

# Population Change in Ishinomaki City, Miyagi Prefecture, with a Focus on the Area around the Earthquake Ruins

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## 1. Introduction

Eight years have passed since the Great East Japan Earthquake of 2011. There is a movement to preserve buildings and structures affected by the earthquake and resulting tsunami as earthquake ruins and to utilize them for storytelling and disaster prevention. In the Tohoku region, where the birthrate is declining and the population is aging, sustainable management of the earthquake ruins will be an issue.

So far, the bereaved families and storytellers (called the kataribe) who live around the earthquake ruins of Ishinomaki are known to have been working on the management of flowers from visitors, cleaning up the earthquake ruins, and improving the flowerbeds. At the same time, residents around the earthquake ruins might be affected by the increase in the number of visitors when the earthquake ruins are opened to the public, so consideration of them is necessary. Therefore, this paper aims to clarify the population change around the former Kadonowaki Elementary School and the former Okawa Elementary School, which are the two earthquake ruins in Ishinomaki.

## 2. Methods

We investigated mesh population data of 500-meter mesh areas from “Population Census,” published by the Statistics Bureau, Ministry of Internal Affairs and Communications, Japan, and analyzed the population change of Ishinomaki between 2010, before the earthquake, and 2015, after the earthquake, using Geographic Information Systems (GIS). We extracted the two earthquake ruins and created buffers of 2,000 meters. We considered the population change within 2,000 meters of the two earthquake ruins as well as the situation regarding Ishinomaki’s recovery.

## 3. Results

As a general overview of the population change in the whole city of Ishinomaki, we can confirm a large population decline in coastal areas that were reached by the tsunami, such as Kadonowaki-*cho*. In addition, large-scale temporary housing was constructed and a population migration to the inland area was confirmed.

Although the overall population decline was significant within 2,000 meters of the former Kadonowaki Elementary School, a population increase was confirmed in a small area near the temporary housing in Hiyorigaoka.

Even within 2,000 meters of the former Okawa Elementary School, the population was decreasing as a

whole, but we could confirm an area where the population increased slightly. There were no large temporary housing structures around the former Okawa Elementary School, and the population did not accumulate.

#### 4. Discussion

In Ishinomaki, after the Great East Japan Earthquake, the population of the coastal area drastically decreased, and population increase in the inland area was confirmed. Both the former Kadonowaki Elementary School and the former Okawa Elementary School had a drastic decrease in population within 2,000 meters. However, the existence of areas where the population was increasing even within 2,000 meters was confirmed. It seems that the presence of temporary housing greatly influenced the change in population.

The population changes around both earthquake ruins were large, so it is thought that there were many cases in which bereaved families and residents involved in the elementary schools had relocated. Particularly concerning the former Okawa Elementary School, there is a possibility that there was a large-scale relocation to the southwestern part of the city, where population increase advanced. In Ishinomaki, the situation with tenancy in temporary housing continues to change even after 2015, and now temporary housing is being demolished and residents are moving into public housing. In the future, it is necessary to track the population changes and consider how to support the activities in the earthquake ruins by residents who cannot easily get there.

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Fig. Population change in Ishinomaki &lt;2010-2015&gt;

