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## **Fukushima – the Housing Situation and Condition of Evacuees of the Triple Disaster Four Years after the 2011 Great East Japan Earthquake**

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### **Abstract**

**The March 11, 2011 Great East Japan Earthquake (GEJE) caused a triple disaster--earthquake, tsunami, and nuclear meltdown--in the northeastern Tohoku region of Japan. Four years later, there are still more than 210,000 evacuees from Tohoku living in temporary or interim housing, and residents of Fukushima Prefecture face additional uncertainty and fear due to the on-going nuclear power plant disaster. Based on periodic field surveys and interviews in Fukushima with evacuees, local government officials, NGOs and local builders, this paper outlines the current situation in Fukushima compared to the rest of the affected region in terms of displacement, government assistance, housing situation and reconstruction process. Unlike the typical disaster recovery and reconstruction process that slowly improves over time, the situation in Fukushima has become more complicated due to uncertainty about safety and the future of radiation-affected areas. Although residents were equally affected, assistance varies for damage caused by tsunami vs. nuclear contamination. Nuclear evacuees face additional disparities as assistance for those who followed governmental instructions is denied to so-called "voluntary evacuees" who evacuated without government's official instruction. Despite a desperate situation, there was a positive attempt to provide better quality wooden temporary, including potential for reuse as permanent housing. Public housing construction is also ongoing in Fukushima Prefecture. Existing policies for disaster recovery do not adequately address the needs of all people affected by the GEJE. Policies exclude nuclear evacuees and do not consider cases where all or some of a town's population must relocate. The leadership role of local governments in deciding the town future is another key complicating factor especially for those who lived or evacuated across municipal boundaries. Additional mechanisms are needed to support the complex realities faced by Fukushima residents in current phases of recovery as well as the long-term future.**

**Keywords:** 2011 Great East Japan Earthquake, Post-disaster housing, Nuclear Evacuees, Displacement, Fukushima



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## 1. Introduction

More than 4 years have passed since 11 March 2011 Great East Japan Earthquake (GEJE) struck vast area of Tohoku region of northeast Japan and caused the triple disaster of earthquake, tsunami and nuclear power plant accident. Radiation caused by the nuclear accident and meltdown of TEPCO's Dai-ichi nuclear power plant contaminated nearby towns in Fukushima prefecture as wind in the days following the meltdown carried radioactive particles northwest, and municipalities are struggling with varied/multiple issues facing recovery.

**Table 1: Damages from the Great East Japan Earthquake**

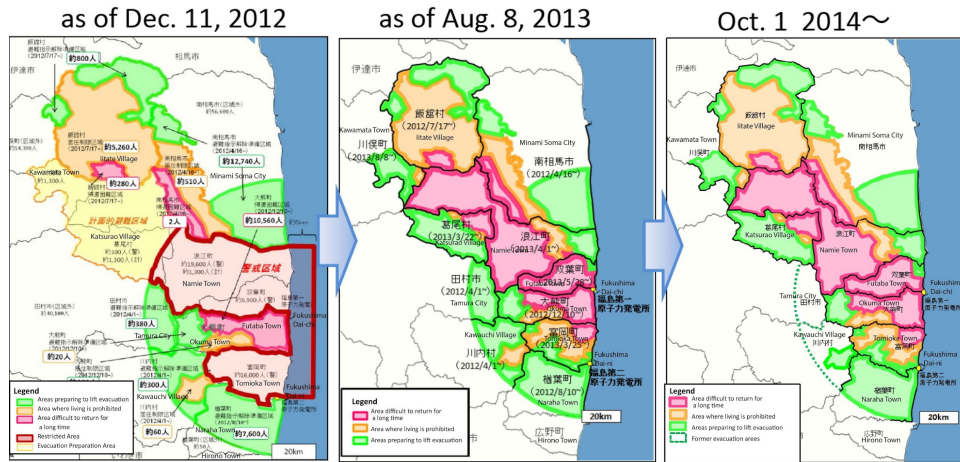
	Casualties (as of 6/10/2015)			Evacuees (as of 5/29,2015)		Damaged Houses (as of 2/27/2013)		Inundated area
	Direct	Missing	Indirect ( <i>kanrenshi</i> )	Within pref	Outside pref.	Totally damaged	Partially damaged	
Iwate	4673	1129	450	27,391	1,554	18,370	19,580	58 km <sup>2</sup>
Miyagi	9539	1249	910	63,962	6,985	85,414	379,707	327km <sup>2</sup>
<b>Fukushima</b>	1612	202	1,884	67,004	45,745	21,116	237,684	112 km <sup>2</sup>
<b>Total</b>	15,891	2,584	3194	211,976		128,931	1,005,368	561 km <sup>2</sup>

Data sources: Japan Reconstruction Agency, Miyagi Prefecture, Iwate Prefecture, Fukushima Prefecture, Kahoku Shinpo, Police Agency, Japan Cabinet Office, Fire and Disaster Management Agency

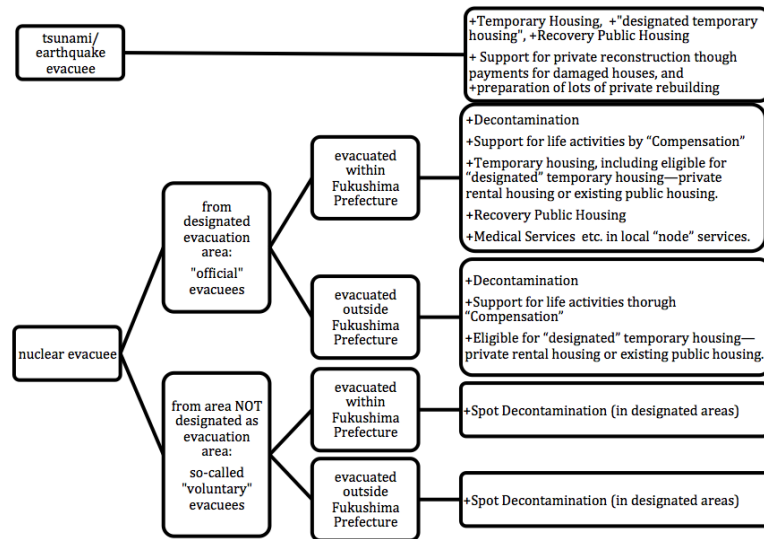
**Table 1** shows overall damages caused by the GEJE including casualties, evacuees, housing damage, and inundated areas in the three most affected prefectures. Compared to Iwate and Miyagi, two factors affect Fukushima residents disproportionately. 1) Compared to the number of people killed directly by the disaster impact or injury, there was a larger number of *kanrenshi*, or "indirect deaths" related to the disaster and evacuation, such as mental and physical stress caused by displacement and uncertain future. 2) Many evacuees from Fukushima are living outside the Prefecture throughout Japan.

## 2. Zoning of Nuclear-affected areas

In the chaotic days after the GEJE and nuclear accident, multiple evacuation orders were issued and revised; by April 2011, the government designated three zones: "Evacuation-designated areas," within a 20km radius from the nuclear plant; "Emergency evacuation preparation areas," including parts or entire towns within a 20-30 km radius of the nuclear plant (restrictions on this area were lifted in Sept. 2011) and "Deliberate evacuation areas," contaminated areas outside the 20km radius. Specific spots in Date City, Minami Soma City, and Kawauchi Village were also recommended for evacuation (Fukushima Pref., 2015). Evacuation categories have since been revised to areas where it is "Difficult to return;" "Not allowed to reside;" and "Evacuation orders preparing to be lifted," as shown in **Figure 1** (Reconstruction Agency). This ostensibly scientific zoning affects the lives of the residents greatly as discussed in the next section, defining the eligibility for various support from the government, recovery plans and people's decisions.



**Figure 1. Evacuation Zones in Fukushima Areas Contaminated by Radiation**  
Modified from Reconstruction Agency Website.



**Figure 2. Chart showing the discrepancy of support for different types of evacuees**  
Modified from Suzuki, H. 2015.

### 3. Types of Evacuee Situations and Discrepancies of Support

Japan has well-established systems for disaster response and reconstruction but support is limited to "victims of *natural* disasters." People whose houses were destroyed by natural disasters, in the case of GEJE, tsunami, are eligible for a range of support unavailable to those with uninhabitable houses due to nuclear contamination. Criteria for eligibility varies depending on the designated evacuation area and if residents evacuated within or outside Fukushima.



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The largest gap is between the "official" and so-called "voluntary" evacuees--people who chose to evacuate of their own will for their own health and safety because they did not feel the level of contamination in their area is "safe" as officially announced/decided through the government-led process. The term "voluntary evacuee" is misleading and casually discredits their hard personal choices; more troubling, they are ineligible for a range of support. Support for people who left Fukushima Prefecture is also limited. At the peak, January 2012, 62,802 people from Fukushima evacuated outside of the prefecture; this decreased to 45,934 by the end of 2014. As shown in **Figure 2**, various support is available for survivors of natural disaster such as earthquake/ tsunami, and is most limited for "voluntary" nuclear evacuees from outside the designated evacuation areas. Support limits affect several aspects of long term recovery, including relocation, housing and community reconstruction. Residents from officially designated radiation contaminated areas are eligible for monthly compensation payments from TEPCO though they do not have any support for building new housing.

#### **4. Available Support in the Housing Recovery Process**

##### **4.1. Temporary Housing after the GEJE and in Fukushima**

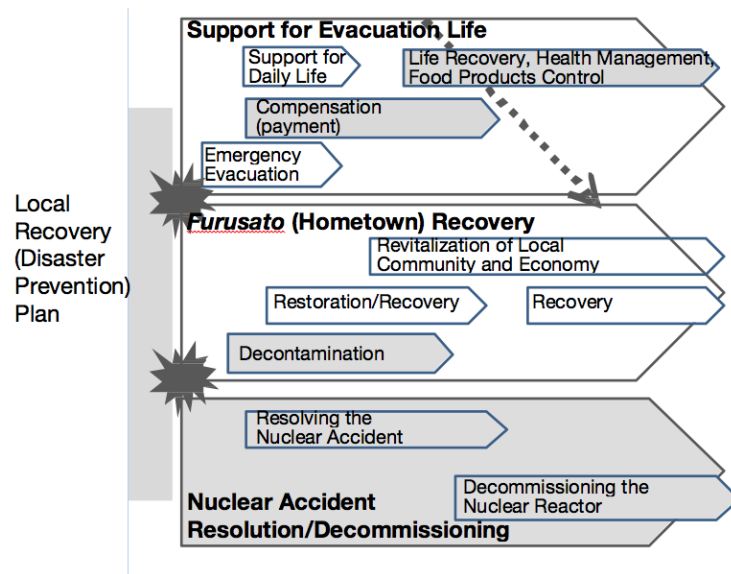
By law, the Japanese government provides 100% funding for temporary housing intended for two years use (although this can and is extended). Temporary housing is usually prefabricated, procured by prefectural governments and managed by municipal governments. After the GEJE, two unprecedented types of temporary housing were: 1) the use of existing private apartments as "designated" temporary housing with government-paid rent (actually a larger number than pre-fab units); and 2) mostly wooden temporary housing constructed by local builders. Since temporary housing is usually located and managed within the local municipality, the situation was more complicated for Fukushima residents forced to evacuate from their hometown, but Fukushima Prefecture provided temporary housing in other towns in the prefecture for these evacuees. Although nuclear evacuees from designated evacuation areas are eligible for "designated" temporary housing, "voluntary evacuees" are not. Predicting a prolonged use of temporary housing due to the nuclear accident, Fukushima Prefecture made an initiative and commitment to build better quality temporary housing using local builders with wooden construction; out of 16,800 temporary housing units in Fukushima, 6537 were built with wooden, which is the largest number in the GEJE area. Some of these houses were designed so they could be relocated and/or combined for permanent use.

##### **4.2. Support for Permanent Housing Recovery**

The Japanese government supported permanent housing recovery after the GEJE in two ways. 1) construction of Disaster Recovery Public Housing *Saigai Fukkou Kouei Juutaku* (multi-family in urban areas and detached houses in rural areas) through existing programs for survivors of natural disaster; Fukushima Prefecture is also providing Recovery Public Housing *Fukkou Kouei Juutaku* for nuclear evacuees. 2) As part of *Collective Relocation for Disaster Mitigation* projects for tsunami affected areas, administered by municipal governments, lots are prepared for sale or rent for private rebuilding.



**5. Place-based or people-centered: rebuilding *furusato* vs. supporting people where they are**  
 Japanese disaster recovery focuses on rebuilding ‘hometowns,’ *furusato* in Japanese. Many relocation projects are on-going in the tsunami-affected areas; these projects are relocating only some local residents within the town, which continues to function. Key questions for Fukushima’s recovery are: 1) to what degree is *furusato* recovery possible? and 2) how to support residents if their *furusato* is uninhabitable? Ten municipalities in Fukushima include nuclear evacuation zones (refer to Figure 1) and seven towns had evacuated their offices to another municipality. It is the role of municipal governments to make critical decisions regarding the future of the town, yet issues are often too complicated, sometimes calling into question the town’s future existence, to be handled by a single municipality. The more critical issue is how to support life recovery of evacuees: 1) from designated evacuation areas; 2) who chose to evacuate although their area was not designated; 3) who may return to their hometown in the future, and in the most extreme case 4) whose hometowns will cease to exist as a place where people can live.



**Figure 3. Recovery Process after Natural Disaster and in Fukushima,**  
 Reproduced from Suzuki, H. 2015.

The diagram in **Figure 3** shows the process of recovery from disaster in three chronologically distinguished layers that are (from the top) 1) supporting life in evacuation, 2) *furusato* recovery and 3) recovery from nuclear accident. The process after natural disasters can be described by the first two layers, however it is entirely different for the process after nuclear disaster and it cannot be resolved in the same way. The arrows with a grey background throughout indicate necessary actions related to nuclear disaster. The regular recovery process after natural disaster, are largely dictated by what goes on in the third layer which is the recovery process after nuclear disaster.

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### 6. Conclusion

Recovery policies still focus on decontamination as the eventual resolution for all issues. The basis of zoning should be reviewed to consider other important aspects beyond scientific factors, including community, culture and history. With the realization that decontamination cannot resolve the complex conditions of nuclear evacuees by itself, recovery policies should shift to supporting residents where they are instead of rebuilding former hometowns; the creation of a double community system that allows people to register as residents of former town and current town is one such example. Most importantly to improve lives of affected people, immediate policy changes are crucial to increase options supporting all evacuees regardless of their location.

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### Author's Biography

Dr. Elizabeth Maly is an Assistant Professor at the International Research Institute of Disaster Science, Tohoku University. Her research focuses on international disaster recovery, post-disaster housing reconstruction and community-based recovery planning. Current research includes post-disaster housing relocation and land use policies after Hurricane Sandy, Mt. Merapi in Indonesia, and the Great East Japan Earthquake in Japan. She received a B.A. in Art from Reed College, Masters of Architecture from the University of Washington-Seattle, and PhD in Architecture from Kobe University.

Tomoko Matsushita was born in Nagoya, Japan. She is a registered Architect in Japan and a member of Japanese NGO Humanitarian Medial Assistance (HuMA). She has worked with humanitarian agencies in a number of countries after disaster since 2004. She received B.A. in Architecture from the University of Washington and Master's degree in Civil Engineering at the University of Tokyo. She is currently writing her PhD on post-disaster housing while working as a researcher for a project to develop a comprehensive disaster resilience system and create collaboration platform in Myanmar, in collaboration with Yangon Technical University.

Dr. Hiroshi Suzuki is Professor Emeritus of Fukushima University. He works as the chairman of the Fukushima Prefectural Reconstruction Planning Committee, chairman of Namie Town Reconstruction Planning Committee and vice-chairman of Futaba Town Reconstruction Planning Committee after the Great East Japan Earthquake, Tsumani and Nuclear Power Plant Disaster. He recommended wooden temporary houses to Fukushima Prefecture just after the disaster and set up a research group about wooden temporary houses on livability, construction method and potentialities of reuse, etc.