

The Situation of climate change adaptation in Tokyo



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1. Current situation of climate impact
and adaptation in Tokyo

2. Movement related to adaptation
and challenges

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1. Current situation of climate impact and adaptation in Tokyo.



Changing Climate in Japan

Japan originally has many natural hazards.

We have responded them historically.

And I thought we have reached an almost enough level of measures.

But Record extreme weather has increased recently, and many disasters are occurring.

Climate disaster in Japan in a year

Sep 2017 Typhoon and Weather front

- ✓ An hour precipitation recorded 90mm at Saeki and 85mm in Daiki, updated the first in observation history.
- ✓ 8dead, 59injured, 14houses destroyed, 531houses damaged, 6,623houses inundated.

Jul 2017 Typhoon and Weather front

- ✓ 546mm/day updated the first in observation history.
- ✓ 39dead, 4missing, 1412houses destroyed, 94houses damaged, 1908houses inundated

Jul 2018 Heavy rain

- ✓ The total rainfall from June 28 to July 8 exceeded 1,800 mm.
- ✓ 24, 48, 72 hours precipitation at the many points are the first in observation history.
- ✓ Many dead and missing people due to river floods and landslides.

Jan 2018 Snow Storm

- ✓ 198 cm snowfall from Jan 22nd to 27th.
- ✓ 28.2 m/s wind speed in Sakata.
- ✓ Many Traffic disturbances, lifeline damages..

Feb 2018 Heavy Snow

- ✓ Recordable heavy snow since 1981 Feb 3rd to 8th.
- ✓ Traffic disturbance.

Oct 2017 Typhoon and Weather front

- ✓ 889mm of the 48-hour precipitation at Shingu
- ✓ 8dead, 215injured, 20houses destroyed, 630houses damaged, 5,882 houses inundated

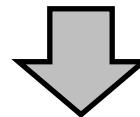


Adaptation in Japanese Government

Nov.2015 National adaptation plan

“Adaptation plan for the impact of climate change”

Jun.2018 The Climate change adaptation law



The adaptation plan and The law set out that municipalities will make **efforts** to tackle climate change adaptation measures.

Adaptation in Tokyo Government



1. Promotion of Energy Efficiency Measures and Energy Management

1 Formul

TMG has promoted measures taking into consideration the impact of climate change, including those for heavy rains and heatstroke and will develop these measures in a more systematic manner than ever to adapt to the impact on natural disasters, natural ecosystem, and human health in the medium to long term, in light of the latest knowledge and the move of the national government.

TOKYO ENVIRONMENTAL MASTER PLAN

March 2016

Sustainable & TOKYO



Source: Climate Change and its Impacts in Japan 2013 from the Ministry of Education, Culture, Sports, Science and Technology etc.



Source: Material from the Ministry of the Environment

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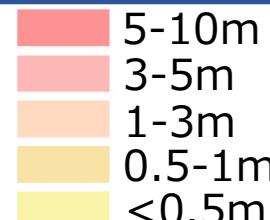
2. Movement related to adaptation and challenges

Movement related to adaptation



Worst-case flood prediction map

- ✓ According to the future prediction, the course of the typhoon may move to the east side than it is now.
- ✓ Therefore, it can be said that this map considered part of climate change risk.
- ✓ This map is excellent in considering complex disasters.
- ✓ However, sea level rise is not considered.



the same time as storm surge

- ✓ Assuming the worst situation, anticipate breaking of embankment etc



Movement related to adaptation

Torrential rain

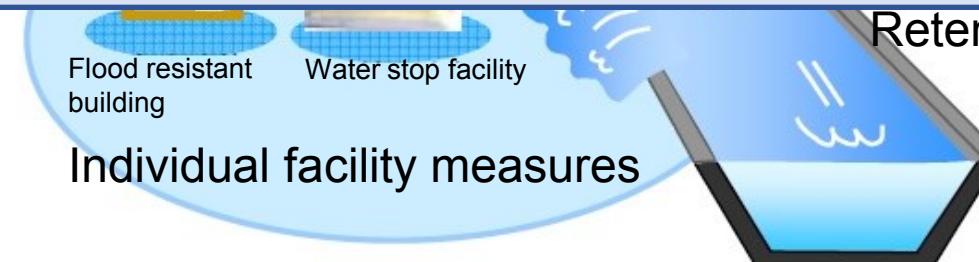
In June 2014 TMG revised the Tokyo Heavy Rainfall Muster Policy.

It has been revised taking into account the increasing strong rain in recent years.

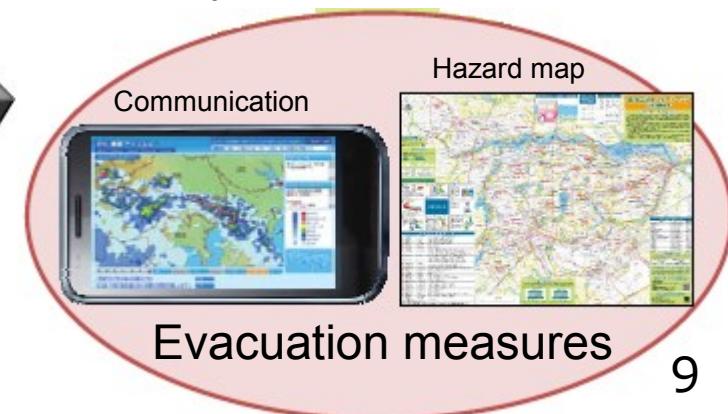
Drainage facility measures



- ✓ However, risks of climate change in the future are still largely unconsidered.



Retention facility measures





Need integration Adaptation measures

Climate change adaptation in Tokyo has only just begun

Some bureaus in TMG have begun to consider adaptation independently based on the national policy.

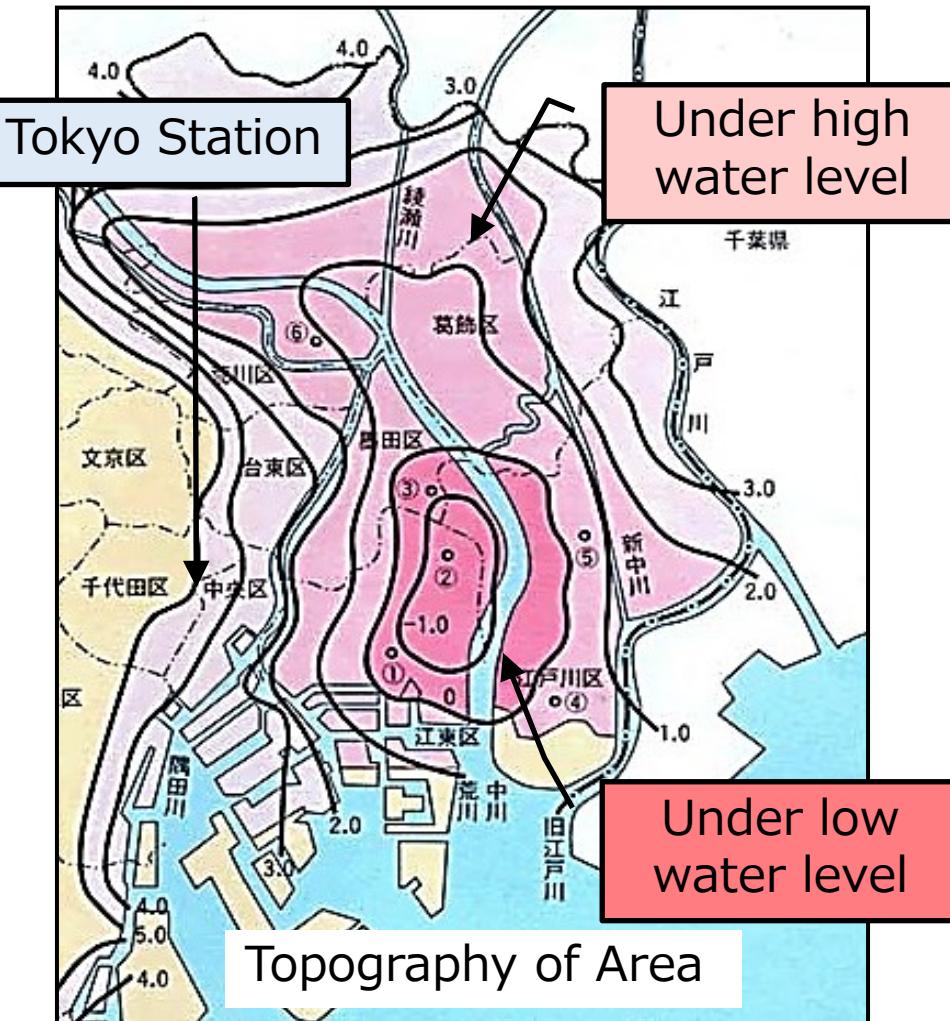
Future Challenge

This becomes measures of a single function considered in a narrow range.

Can you imagine?

Future Challenge

It may be necessary to change the place to live.



Area 116km²

Area of under high water level
Source : Ministry of Land, Infrastructure and Transport, 2006

Population 2.5M

Resident population for the area flooding on the floor.
Source :Koto 5 Ward large-scale flood disaster broad evacuation plan

Inundation depth 10 m

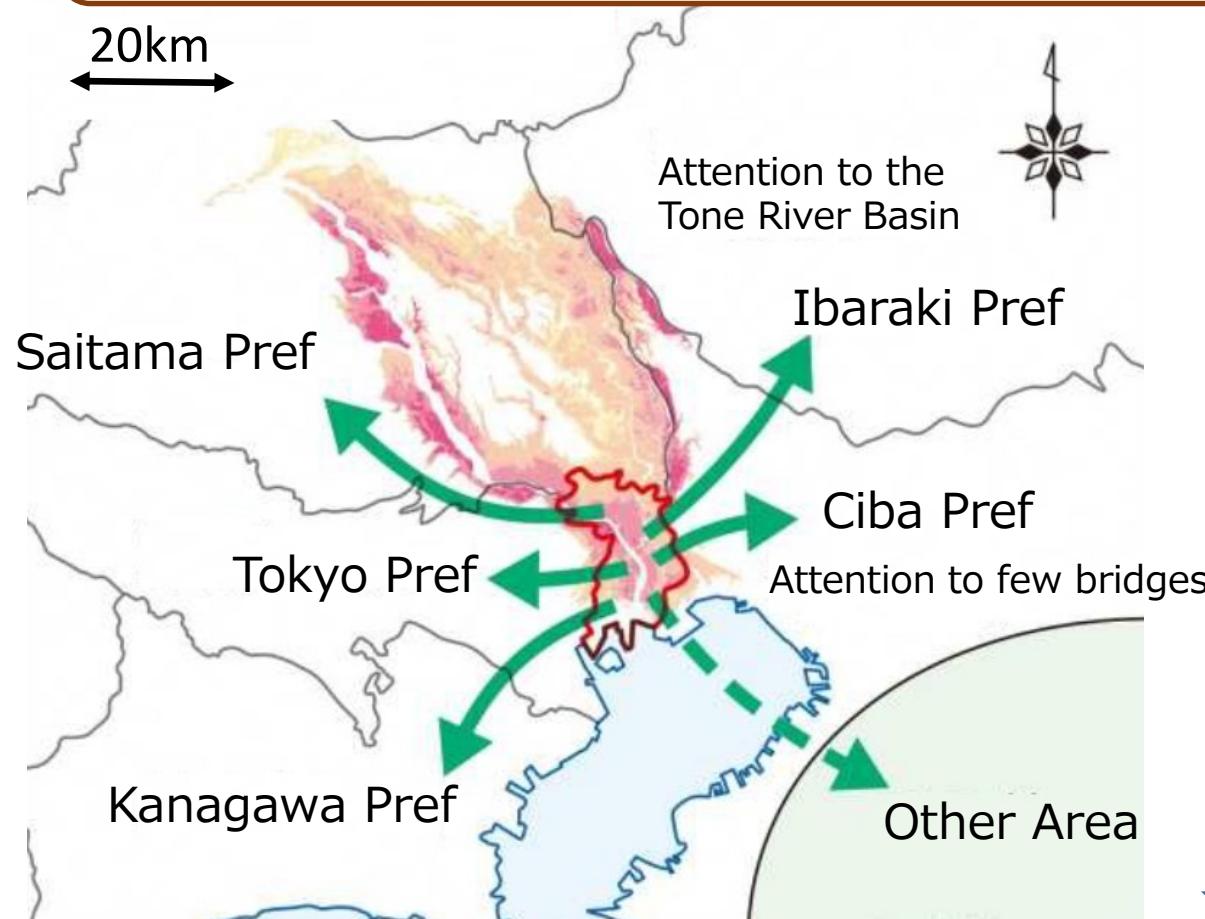
Inundation period 2weeks

Source :Koto 5 Ward large-scale flood disaster broad evacuation plan

Broad Evacuation plan (Aug 2018)

Future Challenge

It may be not functional measures.



evacuation information.
930hpa Typhoon or
400mm/3days(Arakawa river basin)

72-24 hours
Announcement
voluntary broad
evacuation infomation

24-9 hours
Recommendation
voluntary broad
evacuation

9-0 hours
Direction vertical
evacuation within the
region

Source :Koto 5 Ward large-scale flood disaster broad evacuation plan

3. My research



Need Citizens Coop for adaptation

Future Challenge

This becomes measures of a single function considered in a narrow range.

◆ **Integration of adaptation measures**

Challenges are different depending on the area, combination of measures and integration are also different. Citizens knows local conditions the most .



Need Citizens Coop for adaptation

Future Challenge

This becomes measures of a single function considered in a narrow range.

◆ **Integration of adaptation measures**

Challenges are different depending on the area, combination of measures and integration are also different. Citizens knows local conditions the most .

Future Challenge

It may be necessary to change the place to live.

◆ **Critical change for adaptation measures**

Only citizens who live there can decide the future city.



Need Citizens Coop for adaptation

Future Challenge

It may be not functional measures.

◆ **Functional adaptation measures**

Measures that citizens do not understand do not work in emergencies.



My Research Questions

The information from the government is sometime not clearly understand for citizens. Citizen's opinions are often fragmentary and abstract.

- ◆ How do you provide the information to the citizen in an easy-to-understand way?
- ◆ How do you integrate citizen opinion, make it concrete, and provide it that the government official is easy to implement?

Thank you for your attention

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