Influence on Residents Emerged from Location Changes of Convenience Stores, through Comparison of Pre and Post Earthquake Disaster in Rikuzentakata City

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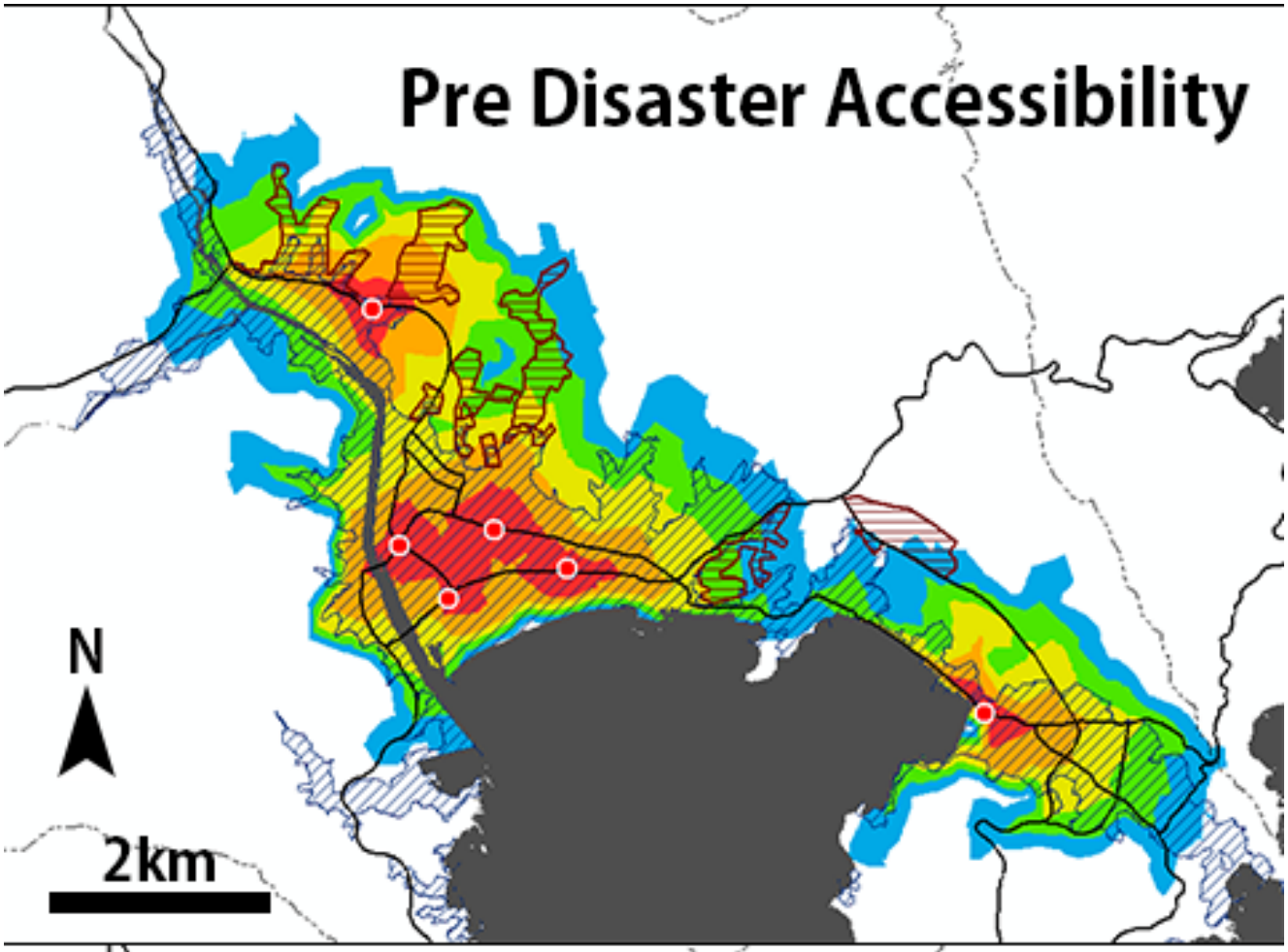
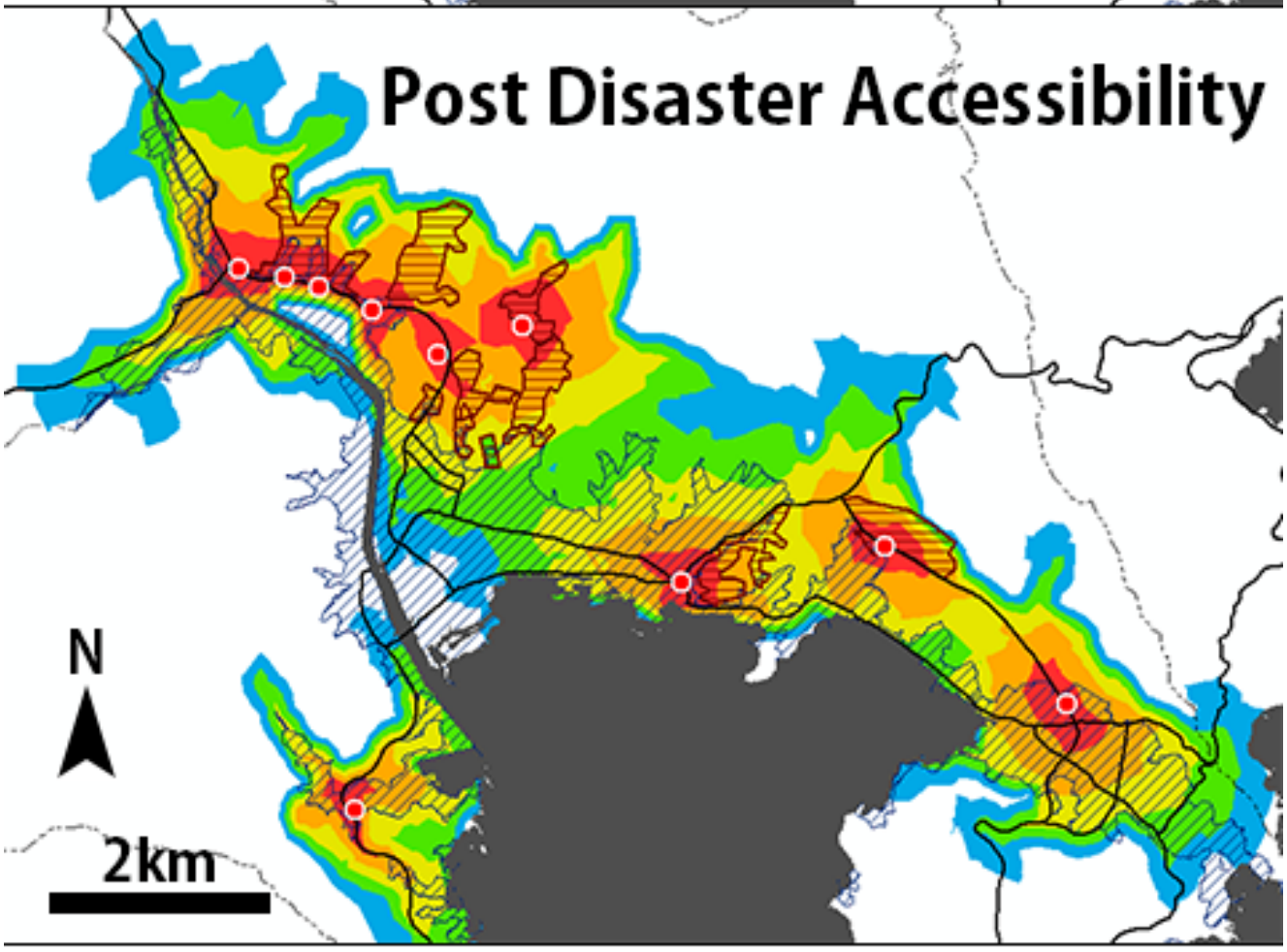
This research analyzes influences driven by the location changes of convenience stores in Rikuzentakata City, Iwate Prefecture. This area was affected by the Tsunami disaster along with the Tohoku Regional Pacific Coast Earthquake of March 11, 2011. Two research methods were applied to compare the situations before and after the earthquake disaster, and residents' attitude and accessibility were analyzed. Accessibility has been defined as a convenience level of transportation, and road distances between one point and its closest convenience store are discussed in this article. The reachable area analysis of GIS was conducted to calculate the figures.
With the residents' attitude research, a questionnaire survey was conducted with residents in the seven districts of Rikuzentakata City, each of which surrounding environment was different. After questionnaires were distributed to each household between September and October, 2015, they were collected through the postal mail. The number of effective responses was 382, where 1,012 questionnaire sheets had been distributed. The survey asked questions related to accessibility, such as "how far the respondents feel to reach the nearest convenience store from home". The subject of the analysis of accessibility was the entire area of the city, and ArcGIS Network Analyst was utilized to compute the reachable area from each store with a certain road distance. The reachable area was computed with the conditions before and after the earthquake disaster.
The result of residents' attitude survey resulted as follows. Regarding the distance to the nearest convenience store before the earthquake disaster, 42.6% "felt far", 22.3% "felt a little far", 19.9% "felt not very far", and 15.1% "didn't feel far". In comparison, the answers to the current conditions ranged from "feel far", 16.9%, 14.5%, 26.9%, and 41.7% respectively. It has been clarified that the respondents feel that the nearest store is closer after the earthquake disaster. In addition, the results were compared among each subject district. With this comparison, the response rate of "feel far" has dropped and "don't feel far" risen in most districts; however, the reverse tendency was detected in the district adjacent to the destroyed city center and surrounding vicinity of the point where Tsunami reached.
With a spatial analysis, it was found that the accessibility to convenience stores was considered high mainly in the flat city center area before the earthquake disaster, whereas the accessibility is considered high in the extended outer surrounding areas after the earthquake. The cause for this change is attributed to the lost stores which concentrated in the flat area and the newly built outlets in the dispersed areas without architectural restrictions.
Lastly, the spatial analysis result was compared with the result of the residents' attitude, and it was found that post disaster accessibility has improved in the majority of the questionnaire subject districts. However, changes in accessibility in the district close to the point where Tsunami reached depended on the location, and there is no clear rising tendency of accessibility detected in this district. Based on the above results, it is concluded that the following areas are consistent: the districts where the response rate of the residents to "feel far" dropped, and those with risen accessibility detected by a spatial analysis. It is confirmed that two different research methods unveiled the same tendency of influence driven by facility locations.
This research was conducted with the Japan digital road map research data contributed by Japan Digital Road Map Association.

Keywords: Tohoku Regional Pacific Coast Earthquake, Rikuzentakata, Accessibility, GIS, Network Analyst





Legends

City limits

