



BCM of the Governments Based on the Lessons of the Great East Japan Earthquake and Other Disasters

H. Maruya ⁽¹⁾

⁽¹⁾ Professor, International Institute of Disaster Science, Tohoku University, maruya@irides.tohoku.ac.jp

Abstract

In Japan, where major disasters continuously occur, introduction and improvement of business continuity management (BCM) for organizations are essential not only for private business but also governments. By the Great East Japan Earthquake (GEJE) in 2011, the main buildings of 13 municipal governments seriously damaged and had to move all the functions to other places. For other many local governments, loss of telecommunication methods and disruption of electric power supply also interrupted their operations to respond to and recover from the earthquake and tsunami damage. After this disaster, Cabinet Office, Japan issued new guidelines for small-scale local governments to introduce business continuity plans (BCP), and revised the guidelines of BCP for ministries and local governments in general. The author contributed to issue and revise these BCP guidelines. Thereafter, all ministries revised their BCP and Cabinet Office have checked and evaluated the improvement every year. The number of municipalities which have their BCPs has increased considerably based on the survey by the Fire Defense Agency.

However, the cases that local governments' main buildings lost operational abilities due to natural disasters continuously occurred after the GEJE. In 2016 Kumamoto Earthquake, main buildings of five local governments in Kumamoto prefecture were damaged and unable to use. In addition, large scale floods also stopped the operation of local governments' main buildings.

The author has evaluated a number of BCPs of local governments. Some of the evaluation were required by the local governments. The author found out that substitution strategies, for example, substitute office, emergency power facility, etc. had not introduced enough in some of their BCPs. And related to this strategies, the viewpoint of "necessary resources for critical operations" should be more focused on the BCM countermeasures. The necessary resources include buildings and space, officials, electric power supply, telecommunication methods, back-up of important information, etc. All governmental organizations should check the preparedness in their BCP/BCM to be able to continue their critical operations, especially in the aspect of necessary resources and substitution strategies.

Keywords: business continuity management (BCM), the Great East Japan Earthquake (GEJE), necessary resources



1. Introduction

Business continuity management (BCM) is a management strategy for public organizations and private companies to facilitate the rapid recovery of critical operations with minimum interruption in the aftermath of a disaster or an accident. BCM includes formulation, execution, exercising and review of the business continuity plans (BCPs). In Japan, central and local governments have been requested to introduce BCM by the Disaster Management Basic plans based on the Disaster Countermeasures Basic Act. The Cabinet Office (CAO), Japan has issued guidelines of BCP for central and local governments.

In 2011, the Great East Japan Earthquake (GEJE) caused direct damage to many local government buildings as well as those of many companies. In the affected area of the GEJE, only a small number of the local governments had their BCPs at that time.

In the 2016 Kumamoto Earthquake, five local governments' main building were seriously damaged. Serious flood after the GEJE also damaged local governments' main building and caused the delay of emergent response and rescue activities.

As there is considerable concern over major earthquakes in Japan such as the Nankai Trough Earthquakes and the Tokyo Inland Earthquakes, Japanese central and local governments should learn the lessons from the GEJE and take effective measures including introducing and revising BCPs.

2. Background Information

2.1 Back Ground of Diffusion of BCM to the Governments in Japan

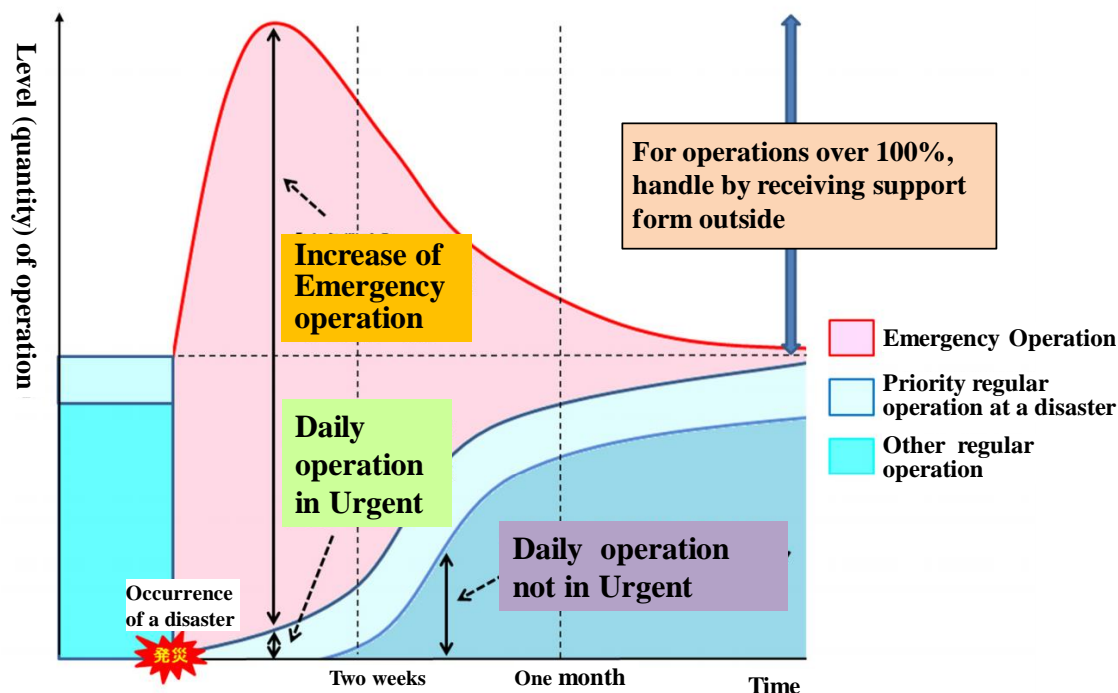
The terrorist attacks on September 11 in 2001 in the United States were opportunity for governments and companies in Japan to know the effectivity of BCM/BCP to continue important business. The example of damaged companies that recovered soon amazingly by their BCPs and, in contrast, failed quick recovery and faced management crisis without useful BCPs moved Japanese industry association and governments to introduce BCM.

The CAO published the first Business Continuity guidelines in 2005, and other several guidelines for companies, central and local governments followed it in about five years. Furthermore, the central government has positioned BCM/BCP as a key pillar of disaster management of the public/private organizations in the event of large-scale incidents including natural disasters such as earthquakes and floods.

2.2 What is Business Continuity?

Fig. 1 shows the concept of business continuity of local governments explained in CAO (2015) [1] and CAO (2016) [2]. When a disaster occurs, the amount of necessary operations of local governments rapidly increase for emergent responses including damage investigation and report, rescue, recovery and so on. Therefore, local governments have to eliminate operations not in urgent drastically and divert the human, material and monetary resource to emergent operations. In addition, the local governments in the damaged area should receive supports from other organizations such as dispatched officials and supplied materials so as to execute disaster-related operations that increase suddenly. These situations are similar to the central ministries and agencies, especially their local branches which are managing public facilities.

Typical important actions of BCM after the occurrence of an incident are; a) To make efforts to continue critical operations by securing necessary resources. The examples of the resource are emergency electricity power systems, communication tools that are available in times of disaster, backup of important administrative data. If the ordinary site turns to be unusable, an alternative site is the most important necessary resource. b) To transmit information to outside in order that the organization can share the information with the related parties. Letting the parties know the real damage and probability of recovery often prevent the damaged organizations from losing credibility from the parties.



Note: Recovery and reconstruction operations gradually increase after the emergency operation begins to decrease, but they are not displayed in this Chart.

Source: Cabinet Office: "Guide for Formulating Business Continuity Plans for Municipality," 2015

Fig. 1 – Concept of Business Continuity of Local governments

2.3 BCM Promotion Policies for Natural Disasters

The Japanese government started the promotion policies for BCM/BCP since 2004, and the CAO published the "Business Continuity Guidelines, First Edition [3]" in August, 2005. The author was a director in charge of drafting the guidelines in the CAO. A trigger to make the guidelines was the quick recovery of some affected companies in the USA from the terrorists' attack on September 11 in 2001, as mentioned above. Another trigger was publication of the estimated damage of the Tokyo Inland Earthquake in December, 2004. If the earthquake occurs, serious damage to the core functions of Japanese government and economy is expected. Suspension of critical supply chains in wide range of business transactions is also concerned. Therefore, the Japanese government started promoting BCM/BCP in addition to the traditional disaster management countermeasures, for example, antiseismic reinforcement and earthquake-resistant mounting.

Regarding central government organizations, the CAO published "Business Continuity Guidelines for Ministries of Central Government First edition" was published in June, 2007 to prepare for the Tokyo Inland Earthquakes. In accordance with the guidelines, all ministries and agencies were requested to formulate their BCPs in fiscal year 2007 and all of them completed in this period.

As for prefectural governments, Tokushima prefecture led the formulation of BCP and completed its first edition in 2008, and Tokyo, Osaka and several other prefectures followed it. In April, 2010, the CAO published "Guide and Commentary of Business Continuity for Local Governments at the Time of Earthquakes," which were the previous version of CAO (2016) [1]. However, the number of the prefectures holding BCPs was not easily increased before the GEJE.

2.4 BCM Promotion Policy of the Governments for Pandemic Influenza

Since 2003, the risk of avian influenza H5N1 was spread in South-East Asia and Japanese government decided the "Action Plan of Countermeasures against Novel Influenza" based on the "WHO Global Influenza Preparedness Plan." After that, the pandemic influenza H1N1 broke out in 2009 worldwide, and it



was the next momentum for public and private organizations to introduce BCPs. Committee of Related Ministries and Agencies for Countermeasures for Pandemic Influenza and Avian Influenza, etc. published “Business Continuity Guidelines for Ministries and Agencies against Novel Influenza” in August, 2009. (This Guidelines was revised in March, 2014 by the new guidelines [4].) Based on these, all ministries and agencies formulated their BCPs for novel influenza.

In addition, the CAO published “Business Continuity Guidelines, the Second edition [5]” in November of 2009 which were for all organizations in private and public. The reason of this revision was to make scope of the business risk wider including pandemic.

3 Experience and Lessons of the GEJE

3.1 Damage to the Governments by the GEJE

In March, 2011, the GEJE occurred. Many people and organizations located in affected area received direct damage by the motion of earthquake and tsunami. In the seven prefectures which were most severely affected, main buildings of 13 municipalities got devastating damage and had to relocate completely, and those of 15 municipalities had to relocate partially (Table2).

Table 1 – Damage of Main Buildings of City, Town and Village Governments by the GEJE

Prefecture (No. of Municip.)	No. of municipalities whose main buildings were damaged			
	Total	Relocation	Relocation partly	No relocation
Iwate (34)	22(6)	2(2)	2(1)	18(3)
Miyagi(35)	32(3)	3(2)	2(1)	27(0)
Fukushima(59)	36(0)	3(0)	3(0)	30(0)
Ibaraki(44)	34(1)	3(0)	5(0)	26(1)
Tochigi(27)	26(0)	1(0)	2(0)	23(0)
Gunma(35)	18(0)	0(0)	0(0)	18(0)
Saitama(64)	31(0)	1(0)	0(0)	30(0)
Chiba(54)	38(0)	0(0)	1(0)	37(0)
Grand TOTAL	237(10)	13(4)	15(2)	209(4)

Note: No. in () are the numbers of main buildings damaged by tsunami.

These numbers do not include relocation by the effect of the Fukushima nuclear accident.

Sauce: Research by Cabinet Office, Japan

Fig. 2 is the photos of the damaged main building of Otsuchi Town in Iwate Prefecture. Tsunami exceeded the roof of the building, and 39 persons including the mayor of the town were killed. This tragedy had brought absence of the headquarters of relief and recovery activities of this town. The supporters who entered from outside might not act quickly and efficiently, as the local governments did not function and they faced difficulty to grasp the local conditions and needs.

3.2 BCM Promotion Policy of Japanese Government after the GEJE

Utilizing lessons of the GEJE, the CAO published “Business Continuity Guidelines, 3rd Edition” in August, 2013 in order to improve effectiveness of BCM [6]. The main standpoints in revision were 1)



Source: Irides, Tohoku Univ.

Fig. 2 – Main Building of Otsuchi Town, Iwate Pref.

necessity of implementing BCM even in normal times and improvement of related contents, 2) importance of including broad responses to risks and consideration of the supply chain, and necessity of a flexible business continuity strategy for them, and 3) importance of involvement by the top management.

For city, town and village governments, “Guidelines for formulating BCP of Municipality” was published by the CAO in May of 2015 [1]. The guidelines showed six important elements for BCP, which even a small municipality whose population is less than 10,000 should work on as soon as possible. They are;

- 1) To clarify representation precedence when the head is absence, and emergency gathering system of personnel
- 2) To identify a substitute government building when the main government building was not able to use
- 3) To secure emergency electricity power systems and water, food, etc. for emergency stockpile
- 4) To secure a variety of communication tools that are available in times of disaster
- 5) To backup important administrative data
- 6) To choose priority operations in a time of disaster

In addition, the CAO revised the guidelines for local governments in general including prefectures. “Business Continuity Guide for Local Governments at the Time of Large-scale Disasters” [2] is the latest version.

As for the central government, “Business Continuity Guidelines for Ministries of Central Government” was revised in April, 2016. Based on these, the CAO requested revision of each ministries’ and agencies’ BCPs.

4 Other Natural Disaster after the GEJE

4.1 September 2015 Heavy Rainfall Disaster in the Kanto and Tohoku Districts

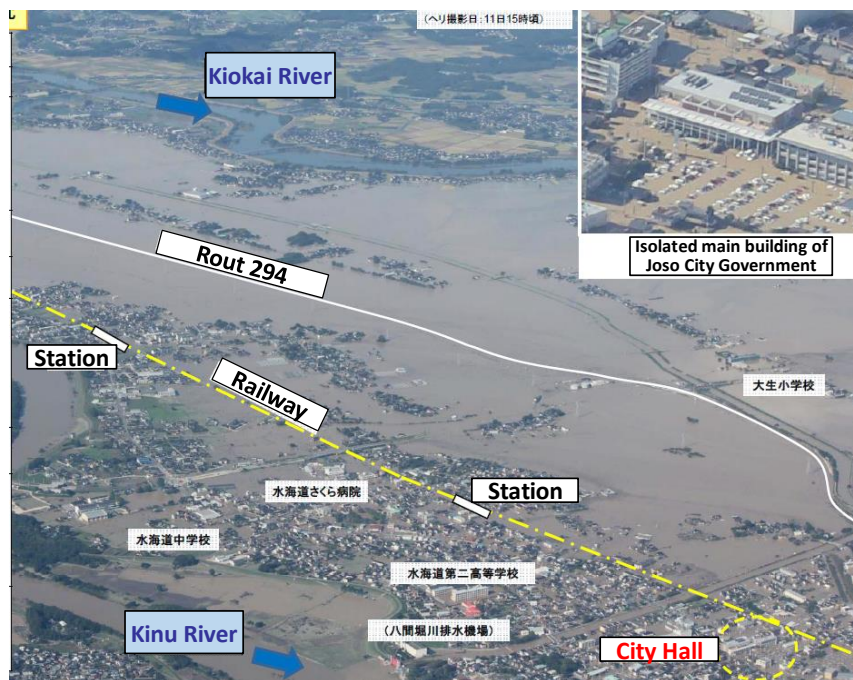
On the September 11, 2015 Heavy Rainfall Disaster in the Kanto and Tohoku Districts in Japan. The main building of the Joso City in Ibaraki Prefecture was flooded because of the bank collapse of Kinu River managed by the central government. The city did not formulate a BCP.

The main building was new, built in November, 2014, but had apparent flood risk. According to the hazard map made by Joso City, 1-2 meters’ flood was expected around the building by the overflow of Kinu River in the heavy rainfall once in 100 years. The dike of Kinu River collapsed at 0:50 pm of September 10, 2015. Steep-water flowed into the city hall located approximately 9 kilos away from the rip place at 10:00 pm. The lobby of was flooded at 2:00 am of the next day, and the power facilities were soaked and lost power. The emergency diesel generator was prepared but it built on the ground level although it had flood risk. If the city had formulated BCP, the generator



must be built on the higher floor by considering the possibility of flood. It stopped two and a half hours later by flood water and the city hall building lost all power sources.

Approximately 1,000 people (about 400 refugees and 600 officials of the city and Self-Defense Forces) were isolated in the building [Fig.3]. A landline and an IT apparatus became unusable, and only the cell-phone was available charged by the battery of the Self Defense Forces. The city office suffered from a malfunction for two days. (Source: Ibaraki Shimbun on Oct. 4, 2015, Tokyo Shimbun on Sep.15, etc.)



Source: Ministry of Land, Infrastructure, Transport and Tourism

Fig. 3 – Bank collapse of Kinu River (First-Grade River managed by MLIT)

4.2 The 2016 Kumamoto Earthquake

The 2016 Kumamoto Earthquake occurred in April 16. The main building of Mashiki Town Government in Kumamoto Prefecture was constructed in 1982 and finished quakeproof construction in 2012. The building was suffered twice by earthquake with a Japanese seismic intensity of 7 (7 is the max level). Cracks were seen in the third-floor and entrance was prohibited. The disaster-control headquarters was set in the parking lot. Then it moved to the Children's House of the Health and Welfare Center. The headquarters returned to the main building on May 2, but the administrative functions were divided into other buildings. The town did not have their BCP and the substitute site had not been prepared.

The main building of the Uto City Government was constructed in 1965 and did not fulfil seismic safety criterion. By the Kumamoto Earthquake, the fourth floor crushed, and entrance was restricted. The disaster-control headquarters was set up in the annex at first, but it moved from there because if the main building collapsed, the annex might be involved. The headquarters was then set up in the parking lot and finally moved to the Citizen Gymnasium. The city did not have their BCP.



Source: Irides, Tohoku Univ.

Fig. 4 – Main Building of Mashiki Town Gov. after the Kumamoto Earthquake in 2016



Source: Irides, Tohoku Univ.

Fig. 5 – Main Building of Uto City Gov. after the Kumamoto Earthquake in 2016

4.3 Typhoon No. 19 in 2019

The main building of Iiyama City Government in Nagano Prefecture were flooded and their first floor was damaged by Typhoon No.19 on October 13, 2019. The counter of the city office opened two days after.

The main building of Marumori Town Government in Miyagi Prefecture was isolated by flood of the same Typhoon on October 12, 2019. As padding of the land was executed to the foundation of the main building before its construction, the first floor was not flooded. However, all the area around the building was deeply flooded and the isolation caused delay of actions such as investigation of damage conditions.

Other damage to the local government building were;

- 1) Basement of the main building and first floor of the annex of Daigo Town Gov. in Ibaraki Prefecture were flooded.
- 2) Ogawa branch of Iwaki City Government was flooded in the first floor.
- 3) The fire department headquarter of Sukagawa City in Fukushima Prefecture was flooded.



These damage to the important buildings of local governments by flood showed that flooding is one of the main causes of disrupting operation of local governments. BCPs of the governments should be prepared for flood, as well as for earthquakes and tsunami.

5. Evaluation of Present BCP/BCM of Local Governments

The author is a member of committee to evaluate and consult the BCPs of the ministries and agencies of the Japanese central government which was set up by the CAO. The author also has been advising for several prefectures and a number of municipalities to formulate BCPs.

In addition, the author evaluated the effectiveness of local governments' BCPs by examining the Fire Defense Agency (2019) "Research Result of the Formulation Status of Business Continuity Plans of Local Governments." [8] All prefectures and 89.7% of municipalities had their BCPs at June 1, 2019. Table 2 shows the Rate of BCPs of local governments that fulfill six important elements of BCP for small municipalities mentioned in section 3.2. For prefectures, 89% of the element of "a substitute building" is the lowest. It means 11% of prefectures have not decided their substitute building. For municipalities, 36 % of the element of "emergency electricity power and emergency stockpile" is the lowest, followed by 71 % of the element of "backups of important data.

Table 2 – Rate of BCPs of Local Gov. Fulfilling Six Important Elements of BCP for Small Municipalities

Six Important Elements	Prefecture ^{a)}	Municipalities ^{b)}
1) To clarify representation precedency when the head is absence, and emergency gathering system of personnel	98%	97%
2) To identify a substitute government building when the main government building was not able to use	89%	86%
3) To secure emergency electricity power systems and water, food, etc. for emergency stockpile	91%	36%
4) To secure a variety of communication tools that are available in times of disaster	98%	77%
5) To backup important administrative data	96%	71%
6) To choose priority operations in a time of disaster	100%	83%

Note: a) The percentage is: [No. of Prefecture fulfilling each item / No. of Prefecture having BCPs (n=47)] * 100

b) The percentage is: [No. of municipalities fulfilling each item / No. of municipalities having BCPs (n=1561)] * 100

Source: Fire Defense Agency (2019) [8]

Based on the experiences and the data, the author has found out that the BCPs of local governments in general seem to fulfill good levels in the elements of emergency response such as representation of the head, emergency gathering systems, confirmation of the safety of officials and systems of the headquarters for disaster control. However, keeping necessary resources for critical operations in time of disasters and "substitution strategies" are thought to be not enough. The countermeasures to realize "substitution strategy" are substitute offices/buildings, substitute personnel with key roles, emergency electricity power systems, communication tools other than landlines and cellphones, back-ups of important information and documents, substitute providers, etc.

It might be difficult for most of officials of local governments to understand the importance of the viewpoint of necessary resources and "substitution strategy" without well-designed lectures and exercises. Because the knowledge and experiment of ordinary disaster management do not generally lead to understand the importance of these. Therefore, education and training of BCP/BCM for the officials should be indispensable. In addition, outside evaluations of the BCP/BCM of local governments by experts are desirable to ensure the ability to continue their critical operations even in the serious damage.



6. Conclusion

The Japanese government prepared several guidelines for formulation of BCP since 2005. The GEJE in 2011 was the most serious incident that showed the necessity of business continuity ability of public organizations. 2016 Kumamoto Earthquake, major storm and flood disaster and pandemic were other opportunities to introduction of BCPs for the governments. However, many of BCPs of local government do not seem to be effective enough at this moment.

The author believes that local governments should make the best use of substitution strategy in their BCPs and more recognize viewpoint of necessary resources for critical operations. Additionally, the Japanese government should start to prepare measures of education and evaluation for BCM for local government especially for municipalities.

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