Disaster-resilient Urban Development in Fukuoka City

FUKUOKA CITY

SADAKARI Atsuhiro
Deputy Mayor of Fukuoka City

2018.8.2 (Thu)
An Abundance of Nature
Kumamoto Earthquakes April, 2016

Magnitude 7.3
(Seismic Intensity up to 7)

259 dead
8,648 residences completely destroyed
183,882 evacuees (peak number)
Northern Kyushu Rainstorm July, 2017

An all-time high of 545.5 mm of rain
※Over a 24-hour period

40 dead
325 residences completely destroyed
4,580 evacuees (peak number)
Rainstorm in July 2018

The most rainfall ever according to a number of observation points

219 dead
3,528 residences completely destroyed
27,620 evacuees (peak number)

14:00 July 25, 2018
From the Central Government's Emergency Response Headquarters
New Support Methods

Self-contained Support

Lower burden on the affected area
Information doesn’t reach victims/can’t be collected!

Support systems fall into disarray!

Supplies fail to reach affected areas!

People’s awareness & local involvement is vital!

Emergency response centers face confusion!

Living in shelters is especially difficult for women and the elderly!

When Disaster Strikes...
Fukuoka, an Advanced Disaster Management City Built through Cooperation

- **Cooperation** with citizens, private firms, & NPOs
- **Wide Area** Working in tandem to assist each other!
- **Disaster Management Leader City** Fukuoka
- **Efforts** Utilization of new technologies
- **Universal** Support network provides peace of mind for all
Securing Supplies

- The city stocks a minimum of **3 days’ worth of** food and water even in absence of support from other sources
- For food distribution and shipping, **we make use of agreements and training with private firms**
- Campaigns to encourage **firms and homes to stock up**
Expansive Support Network

- The Kyushu Association of City Mayors organized The Disaster Management Group
- A rapid response support system created for use in times of disaster
Info Networks Using ICT

- A Disaster Management App『 Tsunagaru+ 』

**On a typical day**

- Form your own groups
- Share information within groups

**In times of disaster**

- Check for evacuation sites on a map
- List of nearby evacuation sites
- Route guidance to the site is also available
- Non-designated sites also displayed

Changes Function
Sound Operation of Evacuation Centers

- **Partitions and portable toilets** are on stand-by at 432 sites, such as public halls and elementary schools.

- Preparing for smooth operation by cultivating evacuation center experts and providing relevant information to citizens.
Disaster Management Leader City Fukuoka, Kyushu
Preventative Measures Against Flooding in Urban Centers
Past Flood Damages

Flood Damage

- June 29, 1999
  Under/Above-floor Flooding 3,173 bldgs. (in city limits)

- July 19, 2003
  Under/Above-floor Flooding 1,721 bldgs. (in city limits)

Flooding around Hakata Station

Rainwater pours into the Hakata Station Underground
Flood Prevention Measures Around Hakata Station

Urban functions are concentrated around the Hakata Station area, and due to increases in utilization of underground spaces, there was a need for a higher standard of preparatory measures.

$59.1 \text{ mm/h} \Rightarrow 79.5 \text{ mm/h}$

*Record for hourly rainfall (from June 29, 1999)
Introducing a Rainwater Collection Infrastructure

In response to heavy rain, the system temporarily collects rainwater to prevent it from flushing down and thus reducing flood damage.
Rainwater Collection Infrastructure

Usable from June 2006

Capable of storing up to 28,000 tons, roughly equal to 75 25-meter pools!

Dug 1.8 meters into a baseball field to create a regulating basin

20,000 tons collected during the localized storm of July 2009

6.4m of effective depth

5m

1 meter’s worth collected

Sanno Regulating Tank No. 2

Sanno Regulating Tank No. 1
During the torrential rain of July 2009, hourly rainfall was measured at 116mm/h.

Flood damage was reduced in the area due to improvements in sewer and river infrastructure.

**Main Causes**
- Improved culverts
- Improved collection infrastructure
- Improved river infrastructure

---

**Buildings with Flood Damage**

- **Hakata Station Area**
  - June 29, 1999 (79.5mm/h): 3,173 buildings
  - July 19, 2003 (104.0mm/h): 1,721 buildings
  - July 24, 2009 (116.0mm/h): 1,122 buildings

- **Fukuoka City**
  - June 29, 1999 (79.5mm/h): 187 buildings
  - July 19, 2003 (104.0mm/h): 238 buildings
  - July 24, 2009 (116.0mm/h): 1 building

---

**Drastic reduction in flood damage around Hakata Station**
Pursuing Disaster-resilient Urban Development

- Continue to make improvements to our infrastructure against floods
- Engage in disaster-resilient urban development, while also facilitating measures including the establishment of information networks for disaster situations