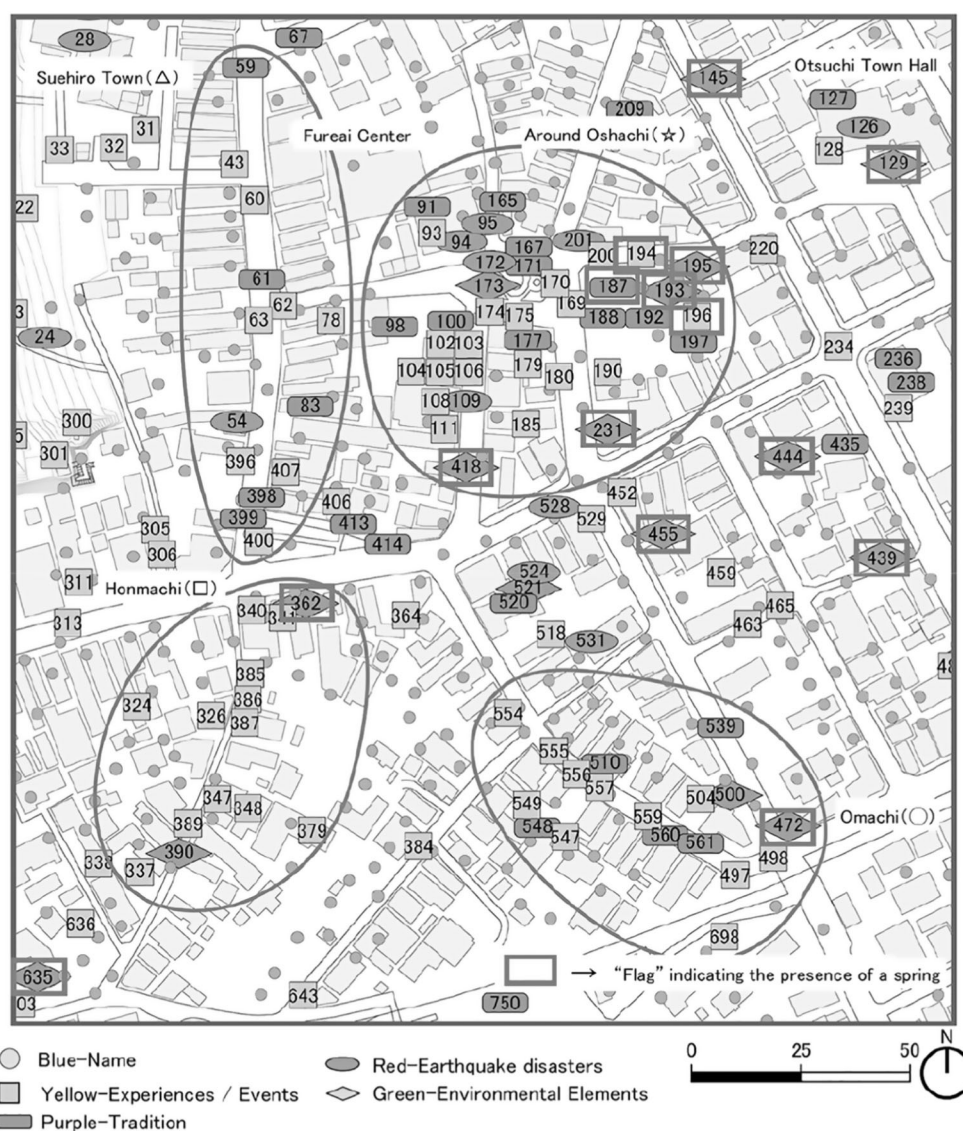


FIGURE 16. The city center, “Tweet Group B” distribution map

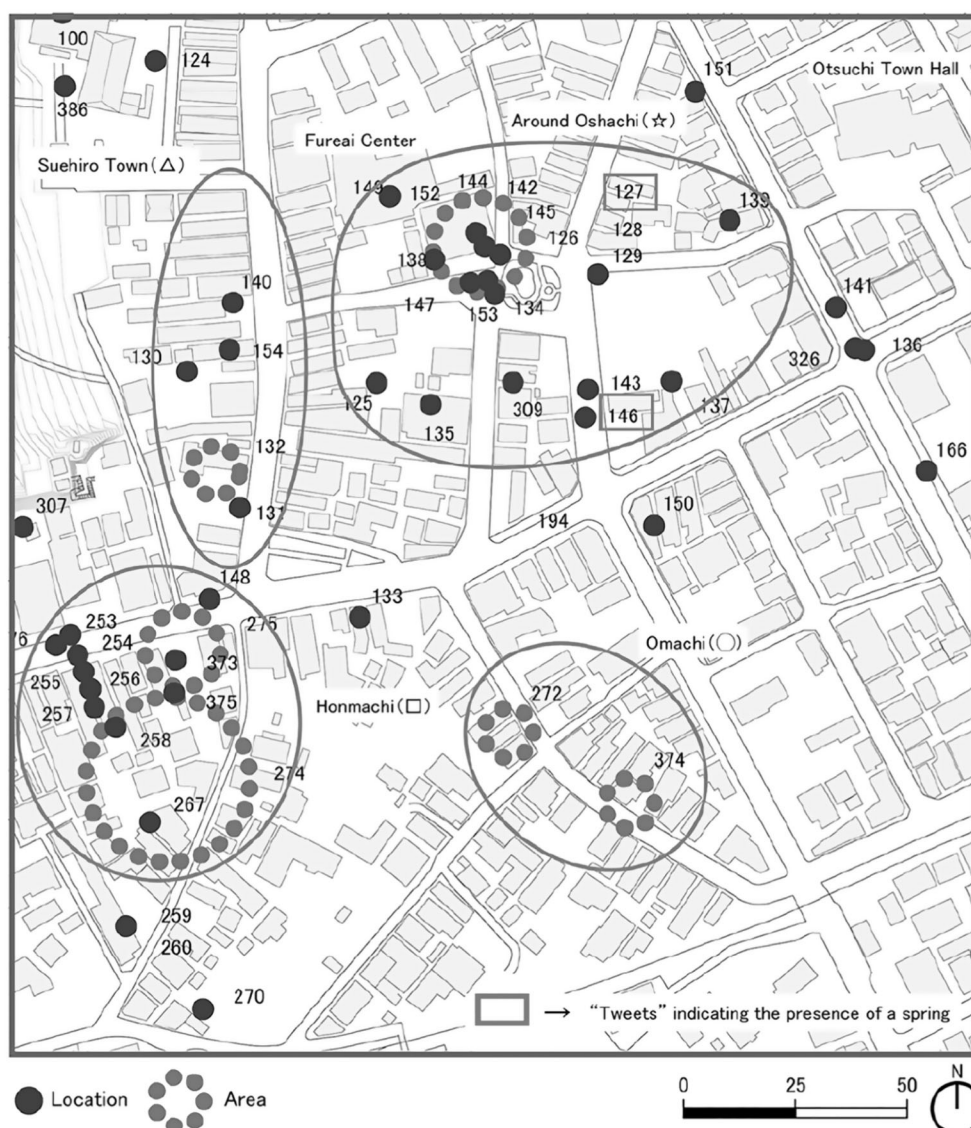


FIGURE 17. Number of flags in the city center/number of tweets in "Tweet group B"

clothes" (Table 6: 324), "I often went out drinking and did some karaoke" (Table 6: 348) and "I was working at Takahashi clothes shop. I enjoyed Kuma-chan Ramen restaurant" (Table 7: 375). In addition, colorful tiles were laid on the road that runs north and south through the same area, creating a characteristic landscape (Table 6: 386 and 7274).

7.5 "Suehiro-cho shopping street"

From the testimonies about Suehirocho Shopping Street, which is adjacent to the west side of Oshachi Park (marked with triangle in Tables 6 and 7), you can learn about more concrete situations in real life such as "shopping", "working", and "interaction between residents" with a wide variety of stores such as daily necessities & essentials stores and restaurants that local residents used on a daily basis. For example, "we went out to eat after soft volley ball activities" (Table 6: 407), "busy shopping street" (Table 6: 063), or "a night market was in Suehirocho shopping street" (Table 7: 154), daily activities and residents. You can see a part of the bustle of the city as a

qualitative space in the same range, such as interaction between each other. In addition, from testimonies such as "festival" (Table 6: 398), "road that has existed since the Edo period" (Table 6: 399), and "← → boundary between Otsuchi and Kozuchi" (Table 6: 400), we come to know that the street and its area formed a space for daily shopping and exchange, working as the main spatial structure of Machikata district since old times.

7.6 "Culture of life shared in the city center"

In the above, we examined in detail the memories of the places collected as "flags" and "tweets" about Oshachi, Omachi, Honmachi, and Suehirocho shopping districts, where the testimonies were obtained from the area extracted as the central city area. It was known that Oshachi Park was a central shared space in the town area before the disaster, but according to the testimonies of the residents, it was crowded due to its historical nature and relationships with surrounding facilities and shops. Landmarks such as stone monuments and

TABLE 6. List of "Flag" in the city center

ID	Color	Contents	Area
022	Yellow	Many graves	
023	Yellow	Walkway to Shiroyama Park	
024	Red	Evacuation route	
025	Yellow	Mini-skiing	
028	Red	The main hall was an evacuation site	
031	Yellow	Playground, I forget what I did	
032	Yellow	In the old days, children used to play in the precinct	
033	Yellow	When I was a child, I used to climb up there	
043	Yellow	When I was carrying stores, I was painted with horse chestnuts	Δ
054	Red	I was at work when the earthquake struck. I took refuge on top of a grave	Δ
059	Purple	Mukogawara shopping street used to be	Δ
060	Yellow	I used to jump over stories every day	Δ
061	Purple	I danced in kindergartens at children's festivals	Δ
062	Yellow	There was a night market	Δ
063	Yellow	A lively shopping street	
067	Purple	Shinmachi Teodori Dance was held	
078	Yellow	Prince Akishino came on an invitation	Δ
079	Blue	Komatsu Hanaya	★
083	Purple	Haruyoshiya (store name)	★
091	Purple	Originally there was a community center	★
093	Yellow	Where the two were reunited	★
094	Red	Some people were saved on the third floor by going up the stairs	★
095	Red	Power was out and automatic doors were closed	★
098	Purple	Festival in October, Tenmangu shopping street joint	★
100	Purple	Stone monument of human sacrifice	★
102	Yellow	It has been on TV. Made around the time of the So-min Festival	★
103	Yellow	Stylish cafe	★
104	Yellow	The owner was a potter	★
105	Yellow	The wife was a weaver	★
106	Yellow	Atelier of a potter	★
108	Yellow	I used to ride my bike through here	★
109	Red	I used to buy things here on the same day	★
111	Yellow	People without cars in the neighbor hood went shopping here	★
126	Red	Cenotaph is being planned	
127	Purple	In the old days, this area was a field of rice paddies	
128	Yellow	Some people used to report their births here	
129	Green	Ikarigawa well	◎
145	Green	Well	◎
165	Purple	Tsunami monument	★
167	Purple	There was a forest that cured sickness	★
169	Yellow	People used to stand around and talk	★
170	Yellow	People used to let carp and goldfish loose	★◎
171	Purple	Gods were worshipped here	★
172	Red	People used to gather here whenever there was a disaster	★
173	Green	There was a pond where carp used to live	★◎
174	Yellow	Children used to play here	★
175	Yellow	A confession spot	★
177	Purple	Bon dance used to be held here	★
179	Yellow	Delicious sashimi bento	★

Table 6. (Continued)

ID	Color	Contents	Area
180	Yellow	Lunch Box with Fried Chicken	★
185	Yellow	A week before the earthquake, the reservations started pouring in	★
187	Purple	Sixty years ago, I walked on water	★◎
188	Purple	The hatchery was moved by the tsunami in the Showa period	★
190	Yellow	There was a roof and a morning market was held	★
192	Purple	Meiji Hatchery	★
193	Green	There was a spring that fed Gosha Pond Park	★◎
194	Yellow	Goldfish tanks were washed	★◎
195	Green	Spring water	★◎
196	Yellow	Used for washing and drinking in the old days	★◎
197	Purple	Formerly a post office and parking lot	★
200	Yellow	Played with bicycles	★
201	Red	There was a fire	★
209	Purple	Ueno store became a perm shop	
220	Yellow	Proud of the 18-meter-long roof	
231	Green	There was a well	★◎
234	Yellow	It was very noisy until the bypass was built	
236	Purple	Former pachinko parlor	
238	Purple	Used to be the Otsuchi Theater Theater	
239	Yellow	Saw a Godzilla movie	
300	Yellow	Someone was praying all the time	
301	Yellow	It was called "Inari-san"	
305	Yellow	Recommended spots in Aburamanjidai	
306	Yellow	Ika Senben, Miso Buns, Candy	
311	Yellow	Mr. Ken Tanaka came here	
313	Yellow	I do not know the name, but it's called a shopping street	
324	Yellow	Hanamaki shop, shoes, bags, clothes	□
326	Yellow	I used to work there	□
337	Yellow	Many bars	
338	Yellow	Ramen noodles after drinking	
340	Yellow	Long-established shop	□
341	Yellow	Old building	□
347	Yellow	Skiing master	□
348	Yellow	We often went to karaoke for drinking	□
362	Green	The spring water was delicious	□◎
364	Yellow	Grandma would come over with golden spit and takoyaki (octopus dumplings)	
379	Yellow	The interior was beautiful	
384	Yellow	South of here is a residential area	
385	Yellow	A light car would work	□
386	Yellow	Colorful tiling	□
387	Yellow	The way people pass by	□
388	Blue	Shichikencho Street	□
389	Yellow	One car can pass through	□◎
390	Green	Spring water	Δ
396	Yellow	He was a prefectural assembly member	Δ
398	Purple	Festival	Δ
399	Purple	A road that has existed since the Edo period	Δ
400	Yellow	←→Boundary between Otsuchi and Kozuchi	
406	Yellow	There was an event on the second floor	Δ
413	Purple	Otsuchi Inari Festival's mikoshi (portable shrine) passing by	
414	Purple	The original road	
418	Green	Spring water	★◎



Table 6. (Continued)

ID	Color	Contents	Area
435	Purple	Night stalls are set up during festivals	★
439	Green	Spring	◎
444	Green	Well	◎
452	Yellow	Fireworks in summer	
455	Green	There was a spring in the house	◎
459	Yellow	There was an evening market	
463	Yellow	There was a drinking district	
465	Yellow	Only one surname in Japan	
472	Green	There was a Spring	◎◎
486	Yellow	Everyone used the parking lot	
497	Yellow	there was a train that people did not ride	○
498	Yellow	Elementary school students used to make a flag	○
500	Green	Salmon came up to the waterway	○
504	Yellow	Both sides of the house were flooded under the floor during the Chilean earthquake	○
510	Purple	The house name Maruichi	○
518	Yellow	Drinking on the roof.	
520	Purple	Built in the Taisho Era (1912-1926)	
521	Green	There was a big pine tree.	
524	Red	My classmate's house, all dead.	
528	Red	3.11, there was a huge traffic jam	
529	Yellow	It's called Hyokkori Yokocho	
531	Red	People who escaped to the rooftop were saved	
539	Purple	A show at the festival	○
547	Yellow	Everyone feasts under the blue sky	○
543	Purple	A place where everyone gathers at festivals	○
549	Yellow	Banquet on top of Koza	○
554	Yellow	There was an irore and the owner played an accordion	○
555	Yellow	Koi Noboris (carp streamers) hung in the distance	○
556	Yellow	Elderly people are also let out on Children's Day	○
557	Yellow	A festival in GW	○
559	Yellow	I used to go for a walk with my relatives	○
560	Purple	They were hanging the national on May 5th	○
561	Purple	They hang a big fishing flag May 5 and watch cherry blossoms	○
603	Yellow	Funa Yake color	
635	Green	Spring water	◎
636	Yellow	A drinking area with wild roses, serina, etc.	
643	Yellow	Kanna" bags were also sold	
698	Yellow	There was a house?	○

ponds were able to depict the qualitative characteristics of the shared space. In addition, you can see that there was a life familiar with spring water in the entire town area, including the area surrounding Oshachi Park, and that a rich life was unfolding in the outdoor space using cool well water as a resource. In addition, like Omachi, activities at the level of the residents' association, which are held every year during the cherry blossom viewing season in May, have been formed as a lifestyle culture unique to the Machikata district. It is thought that the living culture found by collecting the memories of these local residents exists in many other areas as a potential shared resource for the area. Living culture with such a qualitative space cannot be created at the planning stage and is cultivated by the community living in the space over a long period of time.

TABLE 7. List of "Tweet" in the city center

ID	Tweets	Area
100	Her husband was lost at Eganji. I was on top of Shiroyama, so I was saved	
101	There were many eel beds in Hommachi	
121	There was no debris left by the waves in this area. (Around Eganji Temple), debris was swirling around. There was a fire at	
124	After the earthquake, I fled to Renjyo-ji Temple. My grandmother and father fled to Shiroyama	
125	I used to ride my bicycle to the Mizuigami Store	★
126	At the pond in Goshaichi Park, I released carp and fed them all the time	★◎
127	There were arcades on both sides to allow for a market. There was a well and a sign that read "Do not wash dogs"	★◎
128	There was a salmon fountain. There was a Bon Odori dance around the pond and people danced in yukata (summer kimono)	★◎
129	The big zelkova tree had long since died and disappeared, but the small zelkova tree remained	★
130	We always had a takoyaki (octopus dumpling) store at the salmon festival. It was a small store with many cushions. I think it was a teppan-yaki restaurant	△
131	My parents' house was connected to a acupuncture and moxibustion clinic, which had a large 18-meter roof. The size of the	△
132	The neighborhood association held disaster drills twice a year, in spring and fall	△
133	(A store that makes takoyaki and kintsuba) Oden was delicious. When I was little, I used to eat oden while my grandma was coming out of the store and hide the kusubi I ate under the table. When I was little, everyone was misbehaving	
134	There was a legend that a person was buried alive in Goshachi Park, and there was a stone monument to that legend	★
135	Maya (mtzukami) was a swamp. They used to fetch water. There were water pumps around the house	★◎
136	The road in front of the pachinko parlor was often flooded	
137	My husband left Tohoku Electric Power Company and for 43 years we worked together as a couple. We never thought this	★
138	Gosha-ji was inhabited by the monk Soseharu Kikuchi in 1902	★
139	The house had a site of 97 tsubo (960 m ²) with two floors and a length of 18 meters	
140	There were 145 households in the neighborhood association, 98 households before the earthquake, and 17 households lost	△
141	Before the bypass was built, there was a lot of traffic and it was very noisy. My house is along Route 45, and it shook a lot. Since the bypass was built, the shaking has lessened somewhat	
142	They used to dance the Gosha-ji Ondo. They dance it every July during the summer festival. Three members of the dance	★
143	Around Goshaichi, there was a Sasaki cleaning, a tsunami prayer monument, pine trees, and a shrine on the north side, and the road between them was tiled and paved	★



Table 7. (Continued)

ID	Tweets	Area
144	He went to the library every day and used the computers, etc.	★
145	There was a fire in 1946	★
146	There was a public well. The water was good and they were famous for tofu and sake	★◎
147	They fished and caught fish such as sculpin with a colander	★◎
148	Mr. Akatake's building across the street from the North Bank was an old building	□
149	The place where they met was the Fureai Center. The after-party of the coming-of-age ceremony	★
150	An evening market was being held from about 2:30 in the evening	
151	There were many night stalls on the street	
152	The Fureai Center is used almost every day, so much so that it was difficult to get a reservation. The Gosha area was filled with elderly people from morning, and various events such as morning markets, flea markets, puppet shows, and dances were being held	★
153	There was a Bon Odori dance around the pond in Goshaichi	★
154	The night market was in the Suehirocho shopping street	△
253	I have been running the store for more than 30 years since I was groomed by Hanamakaya	□
254	One year after the Central Community Center was built, I asked the same contractor to build a store for me	□
255	His wife and son, who were on the third floor when the earthquake hit, were not swept away and survived	□
256	My son grabbed the arm of a person who was swept away and saved him	□
257	He realized the tsunami was coming when he saw a telegraph pole had collapsed	□
258	The station was close by and we often took the train to visit. My relatives and I used to talk about going there again, but it	□
259	There was a shrine dedicated to Sugawara no Michizane	
260	After drinking in Kamaishi on the way home from work, we ended the day with Kumachan ramen	
267	I think the current road pavement was completed about 30 years ago	□
270	I used to climb over the barbed wire when I was a child because it was used as a lumber yard in front of the station during the Japanese National Railways era	
272	On May 5, we had a hanami (cherry blossom viewing) party. We took out Mr. Sasaki's Goza and table. He had hung a banner	○
274	The road on Shichikencho Street was beautifully tiled. Colorful colors. I don't remember the colors, but they are still there, so please go see them	□
275	I used to go skiing with the master of the New Mountain Hut in Shichikencho to Ajiwari in the back of Koiwai in Morioka. It was a day trip, so the morning came early, but now that I think about it, it was a good trip! I used to get together with other skiing enthusiasts at the lodge, go skiing, and have a drink. Now there is nothing left	□
307	Ken Tanaka came to visit. There was a Western-style building and a Japanese-style room	

Table 7. (Continued)

ID	Tweets	Area
309	It was open day and night. He lived there for almost 20 years. I want to work at the restaurant with my son. I want to return to a business form in this town. For some reason, we got a lot of reservations a week in advance	★
326	I went to Kaneman Pachinko during the September festival. I released goldfish for the festival into the pond	
373	There was a snack bar called El Amigo, which was converted from a warehouse and had no signboard	□
374	There was a bond between people so they could not escape alone. 3 tsunamis in 60 years. After three tsunamis in 60 years, I feel even more attached to the area. Without buildings, it is hard to find the way. The town has always been close, but as the festival goes on, it becomes even closer	○
375	I used to work at the Takahashi Clothing Store. I used to work at the Takahashi Clothing Store and enjoyed the nearby	□
376	He is the second generation and now runs Kirari	
386	He used to come to the work and study sessions held on the second floor three times a month	

8. Conclusion and Findings

The purpose of this paper is to establish a method to make it manifest as information on spatial resources for the regeneration of local communities. We tried to reconstruct the regional space shared in the land with qualitative features by collecting memories of the city before the disaster, targeting residents' participation type WS in the Otsuchi-cho Machikata district. The findings obtained are shown below, and future issues are described.

1. We presented a method for collecting memories of places from disaster victims using a restored model that reproduces the city before the disaster at a scale of 1/500. From the "bird's eye" that overlooks the entire model, you can see the lost image of the entire city, and at the same time, from the "walker's eye" that looks into the street, you can recall the scenery of houses and the city. It was confirmed that the characteristics of the 1/500 scale-restored model that can be made are appropriate from the questionnaire conducted at the exhibition after WS. Also, from the number of WS visitors and the attribute analysis of "tweet" speakers, it was found that this method is easy to accept in various age groups regardless of gender. In particular, there were a wide range of many elderly participants and it was found that it is effective for inheriting the lifestyle and culture of the city.
2. We organized and categorized the testimonies of the memories of the pre-earthquake district obtained through the resident participation type WS held for the Otsuchi town, Iwate Prefecture district. By recording the memories of the places spoken by the residents in WS separately into "flags" and "tweets" memories of various places were recorded on the model. 1337 blue flags indicate the names of places in Machikata district where the number of households before the disaster. It is estimated that the many town



people participated in the workshop and indicated the names of places and buildings in the town. 620 non-blue flags and 611 tweets show the memories of the town, except for those of the names of places and constitute the archive of valuable testimonies that records the lifestyle and culture of the area.

3. To examine how to analyze the testimonies along with the composition of the local space to depict the rich characteristics of the city space that was shared with the local residents before the disaster, we tried to reconstruct the regional space by spatially integrating the “flag” and “tweet” of the central city area where the most testimonies were gathered in the town district. Life that is familiar with spring water exists throughout the town as a base, and the environment that uses cool well water as a resource on a daily basis has created a rich living culture that skillfully uses outdoor spaces. Unfortunately, all of them have disappeared due to the tsunami, but in order to rebuild the city again, it is desirable that such a rich living culture be regenerated and inherited as a shared resource for the region. It is a living culture as a shared resource that should be left for the residents returning to this land and the generations who inherit this land. In addition, I think that it is possible to reconstruct such a qualitative space from the memories of places spoken not only in the central city area but throughout the town district. The living culture of the land can never be created at the planning stage, it is cultivated by the community living in the space over a long period of time, and the memories of the innumerable places gathered on the model are It can be said that it indirectly indicates the existence of such a shared space.
4. It is extremely important for the revitalization of the disaster-stricken area to have a plan that pays attention so that the living culture that the local community has built up can take root in this area again. The memory of the place collected by the 1/500 restoration model and the community participation type WS using it is the regeneration of the unique spatial foundation for inheriting the local community in the situation where the city space is physically lost. On the other hand, it turned out to be effective as a method of finding possibilities. However, in order to realize the revitalization, the local residents, and the local community must be aware of this and be involved in the reconstruction town development. The sharing means and methodologies for this must vary depending on the conditions of the community, but how to archive the restored model in which the “flag” of memory is plotted and the memory of the place classified and organized in this paper. I would like to inherit it or work on it as a future issue while forming the independence of the residents themselves who will be the main body of reconstruction.

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Disclosure

The authors have no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Notes

Note 1) The “City of Memory Workshop” (coloring and interactive workshop) began in June 2011, when a white model of the “Minami Kesennuma Station Area” was displayed in the lobby of Kesennuma City Hall, in response to requests from citizens who saw it. As of May 2013, exhibitions have been held in 13 locations in and around the affected area. As of July 2013, the “Lost City” Model Restoration Project and its derivative reconstruction support activities have been featured 37 times in newspaper articles along with the restored model, and have been broadcast on TV news programs 1 The project has been broadcast four times on TV news programs. Major works include “Art for Remembering” (January 21, 2012) in the cultural section of the national edition of the Nihon Keizai Shimbun, and the NHK Special “Series: Great East Japan Earthquake: Connecting Memories of Hometowns” (first broadcast on April 26, 2013).

Note 2) In this study, the model should be able to represent the society of the affected area and the individual people across the scale of the disaster. It is desirable for the model to show the spatial structure of the area and to recall the individual experiences of the people who lived there. The scale of the model was set at 1/500, because we believed that the conditions for creating a restored model were that it should be a model that, when viewed from the top, would allow the viewer to understand the lost town as a whole, and at the same time, when looking into the streets, would allow the viewer to recall the houses and townscape, and to recognize “my house” along with the townscape. The scale of the model was set at 1/500, which allowed the scale of the house and its relationship with the neighboring land to be expressed. We also tried to reproduce civil engineering structures such as river embankments, roads, railroads, retaining walls, street trees, landforms, and trees of medium size or larger, which play an important role in the formation of the local landscape.

Note 3) For example, “Model Aid” (<http://shinaiba.cocolog-nifty.com/mokeiaid/>) and the “Kansai Architectural Volunteers” project to create a model of the Uozaki district in Higashinada-ku, Kobe City at the time of the Great Hanshin-Awaji Earthquake and its application to urban development are examples of such projects. As can be seen in projects such as these, the use of maps and models is a common method for gathering the opinions and suggestions of residents in participatory urban planning, but the method presented in this paper is in addition to existing methods. The method presented in this paper is based on the following points in addition to the existing methods: (i) 1/500 scale is adopted as a scale suitable for eliciting memories of the city more effectively in the model making stage, (ii) the interviews in the WS are based on the spontaneous narratives of the witnesses, and even personal and trivial memories are actively recorded without limiting the contents to be recorded, (iii) a “coloring” program for the model is incorporated during the interviews, (iv) the testimonies given are plotted directly on the model by “flag (4)” The testimonies are plotted directly on the model using “flags,” and more detailed and voluminous testimonies are written on “tweet sheets” and plotted again in the town space at the organization and analysis stage after the WS. The following improvements have been made.

Note 4) The visitors indicate a specific spot on the model and look into a street, relating their memories about the town with the model. When they find errors or missing parts on the model, they can tell them to the staff to correct them immediately.

Note 5) More stories about the region and the disaster can be told at the time of collaborative activities. Conversational style is effective for collecting various remarks about regional space when the visitors and the staff are around the model, though it does not always bring about consistent responses.

Note 6) In many cases, even those who did not know where their own homes were located when they first saw the model gradually began to speak up as they identified landmarks such as intersections, landmarks, and streets that would serve as landmarks. Through the process of mapping “flags” between a reconstructed model, a medium



that serves as a proxy for urban space, and the actual places in their memories, it is believed that people will regain their memories of familiar places.

Note 7) City of Memory Workshop in Otsuchi Period: May 13–19, 2013/Location: Shiroyama Community Center, Mast 2F/Organized by: Executive Committee for the “Lost City” Model Restoration Project/Co-organized by: Otsuchi Town Board of Education/Supported by: Otsuchi Town/Planning and Production: Osamu Tsukihashi Laboratory and Kondo Laboratory, Kobe University/Cooperation: General Inc. Oraga-Otsuchi Yumehiroba Reconstruction Museum, Caritas Otsuchi Base Camp.

Note 8) As of February 28, 2011 (including foreigners). Source: “Otsuchi-cho Civil Affairs Department, Town Residents Division (November 30, 2011)”.

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