

**Cities' Necessity to build intercity networks  
for their self-sustainability : Lessons learned  
from the Great East Japan Earthquake**

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## **I. Purpose**

1) Proposal a concept of individual-city-centered network for maintaining sustainability of city and region

2) Background:

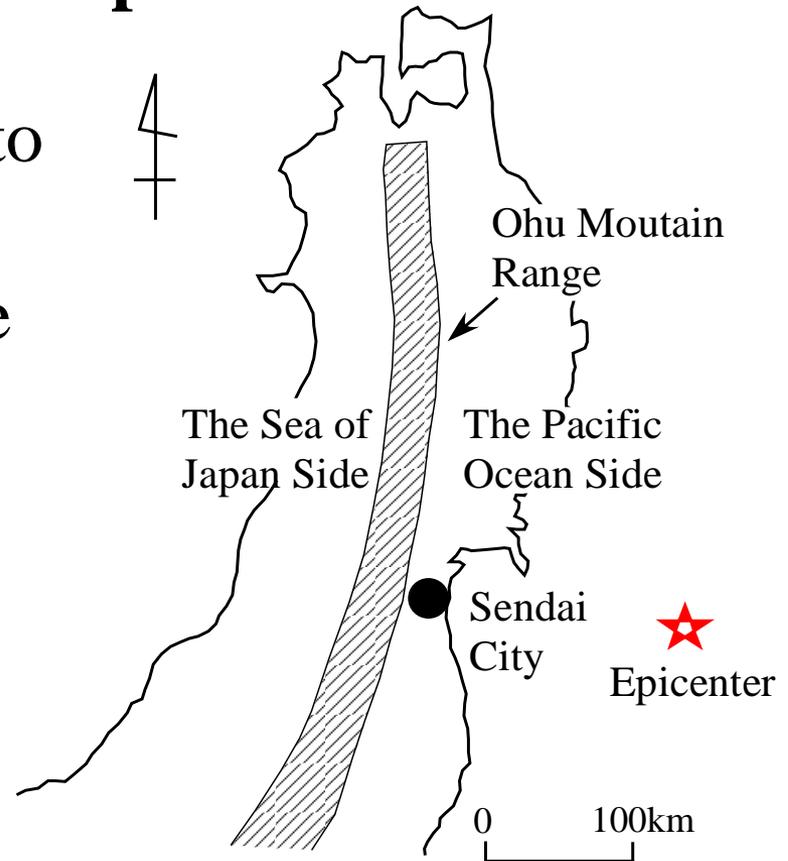
Supply shortage following the Great East Japan Earthquake was caused from the weakness of individual city-centered network in addition to the serious damages of logistics infrastructure.



**Photo 1 : A long row of consumers in front of supermarket on March 21, 2011, ten days after the earthquake**

## II. Outline of North-eastern Japan

- 1) This region is divided into the Pacific Ocean side and the Sea of Japan side by the Ohu mountain range.



**Figure 1 Regionalization of the Tohoku region on physical condition**

2) Tohoku Region is consisted of following six prefectures: Aomori, Iwate, Mitagi, Akita, Yamagata and Fukushima. In some development plan Niigata Prefecture is included in this region.

3) Sendai City is the primate city of this region.

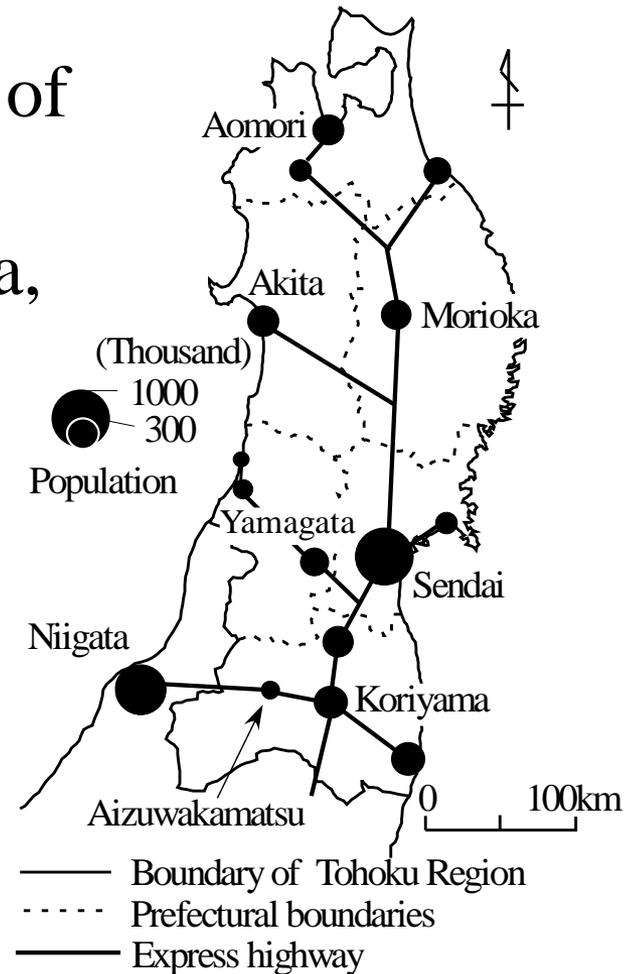
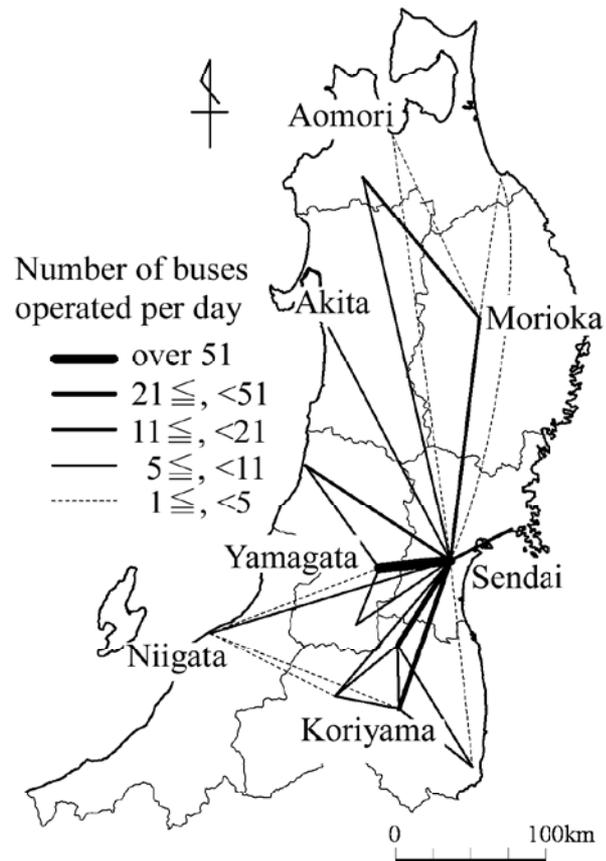


Figure 2: Major cities in Tohoku Region



**Figure 3: Spatial patterns of connections between major cities by express bus operations in Tohoku Region**

Source: *Kotsushinbunsha* (2011): *Kosoku Basu Jikokuhyo* (Express Bus Time Table), Vol.42

### **III. Why did the serious supply shortage of commodities occur in Sendai immediately after the 2011 earthquake?**

#### 1) Problem

The damage of transportation routes and logistic facilities was certainly the first direct reason.

In spite of that, a lot of people could move from Sendai to Niigata by using the long-distance buses.

In light of this, it can be said that it was possible to transport commodities through the east-west routes.

Because the Sea of Japan side did not suffer serious damage.

**However, this possibility was not realized.**

## 2) The underdevelopment of trading relationships between the east and west sides of Tohoku Region

The existence of trade relationships is a prerequisite for the distribution of commodities.

The establishment of a trading relationship requires the trust between entrepreneurs, and it is not likely that a trading relationship will be formed by only a telephone call or two after a disaster.

The general manager of a large corporation that operates chain of convenience stores said the following in newspaper interview:

*“Six logistic bases were located in Tohoku region. All of them were situated along the No. 4 National highway and the Tohoku Express Highway running from south to north in the region. Most of these bases were damaged in the earthquake. Our company had not established a supply route connecting the stores on the Pacific side of the region and the food production sites on the Sea of Japan side. This is one of the reasons why our company could not deliver daily life necessities just after the earthquake.”* (Asahi Shinbun, March 29,2011)

## IV Urban system in the Tohoku region characterized by the development of hierarchical network with Tokyo at the apex

1) Intercity linkages based on the location of branch offices of multi-locational companies

All main cities are strongly connected to Tokyo by branch offices.

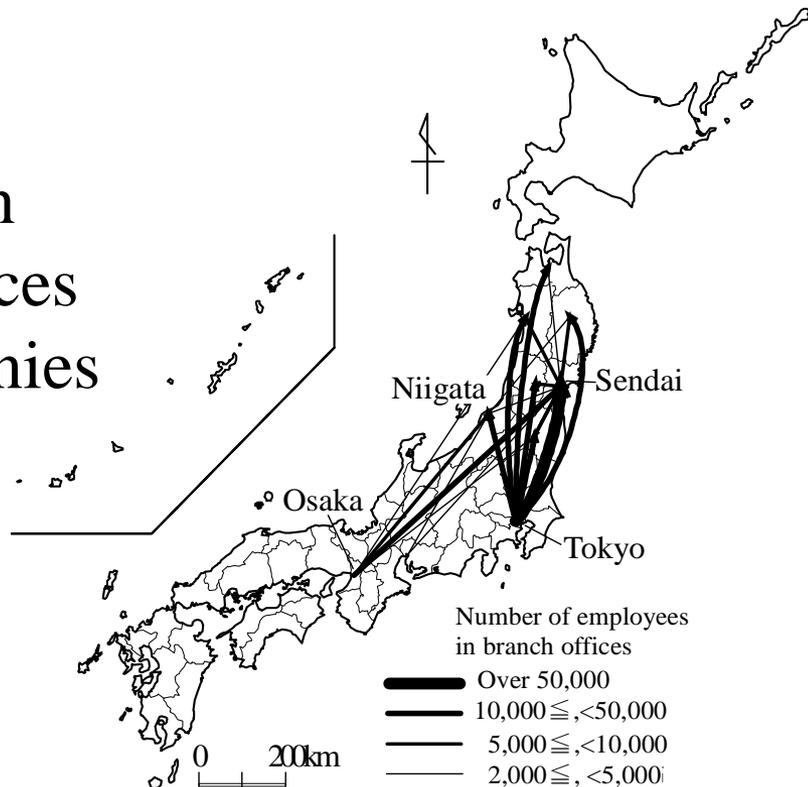
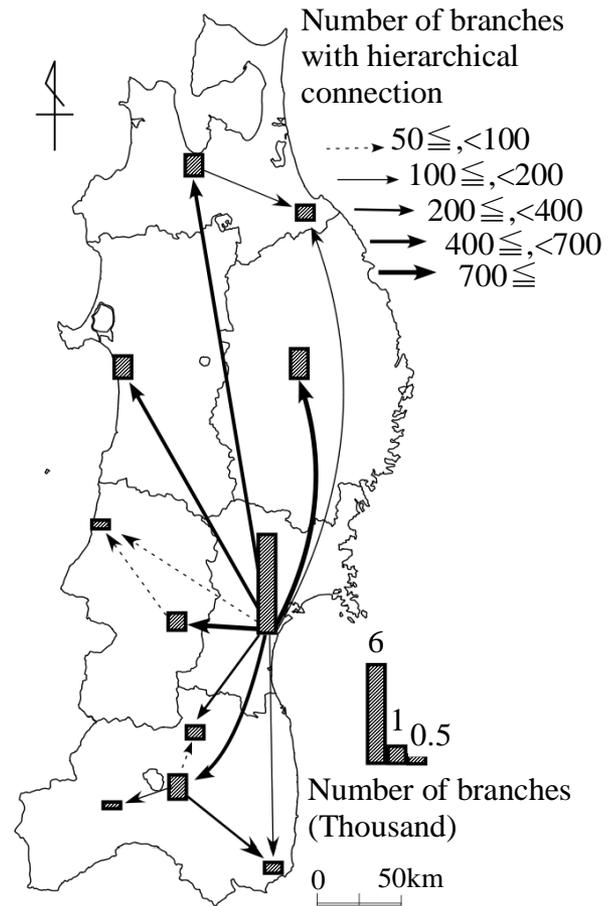


Figure 4: Spatial pattern of main intercity linkages based on strength of connection between headquarters and branch offices in 2006

Source: *The Japanese Establishment Census in 2006*

## 2) Hierarchical relationship between Sendai branches and those in other main cities

Figure 5 shows that a large portion of the branch offices located in Sendai is directly supervised by headquarters located in Tokyo chiefly, whereas many of the branch offices located in other major cities are under the jurisdiction of Sendai branch offices.



**Fig. 5: Spatial patterns of hierarchical connection of branch offices in the Tohoku region**

Source : *M. Hino (1996)*

## V. Individual-city-centered network

1) Four types of potential intercity linkages for a regional city

Type A: Intermediary center

Type B: Gateway city

Type C: Regional city-centered linkages

Type D: Regional city-centered international linkages

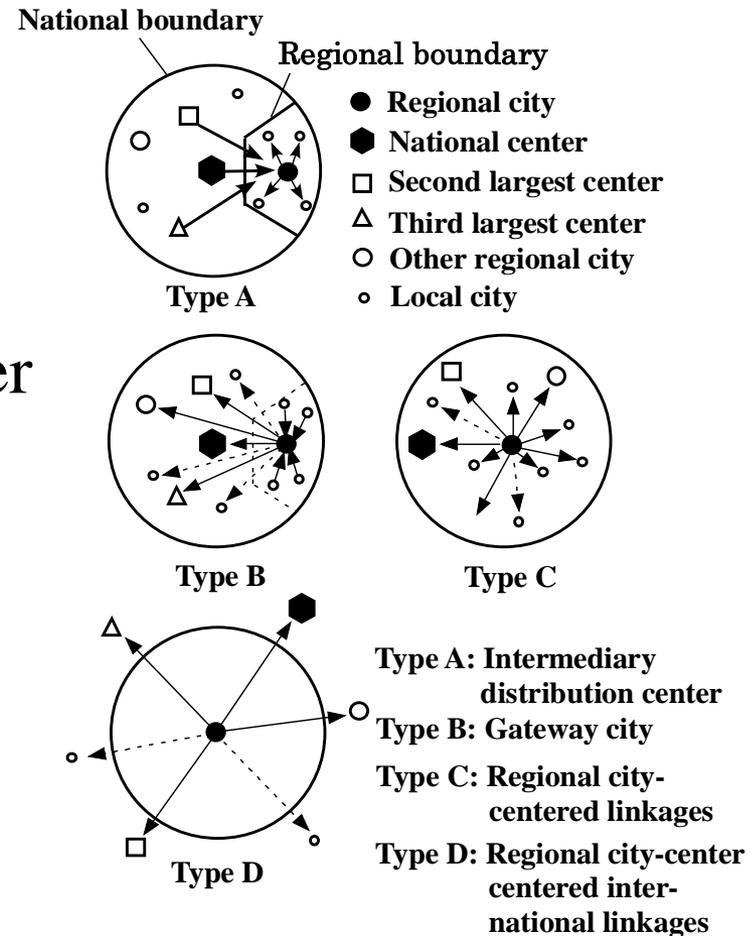
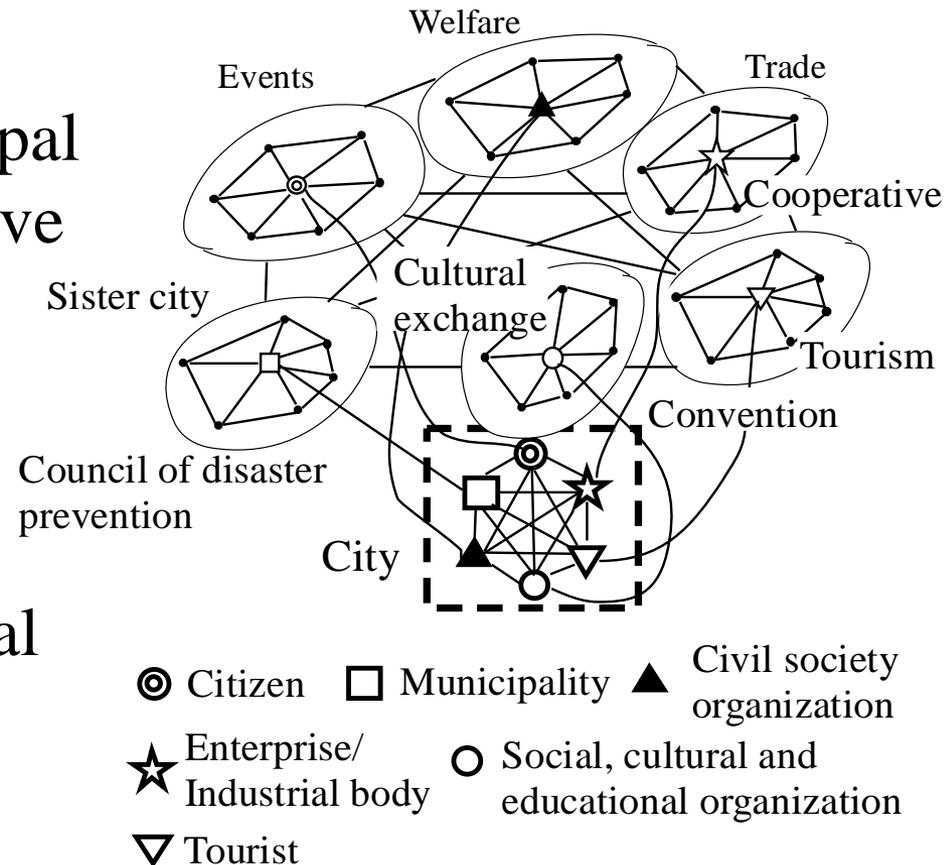


Figure 6: Types of intercity linkages in a regional city

Source: Hino(2009)

## 2) Actors forming Type B, C and D intercity linkages

- 1) citizens, 2) municipal and other administrative organization, 3) civil society organizations, 4) company and trade associations, 5) social, cultural and educational Organizations, and 6) visitors and tourists.



**Figure 7: Image of actor-centered networks**

## V. Conclusion

It is necessary to recognize the actors forming intercity linkages and to know the activities by which they form such linkages. With this point in mind, it is necessary to promote intercity linkages by arranging the physical and socio-economic environments that meet these actors' needs. In the context of the Tohoku region, the east-west linkages between cities can be strengthened through such endeavors, although this may take years to accomplish adequately.