

Indexes for Recovery and Recounstruction following the Great East Japan Earthquake

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NATIONAL
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NIRA Report

**Indexes for Recovery and Reconstruction
following the Great East Japan Earthquake**

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Indexes for Recovery and Reconstruction following the Great East Japan Earthquake

Recovery and Reconstruction Indexes Research Team

1. Overview of the Research: Background and Issues

Half a year has passed since the enormously destructive Great East Japan Earthquake. During this period, a variety of efforts towards recovery and reconstruction have been advanced in the area struck by the disaster. The level of progress towards recovery and reconstruction as a result of these efforts and the status of economic activity in the region are reported daily via the news media, but little attempt is being made to utilize available data to systematically grasp changes in the status of progress.

The National Institute for Research Advancement (NIRA) therefore commenced a project which sought to formulate indexes for recovery and reconstruction following the Great East Japan Earthquake, and examined methods of gaining a systematic understanding of the status of progress in these areas.

The formulation of indexes in this project must be seen as purely experimental, because the data gathered for the project cannot be considered to have been entirely adequate. As essential data was not made available to the public, it was necessary to forgo the use of a great deal of potential data. It is our hope nevertheless that this trial can serve to encourage the advancement of future recovery and reconstruction efforts in the area struck by the disaster through considerations based on data, and, at the same time, to promote examination by the government of effective modes of collection and publication of data in the event of disasters of this type.

2. Formulation of the Indexes of Recovery and Reconstruction

The indexes formulated during the course of this project synthesize some tens of related indicators in order to show changes in the status of recovery and reconstruction in the region struck by the tsunami generated by the Great East Japan Earthquake (37 cities, towns and villages ¹ / Three prefectures).

¹ “37 cities, towns and villages” refers to those coastal municipalities in the three

Two indexes were formulated: An index expressing the status of recovery of basic infrastructure, and an index expressing the status of activity, for example in the areas of production and distribution.

The index for the status of recovery of basic infrastructure is an attempt to numerically express the status of recovery, given that the ability of those affected to rapidly resume normal lives is the top priority immediately following a disaster. The rates of recovery of relevant items have been simply averaged, and this index can therefore be indicated as expressing the overall rate of recovery of basic infrastructure. The research team had intended as much as possible to collect data at the city, town and village level in order to achieve a detailed grasp of the status of recovery, but it proved difficult to obtain data at this level in certain areas, including data concerning the status of displaced persons, the status of orders for public works projects, and the status of the activities of workers in the fields of healthcare and education.

The index expressing the status of activity attempts to offer an understanding, over a time series, of the status of the victims of the disaster and their regions in respect of the degree to which activity in specific regions was affected by the disaster, and how smoothly reconstruction is proceeding. In addition to standard economic indicators, the data series employed included the fish catch for the fisheries industry, which brings in the industrial structure of the region, amount of payment of fees for medical services, and the number of passengers using regional airports and the volume of freight shipped through the airports. The index that synthesizes these data series expresses a level for each month, with February 2011, the month before the disaster, as 100, and enables comparisons with changes in the status of economic activity over time, and comparisons between the three affected prefectures or with national figures. Positive changes in this index indicate that activity is increasing, while negative changes indicate that activity is stagnating.

Published data were processed according to fixed criteria, and indexes were experimentally formulated to express the level of recovery in each city, town and village focused on. The calculation of these indexes did not incorporate any intention to evaluate efforts towards recovery and reconstruction in these cities, towns and villages.

affected Tohoku prefectures (Iwate, Miyagi and Fukushima) which contain areas (as designated by the Ministry of the Environment) in which the March 11 tsunami deposited large amounts of debris such as rubble from destroyed houses and buildings. There are 12 such municipalities in Iwate Prefecture, 15 in Miyagi Prefecture, and 10 in Fukushima Prefecture.

3. Status of Three Prefectures in the Tohoku Region as Expressed by Indexes of Recovery and Reconstruction

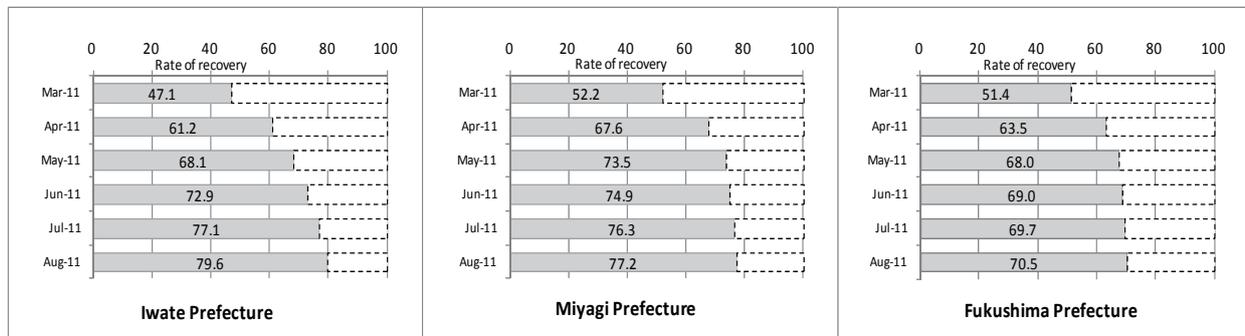
(1) Index expressing the status of recovery of basic infrastructure

The index expressing the status of recovery of basic infrastructure is synthesized from the following indicators.

<Data series>
 Ratio of number of residents of evacuee centers to the population of cities, towns and villages (negative indicator), ratio of number of evacuees within the prefecture and outside the prefecture to the population of cities, towns and villages (negative indicator), rate of recovery of electricity, rate of recovery of gas, rate of recovery of railways, rate of recovery of highways, ratio of number of hospital facilities to pre-earthquake figures, ratio of number of medical facilities to pre-earthquake figures, rate of removal of rubble, number of workers dispatched from other local administrations, ratio of donations and insurance payments to total cost of damage, ratio of loans to total cost of damage, ratio of number of convenience stores to pre-earthquake figures (13 data series in total)

Figure 1 shows trends in the index synthesized from these data series.

Figure 1 Trends in index expressing status of recovery of basic infrastructure



Note : March, when the earthquake occurred, is referred to as “Immediately after earthquake”

Study of the status of recovery of basic infrastructure in the three prefectures in the Tohoku region under consideration shows that each is gradually recovering. However, while recovery is steady in Iwate, the pace of recovery is rather slow in Fukushima Prefecture by comparison.

Consideration of individual data series (please refer to reference materials) shows that recovery of electricity, gas, railways and highways has proceeded rapidly since the immediate post-disaster period, and recovery was largely complete by April in areas in which houses and public infrastructure had not been swept away or destroyed. By contrast, the disbursement of funds including donated monies and the removal of rubble are among areas in which little progress

can be seen. Of these, there are significant differences in the status of the removal of rubble between different areas. The disbursement of donations, loans, and other funds is essential to the recommencement of normal life and the reactivation of business. It will be necessary to give close attention to the background to differences in this area and the ways in which delays in disbursement affect recovery. With regard to medical facilities in the area struck by the disaster, recovery is largely complete although it may be optimistic assessment as temporary medical examination is defined as recovery. It should be also noted that these areas have suffered from the shortage of medical services. It is to be hoped that access to healthcare and welfare services will be rapidly restored to provide help to victims of the disaster in these regions which have a high proportion of elderly citizens.

Furthermore, the number of evacuees outside the prefecture is increasing in Fukushima Prefecture, and many students and pupils are transferring to other school. Detailed policy responses are necessary for those people.

(2) Index expressing status of activity

Two versions of the index expressing the status of activity were formulated as an experiment. One of these versions is comparatively closely linked to the status of the region, while the other incorporates flows of people and goods, using data concerning the number of passengers using regional airports and the number of freight shipments handled. The indexes specifically synthesize the following indicators.

<Data series: Version 1>

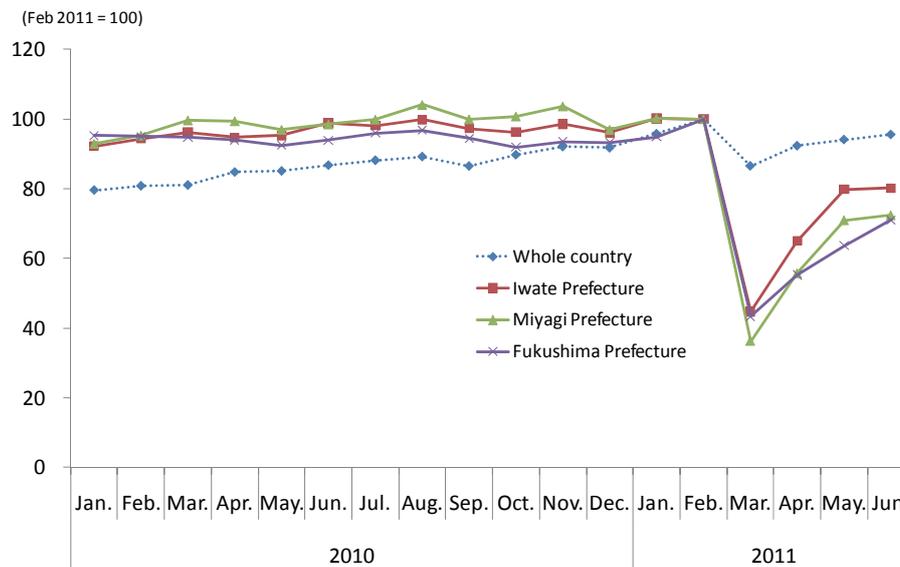
Volume of transactions in agricultural wholesale markets, ratio of job openings to job seekers, amount of payment of fees for medical services, fisheries catch, Industrial Production Index, volume of power used by large users, sales figures for large retail stores, number of housing starts, number of business bankruptcies (negative indicator) (Nine data series in total)

<Data series: Version II>

Adds number of passengers at regional airports and volume of freight handled at regional airports to data series for Version 1 (Total of eleven data series)

Figure 2 is a plot of trends in the index synthesizing the Version I data series, with figures for February 2011 as 100.

Figure 2 Trends in index expressing status of activity (Version I)



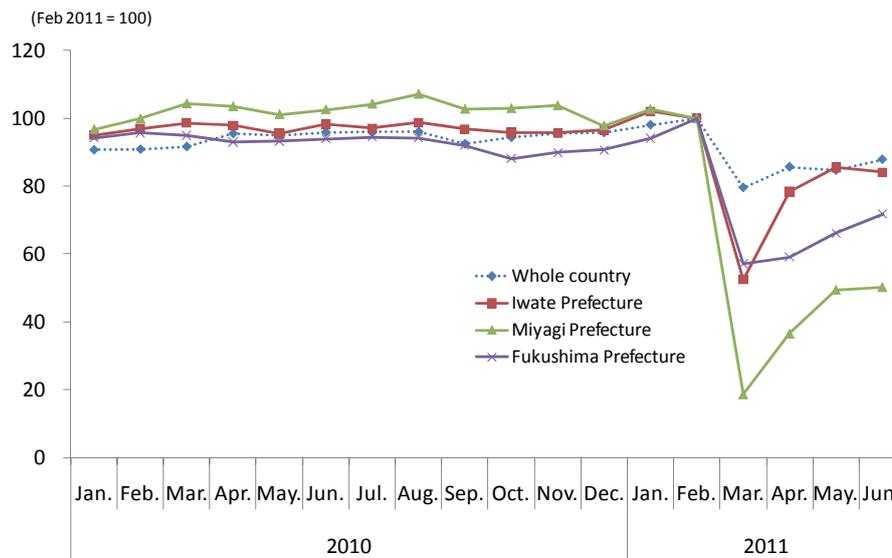
A survey of the status of activity in the three prefectures in the Tohoku region under consideration indicates that the earthquake had a powerful impact. Sales figures for large retail stores, industrial production, and large-scale power use declined significantly in all the prefectures in March. However, in April, all of these figures rebounded positively against the previous month, and overall trends reversed in all the prefectures. Following this, the index maintained basically flat profiles for May and June. Considering trends by prefecture, we see that the decline in sales figures for large retail stores, the Industrial Productivity Index, and the ratio of job openings to job seekers, was greater in Miyagi Prefecture than in the other prefectures. It will also be necessary to focus on trends in the fisheries catch, given that the fishing season will be commencing later in the year. Payments of fees for medical services, which had declined in March, recovered in April. However, considering that the number of people requiring medical consultations increased in the disaster zone and evacuated outside the prefecture, it is possible that standard consultations and examinations such as checkups may have been postponed. A more detailed study, including examination of health insurance claims, will be necessary in this area.

Next, we will consider Version II of the index expressing the status of activity, which incorporates the number of passengers and the volume of freight shipped at regional airports (Figure 3).

In this version, the impact of the disaster is felt most strongly in Miyagi Prefecture. This is due to the fact that the effect of the disaster on Sendai Airport had an enormous impact on freight shipment and passenger transport. Hanamaki Airport in Iwate Prefecture and Fukushima Airport in Fukushima Prefecture are located inland, and thus avoided being damaged by the tsunami. Each of the

annual volume of freight shipped through Hanamaki Airport and Fukushima Airport is less than 10 percent that of Sendai Airport. The effect of the damage to this hub for human movement and distribution of goods is significant to increase those through substitutive route, and it will be necessary to give attention to the effect of this factor on reconstruction in Miyagi Prefecture.

Figure 3 Trends in index expressing status of activity (Version II)

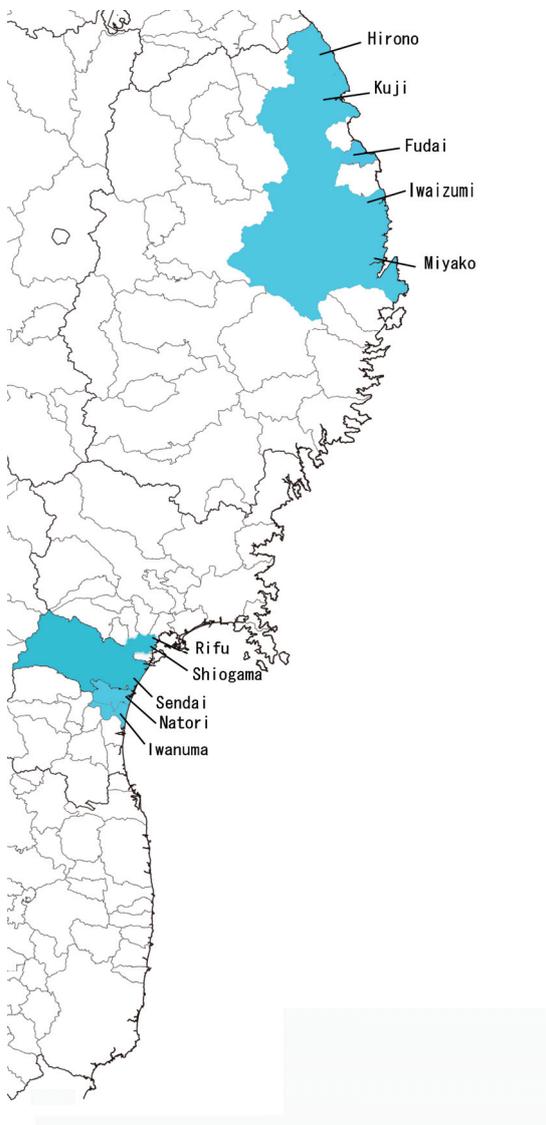


4. Status of Recovery in Cities, Towns and Villages as Expressed by Data

The study indicated that overall, recovery is proceeding steadily in the 37 cities, towns and villages focused on. This is, it goes without saying, an effect of the fact that despite the unprecedented scale of the tsunami disaster, the government and local authorities, residents of the region, and institutions including the SDF, the police, and electricity and gas utilities, are working tirelessly to achieve recovery in the region as quickly as possible. We hope that in future, using this data as a reference, the government will provide a greater level of practical and financial support to regions which need time for recovery.

Looking at the differences between individual cities, towns and villages, we find that the level of recovery is affected by the rate of recovery of rail transport, the rate of clearance of rubble, the rate of disbursement of donations and compensation payments. The ten local authorities which have achieved the greatest level of recovery in these areas can be classified together as follows.

Figure 4 Cities, towns and villages displaying the most rapid recovery



- Cities, towns and villages displaying steady recovery overall (Iwaizumi, Iwate Prefecture; Fudai, Iwate Prefecture, Hirono, Iwate Prefecture)
- Cities, towns and villages displaying steady recovery, despite the fact that the clearance of rubble remains an issue (Miyako, Iwate Prefecture; Kuji, Iwate Prefecture; Rifu, Miyagi Prefecture)
- Cities, towns and villages in which the early recovery of gas, electricity, roads, etc. is boosting overall recovery, despite the continued effect of a number of issues (Sendai, Miyagi Prefecture; Natori, Miyagi Prefecture; Iwanuma, Miyagi Prefecture; Shiogama, Miyagi Prefecture)

Recovery efforts were at a standstill in most of the cities, towns and villages considered in Fukushima Prefecture. The accident at the Fukushima Daiichi Nuclear Power Station represents a significant factor in this.

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What's NIRA?

The National Institute for Research Advancement (NIRA) is an independent, private-sector research institute which defines urgent policy issues and formulates bold and timely policy proposals, seeking to contribute to the revitalization and further development of Japanese society and the Japanese economy.

Utilizing a network of scholars, researchers, and specialists in a wide range of subjects, NIRA works for the public benefit from a fair and neutral perspective, attempting to reinvigorate policy debate and contribute to the process of policy formation in Japan. The institute focuses on domestic social and economic policy, international relations, and regional issues in Japan as its principal areas of research.

Established in 1974 as a government-authorized independent research institution, NIRA became an incorporated foundation in 2007, and since February 2011 has been recognized as a Public Interest Incorporated Foundation.

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