The Situation of climate change adaptation in Tokyo

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Tokyo Metropolitan Research Institute for Environmental Protection
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1. Current situation of climate impact and adaptation in Tokyo

2. Movement related to adaptation and challenges

3. My research
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.
- 8 dead, 59 injured, 14 houses destroyed, 531 houses damaged, 6,623 houses inundated.

**Jul 2017 Typhoon and Weather front**
- 546mm/day updated the first in observation history.
- 39 dead, 4 missing, 1412 houses destroyed, 949 houses damaged, 1,908 houses inundated.

**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.

**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.

**Oct 2017 Typhoon and Weather front**
- 889mm of the 48-hour precipitation at Shingu.
- 8 dead, 215 injured, 20 houses destroyed, 630 houses damaged, 5,882 houses inundated.
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.
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.
2. Movement related to adaptation and challenges
✓ 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.

Assuming the worst situation, anticipate breaking of embankment etc.
Movement related to adaptation

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

Individual facility measures

Source: Tokyo Heavy Rainfall Muster Policy
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 2 weeks**

Source: Koto 5 Ward large-scale flood disaster broad evacuation plan
Future Challenge
It may be not functional measures.

72-24 hours
Announcement voluntary broad evacuation information

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
Future Challenge
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- **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.
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◆ 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.
**Future Challenge**
It may be not functional measures.

**Functional adaptation measures**
Measures that citizens do not understand do not work in emergencies.
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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