Impacts of collective housing relocation in the Ogatsu area of Ishinomaki City after the 2011 Great East Japan Earthquake and Tsunami

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Abstract
Eight years have passed since the Great East Japan Earthquake and tsunami, which devastated communities along Japan’s northeast Tohoku coast on March 11, 2011. Housing reconstruction programs in tsunami-affected municipalities included the provision of new residential lots in highland areas and the construction of public housing. The implementation of government-driven recovery projects is almost complete in the municipalities that were destroyed by the tsunami. However, even with these projects, some areas have suffered extreme population loss. Looking at the example of Ogatsu Peninsula and the case of Tachihama village, this paper considers the factors that contributed to residents’ deciding to move away or return and rebuild. According to the majority of the residents who moved away, the prospect of living in temporary housing for the length of time needed for permanent housing to be ready was their main reason for deciding to move somewhere else. Although housing recovery programs are intended to support the rebuilding of communities, the implementation and timeline of the government’s reconstruction programs may actually contribute to or accelerate population decline. As the implementation of reconstruction programs alone after a disaster occurs is not enough to guarantee the housing recovery of all residents, it may be important to consider pre-disaster community-building for the long-term sustainability of disaster-affected communities.

1. Introduction
In the communities devastated by the Great East Japan Earthquake (GEJE) and tsunami on March 11, 2011, housing reconstruction projects supported by the government are almost finished. Along with the planning and reconstruction of new facilities and needed infrastructure, two of the main types of government-supported housing recovery projects include the provision of public housing for disaster survivors and preparation of new residential lots by the government for private housing reconstruction by residents, with a large part of new housing relocated to high land areas away from the coast. As of March 31, 2019, 29,654 of 29,493 planned public housing units, or 99.5%, have been completed, and 17,793 of 18,226 planned new residential lots, or 97.6%, have been transferred to residents [1]. Disaster survivors who wanted to come back and live in their hometowns have had to wait many years for recovery projects to be completed to have houses on their new sites. In the end, some survivors chose instead to rebuild houses in other areas to support their own life recovery. Although the purpose of recovery programs is to support the rebuilding of affected communities, in parts of the disaster-affected area the result has instead been that the local population is continuing to decrease. This paper considers this issue of population decrease in the tsunami-affected areas eight years after the GEJE. Focusing on the case of the Tachihama fishing community in the Ogatsu area of Ishinomaki City, this paper explains people’s movements and population changes during the recovery process and investigates the main
factors that contributed to peoples’ processes of deciding whether or not to return and rebuild in their former communities. The rest of this paper is organized as follows. Section 2 explains the research objective and methodology, and Section 3 presents an overview of the GEJE and housing reconstruction projects implemented for the recovery of tsunami-affected communities. Section 4 provides the context of the Ogatsu area before and after the GEJE and the status of reconstruction and repopulation in the eight years after the tsunami. Section 5 explains the situation in the community of Tachihama and shares information gathered from interviews with Tachihama residents, towards an attempt to clarify reasons for people not to return. Finally, Section 6 offers reflections from the experience of Ogatsu residents after the GEJE and potential future policy implications.

2. Research Objectives and Methodology
Eight years after the Great East Japan Earthquake and tsunami, reconstruction projects to support the relocation of residents to high land areas are nearing completion. Although the goal of these projects is to keep communities together, and the majority of residents (60%) in the Ogatsu area of Ishinomaki City stated that they wanted to return to their former hometowns [2], many tsunami survivors have not returned to their former communities. The population loss in areas where people have not returned is especially severe in the Ogatsu area. The two research objectives of this paper are as follows: 1) to confirm the actual situation of housing reconstruction and repopulation in the Ogatsu area, compared to the number of households who originally intended to join the collective relocation projects; and 2) to understand the reasons and factors that led residents to continue or drop out of housing relocation projects.

This research combines an analysis of official population data, considered in the context of the timeline of government relocation programs, with information gathered from interviews with local residents conducted by one of the authors over several years from 2013 until 2019. Sources of official government data include the Japanese national census, residents’ registration data, and household data from the local government. Within the Ogatsu area, this research focused on the case of the residents from one community, Tachihama, which is one of 15 fishing villages dotted around the Ogatsu Peninsula. With 15 households out of 42 who rebuilt through participating in official housing reconstruction projects, including more than 30% of households, Tachihama has one of the highest rates of return of all the community in Ogatsu. The size of Tachihama is also representative of a mid-size village in Ogatsu. Three other villages and the Central Ogatsu area had larger populations and larger numbers of housing reconstruction projects than Tachihama; in 10 other smaller villages reconstruction projects included 10 or fewer households. In addition, one of the authors was able to contact the majority of Tachihama residents, including those who moved away from Ogatsu as well as those who returned and rebuilt, thereby contributing to the understanding of why households drop out of reconstruction projects, an important and understudied question in recovery.

3. Housing reconstruction after the GEJE
The Great East Japan Earthquake and tsunami destroyed 118,636 houses and damaged 182,193 houses throughout communities along Japan’s northeast Tohoku coastline [3]. After staying for several months in emergency shelters in schools or municipal buildings, several types of temporary housing were provided by the Japanese government for tsunami survivors. Temporary housing included more than 50,000 units of newly-built emergency temporary housing, and over 70,000 units of “designated temporary housing,” a system where the government pays for the rent of private apartments used for temporary housing. The Japanese national government provided and funded a menu of recovery projects for tsunami-affected municipalities, used by each city to create their recovery plans.

The main programs to support housing reconstruction for tsunami survivors were 1) the provision of public housing units and 2) the preparation of new residential lots for private housing reconstruction in high land areas, most using a program called Collective Relocation for Disaster Mitigation. The Collective Relocation Program includes the designation of tsunami-damaged former residential areas as “hazardous,” which means that new residential construction is forbidden and the owners can sell their land to the government. Residents can buy or rent new residential lots in high land areas to reconstruct their houses. Residents who can’t or don’t want to rebuild their own houses have the option to move into Disaster Recovery Public Housing, government-subsidized rental housing for disaster survivors. Types of public housing include multi-family apartment buildings and single-family
detached houses. In many cases, especially in smaller fishing villages, high land relocation areas included both lots provided through collective relocation programs as well as single-family public housing units. Eight years after the GEJE, housing reconstruction projects in the tsunami-affected communities of Tohoku were almost complete. As of March 31, 2019, 29,654 of 29,493 planned public housing units, or 99.5%, were completed, and 17,793 of 18,226 planned new residential lots, or 97.6%, had been transferred to residents. As of November 1, 2019, all of the public housing for tsunami survivors had been completed.

4. Local context and recovery situation

4.1. Ogatsu and housing recovery
The Ogatsu Peninsula is located on the southern part of Tohoku’s jagged rias coastline and is part of Ishinomaki City in Miyagi Prefecture (Figure 1). The Ogatsu Peninsula, which became part of Ishinomaki City during a municipal merger in 2005, includes the central Ogatsu area, and multiple fishing villages dotted around the peninsula. Even before the GEJE, the population of Ogatsu had been declining, from 11,214 in 1955, to 3,994 in 2010 [4].

![Figure 1. Locations of Miyagi Prefecture, Ishinomaki City, and the Ogatsu Peninsula](image)

After the Great East Japan Earthquake, most temporary housing for Ogatsu residents was built inland, in areas with less tsunami damage. Only 10.9% (161 out of 1467 units) of temporary housing for Ogatsu residents was built inside Ogatsu [5]. Starting from this temporary housing phase, most survivors from Ogatsu moved to inland areas of Ishinomaki City or other nearby towns. In 2012, it was decided that Collective Relocation projects would be used for the housing reconstruction of fishing villages of Ogatsu as shown in Figure 2.
However, the result as of 2019 was that the 162 households returning to live in new housing in Collective Relocation Project areas represent only 11% of the 1,467 houses damaged by the tsunami [6]. Figure 3 and Table 1 show the number of housing units and relocation sites in Ogatsu, including lots for private reconstruction and public housing units. As shown in Table 1, by April 2019, of the 98 lots for private reconstruction in Ogatsu, residents had built on 74 lots while 24 lots remained empty. Residents had moved into 88 of the 94 public housing units while 6 remained empty.

| Table 1. Number of lots and public housing units in relocation sites in Ogatsu |
|---------------------------------|----------------|-----------------|-----------------|
| Total number of lots and houses in each relocation site | Lots for private rebuilding | Public Housing Units |
| | Number of Lots | Empty lots | Units built | Empty housing units |
| Naburi | 25 | 8 | 4 | 17 | 1 |
| Funakoshi | 25 | 11 | 5 | 14 | 1 |
| Osu | 4 | 3 | 1 | 1 | 0 |
| Kumazawa | 4 | 0 | 0 | 4 | 0 |
| Hazaka | 5 | 3 | 0 | 2 | 0 |
| Tachihama | 15 | 12 | 0 | 3 | 0 |
| Ohama | 8 | 6 | 0 | 2 | 0 |
| Ojima | 10 | 7 | 2 | 3 | 1 |
| Myojin | 9 | 7 | 2 | 2 | 0 |
| Central Ogatsu | 30 | 14 | 2 | 16 | 1 |
| Hara | 11 | 1 | 1 | 10 | 1 |
| Funato | 6 | 4 | 0 | 2 | 0 |
| Karakuwa | 5 | 4 | 0 | 1 | 0 |
| Mizuhama | 23 | 12 | 3 | 11 | 1 |
| Wakehama | 6 | 5 | 4 | 1 | 0 |
| Namiita | 6 | 1 | 0 | 5 | 0 |
| Total | 192 | 98 | 24 | 94 | 6 |
4.2. Changes in population
Looking at changes in population between 2011 and 2019, certain trends have emerged in Miyagi Prefecture and in Ishinomaki City. As shown in Figure 4, population growth in Miyagi Prefecture has been centered in areas near Sendai City, the largest metropolitan area in the prefecture, while Ishinomaki City as well as nearby coastal cities have lost population.

Changes in population across the municipality of Ishinomaki City, as shown in Figure 5 also reflect the greatest increases in suburban areas with significant population losses across coastal areas, including Ogatsu. These population trends reflect the reality of survivors’ lives, as Ogatsu residents moved away from their former communities and into temporary housing in other parts of Ishinomaki City.
5. 3.11 and Recovery in Tachihama

5.1. Tachihama before and after 3.11
Before the tsunami on 3.11, 46 households lived in Tachihama fishing village (Figure 6). The tsunami caused massive destruction to Tachihama (Figure 7 and Figure 8) and destroyed all but four houses.
5.2 Location and movement of Tachihama residents after the disaster

After the tsunami, residents from Tachihama whose houses had been destroyed moved to stay in various places, at different distances from their former community. As of June 2012, the location of evacuees was as shown in Table 2.
Table 2. Location where Tachihama residents stayed in evacuation and temporary housing

| Location in evacuation and temporary housing | Number of households | Number of households living in emergency temporary housing |
|---------------------------------------------|----------------------|----------------------------------------------------------|
| Tachihama village in Ogatsu                  | 14                   | 9                                                        |
| In Ishinomaki (former downtown)              | 13                   | 3                                                        |
| In Ishinomaki (greater area)                 | 5                    | 4                                                        |
| Other City (Sendai, Osaki, etc.)             | 7                    |                                                          |
| Unknown                                      | 3                    |                                                          |

Source: Based on interview surveys with residents and key stakeholders by the author.

Fourteen households remained in Tachihama, including nine households who were living in emergency temporary housing provided by the government. Thirteen households were living in the former central city area of Ishinomaki city, and five households were staying in other parts of Ishinomaki city. Seven households had moved to other cities, including Sendai City or Osaki City, and the whereabouts of three households was unknown.

5.3 Recovery plan and implementation in Tachihama

The recovery plan for Tachihama village focused on the creation of a Collective Housing Relocation Site, as shown in Figure 9 and Figure 10. This site included 15 housing lots, including 12 lots for families to use to rebuild their own homes and 3 for single family detached public housing units. The preparation of these lots was complete in March 2016, and the majority of residents had rebuilt their houses as shown in Figure 11.

Figure 9. Location of Tachihama Relocation Site as of 2016. Photo: Geospatial Information Agency of Japan ©2016 [10].
Of the 46 households who had lived in Tachihama before the GEJE, all but 4 had lost their homes in the tsunami. Of these 42 households, 14 had stayed in temporary housing within Tachihama, and 28 had stayed outside. By 2016, 5 years after the tsunami, 19 households were living in Tachihama, including 15 households who had rebuilt and 4 households without housing damage in 2011. 27 households had rebuilt in other areas.

Starting in 2013 and continuing until now, one of the authors was involved in regular field work in the Ogatsu area, including multiple visits and meetings with residents from Tachihama. The author also participated in a regularly held meeting of former Tachihama residents called Kizuna no Kai. As many of the residents who had rebuilt their lives in other cities still attended the Kizuna no Kai, this community group meeting became a key source of information and chance to meet residents who had moved away from the village. Understanding about residents’ relocation patterns and moving to other locations post-disaster and their decision-making process about rebuilding was informed by information gathered through interviews with key stakeholders and community members at these community meetings and in individual interviews with residents conducted between 2013 and 2017. During this time, the author interviewed around half of former Tachihama households, including some who were
of those who had decided to rebuild in other places instead of returning to Tachihama, for the majority, their primary reason was that living in temporary housing for a long time was difficult, and for this reason they didn’t want to wait to rebuild their permanent houses. Several residents also mentioned that they could not return to Ogatsu because of a lack of medical or care services, and one resident gave the reason of not wanted to change schools from the one their children had been attending for five years.

6. Lessons learned and implications
Based on residents’ reasons for deciding to move away and rebuild somewhere else instead of their hometown, the importance of the factor of time can be understood. According to the majority of the residents who moved away, the prospect of living in temporary housing for the time needed for permanent housing to be ready was their main reason for deciding to move somewhere else. Even before 2011, Japan had already been facing the issues of an aging society and depopulation of rural areas; the Great East Japan Earthquake and tsunami devastated an area already experiencing more advanced and rapid aging and rural depopulation compared to the national average. The experience and demographics of Ogatsu residents are notable, but also representative of issues of aging communities throughout the disaster-affected areas. In a community with many elderly residents, their age may make the inconvenience of life in temporary housing more difficult, and therefore their desire to rebuild quickly and move out of temporary housing may be stronger. The additional importance of facilities needed for aging residents, including hospitals and other care facilities, also contribute to the difficulty of moving back to a rural area. In this way, not only the tsunami disaster but also the recovery projects and their implementation contributed to an acceleration of an ongoing aging and depopulation in the affected areas. Combined with the fact that almost all the residents who moved to temporary housing outside of their community continued to rebuild their lives without returning suggests that having an option to stay within or close to former communities, in a comfortable temporary housing situation, may help facilitate people being able to rebuild in their hometowns. Therefore, it may be important to consider other ways to support residents ability to stay close to their hometowns during the temporary housing phase. Although housing recovery programs are intended to support the rebuilding of communities, the implementation and timeline of the government’s reconstruction programs may actually contribute to or accelerate population decline. As the implementation of reconstruction programs after a disaster occurs is not enough to guarantee the housing recovery of all residents, it may be important to consider pre-disaster community-building for the long-term sustainability of disaster-affected communities.

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