

# Chapter 15

## Government Systems for Disaster Management



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**Abstract** This chapter gives an overview of disaster prevention and mitigation, i.e., disaster management, activities by the government. Such activities by the central government involve a number of tasks including maintenance and management of infrastructures, building disaster prevention plans, and research for promoting disaster management. The central government is also involved in accident investigation for securing safety and security for the people of Japan and arranging systems for public health. Local governments also carry out administration work for securing safety for the residents.

**Keywords** Accident investigation · Disaster prevention · DMAT · Health center · Local government

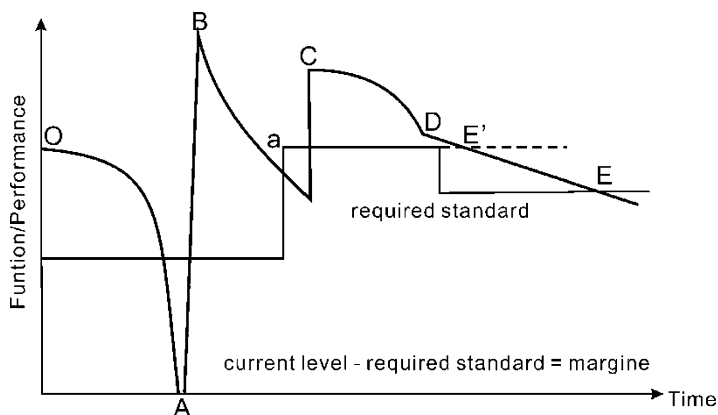
### 15.1 Disaster Management Activities by the Government

#### 15.1.1 Maintenance and Management of Infrastructures

Triggered by the Sasago Tunnel ceiling collapse on the Chuo Expressway of Japan in December 2012, the MLIT started serious countermeasures for old infrastructures. In January of 2013, the MLIT established the Committee on Aging of Social Capital, and in November of the same year, the Relevant Ministries and Agencies Liaison Conference on Aging of Social Capital announced “Action Plans for Life Extension of Infrastructure” (MLIT 2015). The life of infrastructures is, in general, 50 years; however, some keep good conditions even after 50 years since their constructions. The measure extends the life of infrastructures by proper maintenance and repairs without immediately replacing those that have surpassed 50 years since their constructions.

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**Fig. 15.1** Concept of life cycle. (Modified and redrawn based on Hashimoto et al. 2016)

A recent trend in maintenance of aging infrastructures is a method called asset management. The Japan Society of Civil Engineers, Construction Management Committee, defined asset management as “systemized practical activities for efficient and effective management of social capital, which are shared properties of the people of Japan, for enhancing profit for the people on a long-term basis,” and the committee is committed to “continued efforts applying overall knowledge from fields that cover engineering, economics, and business management.”

One of the basic concepts of asset management is the “concept of life cycle” (Fig. 15.1). Asset management targets minimization of life cycle cost (LCC) that includes maintenance cost of infrastructures over its entire life cycle in addition to the initial construction cost. First in Fig. 15.1, defining the “function/performance” for the vertical axis is important. Load, strength, and volume are easily quantified; however, such measures like usability or appearance are difficult to quantify objectively. “Function/performance” is a measure for the user to quantify serviceability of whether the social infrastructure can provide the intended “service” or not. “Function/performance” is initially at a level above the required standard; however, it degrades with time. There are cases when the level suddenly drops below the standard with an unexpected event like a natural disaster (A). The level shows a large improvement with reconstruction (B); however, uncertainty in material or construction may cause rapid decrease after level B. A rise in the requirement standard (a) forces reinforcement (C) to raise the level. At level D, implementing a measure to delay the speed of degradation succeeds, however, with a predicted life when the level falls below the requirement standard (E’). The figure shows life extension to level E by lowering the requirement standard by, for example, limiting the use. The margin of an infrastructure is defined as the current level minus the requirement standard, and proper margin against the situation surrounding the infrastructure is in need. The evaluation of current “function/performance” and its forecast of decay determines the time for maintenance. The definition of a decay

model requires clarification of the decay mechanism and accumulation and management of measurements and monitoring data.

Continuing maintenance management of aging infrastructures involves the following concerns: (1) Make use of information and communication technology to build a construction system that can perform total management of evaluation, design, and maintenance data and at the same time conform to the international standards of asset management ISO 55000 series. (2) Clarify the responsibilities of the facility manager and make further use of civilian power for sufficient maintenance systems. (3) Pass down information about maintenance management of infrastructures and train human resources. (4) Secure sufficient budget maintenance for developing robots or unmanned aerial vehicles, technologies for efficient maintenance with nondestructive testing, or laser scanning measurement, real-time measurements, and monitoring systems.

### ***15.1.2 Government Plans of Disaster Management in Japan***

With over 100 laws, Japan's national disaster management administration failed to mark sufficient effect with individual agencies tackling problems on disaster management separately up until the mid-twentieth century. The problem surfaced with the first wide-area mega disaster of the postwar period in Japan, Isewan typhoon in September 1959. The flooded area reached about 310 km<sup>2</sup> along the coast of Isewan (Ise Bay). During the disaster, over 1000 people were dead or missing in the two prefectures of Aichi and Mie. On the fifth day from the disaster breakout, the central government established the on-site disaster management headquarters within the Aichi Prefectural Government Office building where the deputy prime minister, vice ministers, head of departments from ministries, and staff members of the prefectural governments and Japanese National Railways (currently Japan Railways Group) gathered. The intention was to allow quick decision-making about guidelines and special measures at the headquarters to counter various problems that kept arising.

Later, the central government decided to build the Basic Disaster Management Plan, and prefectures and municipalities the local disaster management plans, so as to promote a comprehensive planned disaster management administration instead of an inconsistent disaster management administration on a one-on-one basis. The national plan completed in 1963 and those by prefectures and municipalities followed. Disaster management committees at the national and local levels arranged discussions among varieties of members from different fields for continuous reviews of the plans. The Central Disaster Management Council has the prime minister as the chairperson and all cabinet officials, heads of primary public institutions, and academic experts as its members. Since the council has leaders of central ministries and public institutions as its members, the nation's Basic Disaster Management Plan can incorporate functions for mutual arrangements of disaster management administration plans by each organization from long-term viewpoints (Cabinet Office 2015). The Basic Disaster Management Plan defines "comprehensive long-term

plans for disaster management,” “emphasized measures in the central and regional disaster management plans,” and “standard measures in preparing central and regional disaster management plans.” The actual disaster management measures are carried out based on the Disaster Management Operation Plan and the Local Disaster Management Plan.

The Basic Disaster Management Plan underwent a major revision after experiencing the 1995 Great Hanshin Awaji earthquake to clarify responsibilities for the central and local governments and public institutions. The measures to take in each phase of prevention and preparedness, emergency response, recovery, and reconstruction were spelled out for different disasters of earthquake, storm and flooding, volcano eruption, and so on. Experiences from the 2011 Great East Japan earthquake led to the addition of a new chapter for tsunami disaster management.

Upon a wide-area mega disaster like the Great East Japan earthquake, wide-area support activities are needed. At the same time, local residents have to survive the state when public support is insufficient, and thus disaster management activities in the local communities are extremely important as well. For this reason, a community disaster management plan started since April 2014 to promote disaster management activities among residents (including both individual and corporate residents). The Union of Kansai Governments, with eight prefectures and four ordinance-designated cities in Kansai (area surrounding Osaka and Kyoto) area, has built Kansai Disaster Management Plan under coordinated efforts of its member organizations. The current Basic Disaster Management Plan specifies the need for these regional plans.

The Basic Disaster Management Plan further specifies the need to discuss measures for specific types of disasters and regions as needed. The Central Disaster Management Council, in 2014, established the policy framework for large-scale earthquake disaster prevention and reduction that summarized measures to take for disaster management against the specific mega-earthquakes of Nankai Trough and Tokyo Inland. Further efforts are underway to build comprehensive policies that involve national land policies and industrial policies beyond “disaster management” to build national resilience over the entire nation against major disasters (National Resilience Promotion Office 2014).

### ***15.1.3 Researches on Disaster Management***

The Japanese government, with its Basic Disaster Management Plan, promotes researches on science and technology on disaster management. The Basic Disaster Management Plan has a target to “Promote researches, and enhance and reinforce forecasting and observation” of disasters by, in addition to earthquakes, tsunamis, storm and flooding, volcano eruptions, heavy snow, maritime, aviation, railways, roads, nuclear power, hazardous material, large-scale fires, and forest fires. The rest of this section describes researches on earthquake disasters.

Science and technology researches about disaster management involve scientific and engineering researches about the disasters themselves and sociological researches about human actions or information transfer at times of disasters. The Basic Disaster Management Plan places emphasis on promoting coordination among research institutes and administrative bodies through research institutes providing information to disaster management institutes, so outcome of the researches can apply to enhancement of disaster management systems and disaster management policies. Related agencies and ministries and designated public institutes like the Japan Meteorological Agency, MEXT, Cabinet Office, and the like have set their actual research guidelines in their disaster management operation plans based on the Basic Disaster Management Plan.

The 1995 Great Hanshin Awaji earthquake was a big turning point of our researches on disaster management. The impact of the earthquake disaster revealed that accomplishments of investigation and researches on earthquakes had not been sufficiently transferred to the residents and institutions in charge of disaster management. In July of the same year, the Headquarters for Earthquake Research Promotion headed by Director-General of the Science and Technology Agency was established in the General Administrative Agency of the cabinet (the headquarters were transferred to the MEXT with the 2001 reform, and the head is the minister). The government intended to have a single line of promoting efforts that clarified the responsibilities of the investigation and research organizations, so their results can directly make effects on the administration policies. The budget for earthquake investigation and research for the fiscal year (started in April and ended in March of the following year) that followed the Great East Japan earthquake had an increase to reach 35.6 billion Japanese yen (JPY) (about US\$430 million), and the annual budget in recent years has been about 11 billion JPY (about US \$100 million).

The Headquarters for Earthquake Research Promotion carries out the following research activities: (1) Arrange and analyze observation results of ground motion, study them, and make overall evaluations to publish them monthly. (2) Perform long-term evaluations to estimate probabilities of earthquake occurrence within set timespans and their sizes primarily along major active faults and ocean trenches. (3) Carry out strong ground motion evaluations to estimate the seismic intensities in the surrounding area in cases of specific earthquakes. (4) Publish “National Seismic Hazard Maps for Japan” with probabilistic earthquake prediction maps of probability numbers for regions to suffer seismic activities with timeframes and earthquake movement prediction maps with earthquake source faults identified. Further, for specific probable earthquakes, publish “long-period earthquake ground motion hazard maps” that forecast long-period earthquake ground motions that can cause major damages to structures far from the earthquake sources.

The Headquarters for Earthquake Research Promotion also takes on the role of promoting establishment of the seismic observation network. The seismic observation network is going through the arrangement of setting observation points over the nation land managed by the National Research Institute for Earth Science and Disaster Resilience, Geospatial Information Authority of Japan, Japan

Meteorological Agency, and so on. The 562 high-sensitivity seismographs in 1996 greatly increased to cover 1498 points over the nation in 2016. Similarly, broadband seismographs went from 82 points to 189, strong motion seismographs from about 2809 to 2853, and GPS continuous monitoring facilities from 716 to 1492.

## **15.2 Public Systems for Societal Safety**

### ***15.2.1 Accident Investigation***

#### **15.2.1.1 Significance and Purpose of Accident Investigation**

An effective way in preventing reoccurrence of an accident is to investigate and analyze the accident cause to prevent similar accidents from repeating and learn knowledge and lessons effective in preventing other types of accidents (Abe 2011). The world's first commercial jet plane Comet in the UK went through accidents of falling apart while in-flight from 1953 to 1954. The accident investigation identified the cause of metal fatigue of the fuselage with repeated pressurization and depressurization. The knowledge gained from the investigation greatly contributed to enhancing safety of airplane operations that followed. Accident investigation is so effective in accident prevention and safety enhancement (Ministry of Transport and Civil Aviation 1955).

#### **15.2.1.2 Types of Accident Investigation**

Categorizing accident investigation based on the organizations that carry them out, we have accident investigations by (1) permanent public organizations, (2) temporary public organizations, (3) government or administrative organization as part of its duty, (4) the organization responsible for the accident, (5) third party from the civilian section, and so on. Also, separately from these accident investigations, many countries in the world, including Japan, have their police force investigate accidents in case of deaths or injuries. The police investigation is intended for criminal prosecution of causing death or injury through negligence in the pursuit of social activities; however, since it sometimes identifies the cause to certain levels, it can be deemed a type of accident investigation.

The most important type of investigation among the above is that by permanent public organizations that aim not at pursuing the responsibility but at finding the accident causes, extracting the lessons, and preventing repeating the same accident again. The National Transportation Safety Board (NTSB) of the USA is internationally well known to be an investigation organization with such purposes.

The NTSB was established in 1967 as an organization under the US Department of Transportation. The board, however, to keep independence in its accident investigation, demerged from the Department of Transportation into an independent

federal institution. Accident investigation is nothing but serious work to identify flaws and weaknesses of organizations or systems. At times, it functions to point out defects in administrative regulation. Accident investigation, therefore, has to keep independence not only from those responsible but also from related administrative organizations.

### 15.2.1.3 History of Accident Investigation

Accident investigation by permanent public organizations started early in transportation. In 1951, the International Civil Aviation Organization (ICAO) adopted an article from the Convention on International Civil Aviation about the Standards and Recommended Practices for Aircraft Accident Inquiries and designated it as Annex 13 (ICAO 2016). When an aviation accident breaks out, contracting countries to the convention carry out accident investigation following this annex. Japan, in 1974, established the Aircraft Accident Investigation Committee within the Ministry of Transportation (now part of the MLIT).

A number of countries in the world started investigations of maritime accidents since before World War II. In Japan, the Marine Accident Inquiry Agency (formerly Marine Court) was established in 1949, and it continued its investigations into accident causes and disciplinary actions to marine personnel as an affiliated agency of the Ministry of Transportation up until 2008. For railway accidents, on the other hand, investigations were made by railway companies or administering agencies since old times, however, not by permanent organizations. Investigations of railway accident by a permanent organization in Japan started in 2001 with the establishment of the Aircraft and Railway Accidents Investigation Commission (JTSB 2018).

In recent years, with the growing international social concerns for safety, movements to establish permanent accident investigation organizations are on the rise among advanced countries. Especially for transportation accidents, the International Transportation Safety Association (ITSA) was established in 1993 as an international union for accident investigation. As of June 2017, accident investigation organizations from 16 countries, including Japan, have joined this association.

### 15.2.1.4 Permanent Accident Investigation Organizations in Japan

Not all accidents in Japan undergo investigation by permanent accident investigation organizations. Fire departments and the Fire and Disaster Management Agency investigate fires that amount to about 40,000 annually, and the police looks into the 500,000 or so annual automobile accidents that cause deaths or injuries. An extremely rare accident takes a temporary investigation committee each time. For example, the 2011 Tokyo Electric Power Company (TEPCO)-owned Fukushima Daiichi NPP accident led to separate investigation committees, one by the central government and one by the diet.

As of now in October 2017, we have four permanent accident investigation organizations: the Japan Transport Safety Board, Consumer Safety Investigation Commission, Commercial Vehicle Accident Investigation Commission, and Medical Incident Investigation Support Center. The Japan Transport Safety Board established in 2008 with the merger of the Aircraft and Railway Accidents Investigation Commission and part of the Marine Accident Inquiry Agency carries out investigation of aviation, railway, and maritime accidents and serious incidents to identify the causes, prevent recurrence, and reduce damages. The Consumer Safety Investigation Commission started in 2012 for accidents related to consumer products, food, facilities, and services. The 2014 Commercial Vehicle Accident Investigation Commission investigates accidents with commercial vehicles of buses, taxis, and trucks and the 2015 Medical Incident Investigation and Support Center medical accidents (Medical Safety Promotion Office 2016).

## ***15.2.2 Public Health Systems***

### **15.2.2.1 Establishment of Public Health Systems**

Hippocrates from the fourth century BC described that clean water and air and proper housing have strong correlation with the health. In the fourteenth century, Europe faced an outbreak of plague, and quarantine started at newly placed health offices in the northern Italian cities of Florence and Venice (Cipolla 1981). The system of public health that carried on to date started in the nineteenth-century UK. In the UK, commerce and industries showed rapid growth, and with the increase in city populations, the health environment in cities declined. Large cities like London suffered outbreaks of infections like cholera entering the vicious spiral of poor hygiene, disease, and poverty. The social systems at the time could not handle the situation, and Edwin Chadwick built the new system of the Health of Towns Associations in local communities with professional staff to perform duties and established the Public Health Act in 1848. This system spread to the rest of the world as a public health system (Tatara 1999).

### **15.2.2.2 Definition of Public Health**

The forming of systems for providing medical services deemed the public health system established in the nineteenth century unnecessary. Even with such systems shaped, however, medical service alone could not solve many health problems like dealing with spread of infections. Since around the 1980s, many countries went through reforms of their public health systems. The UK redefined and promoted public health to mean “Science, technology and policies to assemble various forces of the societies to promote and protect health of the people for their health and peace, to prevent illnesses, and extend their lives” (Acheson 1988).



### 15.2.2.3 Public Health in Japan

The “Medical System (1874)” promulgated in early Meiji era started with an article on health administration to introduce the system of public health into the country. Public health system, however, made its way clear for the first time with the Constitution of Japan in 1947 (Prime Minister of Japan and his Cabinet 1947). Article 25, Section 2 of the Constitution clarified the nation’s responsibility in improving and promoting public health and further assigned local public organizations to carry out public health operations. The postwar public health operations developed around public health centers based on the 1947 Health Center Act. Since 1978, the change in the policy made municipalities build their health centers and increase their municipality health center staffs, so the municipalities could play the central roles in public health. In 1994, the Health Center Act was amended to “Community Health Act,” and municipalities were legally assigned the central roles for providing basic public health functions of health, welfare, and nursing servicing for the citizens (Tatara and Okamoto 2009).

Cities with health centers (ordinance-designated cities and core cities), in addition to health centers, have “Local Research Institutes of Hygiene” (Tatara and Okamoto 2009). The MHLW has built “quarantine stations” in primary ports and airports. We also have a number of special institutions and research centers, e.g., the National Institute of Infectious Diseases, National Institute of Public Health, National Institute of Health Sciences, and so on. In addition to these administrative institutes and organizations, the private sector has built the Japan Public Health Association, Japan Food Hygiene Association, and so on to support the public health system.

### 15.2.2.4 Health Center Operations as Defined in Community Health Act

Health centers are specialized institutions for public health activities with medical doctors, public health nurses, public health inspectors (environment, food, pharmaceuticals, and inspections), and so on. Article 6 of the Community Health Act defines the following 14 tasks as duties for health centers:

- Enhancing concepts of community health
- Dynamic regional population and other statistics about community health
- Improving nutrition and food hygiene
- Environmental health concerns like living space, water supply, sewage, garbage disposal cleaning, and other matters related to environmental hygiene
- Medical and pharmaceutical concerns
- Matters about public health nurses
- Improvement and promotion of public health activities
- Health of mothers, infants, and elderlies
- Dental health
- Mental health

- Health of those with infections without established cures and those in need of long-term treatment due to other special infections
- Prevention of AIDS, tuberculosis, venereal diseases, contagious diseases, and other diseases
- Hygienic testing and examination
- Other matters for protection and promotion of health of community residents

### ***15.2.3 Establishment of Emergency Lifesaving System***

#### **15.2.3.1 History of Emergency Medical System in Japan**

The 1947 Fire Defense Organization Act triggered the establishment of emergency medical service systems in Japan with municipalities in charge of administration of defense against fires. The year 1961 marked the establishment of a universal healthcare system, and the number of medical institutions greatly increased to accommodate emergency patients. In 1963, fire departments were assigned with the tasks of emergency transportation. In 1964, the notification system of emergency medical institutions started, and patients with first-degree emergencies (mild cases) and second-degree emergencies (moderate cases) were subject to emergency medical service within municipalities.

Patients with severe cases of third degree, however, needed institutions specialized in lifesaving with specialized medical doctors trained for emergency medical service. Such systems were not organized until university hospitals that were training such medical doctors started to accommodate third-degree patients. In 1967, the Osaka University Hospital established the emergency department to accommodate third-degree emergency patients. It was the first among all university hospitals in Japan. It also started a course on emergency medical service for education and training of doctors specialized in emergency medicine. Osaka Prefecture in 1979, starting with the Osaka Prefectural Senri Lifesaving Emergency Center, built third-degree lifesaving emergency medical centers in blocks that divided the prefecture. The emergency medical administration by Osaka Prefecture spread throughout the nation (Kidokoro 2001). Currently further specialized “Advanced Lifesaving Emergency Centers” for extensive burns, severed limbs, acute intoxication, and so on are spreading throughout the nation.

The probability of saving an emergency patient is limited with only the doctor’s treatment after reaching a hospital, and in 1991, the system of emergency lifesaving technician started, so the technician can perform lifesaving treatment during transportation of emergency patients. Many ambulance team members now carry the qualification of emergency lifesaving technicians to provide resurgent and lifesaving treatment.

### 15.2.3.2 Base Hospital upon Disasters and Formation of Medical Teams

When a major wide-area disaster like the 1995 Great Hanshin Awaji earthquake breaks out, the regular emergency medical service system based on municipalities cannot handle the large number of injured patients. A detailed analysis of response cases to emergency patients at the time of the Great Hanshin Awaji earthquake led to the conclusion that such a situation needs a “Disaster Base Hospital” and a “Disaster Medical Assistance Team (DMAT)” (Kondo et al. 2009). Arranging hospitals that can serve as bases of lifesaving emergency medical service and organizing DMAT for the time of disasters are underway since 1996.

A disaster base hospital, in response to a request by the prefectural governor, accepts the injured immediately after the breakout of a disaster and dispatches medical teams as needed. DMAT is a medical team with various members including doctors, nurses, and specialists (emergency lifesaving technician, pharmacist, clinical engineer, clinical laboratory technician, physiotherapist, occupational therapist, radiology technician, social welfare counselor, healthcare professional, clerk, and so on). It carries medicine and medical equipment to disaster-struck areas with medical staff to perform independent emergency medical service.

Prefectures have “Prefectural DMAT” in preparation for medical needs upon disasters, and the MHLW has “Japan DMAT” to respond to major disasters. The two cooperate in disaster-struck areas in providing medical support of long- and short-range transportation, setting up temporary medical camps, and supporting local hospitals.

At the time of the Great Hanshin Awaji earthquake, hardly any helicopters transported emergency patients for lifesaving. The administration, thus, started to deploy Doctor-Heli (doctor helicopter) around the nation, so they can transport patients to remote medical facilities with a doctor, a medical nurse, or an emergency lifesaving technician onboard. The 2011 Great East Japan earthquake was the first major disaster for the emergency medical facilities and medical teams to go fully operational.

It is now clear that setting up lifesaving emergency medical service systems is insufficient in saving victims of disasters. After the Great Hanshin Awaji earthquake, people found that although emergency medical service immediately after the disaster outbreak is important, people tend to worsen their medical conditions or in some cases die, during the mid- to long-term evacuation that followed. The need for teams for mid- to long-term medical and health-supporting activities arose in disaster-struck areas to follow DMAT after its departure after several days of action. After the Great East Japan earthquake, the Japan Medical Association formed the Japan Medical Association Team (JMAT) and dispatched them, for the first time, to areas struck by the earthquake. Upon outbreak of a disaster, not just Japan Medical Association but national and public hospitals and private medical institutions like the Japan Red Cross Medical Center form medical teams for entering disaster-struck areas to perform medical services.

## 15.3 Local Government and Societal Safety

### 15.3.1 *Safety Securing Duties of Local Governments*

Article 92 of the Constitution of Japan states that “Regulations concerning organization and operations of local governments shall be fixed by law in accordance with the principle of local autonomy.” The principle of local autonomy consists of organizational autonomy and residential autonomy. Organizational autonomy acknowledges local governments, independent from the nation, at regions, and it is the principle of voluntary administration under the responsibility and intention of the local governments for securing safety and security for the residents. Residential autonomy means that local autonomy is based on intentions of the residents. Under local autonomy, we have to “protect safety and security of our community with our own hands.”

Administration by local governments cover a wide range of policing, firefighting, disaster response, environment protection, public health, health management for the residents, and welfare policies. For fairness and equality over the entire nation, these administrative services by the basic local autonomies and the municipalities work in coordination with prefectures responsible for wide-area administration, under the control by the central ministries and agencies.

For example, we have the Consumer Affairs Agency (CAA) that started in 2009 as a national institution for protecting consumer’s safety. The agency has centralized control of claims from consumers filed at consumer affairs center in prefectures and municipalities. Problems reported to consumer affairs centers cover a wide range of incidents, in fact, almost everything, like purchases through the Internet, fraudulent businesses for the elderly, fraud in home remodeling, accidents with playground equipment, troubles with home medical devices, troubles with cosmetic medical treatment, dangerous drugs, loan sharks, forged credit cards, and malignant business deals (CAA 2017).

Organizational charts at entrances of city halls show that local governments have varieties of departments. For example, a department in charge of crisis management supports activities by disaster management organizations or carries out activities for promoting consciousness about disaster management among the residents, so the power of disaster management is enhanced in the community. The firefighting department keeps daily activities to immediately respond to firefighting and rescue requests for saving lives of the residents. A welfare-related department carries out fine operations to support those in need, like elderlies or handicapped. A department in city planning keeps roads, parks, and public areas in good conditions for keeping the safe and secure community. The board of education works on the safety management systems at school, so children are not involved in incidents.

Our modern societies have to face a large number of risks, and the responsibilities for local governments are growing. The staff are busy carrying out their duties in protecting the safety for the residents. And once a major disaster breaks out, the staff has to quickly gather at their positions and conduct disaster response under the

instructions from the headquarters. Most people used to think of local governments as terminal nodes in the top-down system with the central government at the top; however, in fact, they have the heaviest responsibilities in keeping safety of local regions.

### ***15.3.2 System for Securing Safety by Local Governments***

This section overviews the level of involvement by local governments to securing safety for the residents. Through this analysis, we will try to roughly grasp the current problems. We will especially compare the police and fire stations in Sect. 15.3.1 that are somewhat close entities to the residents in their efforts of protecting safety and security for them.

Police headquarters are set for each prefecture, whereas fire department headquarters are located for municipalities. A police headquarter then places police booths, police boxes, and police stations in its prefecture, and a fire department headquarter places fire stations and substations in its municipality. The system allows police officers and firefighters, familiar with the regional roads, to swiftly and accurately carry out their missions.

In Japan fiscal year (starts every April of the year) 2016, all the police station staff accounted 288,000 with all prefectures combined and fire department staff from all municipalities 163,000. They, respectively, amount to 10.5% and 6.0% of all local public employees. The Japan fiscal year 2015 expenditure amounted to, in JPY, 3231 billion (about US\$30 billion) for the police force and JPY 2097 billion (about US\$20 billion) for the firefighters (MIC 2017). The figures, respectively, amounted to 3.3% and 2.1% of total local government expenses. The numbers tell us that local governments spend huge amounts of manpower and cost in securing safety for the residents.

Revenue shortages in local finances these days are forcing each department to streamline (rationalization and higher efficiency) the administration. The transition of local expenses during 10 years of 2005–2015 showed consistent ratio for the firefighting expenditure; however, the police spending declined in its ratio to overall local expenses. Revenue shortages for local finance affect local government operations of securing safety for the residents and raise big concerns (MIC 2017).

As the societies grow complex and advanced, operations for securing safety for the residents are turning internationalized, advanced, and complex as well. The reality is demanding preparedness for the following concerns (FDMA 2016):

- (a) Internationalization: Local administration is undergoing rapid internationalization. Crimes and troubles by foreigners are problems not just for the police but also for emergency transportation for the firefighters. We are also concerned about terror attacks by foreign terrorist groups, and the police and firefighters have to quickly prepare against nuclear, biological, and chemical disasters (NBC disasters).

- (b) Advancement: Crimes that take highly advanced knowledge for suppressing them are increasing these days. They are cyberterrorism targeting weaknesses of information security, fraud over international networks, money laundering, and so on. Equipment and systems for fire extinguishing and rescue are highly advanced and sophisticated. The measures that require high costs are demanded just like with internationalization in (a).
- (c) Complication: In case of a mega-scale disaster, we can foresee added complication in the disaster-struck areas with trains overturning and multiple collisions, explosions at chemical factories, and terror attacks. We thus need to be prepared to apply “triage” that prioritizes how to apply limited resources to the troubled events. The streamlined organizations with short budget have no margin and will have to make hard decisions.

As we described above, systems for protecting safety of citizens have to make continuous efforts to reform themselves with the changing requirements of the time and societies. Otherwise, the systems will be quickly outdated and weakened. There are expectations toward the buzzwords “New Public Commons” or “Government 2.0” (Chen 2011) based on “residential autonomy” for local autonomy that makes use of cooperative efforts by many of the residents.

### ***15.3.3 Local Governments and Emergency Drills***

Administrative bodies of the nation and governments make disaster management activities primarily targeting natural disasters. With disasters of larger magnitudes, however, that is, the more we acknowledge the situation as severe, response and recovery by the administration fail to provide sufficient functions. A white paper on disaster management in Japan also pointed out limits to public aid: “It was clear that administration alone had difficulties in providing quick support for all the disaster victims and there were cases that administration functions suffered damages and were paralyzed in providing their intended functions in case of mega-scale wide-area disasters like the Great East Japan earthquake” (Cabinet Office 2015).

With the assumption that disaster management measures by administrative organizations are limited, promoting disaster management activities in households and regions is one of the important activities for local governments. Disaster education and emergency drills are activities for promoting disaster management activities in households and local regions.

The most common emergency drills by local governments are regional overall emergency drills. Regional overall emergency drills are trainings for a number of disaster management-related organizations, and thus participants are often limited to experts. These events, thus, often end up being just chances for local residents to observe results of training by experts. The drills need to involve more regional residents by, e.g., having them experience earthquake simulator trucks or initial

actions in fire extinguishing or having them walk from their homes to the training ground.

In recent years, communities organize “shakeout drills” that involve wide areas like the whole prefecture or municipality to coordinate emergency drills at companies, schools, and households at the same time on the same day. Shakeout drills are major-size emergency drills that started in 2008 in California, USA (Jones and Benthien 2011), and they are spreading throughout the world. In addition to shakeout drills are “plus one drills” that have the participants add one additional disaster management activity like checking the emergency supplies or dangerous spots. Shakeout drills and plus one drills are one of the most important trainings led by the local governments for the promotion of self-support and mutual support by regional residents.

These emergency drills are often carried out in Japan during a specific period. The most popular is the “Disaster Preparedness Day” on September 1st. September 1st is the day the Great Kanto earthquake hit in 1923. It is also the time of the year when typhoons hit. The cabinet meeting set the day in 1960 as the Disaster Preparedness Day to promote training to understand the threats of disasters. In addition to Disaster Preparedness Day, we have from past disasters, Disaster Reduction and Volunteer Day (January 17), World Tsunami Awareness Day (November 5), and so on.

Local governments need, in addition to simply remembering past disasters on the above specific days related to disaster management, to have regional residents to actually realize that disaster management is accomplished for the first time upon everybody’s cooperation.

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