A PROPOSAL FOR DISTRICT CONTINUITY INTENSIFICATION BY DRAWING UP AND SUPPORTING A BUSINESS CONTINUITY PLAN (BCP) FOR CONSTRUCTION COMPANIES: A NEW WAY OF DISTRICT DEVELOPMENT

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District continuity after large-scale disasters requires that the business continuity of local organizations such as administrative groups and companies within the community be considered first. However, only 27.6% of large companies and 12.6% of middle-sized companies have their own Business Continuity Plan (BCP). Therefore, it is necessary to promote the concept of BCP.

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1. INTRODUCTION

District continuity after large-scale disasters requires that the business continuity of local organizations such as administrative groups and companies within the community be considered first. However, only 27.6% of large companies and 12.6% of middle-sized companies have their own Business Continuity Plan (BCP). The revival of the local community and economy significantly depends on the early recovery of local infrastructures, such as electricity, gas, roads and railways. Immediately after a disaster occurs, the construction industry, which is familiar with the local conditions, can play a significant and highly expected role. Therefore, it can be said that a BCP for construction companies can contribute to achieving district continuity. This study suggests intensifying district continuity based on new knowledge acquired from the development of a system that supports making a BCP.

Key Words : business continuity plan (BCP), district continuity plan (DCP)

To prevent similar situations, the development of a Business Continuity Plan (BCP) has been suggested. However, only 27.6% of large companies and 12.6% of middle-sized companies in Japan have their own BCPs. Therefore, it is necessary to promote the concept of BCP.

In January 2010, it was predicted that the Nankai earthquake has a 60% probability of occurring within the next 30 years in Shikoku, Japan. Especially, Kagawa, which is the central hub in Shikoku, is an important base of companies operating nationwide.
Therefore, developing disaster prevention measures and ensuring business continuity of individual organizations is urgently needed.

A delay in the organization’s business continuity leads to a delay in the restoration of infrastructures, such as roads, railways, and the lifeline of the region. As a result, district continuity also declines. The revival of the local community and economy significantly depends on the early recovery of local infrastructures. Thus, a delay in the organization’s business continuity must be prevented.

In the recovery period after a disaster, the construction industry has an important role because of its familiarity with local conditions. Therefore, the business continuity of the construction industry is considered to contribute greatly to achieving district continuity.

A questionnaire on disaster prevention and BCP (conducted by the Crisis and Security Management Research Center, Kagawa University in September 2008) has reported that the formulation rate of BCP is low. Only 16% of companies have formulated their BCPs, broken down as follows: companies with more than 1 billion capital – 72%; small- and medium-sized enterprises – 6%. In the construction industry, 41% of companies have formulated their BCPs. Although it is a high percentage compared with 16% of all industries, companies with more than 1 billion capital occupy a lot of it.

The reason for the lower formulation rate of BCP is the lack of know-how and skills needed to formulate BCP and the lack of internal awareness about the need for BCP. Solving these problems and supporting the formulation of the construction industry BCP will thus lead to the improvement of district continuity.

In this study, an attempt is made to propose a district continuity intensification plan from new knowledge acquired through the development of BCP formulation support systems in the construction industry. We propose that support be considered for the formulation of a BCP leading to a District Continuity Plan (DCP), the establishment of a promotion organization focusing on the universities, and the clarification of roles.

2. PROBLEMS OF THE CONSTRUCTION INDUSTRY REGARDING DISTRICT CONTINUITY

(1) Concept of district continuity

Fig. 1 shows the concept of district continuity. There are many components in the region, such as individuals, families, communities, businesses, infrastructures, community assets, and so on. The regional components cooperate with other components to achieve district continuity (Fig. 1(b)). As close cooperation develops, these components cover the entire district (Fig. 1(c)).

The degree of district continuity is composed of three stages as follows:

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\text{degree of district continuity} = \sum \text{degree of organization’s business continuity} + \text{synergy of inter-organizational cooperation}
\]

Fig. 2 Stages of district continuity.

Fig. 1 Concept of district continuity.
Stage 1 Improvement of the organization’s business continuity
Stage 2 Improvement of the organization’s business continuity through inter-organizational cooperation
Stage 3 Improvement of the entire district continuity

(2) Problems of the construction industry regarding district continuity

District continuity is achieved through the restoration of local infrastructure (Stage 1), reconstructing livelihoods and the organization’s business continuity (Stage 2), and restoration of economic activities and inter-organizational cooperation (Stage 3) (Fig. 2).

The regional construction industry plays a great role because the local infrastructures must continue in order to foster district continuity.

In the following, we discuss the importance of formulating a BCP in the construction industry based on current situations and business characteristics.

"Business Continuity Guidelines for the Construction Industry, 2nd ed." has reported the business characteristics of the construction industry as follows:

- The construction industry is a pyramidal organization with many business locations.
- The construction industry is labor-intensive. Business is not a standalone company.
- It deals with a number of partner companies, equipment manufacturers and others associated with construction. Also, there are the workers and the construction machinery. During disasters, these are immediately available.
- There are a number of completed structures. Since responsibility for a certain project continues after delivery of works, it has a long-term relationship with customers.
- During disasters, the construction industry is responsible for important work, such as restoration of infrastructure and removal of obstructions.
- Because the construction site is in close contact with the local community in pre-disaster time, construction companies are able to conduct rescue operations in the region during disasters.
- The construction industry owns disaster prevention and mitigation technology. Construction companies are able to determine the risks posed by buildings.
- Immediately after a disaster, it will be a very busy season for the construction industry.

Construction work is performed in cooperation with other companies, and the construction industry is in close contact with the region. It is familiar with local conditions in the region because of its construction activities. Since a construction company is an organization that is able to respond to an emergency, it is expected to help out in the region during disasters.

On the other hand, the actual business situation of the construction industry is a very difficult one. The Japan Federation of Construction Contractors has reported that construction investment in 2009 has decreased by up to 50% (42.2 trillion yen) of the peak (84.0 trillion yen), whereas decrease in the number of construction industry has stopped at about 85% (513 thousand companies) of the peak (601 thousand companies). The number of workers engaged in the construction industry has decreased by about 75% (5.17 million people) of the peak (6.85 million people).

Compared to the decline in construction investment, the number of construction has not decreased. Therefore, this indicates that the business conditions per company are very strict.

In such situations, a construction company may not be able to respond to an emergency because it does not possess important assets of the construction industry such as human resources and heavy equipment.

Because disaster recovery may affect the business opportunities of the construction industry, the BCP is a measure for survival in the construction industry. It is an important issue that has direct impact on district continuity.

3. SUPPORT FOR THE FORMULATION OF DISTRICT CONTINUITY IN THE CONSTRUCTION INDUSTRY

Various initiatives such as the public dissemination guidelines for the BCP have been taken by government and industry groups. However, there is a limit to measures that target an unspecified number of companies. Therefore, it is necessary to support the formulation of a BCP for the construction industry. In this study, an attempt is made to develop a support system for the BCP. By using the proposed system, small- and medium-sized enterprises, which do not have the necessary know-how and skills, are able to formulate a BCP easily. The proposed system also has the concept of improving district continuity.

The support system consists of the awareness-raising activities through a BCP workshop and BCP toolkits for the construction industry. Details of the tools are described in the previous study. In the following, we present an overview of the pro-
posed system and its potential problems.

(1) Development of a BCP support system

a) Awareness-raising activities of a BCP workshop in the Kagawa construction industry

A workshop for the formulation of a BCP was held by the Crisis and Security Management Research Center, Kagawa University. In the workshop, we taught the basics of BCP in the construction industry based on the "Certification procedure for business continuity on disaster" formulated by the Shikoku BCP Construction Committee (composed of the Shikoku Regional Development Bureau, administrative organizations and universities in Shikoku). We also tried to explain that the objective of formulating a BCP is not only to help the company survive, but also to enable it to contribute to district continuity.

Specifically, the participating companies learned how to cooperate with the District Continuity Plan (DCP) in mind. The workshop was conducted using group work rather than lectures. Each company presented the consequences of the challenges, which were given in advance. Sharing the consequences, they discussed the solutions with the group.

The following consensus was obtained from the participating companies: it is important to coordinate and cooperate with competitors, the region or the government in order to formulate a practicable BCP.

b) Development of a BCP toolkit for the construction industry

The proposed system is developed with the following objectives:
- to reduce the burden of formulating a BCP
- to reduce the maintenance costs through the effective use of an enterprise information system
- to ease the updating of the BCP based on the PDCA cycle.

We do not plan to develop a new system for the formulation of BCP. The proposed system will be developed by utilizing the existing company-owned systems. Web servers and database systems, which companies use on a daily basis, will be linked. Documents for the formulation of the BCP will be created and stored.

The decision support toolkit has document formulation support, retrieval support and operational support (Fig.3). Retrieval support provides information required to formulate the BCP. But instead of the BCP creating and filling up the form, the proposed toolkit supports the formulation of the BCP according to specific company situations by assuming its status. When a user enters data into the system, the toolkit presents additional information to guide user entries.

For example, for the selection of important business tasks, it is necessary to determine the priority of undergoing operations. It is difficult to assess the objective because a comprehensive assessment of the business requires such information as impact on earnings, impact on sales, cash management, relationship with suppliers and so on. The proposed toolkit presents these assessment criteria. It assists in the determination of the importance of each business by assessing the degree of influence of each item.

(2) Problems encountered in the workshop

In the workshop, various opinions were presented as follows:
- Even if the company has decided on its important business priorities, if the manual created does not consider regional cooperation, confusion may occur.
- Disaster recovery is the mission of the construction industry but no activity may be started unless the safety of the family has been secured.
- Administrative organizations have to unify the chain of command from the country down to cities and towns. It is also necessary to work in close cooperation with construction industry associations.
- It is necessary to exchange opinions as much as possible with the relevant organizations on the formulation of a BCP.
- It is necessary to create a network and establish cooperation in the region and with other companies.
- During the formulation of the BCP, regional cooperation may start.
- Each company should not formulate its own disaster recovery plan. A management organization such as the local government should determine the priorities for recovery. It should assign responsibilities, including con-
tractors outside the prefecture from the top down.

- It will be for the benefit of this BCP workshop to ask the local government to build a larger framework, which a single company alone cannot build.

In the next section, we discuss improvements on the DCP based on the above opinions.

4. PROPOSAL FOR IMPROVING DISTRICT CONTINUITY BY USING THE BCP CONSTRUCTION DECISION SUPPORT

Supporting the formulation of a BCP in the construction industry leads to district continuity. A BCP is also effective in making the construction industry survive.

On the other hand, there are various challenges in disaster recovery, which become important concerns for the construction industry.

In this section, we propose a solution that takes these challenges into account.

(1) Establishment and management of district continuity management councils

District continuity management refers to the performance of disaster recovery starting from pre-disaster time, to negotiating in advance for response activities after the disaster. Members will aim to achieve the required mitigation measures and consider restoration priority areas from the perspective of local residents.

In a disaster, the council acts as the coordinating agency for each organization, and adjustment personnel are assigned. Adjustment personnel share disaster information and local needs to the council. Then, they adjust the recovery priority, personnel, heavy equipment and materials.

To perform the role shown in Fig.4 in a disaster, various pieces of information are shared in pre-disaster time by the council. Decisions of the council are based on the consensus of the community.

(2) District information sharing and disclosure system

a) Publishing and standardization of the decision support toolkit for the BCP

The proposed system is intended for the construc-

![Fig.4 Overview of the management of the District Continuity Management Council.](image-url)
tion industry. It is necessary to expand it to other industries such as agriculture, forestry and fisheries, manufacturing and so on.

b) Collaboration between the decision support toolkit for BCP and various databases

Collaboration with various databases, such as damage prediction for the region, history of the affected region and disaster information is required.

c) Accumulation and sharing of BCP formulation cases and disaster cases

Although the toolkit presents additional information for guiding user entries, concrete BCP cases are required for construction companies that participate in the workshop.

It will be beneficial to accumulate cases of BCP formulation by using the proposed system and to publicize helpful information in the formulation of the BCP. It is also necessary to accumulate disaster recovery cases of companies that have formulated their BCPs.

(3) Continued efforts to improve social needs related to BCP and DCP

Social needs related to BCP and DCP are crucial to the management of the district continuity management council.

a) Clarification of the window such as the establishment of an office for district continuity management

To raise awareness in the region, an office such as “Support Center Improvement of District Continuity” must be established. Through wide publicity, awareness of the social aspects of BCP and DCP can be achieved. A stationary window is also required.

b) Approaching the administrative organizations

Opinions raised in the workshop described in Section 3 indicate that awareness of administrative organizations about the BCP is low. Therefore, the administrative organizations should participate in the council because they have regional information. It is necessary for universities to approach administrative organizations.

c) Proactive public relations to promote companies in good BCP standing

Companies in good BCP standing have been honored by various institutions. Universities and the council must actively publicize good practices.

(4) Human resource development for Business Continuity Management (BCM)

a) Free education by administrative organizations and universities

The Crisis and Security Management Research Center of Kagawa University has offered “District Disaster Management Leadership Training Course.” Course graduates are given qualifications for candidacy for an examination to qualify them as disaster prevention experts.

We propose to establish a “Certification System for Business Continuity Manager.” Administrative organizations and universities should regularly offer the course and candidate qualifications for an examination.

b) Development of a human resource development curriculum for BCM

The Ministry of Economy, Trade and Industry (MOT) has published the “MOT Educational Guidelines” as a method of technology management. These guidelines aim to develop human resources and technology management.

A curriculum for human resource development for BCP based on business continuity management should be developed in this regard.

(5) Improvement of business continuity support for the construction industry

To improve business continuity in the construction industry, the formulation of a BCP is an effective strategy. However, heavy equipment and materials are required to execute the BCP and disaster recovery.

Considering the challenges in the management of the construction industry as described in Section 2, human and material resources support and the improvement of business continuity force must be ensured.

a) Ensure support personnel with special skills or heavy machinery holdings (Points added to bid evaluation eligibility and establishment of subsidies)

The number of heavy equipment rentals has been increasing every year. The lack of heavy machinery is a serious concern. In the preliminary screening of prospective bidders for public works, the retention of heavy equipment should be evaluated.

The administrative organizations should grant the construction industry a subsidy for the purchase of heavy equipment and materials required for disaster recovery. Likewise, a system for employee wage subsidy should be established.

b) Securing means of information and communication support during emergencies (Rental of satellite phones and wireless)

A plurality of communication means is required for rapid disaster recovery. Administrative institutions have been promoting the establishment of satellite phones, municipal disaster management radio communication network, and priority telephone links during disasters. Although establishment of these systems are important, they require capital investment costs. Therefore, the council lend to these the construction industry associations and construction.
companies.

(6) Measures to secure heavy equipment and materials

a) Acquisition of legal personality and financial resources by the council

Financial resources are necessary for the council to perform its management role. It also needs to have a corporate status to be able to handle its own funds. On the other hand, when considering the new financial resources of the council, it is also necessary to ensure budget donations, fundraising and tax system.

In addition, the council must have a legal personality because lack of it may interfere with the execution of the budget. It must have a legal status as a public benefit corporation to justify its acceptance of donations.

b) Support the introduction of heavy machinery

Government should lend heavy equipment to the council in preparation for disasters. However, if heavy machinery is used only during disasters, it is difficult to secure the necessary budget. Therefore, financial resources must be allocated for the time-sharing of heavy equipment in pre-disaster periods for the construction industry and construction companies.

(7) Create systems to support disaster recovery workers in the region

The construction industry is expected to do recovery work during disasters. Unless the safety of families is ensured, recovery work is difficult. If disaster recovery workers are pre-identified in the region by the council, they are able to respond immediately to disaster recovery. Therefore, regional cooperation activities are required.

5. DCP: A NEW WAY OF DISTRICT DEVELOPMENT

BCP is a plan for business organizations. DCP is a plan for local district organizations to achieve the same objectives (Fig.5). Priority operations of the business organizations are not always priorities for the district to pursue. To ensure continuity in the region, it is important to build relationships between the BCP and the DCP, specifically because of the addition of district priority operations to the BCP. This is a new way for district development.

6. CONCLUSIONS

In Shikoku, Japan, the “Shikoku Earthquake Disaster Reduction Strategy” has been formulated to reduce the damage of great earthquakes after the disasters caused by the Tonankai and Nankai earthquakes.

In the case of great disasters, such as the Tonankai and Nankai earthquakes, severe damage is prospected. For rapid disaster recovery, a BCP should be formulated taking into account district continuity.

In Shikoku, Japan, the level of BCP in the construction industry has been raised through the cooperation of four Shikoku universities. In the future work, we shall proceed to formulate a BCP for DCP and formulate a DCP based on the construction industry.

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