

Disaster Management System for Wide-Area Support and Collaboration in Japan

— Focused on Mega-disaster in Tokyo Metropolitan Region —

日本における広域応援と広域協働による災害対応システムの現状

— 首都圏の巨大災害を事例に —

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Abstract

The aim of this paper is the introduction of Japanese disaster management system and the wide-area support system in case of Tokyo Inland Earthquake and the discussion of the important issues for effective wide-area support. Learning from the 1995 Hanshin-awaji Earthquake, the support system among local autonomies and between local autonomies and National government has been revised and enlarged in Japan. In this paper, especially the wide-area support system in huge metropolitan region is focused on. For Tokyo inland earthquake which provability in three decades is approximately 70%, Japanese National Government has established the new wide-area support system. The one is the emergency response teams of local governments conducted by National Police Agency and Fire & Disaster Management Agency for the rescue, relief, emergency medical service, emergency fire service and so on. The other is the wide-area support system of JNG by the Self-defense Force and Japan Coast Guard according to request from prefectural local governments. On the other hand, many local governments established the co-supporting system among not only the remote local governments but also the neighboring local governments in the wide area. In Tokyo metropolitan region, eight prefectural governments and large city governments conclude the agreement of wide-area support for each other. However, the emergency activities are based on each Local Disaster Management Plan, which is established under the Basic Disaster Management Law by each other. There is no Wide-area Disaster Management Plan.

Key Words: Tokyo Inland earthquake, Mega-disaster, Wide-area support system, Disaster Management system

要 約

本論文の目的は、日本の地域防災システムの紹介と首都直下地震対策としての広域応援および広域連携システムを紹介し、効果的な広域応援のあり方を論考することである。1995年の阪神・淡路大震災の教訓として、国家政府と地方自治体の連携体制および地方自治体同士の相互応援・連携体制は改定され、拡張されている。本論では、とくに巨大都市圏における広域応援システムに焦点を当てている。事例として、今後30年間に発生する確率70%といわれる首都直下地震をとりあげ、日本における新しい広域応援システムを紹介する。ひとつは、国家公安委員会警察庁や総務省消防庁が救急・救助・緊急医療サービスなどのために創設した緊急対応チームについてである。もうひとつは、地方自治体からの応援要請に対応した海上保安庁および自衛隊による緊急支援の仕組みでの強化である。他方、地方自治体は個別に遠隔地の自治体との間で任意に応援協定を締結したり、近隣の自治体間での相互応援協定を締結する事例が増えている。とくに首都圏では、巨大都市圏を構成している8都県市（東京都、千葉・神奈川・埼玉県、横浜・川崎・さいたま・千葉の政令指定都市）が、同時被災する可能性が高い首都直下地震時の相互応援協定を新たに締結した。しかしながら、個々の自治体の災害時対応は、個々の「地域防災計画」に依拠している。この地域防災計画は「地方自治」を原則として「自治域内で、全ての災害対応を全うする計画」となっている。しかし、巨大災害となることが想定されている首都直下地震では、自治の範囲を超えた広域的な取り組みを可能とする新しい法制度の創設が必要となっている。

キーワード: 首都直下地震、巨大災害、広域応援システム、災害対応システム

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INTRODUCTION

Many huge and wide-area disasters had occurred in Japan of the 20th Century. Those mega-disasters were the opportunities to develop new systems and to revise the conventional systems. In 1962, the Disaster Countermeasures Basic Act was developed after the Ise-wan Typhoon of 1959. This Act supplied the Basic structure and the basic direction of governmental countermeasures. Those countermeasures are developed under the philosophy of “Local Autonomy”. If the affected governments cannot send the messages of require of support and help to a national government or neighboring local government, they cannot accept the support and relief from National government and other local governments.

On the hand, it is assumed that a huge and wide-area disaster will increase in Japan of the 21st century. However, management system for a huge and wide-area disaster is not enough in Japan. In this paper, the author suggests the basic concept of wide-areas disaster management planning.

WIDE-AREA AND HUGE DISASTERS IN JAPAN OF THE 20TH CENTURY

Japan is the most hazardous country in civilized countries of the world. In Japan of the 20th century, many huge and wide-area disasters were occurred. Thirteen of wide-area disasters were occurred. The wide-area disaster is defined by the author, as follows; more than three neighbouring prefectures where are affected severely and more than one thousand persons are killed (Table 1). Nine of all wide-area disasters are typhoon and heavy rain, and four of all wide-area disasters are Earthquake and Tsunami.

Many huge typhoons were damaged in the wide areas of many prefectures simultaneously, but a few in case of earthquake. The huge off-shore Earthquakes of Magnitude 8 class with Tsunami caused the damage in a wide-area.

In the 20th century of Japan, six huge disasters were occurred. We defined a huge disaster as follows; more than one thousand persons are killed in less than two prefectures (Table 2), Five of all huge disasters are caused by the inland earthquake of magnitude 7 class. The hugest on is the Great Hanshin-Awaji Earthquake

Table 1: Wide-area disasters in Japan of the 20th Century

Year	Name of Disaster (Kind of disaster)	Killed & missed
1910	Meiji Great Kanto Flood (Typhoon)	1,359
1917	Flood (Typhoon)	1,300
1923	Great Kanto Earthquake (Earthquake (M.7.9) and Tsunami)	105,000
1933	Sohwa Sanriku Jishin Tsunami (Earthquake (M.8.3) and Tsunami)	3,064
1934	Muroto Typhoon (Typhoon)	3,036
1944	Tonankai Earthquake (Earthquake (M.7.9) and Tsunami)	1,223
1945	Makurazaki Typhoon (Typhoon)	3,756
1946	Nankai Earthquake (Earthquake (M.8.0) and Tsunami)	1,330
1947	Catherine Typhoon (Typhoon)	1,930
1953	Heavy Rainfall (Torrential rain and landslides)	1,023
1954	Tohya-maru Typhoon (Typhoon)	1,761
1958	Kano-gawa Typhoon (Typhoon)	1,269
1959	Ise-wan Typhoon (Typhoon and Tidal wave)	5,008

Table 2: Huge Disaster in Japan of the 20th century

Year	Name of Disaster (Kind of disaster)	Killed & missed
1927	Kita-tango Earthquake (Earthquake (M.7.5))	2,925
1943	Tottori Earthquake (Earthquake (M.7.2))	1,083
1945	Mikawa Earthquake (Earthquake (M.7.6.8))	2,306
1948	Fukui Earthquake (Earthquake (M.7.1))	3,763
1953	Nankai Heavy Rainfall (Front Rain and landslides)	1,124
1995	Great Hanshin-Awaji Earthquake (Earthquake (M.7.3))	5,502 (6,437)

*Included the related death

of 1995

Those wide-area and huge disasters were opportunities of revision and establishment of new disaster management systems. The Nankai Earthquake of 1946 is the opportunity of establishment of the Disaster Relief Act of 1947. The Fukui Earthquake of 1947 was the opportunity of establishment of the Building Standard Act of 1950, and the Ise-wan Typhoon of 1959 is the opportunity of establishment of the Disaster countermeasures Basic Act Law of 1962. Since the Ise-wan Typhoon, the huge and wide-area disaster had not been occurred in the period of high economic growth of Japan. In 1995, the great Hanshin-awaji Earthquake was occurred.

The Hanshin-Awaji Earthquake also enlarged the Japanese Disaster Management System of Japan with

the Damage Reduction System and the Recovery and Rehabilitation System. One of the enlarged systems is the wide-area supporting system for effective response activities against huge Earthquake disasters which are assumed the occurrences in near future as the below.

As a lesson from the Hanshin-awaji Earthquake, the long term evaluation of provability of each earthquake are announced, which is selected a hundred fifteen active faults and huge earthquakes occurred along troughs and trenches surrounding Japan Inlands. As a result of this research, many wide-area earthquakes of high provability in three decades are announced; Tokai Earthquake of 87%, Tokyo Inland Earthquake of 70%, To-nankai (Eastern Nankai) Earthquake of 60-70%, Nankai Earthquake of 60-70%.

In the 21 century, various earthquake disasters must hit Japan. Some of them may be mega-disasters such as wide-area disasters and huge-damage disasters. Every earthquake shake several prefectures or more and the estimated damages are very huge more as several times as the damage of the Hanshin-awaji Earthquake of 1995 (**Table 3**). The number of severely collapsed houses is approximately 105,000 and seven thousands of wooden houses were burnt down. If these earthquakes occur simultaneously or continuously, very wide area more than five prefectures will be damaged severely.

MEGA-DISASTER; ESTIMATED DAMAGE OF TOKYO INLAND EARTHQUAKE

The Tokyo Inland Earthquake which provability in three decades is 70% caused mega-scale damage in

Capital Tokyo as a metropolitan region among four prefectures; Tokyo Metropolitan Government and three neighboring prefectures of Kanagawa, Saitama and Chiba. Among eighteen scenarios of damage scenario conducted by Central Disaster Management Council of the National Cabinet, the Northern Tokyo Bay Earthquake which epicenter is located on the northern Tokyo Bay and attacked the central Tokyo as a nationwide CBD directly is the severest case of scenario. According to it, two hundred thousands of houses are collapsed by quake motion and 650thousands of houses may be burnt down by fires after the earthquake. Approximately 1,100persons are killed and 210 thousands persons are injured. Twenty one millions of people are suffered outside of each home and six and half millions of people are unable to return home easily. Seven and half of households lose their dwelling homes by quake and fires. Seven and half millions people evacuate in shelters established by local government. In the severest damaged zone of the crowded wooden houses area, a shortage of shelters is assumed.

The magnitude of this scenario is M.7.3 as same scale as of the Great Hanshin-Awaji Earthquake that caused by active faults. However, the Northern Tokyo Bay Earthquake attacks more wide area among four prefectures, because it is assumed that this earthquake occurred in the depth of 30km. The number of local governments located in the area of strong tremor of Japanese Seismic Intensity 6 upper and lower, is 143 local governments in five prefectures; Tokyo(43), Kanagawa(29), Saitama(29), Chiba(35) and Ibaraki(7). The result of each prefecture is shown in Table 4.

Table 3: Scale of Damages among the Hanshin-awaji Earthquake and the Imminent Wide-area Earthquakes

Item of Damage	Northern Tokyo Bay EQ (M.7.3)	Tokai EQ (M.8.2)	To-nankai &Nankai EQs (M.8.2-8.3)	Hanshin-awaji EQ (M.7.3)
Provability in three decades	70%	87%	60-70%	In 1995
Collapsed by Shake	185,000 houses	200,000 houses	250,000 houses	105,000 houses
Burnt-down by fire	650,000 houses	50,000 houses	40,000 houses	7000 houses
By Tsunami and Land slide	12,000 houses	15,000 houses	60,000 houses	Few
Total of Damaged houses	850,000 houses	265,000 houses	350,000 houses	125,000 houses
Households lost house	1,600,000 families	470,000 families	630,000 families	200,000 families
The killed directly	11,000 persons	9,000 persons	18,000 persons	5,500 persons
The killed related indirectly	1,900 persons	1,500 persons	5,000 persons	930 persons
Number of affected areas	4 prefectures	4 prefectures	6 prefectues	1 prefecture

Table 4: Damage of each prefecture in Northern Tokyo Bay Earthquake** estimated by the Cabinet

Prefecture	Severely Damaged Buildings			Killed	Evacuator (next day)	Long distant Commuter*	Damaged Roads	Debris (thousand ton)
	Collapsed	Burnt	Total					
Tokyo	120,000	410,000	530,000	7,800	720	3,900,000	720	67,000
Kanagawa	34,000	86,000	120,000	1,200	130	1,100,000	130	14,000
Saitama	16,000	69,000	85,000	700	210	670,000	210	6,000
Chiba	24,000	86,000	110,000	1,200	180	820,000	180	8,000
Others	1,500	-	1,500	-	-	-	-	200
Total	195,000	650,000	850,000	11,000	1,240	6,500,000	1,240	96,000

** In case of earthquake occurred in evening of weekday, in winter, under strong wind of 15m/s.

* "Long distant Commuter" means the people who is difficult to go back to home by walk after the earthquake.

JAPANESE DISASTER MANAGEMENT SYSTEM AND ITS CHARACTERISTICS

After the Ise-wan Typhoon of 1959, the Disaster Countermeasures Basic Act was established in 1961 to protect national land as well as citizen's lives, livelihoods and properties from disaster. This Basic Act has given a basic structure and system of countermeasure for all of the disaster phases of prevention, mitigation and preparedness, emergency responses as well as recovery and rehabilitation/reconstruction. It also clarified each role and responsibility of National Government including Designated Government Organizations, local Governments of prefecture and municipality, and sixty three of related public and private organizations of disaster management such as NHK(broad casting media), JR(Japanese Railways company, Red cross, Bank of Japan, NTT(Japanese Tele-communications) and so on.

The contents of Disaster Countermeasures Basic act are mainly as follows; 1) definition of each responsibility for disaster management, 2) Disaster management organizations, 3) Disaster management planning system, 4) Planning and measures of prevention and preparedness, 5) Disaster response activities, 6) measures for disaster recovery and rehabilitation/Reconstruction, 7) Financial measures, and 8) Response of Disaster Emergency situation. The Disaster Countermeasures Basic Act provides the disaster management system of Japan (Fig 1). The basic philosophy of this act is the "autonomy" of each local government under the Local Autonomy Act designated after the World War II. Each disaster management plan has been made to protect each area by itself. There

is not a philosophy of co-operation and collaboration among prefectural governments and among municipal governments, but a philosophy of share and adjustment between a prefecture and each municipality.

If huge scale of damage caused a shortage of relief and man-powers, and if each municipal government cannot cope with it by itself under the constraints of response activities, prefectural government supports the affected municipality and national government supports the affected prefecture. However, these supports are implemented under the request of each local government; from municipality to prefecture and from prefecture to national government. If there is no request from affected prefecture or municipality, the upper government cannot give a relief and support to lower local government under the principle of autonomy.

However after the Hanshin-Awaji Earthquake of 1995, Japanese National Government revised the system of disaster management headquarter. The function of a Cabinet office is enlarged. And National Government established the new wide-area support system, such as

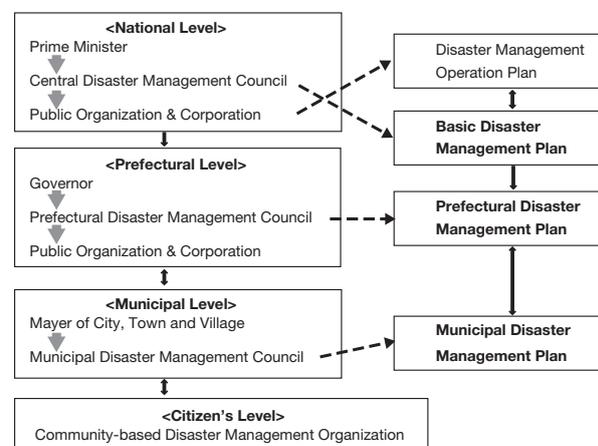


Fig.1 Outline of the Disaster Management System in Japan

rescue, relief, emergency medical service, emergency fire service, and so on by the emergency response teams of local governments conducted by the National Police Agency, Fire & Disaster Management Agency. Also JNG conducted wide area support by the Self-defense Forces and Japan Coast Guard according to request from prefectural local governments.

OUTLINE OF JAPANESE WIDE AREA SUPPORT AND COLLABORATION

In recent Japan, there are three levels of wide-area support and collaboration systems; wide-area support system conducted by national government and wide-area support and collaboration system among local governments.

(1) Wide-area support system conducted by national government

National government revised the Cabinet office disaster response system after the Hanshin-Awaji Earthquake. The main revision is as follows; 1) Dispatch of emergency response teams by national government, and 2) On-site disaster management headquarter of national government.

Conventionally, national government required the disaster information from the affected prefectural government, which required information from affected municipalities. In case of severe damage, affected municipality and/or prefecture is very busy to response the victims and the others. The request of information from national government disturbs these response activities of affected local governments.

Recently, national government collects disaster information at the Cabinet Information Collection Center for 24 hours a day. If a large disaster happens or forecasts, the designated emergency response team comprised of the director-generals of the respective ministries and agencies gathers in the Crisis Management Center in Prime Minister's Office immediately. At a time of a large disaster, according to the level of damage, the government may establish a Major disaster management headquarter or an extreme disaster management headquarter in the Cabinet office. Also, the government sends a initial emergency survey team and establish an On-site disaster management

headquarter.

This information collection system and communication at On-site headquarter makes the support for not only the emergency response but also the recovery response to be more effective.

In the case of large scale of damage that exceeds the response capabilities of the affected local government, the various wide-area support systems, are implemented by national government; such as Inter-prefectural Emergency Rescue Team coordinated by the National Police Agency, Emergency Fire Rescue Team coordinated by Fire and Disaster Agency, and the other activities by Japan Coast Guard, the Self-Defense Force. Recently, a wide-area medical transportation system for Disaster Medical Assistance Team (DMAT) and Ambulance Parties for transporting the seriously injured people to the disaster management Base Hospitals which is located outside of the disaster-affected area is being developed.

(2) Wide-area support and collaboration system among local governments

On the other hand, Local government found the co-support among the local governments in a large scale of disaster. Mainly two kinds of co-support systems are progressing.

1) Agreement of co-support with distant local government

Many municipal government are taking agreement of disaster co-support with the related municipal governments such as a sister city, far from each other in order to be affected by disaster simultaneously. If the disaster occurs, the related municipalities send relief and stuff to the affected municipality as quickly as possible. If the affected municipality request to evacuate the elderly or the disabled to the facilities in the related municipalities, such evacuation may be implemented. Actually, there are few cases of such wide-area evacuation.

2) Agreement of wide-area support with neighboring local governments

Many of natural disasters are affected the wide area among several prefectures simultaneously. Especially, three major metropolitan regions are expanded among several prefectures. Metropolitan Tokyo mainly is consisted of Tokyo, Kanagawa, Saitama and Chiba prefectures, Metropolitan Nagoya is consisted of Aichi, Gifu and Mie prefectures, and

Metropolitan Osaka is consisted of Osaka, Kyoto, Nara, and Hyogo prefectures. The population of these three metropolises shares approximately half of Japanese population. When the earthquake or typhoon affects these metropolitan regions, a huge and wide-area disaster is caused. In this case, it is very important that the neighboring prefectures and designated major cities such as Yokohama, Kawasaki, Saitama and Chiba city in Metropolitan Tokyo, Nagoya city in Metropolitan Nagoya, and Osaka, Kyoto, Kobe city in Metropolitan Osaka, support each other for emergency relief and recovery. The designated major city has the autonomic right and responsibility similar to the prefecture. Therefore, these neighboring prefectures and designated major cities negotiated with each other and exchange an agreement of wide-area support with neighboring local governments.

(3) Wide-area support movements of various disaster volunteers

The Hanshin-Awaji Earthquake made us to be important role of volunteer's activities, especially citizen's voluntary. Today, if a large scale of damage caused by natural disaster, various accidents, and so on is announced through TV, Radio and newspapers, many volunteers gathers individually to the affected areas. This citizen's voluntary is controlled by voluntary organization to collaborate with municipal government and local communities.

It is rapidly progressing to the aged society in Japan. Citizen's voluntary, especially students and young people's voluntary is a important support power for the elderly.

TOKYO INLAND EARTHQUAKE AS A MEGA-DISASTER AND WIDE-AREA SUPPORT SYSTEM IN TOKYO CAPITAL REGION

As mentioned the above, the provability of Tokyo inland earthquake is 70% in next three decades. According to the results of damage estimation research conducted by a Cabinet Office, a scale of damage in the severest case of Northern Tokyo Bay Earthquake (M.7.3) which occurs in the evening of weekday in winter with strong wind(15m/s), is as eight-ten times as the damage

in the Hanshin-Awaji Earthquake(see Table 4).The severely affected areas expands into Tokyo, Kanagawa, Chiba and Saitama prefectures, including Yokohama, Kawasaki, Saitama and Chiba Designated Major Cities. In Tokyo metropolitan region, Eight Local Governments Summit Organization of Great Tokyo was established, in order to cope with effectively not only a disaster emergency response but also an environmental problem, traffic problem and the other administrative issues of Tokyo Metropolitan region consisted of many local governments. The eight local governments are consisted of 4prefectures and 4 designated major cities, which cities are Tokyo, Kanagawa, Saitama and Chiba prefectures and Yokohama, Kawasaki, Saitama and Chiba Cities of Great Tokyo (Fig 2).

The eight local governments Summit Organization of Great Tokyo is established a commission of disaster mitigation and emergency management for the collaborated and co-supported emergency response. The commission of disaster mitigation and emergency management develops the system of co-support and implements the training and drill of emergency management and response activities to operate effectively the disaster responses and emergency managements in time of wide-area disasters such as earthquake, typhoon, flood, and so on.

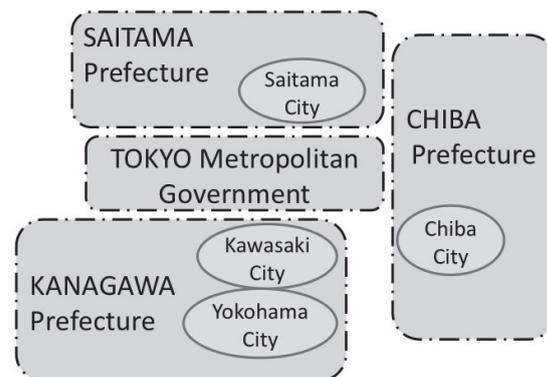


Fig.2 Eight Major local Governments Tokyo Capital Region in 2009

(1) Agreement of Co-Support in time of Disaster with Eight Local Governments of Great Tokyo

For preparedness of the co-support and co-operation, the Eight Local Governments Summit Organization of Great Tokyo concerted the "Agreement of Co-Support in time of Disaster with Eight Local Governments". The contents of it are as follows.

<Preamble> In order to collaborate and co-support

each other in time of huge wide-area disaster, eight local governments concerted a agreement with each other.

<Article 1> Definition of disaster: Natural disaster as earthquake, typhoon, and so on and Huge accident caused by society and human behaviors.

<Article 2> Contents of collaboration and co-support

- 1) Donation & mediation of materials and personals;
 - Drinking water, foods, livelihood materials and means of delivery of them
 - Materials of rescue, relief, medical services, sanitary, and quick recovery of public facilities.
 - Vehicle, helicopter, ship and boots.
 - Dispatch of personals for rescue and quick recovery.
- 2) Intercession and Reception for the injured to hospitals.
- 3) Intercession and tender of victims temporarily.
- 4) Intercession and Reception of suffered students to Schools
- 5) Intercession and tender of yards of emergency materials, sites of temporary houses, Crematory, waste treatments facilities.
- 6) Usage of evacuations bases, Clearance of emergency road, especially near the border of prefectures.
- 7) The others to be necessary.

<Article 3> Request of support, according to the manuals.

<Article 4> Self-decision to start supporting activities

- 1) In the case of disruption of information caused no communication, and case of recognitions of the necessity to support quickly, the other governments can start the supporting by the their decision.
- 2) Local government of supporter have to contact the affected local government and inform the contents of supports,.
- 3) Collecting the local information and send to the affected local government.

<Article 5> A coordinator of local government

- 1) A coordinator is designated previously among eight local government for effective operation of the supporting corresponding to various cases of damage.
- 2) Communication with the affected government is done through this coordinator

<Article 6> On-site emergency connection headquarter is established in the coordinator prefecture.

<Article 7> Cost of supporting/

Cost of supporting is discharged by the affected local government.

<Article 8> Ordinary efforts continue.

- 1) Arrangement of spaces and facilities for effective reception system of materials and personals
- 2) Empowerment of communication system among
- 3) Sharing the information among eight local governments
- 4) Training and drills is continued every year.
- 5) The others to be necessary to cope with.

<Article 9> Conference about this agreement is held by Eight Local Governments Summit Organization of Great Tokyo.

<Article 10> Others; The issues without this agreement is determined by Eight Local Governments Summit Organization of Great Tokyo

<Date of Issue> designated in 1st April 2003, Revision at 19th May 2005.

(2)Development of a new “Main Wide-area Disaster management Base” and enlargement of the Network among local government and national government

In order to wide-area collaboration and co-support for effective emergency response, recovery and restoration activities in the time of Tokyo Inland Earthquake and the other mega-disaster, a disaster management bases with such function as management of information, collaboration of response activities, sharing and delivery of logistics is important. The new base is been developing. Japan National Government (a Cabinet and National Land and Transportation Ministry) is developing the Main Wide-area Disaster Management Bases in Tokyo bay area, head quarter in Ariake-nooka zone (Tokyo) and Delivery center of emergency materials in Higashi-ogishima zone (Kawasaki), for co-operation between National, prefectural and local governments with Tokyo prefecture and Kawasaki city. This is a new base for collaboration with national government and Eight Prefectures and designated major Cities of Great Tokyo.

When the disaster occurs, at first, National Government set up a emergency management headquarter in the office of a Prime minister. After then, the operation team of National Government is started in the main wide-area Disaster management Base. At same time, the representatives of 4 prefecture and 4 designated major cities are gathering.

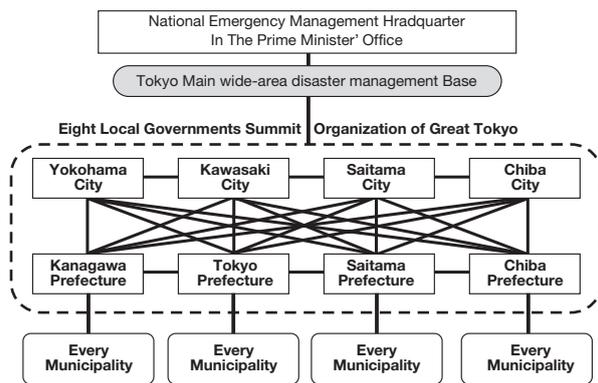


Fig. 3 Network of Government for Mega-disaster in Tokyo Metropolitan Region in 2009

On the other hand, every local government set up a disaster management system and establishes the headquarter of disaster management in his prefectural hall and in his city hall. After then every prefecture and major city send their exponents to the Tokyo Main Disaster Management Base for collaboration of response. Therefore, it is very important to make a network of each headquarter of local government. This network is very effective to collaborate and co-support among main local governments and national government. Under this network, every prefecture has the other type of information system between prefecture and every municipality.

CONCLUDED REMARKS

In the Japanese disaster management system, Disaster Countermeasures basic Act demands every local government to make a local disaster management Plan. This Act was established in 1961 under Local Autonomy Act that was established after the World War II. Local Autonomy is a very important philosophy in Japan after the War. Therefore, every Local Plan must be made under the philosophy of "Local Autonomy". In this concept, there is not the concept of supporting another local government without their requests and not of being supported by the other local government in spite of no request. The role and capability of National Government is not respected as a "strong leadership", but only as a "supporter" to local governments. The support of national government can be implemented only in the case of that the affected local government require the support from national government.

However, if the huge disaster and wide-area disaster occurs, the affected local government cannot response

to the damages by itself. The Hanshin-Awaji Earthquake clarified the limitation of local government activities from the point of manpower, and also of materials. And it is very difficult to send message of supporting require to National Government quickly. In addition, the support can be send quickly from near local government, not from distant government. Three issues for the wide-area and huge disaster are concluded as fallows;

(1) Importance of new support system of neighboring local governments.

The "collaboration, co-supporting and sharing of role" are the important concepts of response against huge and wide-area disaster. In case of Tokyo Inland Earthquake, various types of responses are necessary as follows;

1) Collaboration

According to the damage estimation of Northern Tokyo Bay Earthquake, approximately twenty one million people are affected without their home, and have to walk back to each home, because the public transportation of railway and buses are stopped and not easy to re-operate again soon. The six and half million people cannot walk back to each home until next morning, whose home is located more than 20tm far away from offices, schools, shopping facilities and so on where they are. These long distant commuters who are not easy to walk back to home. The support system for these long distant commuters has to be implemented by the collaboration with eight local governments. Four million of long distant commuters who affected in Central Tokyo are lived in neighboring prefectures such as Kanagawa, Saitama and Chiba and four major cities. The support system of long distant commuter's walking back must be collaborated with eight local governments. However, the support system is established only by Tokyo metropolitan government.

2) Co-supporting

Six and hale million people are long distant commuters, and seven million people evacuate to the shelters. The other people cannot live easy in their homes without water, piped gas, and so on. After the earthquake disaster, a shortage of materials is very severe. Such problem can be resolved in a few days after earthquake by the co-supporting system that makes the best of limited materials reserved in every government.

3) Sharing of role

In the presence, the shelter system is concluded in every municipality. However, the shortage of shelter is clarified in the severest area by the damage estimation research of a Cabinet. Beyond the barrier of “local autonomy”, new shelter system has to be developed. A sharing of role by municipality may be necessary in case of wide-area and huge disaster. A part of the victims who lose their homes evacuate into another governmental areas. The role of severely damaged governments responds not only the shelter service but also the quick recovery of various services. The role of slightly damaged government can accept many suffered people for temporary evacuation. Such sharing of role is important system in a wide-area and huge disaster,

(2) Importance of cooperation between local governments and national government.

In case of wide-area disaster, the cooperation of a national government and local governments is very important. In Tokyo metropolitan region, the main disaster management base is developed for new cooperation against Tokyo Inland Earthquake. This base makes not only a new space for cooperation but also an opportunity to new system of cooperation between national government and local government. Additionally, the network of eight local governments is empowered. Such cooperation is able to make the local government to go beyond the barrier of “local autonomy”. As an agreement of eight local governments of Great Tokyo, various disaster managements are progressing not to need the “request from the most severely affected government”.

(3) Importance of Wide-area Disaster management Plan system

As the above mentioned, the planning concepts of “collaboration, co-supporting, cooperation and sharing of role among municipalities” is very important for response against wide-area and huge disaster. However, there is not Act on the Wide-area disaster management. The author suggests that a wide-area disaster management plan is necessary for Tokyo. The “wide-area disaster management” is implemented based on an agreement of eight local governments in Tokyo. New act for management plan is necessary to implement more effectively in a huge metropolitan region.

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