

# CASE STUDY OF CONSENSUS BUILDING FOR ENHANCEMENT OF THE REGIONAL DISASTER RESILIENCE

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**ABSTRACT:** In Japan's regional cities, the danger of disasters is greater than it is in large cities as a consequence of the difference in the population structure and the fragility of roads and other infrastructure. To prevent the deterioration of regional cities under the impact of disasters, it is important that they be restored rapidly, and an effective way to achieve this is for regional companies to enact and implement business continuity plans (BCPs). However, regional cities are often supported by small and medium companies, which lack information, personnel, knowledge, and capital, and so cannot easily enact BCPs on their own.

For the above reasons, to enable regional small and medium companies to enact BCPs to improve disaster resilience, administrative bodies must provide support premised on an awareness common to entire regions. The purpose of this research is to incorporate a consensus building method and form study committees capable of sharing information and knowledge concerning support for the enactment of BCPs and disaster resistance in order to enhance regional disaster resilience.

This effort is now being implemented in two cities in the Shikoku Region. Study committees are formed by several companies, chambers of commerce, administrations, and academic experts. The participating companies exchange information and study the enactment of their own BCPs, based on an agreement to enhance the disaster resilience of their regions.

**KEYWORDS:** regional disaster resilience, business continuity plan, consensus building

## 1. INTRODUCTION

Japan is a part of Asia and is at high risk of natural disasters because of its location, topography, geology, weather and other features of the natural land and conditions. Statistics on the number of fatalities caused by different types of natural disasters around the world show that more than 80% of fatalities caused by floods, tsunamis, storm surges, and powerful winds, and more than 60% by droughts and earthquakes, occur in Asia. Furthermore, approximately 46% of all damage by cost caused by natural disasters worldwide occurs in Asia. Within Asia, Japan is a disaster-prone country where,

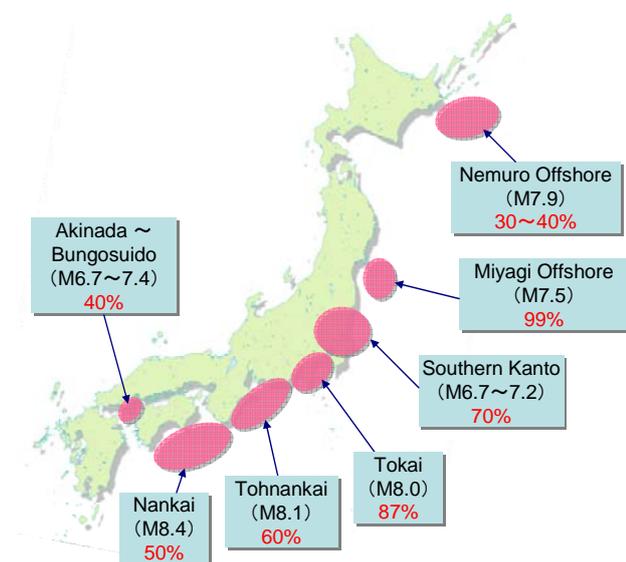
in terms of cost, about 15% of disaster damage worldwide occurs, yet it occupies only 0.25% of the global land area. It has been pointed out that large earthquakes—the Tokai Earthquake, the Tohankai and Nankai Earthquake, and the Southern Kanto Earthquake—are imminent, resulting in a growing fear of disasters.

The population is declining, the birth rate dropping, and the society aging throughout Japan, particularly in regional cities. In past disasters, the percentage of elderly victims that are killed or go missing is high, and in regional cities where society is aging, the danger from disasters is also high.

It is clear that the disaster-resistance of roads and other infrastructure must be enhanced. However, the road networks and other infrastructure in regional cities are fragile and have little redundancy, so the danger from disasters in regional cities is high.

Enhancement of the regional disaster resilience of regional cities at high risk of disasters is an urgent challenge.

This research aims to identify problems hindering enhancement of the regional disaster resilience of regional cities and to propose effective measures and introduce specific efforts to overcome these problems.



Source: The Headquarters for Earthquake Research Promotion

Figure 1.1 Probability of a large-scale earthquake occurs within the next 30 years

## 2. POSITIONING OF THE RESEARCH

Some of the past researches and initiatives undertaken to enhance regional disaster resilience focused on the roles of self assistance and mutual assistance and on BCP by companies, topics similar to the focal points of this research. In these researches of on self assistance and mutual assistance, ordinary residents are the subject and they provided the know-how for companies to enact their own BCPs.

While, this research focuses on the enhancement of regional disaster resilience based on self assistance and mutual assistance through the enactment of BCP by individual companies, and establishes, as a social system, procedures to help small and medium companies and administrative bodies cooperate with each other and enact their own BCPs.

Okanishi and Sadohara et al. have revealed the state of links between people and the state of disaster countermeasure activities in local governments and neighborhood associations. They have defined links between people in regional communities as, “potential regional disaster resilience”: the ability of a region to unite during a disaster to protect itself. The degree of disaster resistance countermeasure activities is, as one item in a variety of day-to-day activities, defined as, “practical regional disaster resilience”, that is, the possibility of activities that can be implemented during disasters.

Takeuchi, Xu, and Kajitani et al. have established parallel hard measures and soft measures to prevent natural disasters. They argue that in order to build up the soft measures, it is vital to conduct risk management: a process that includes the sharing and understanding of information about disaster resistance during normal times by residents, regions, and administrative bodies to build trusting relationships between these areas, and to clearly distribute their roles during a disaster. They proposed the Communicative Survey Method as a means of doing this.

Okazaki proposed “Co-learning”: mutual education between researchers, administrative bodies, and residents so that people in regional communities can continue to be concerned with disaster resistance and take measures and conduct activities to autonomously avoid disasters, and risk communication plays a major role in this process.

In their research, those practicing “self assistance” and “mutual assistance” are often ordinary residents.

In recent years, the focus of corporate disaster

resistance has been on business continuity planning (BCP), guidelines concerning the support of BCP enactment have been enacted, and action taken to encourage their application.

The Government of Japan is, assuming that having companies enact BCP is an effective way to reduce the damage and losses caused by disasters, promoting the enactment of BCP and has prepared guidelines for BCP enactment.

Maruya has, moved by concern for the effectiveness of measures to spread BCP to small and medium companies, prepared the “BCP Step-up Guide for SMEs” in order to introduce BCP to small and medium companies in stages. This is divided into three parts so it can be implemented easily by such companies.

These initiatives supply companies with the know-how needed to enact BCP.

In this way, past research and initiatives did not focus on the enhancement of regional disaster resilience through corporate disaster resistance, and did not include efforts to unite regional companies and administrative bodies to communicate with each other to support the enactment of BCP.

### 3. CHALLENGES TO BE OVERCOME IN ENHANCING REGIONAL DISASTER RESILIENCE

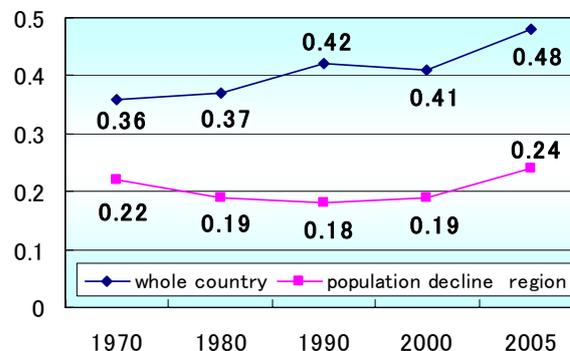
#### 3.1 Strengthening “self assistance” and “mutual assistance”

To realize disaster resistance countermeasures, it is vital that self assistance (protecting one’s own life), mutual assistance (all members of a town maintaining its safety), and public section’s assistance (administrative bodes protecting the regional infrastructure) each function appropriately and remain balanced.

Under present harsh financial restrictions, regional cities are cutting budgets for infrastructure that resists the effects of earthquakes and strong typhoons. This

trend is remarkable in depopulated regions where population decline is becoming more severe, creating extremely difficult conditions: financial strength indices are about half of their national values. Under these circumstances, it is difficult to enhance regional disaster resilience, which requires strengthened self assistance and mutual assistance, by relying only on public section’s assistance. Few people now join or participate in neighborhood associations, and the number of fire brigades that are regional independent fire-fighting organizations are declining as their members are aging, indicating that regional communities that have played major roles in self assistance and mutual assistance have deteriorated.

Since public section’s assistance by administrative bodies is limited as explained above, self assistance and mutual assistance do not function adequately, requiring self assistance and mutual assistance to be strengthened by enhancing regional fire-fighting organizations.



Source: Ministry of Internal Affairs and Communications

Figure 3.1 Trend of the financial coefficient

#### 3.2 Business continuity of companies

In August 2006, one year after the disaster caused by Hurricane Katrina in August 2005, the population of New Orleans was only about 40% of its level before the disaster. One cause of this low return rate is assumed to be a lack of employment in the region. This results in a vicious circle: declining population and labor force, reduced urban vitality, and declining public

and private sector services.

The same problem has appeared in Japan. For example, the 2005 population of the town of Miyakemura, the residents of which evacuated along with all residents of Miyakejima Island in September 2000 following the eruption of Mt. Oyama on Miyakejima Island, was only 36.3% of the population in 1995. The cause is assumed to be a lack of employment opportunities for young people, as well as the impact of volcanic gases.

For these reasons, ensuring employment has a great impact on the speed of recovery of a region, which means that the continuity of business activities by companies is essential following a disaster.

Industrial restructuring in recent years has expanded supply chain management. The Niigata Chuetsu Offshore Earthquake of July 2007 damaged the facilities of an auto parts manufacturer, shutting down all production lines at its Kashiwazaki plant. This hindered the procurement of parts by auto makers, forcing almost all auto factories in Japan to halt production.

For these reasons, considering the impact on the overall economy, it is important that companies' supply chains are not affected during disasters. To ensure this, business operations must continue.

#### 4. SUPPORT FOR THE ENACTMENT OF BUSINESS CONTINUITY PLANS

An effective countermeasure against the above problem is to have each company enact a business continuity plan (BCP), establishing self assistance and mutual assistance activities to allow these companies to continue operating.

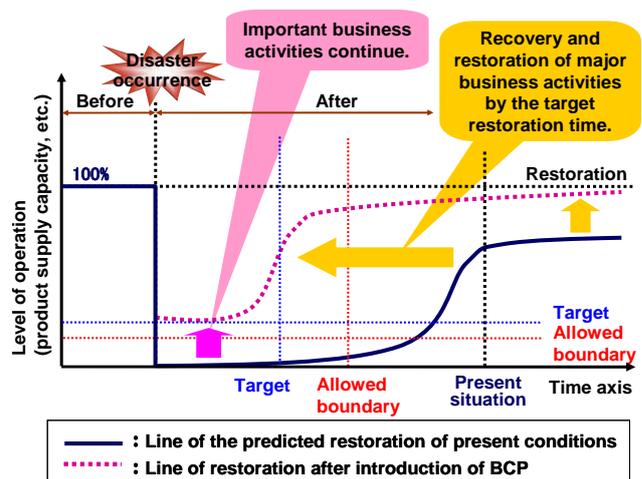
##### 4.1 Outline of BCPs

A BCP is a plan to reduce the decline of the core business of a company's business offices to a degree, thus ensuring continuity following a disaster or accident that has temporarily lowered their operating

level (allowing the core business to continue), and to minimize the recovery time to allow full operation to resume as early as possible, thereby minimizing losses at each plant and permitting business activities to continue after the occurrence of a disaster or an accident.

Enacting a BCP can ensure employment by permitting business activities to continue following a disaster, and at the same time, can avoid any impact on the supply chain, preventing economic losses.

A BCP contributes to strengthening self assistance and mutual assistance, because it includes the concept of regional contribution, based on the philosophy of Corporate Social Responsibility (CSR).



Source: quoted and partly revised from the Business Continuity Guideline, Prime Minister's Office

Figure 4.1 BCP Image

##### 4.2 Supporting small and medium enterprises in regional cities

Corporate BCPs have advanced rapidly among large corporations as part of supply chain management. However, small and medium companies that conduct smaller scale business operations lack sufficient information, personnel, and knowledge, making it difficult for them to implement a BCP on their own, thereby slowing penetration among these companies.

In many regional cities, most companies are small and

medium companies of this kind and many of their employees are local residents. As explained above, regional cities are prone to severe damage by disasters and their disaster resistance measures are inadequate, so it is important to support the enactment of BCPs by companies in regional cities.

### 4.3 Information provision by administrative bodies contributing to the enactment of BCPs

We interviewed many companies concerning the enactment of BCPs in 2006. The results revealed that a company must gather information of various kinds to enact a BCP. In particular, some expressed the view that during a disaster, “We want to provide information at an early stage, even if its precision and reliability are low.”

Therefore, we focused on the provision of information by administrative bodies to assist a company with enacting a BCP.

## 5. INTRODUCTION OF INITIATIVES

In response to the above findings, initiatives are being taken in regional cities to create partnerships that contribute to supporting the enactment of a BCP while communicating with regional companies centered on regional disaster resistance leaders, in order to enhance regional disaster resilience through the use of company BCPs. This initiative is being taken in two cities: Komatsushima City in Tokushima Prefecture and Ozu City in Ehime Prefecture.

### 5.1 Outline of the BCP study meetings

#### 5.1.1 Purpose of holding study meetings

##### (1) Supporting the enactment of common parts to enact BCPs

There are BCP enactment-related topics, such as damage hypotheses that can be studied jointly by every company in a region. By obtaining support from administrative bodies concerning these common parts

by holding study meetings, it is possible to lower the burden on companies by enacting common parts of BCPs by means of an agreement between administrative bodies and companies.

Expanding the common parts reduces the topics studied separately by individual companies, thus lowering the burden on each one. This fact permits each study to focus on matters unique to each company, permitting the widespread enactment of complete BCPs. This will lead to an increase in regional disaster resilience.

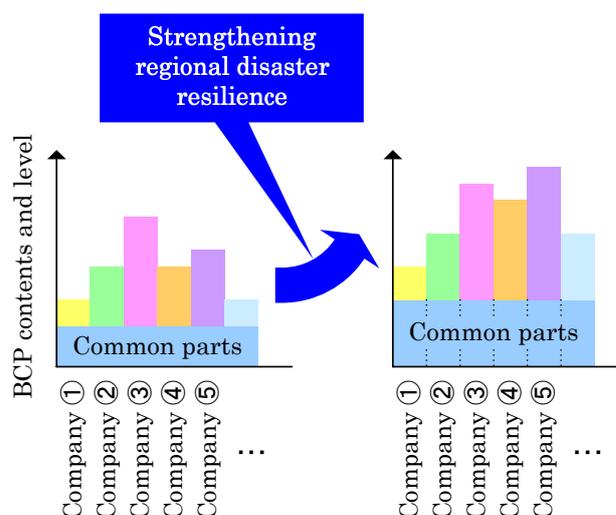


Figure 5.1 Enactment of Common Parts

##### (2) Measures to establish a BCP as a permanent public system

Enacting a BCP does not end the process. A plan that has been enacted must be one that can be implemented and the plan must include measures so that the level of its contents can be improved.

It is, therefore, essential to establish procedures in which each company continuously improves its BCP by finding plan’s flaws through disaster management drill and developing measures to address the flaws, and to feed back those information into the study committee.

**(3) Measures to share information and accumulate knowledge to prepare for disasters**

It is possible to effectively implement a BCP during a disaster, if companies and administrative bodies can effectively exchange and link information, not only when a disaster occurs, but also during normal times. Therefore, it is necessary to establish the means to regularly discuss disaster resistance and to accumulate knowledge obtained through supporting the enactment of BCP measures by participating companies during normal times.

Therefore, procedures will be established to share the findings of study meetings. At the same time, knowledge obtained by applying the findings to other companies will be accumulated.

**5.1.2 Contents studied**

As shown in Table 5.1, the contents of the study meetings mainly concern information needed to enact a BCP ((1) and (2) in the table below).

These types of information may be imprecise: possible errors or information that is not necessarily accurate. Therefore, when an administrative body releases this information, it is necessary that the parties receiving the information understand that the information they have received may include such imprecise information and that concerned regional parties have acknowledged this fact.

The consensus building method has been adopted so that this information can be approved and agreed on by all participants.

**5.2 Initiatives in Komatsushima City**

**5.2.1 Outline of Komatsushima City**

Komatsushima City is located south of Tokushima City at the eastern end of Tokushima Prefecture, occupies 45 km<sup>2</sup> of land facing the sea, and is home to approximately 42,000 people.

Komatsushima City has never suffered a severe disaster,

Table 5.1 Matters Considered by the Study Committee

Contents	Sample items
(1) Common parts of a BCP that are enacted	<ul style="list-style-type: none"> <li>• Hypothetical damage</li> <li>• Contents of regional contribution activities</li> <li>• Sustainable activities in a region</li> <li>• Restoration priority etc.</li> </ul>
(2) Information needed to enact a BCP	<ul style="list-style-type: none"> <li>• Contents and methods of information provision by administrative bodies</li> <li>• Acceptability of risk posed by information etc.</li> </ul>
(3) Problems to be overcome when enacting a BCP	<ul style="list-style-type: none"> <li>• Enacting BCP: problems, improvements, needs</li> <li>• Clarifying awareness of measures to introduce BCP</li> <li>• Degree of contribution to regional society, etc.</li> </ul>

so the people are not very alert to the threat of a disaster.

Severe disasters that might strike Komatsushima City are presumed to be the Tonankai or Nankai Earthquakes and tsunami triggered by them.

**5.2.2 Organization of the Study Committee**

As shown by Table 5.2, study meetings in Komatsushima are held mainly by participants from Tokushima Prefecture.

**5.2.3 Activities at the Study Meetings**

When the first study meetings were held, many of the participating companies did not know about BCP. However, as they studied the risk of disasters and the need for BCPs, they gained a shared sense of crisis as they learned that small and medium companies would not be able to recover if a serious disaster were to occur, and as a result have become conscious of the

Table 5.2 Organization of the Komatsushima City BCP Study Meetings

Local parties	<ul style="list-style-type: none"> <li>Local companies (marine transporter, shipbuilder, medical treatment equipment manufacturer, cable television provider, bank, construction company, printing company etc)</li> <li>Chamber of Commerce</li> <li>Junior Chamber of Commerce</li> </ul>
Administrative bodies	<ul style="list-style-type: none"> <li>Komatsushima City</li> <li>Tokushima Prefecture</li> <li>Ministry of Land, Infrastructure and Transport</li> </ul>
Advisors	<ul style="list-style-type: none"> <li>Academic experts</li> <li>National Institute for Land and Infrastructure Management</li> </ul>

importance of self assistance. The participants agreed to enhance the resilience of their region by enacting BCPs.

At the meetings, the participants studied the contents of Part I (of three parts) of the Tokushima Prefecture BCP Step-up Guide, and each company prepared their own contents, and through this process identified problems, and are now studying measures to resolve these problems.

Through past study meetings, each company learned that even if it did not take the form of a BCP and disaster resistance plans, each considered countermeasures to deal with disasters, although the level of contents varied.

### 5.3 Initiatives in Ozu City

#### 5.3.1 Outline of Ozu City

Ozu City is located in the Nanyo Region of Ehime Prefecture on approximately 432 km<sup>2</sup> of land inhabited

by about 50,000 people. The Hiji River, which has unique topographical characteristics that distinguish it from other rivers, for example 90% of its drainage basin is mountainous land, flows through central Ozu City.

Between 1945 and 1995, the Ozu Plain and plains downstream were flooded typically once every three years, so the local people are acutely aware of disasters. Severe disasters that could occur in Ozu City include flood discharge on the Hiji River and the Nankai Earthquake.

#### 5.3.2 Organization of the study meetings

As shown by Table 5.3, participants in the study meetings held in Ozu City were mainly from Ozu City.

Table 5.3 Organization of the Ozu City BCP Study Meetings

Local parties	<ul style="list-style-type: none"> <li>Local companies (construction company, service industries etc)</li> <li>Chamber of Commerce</li> </ul>
Administrative bodies	<ul style="list-style-type: none"> <li>Ozu City</li> <li>Ministry of Land, Infrastructure and Transport</li> </ul>
Advisors	<ul style="list-style-type: none"> <li>Academic experts</li> <li>National Institute for Land and Infrastructure Management</li> </ul>

#### 5.3.3 Contents of the study meetings

The first study meeting in Ozu City was held in December 2007, although gatherings organized as discussion groups were held prior to this, at which participants confirmed the risk of disasters and the need for BCPs. During the discussions, the importance of administrative bodies providing information about flooding was pointed out. It is now reasonably possible to predict the damage that will be caused by a flood anticipated in Ozu City, by considering rainfall,

weather conditions, and a change in river level, so it is important to discuss the contents and timing of providing information on evacuation etc.

## 6. FUTURE CHALLENGES

Initiatives undertaken in Komatsushima City and in Ozu City are still not complete and discussions on future challenges in enhancing the region's disaster resilience while enacting BCP are continuing.

Efforts will be made to share disaster-related information that may include errors and imprecise information with the recipients recognizing that the information may be incomplete, and to promote contributions to the region by its companies.

In order that companies that participate in the study meetings not only enact BCPs, but also expand these to the region, it is also essential to provide information about initiatives discussed at the study meetings to companies that do not participate in the meetings to enlighten them. It is also important to expand this approach beyond these two cities to other regional cities. A web site has therefore been set up to communicate the initiatives in Komatsushima City and Ozu City to other cities and to carry out web questionnaire surveys (<http://www.nilim.go.jp/lab/gbg/bcp.html>). We intend to provide information through this web site and to measure the effectiveness of such information web sites.

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