

An aerial photograph of Tokyo, Japan, showing a dense urban landscape with numerous skyscrapers and a large green park in the foreground. The sky is hazy, and the overall scene is dominated by the city's architecture.

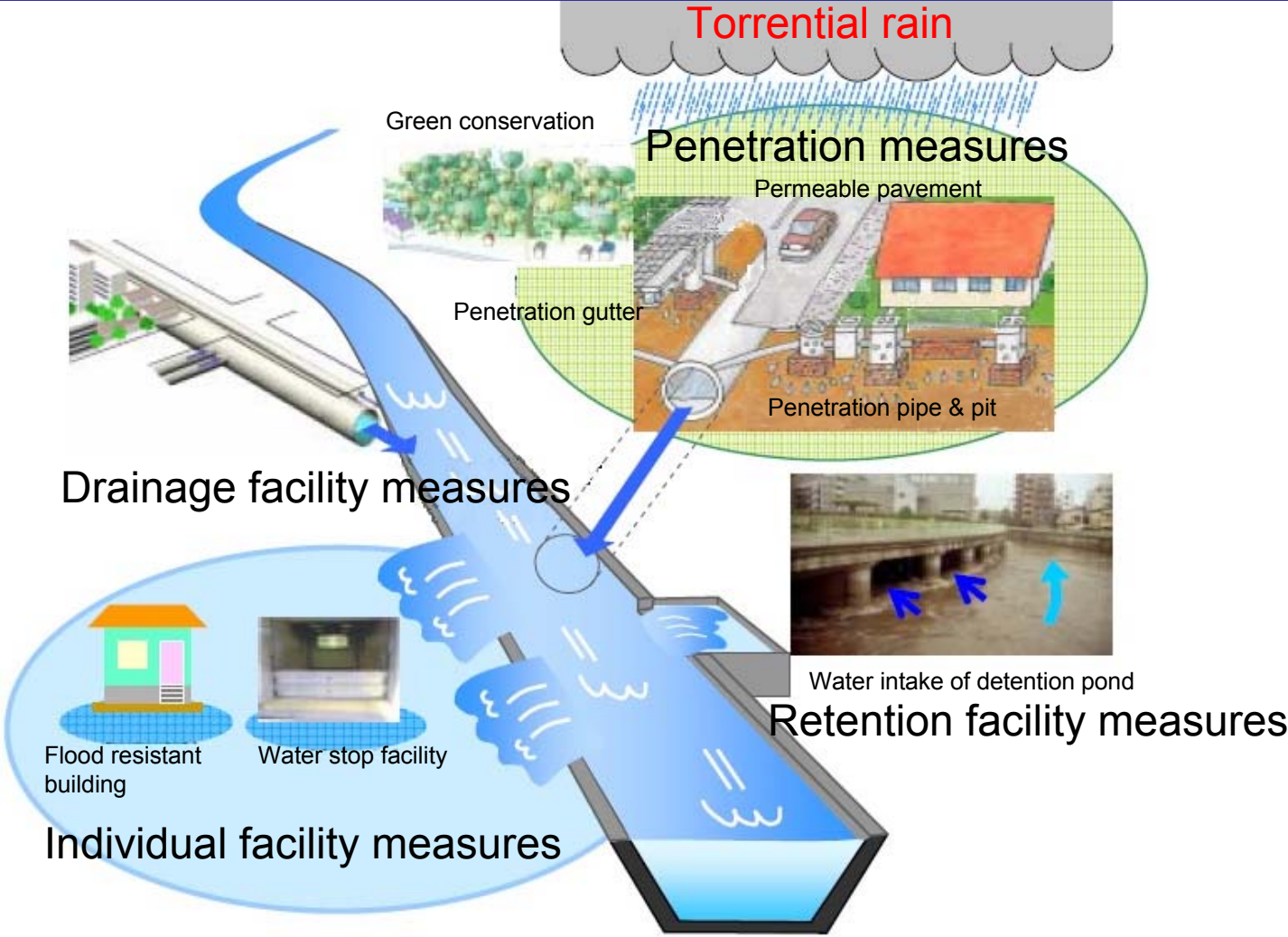
# Tokyo Assessment Climate Change Effects

C40 Workshop on Climate Adaptation &  
Risk Assessment Rotterdam, The Netherlands  
Tokyo Metropolitan Government  
Bureau of Environment  
Arata Ichihashi

# Outline

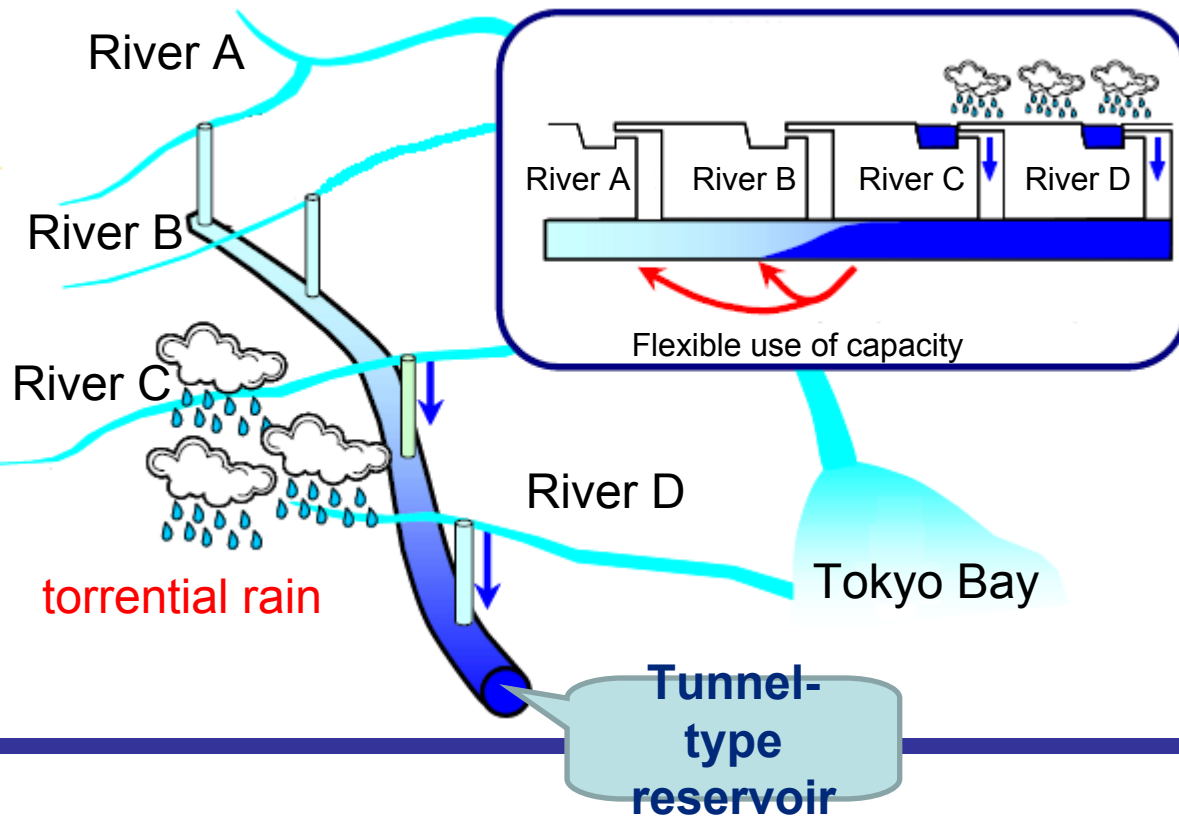
- ◆ Tokyo is already a resilient city after implementing various measures to combat current climate risks.
- ◆ We have assessed impacts of climate change in Tokyo comprehensively with National Institute of Environment studies and national government.
- ◆ We developed various simulation models which can be used to evaluate adaptation measures.
- ◆ It is necessary to verify the efficacy of each facility and project whether they are suitable for future climate risks.

# Overall Flood Control Measures



# Tunnel-type Reservoir connecting with different rivers

Flexible use of planning capacity  
between different rivers

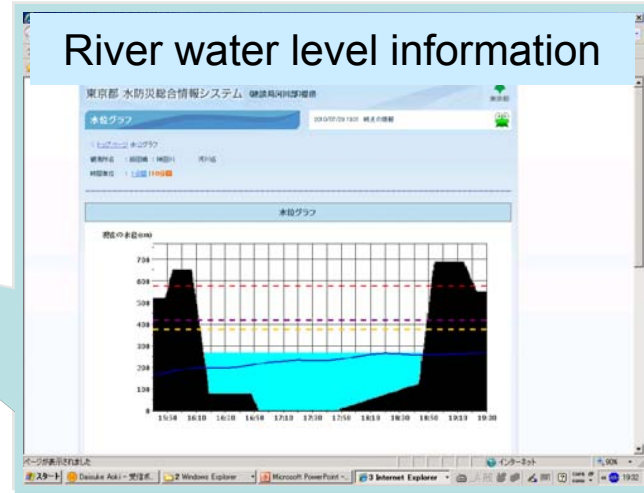


# Provide Rainfall and River Water-Level Information

Entire area information



River water level information

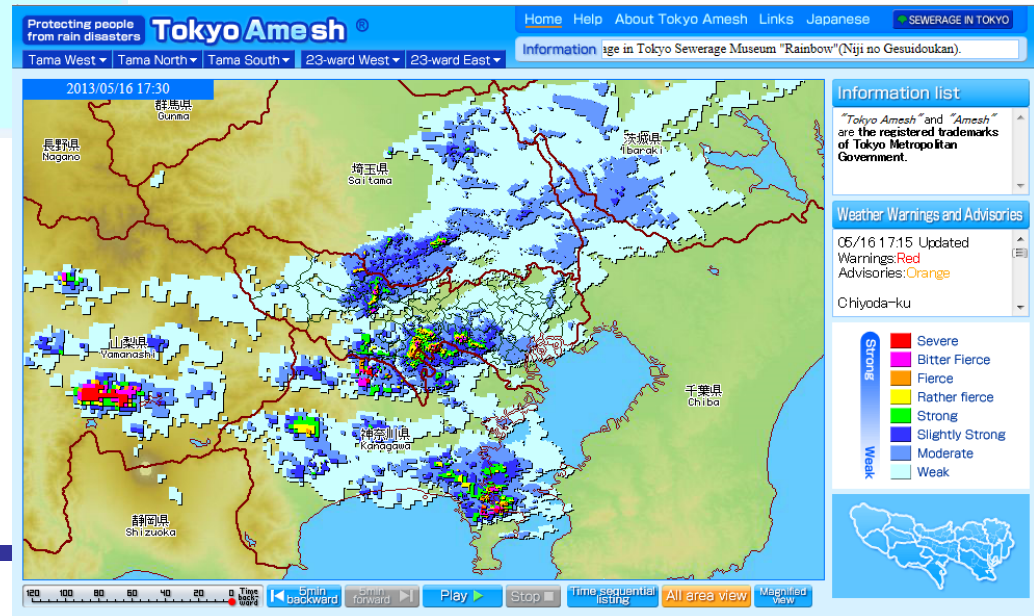


## Rainfall / 10min

- 20mm以上
- 10~19mm
- 5~9mm
- 1~4mm
- 0mm
- 休止・欠測等

## 水位観測所シンボル

- ▲ danger
- ▲ warning
- ▲ attention
- ▲ waiting flood fighting team
- ▲ normal
- ▲ repair



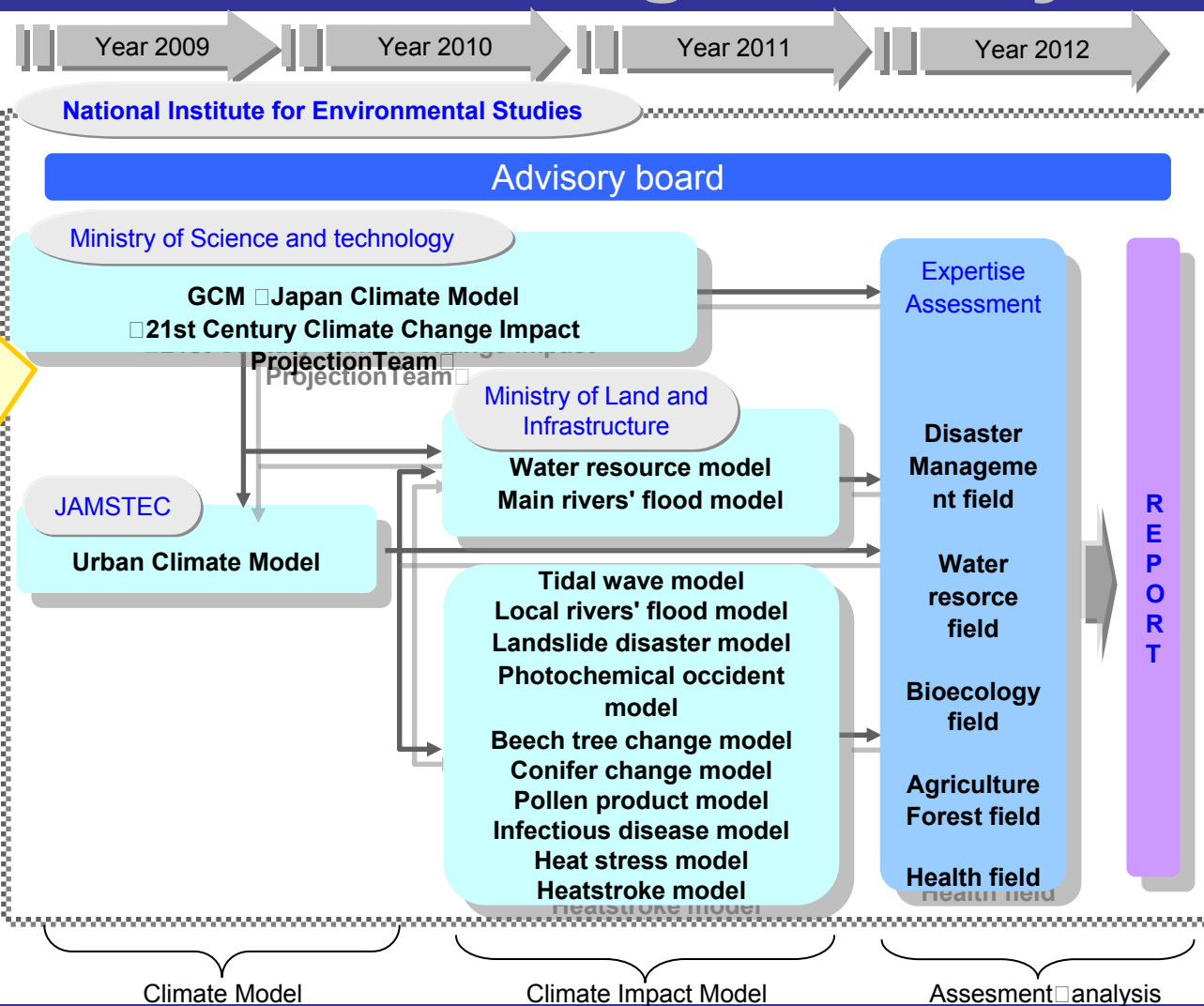
# Collaborative Research on Impacts of Climate Change in Tokyo

## Agreement for the collaborate study

- Ministry of the Environment (National government)
- Ministry of Science and technology (National government)
- Ministry of Land and Infrastructure (National government)
- National Institute for Environmental Studies
- Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
- Tokyo Metropolitan Government (TMG)

## The study team for the adaptation for climate change in TMG

Headquarters of the Governor of Tokyo  
 Bureau of Environment  
 Bureau of General Affairs  
 Bureau of Finance  
 Bureau of Urban Development  
 Bureau of Social Welfare and Public Health  
 Bureau of Industrial and Labor Affairs  
 Bureau of Construction  
 Bureau of Port and Harbor  
 Bureau of Waterworks  
 Bureau of Sewerage



# A List of Sectors for Impact Assessments

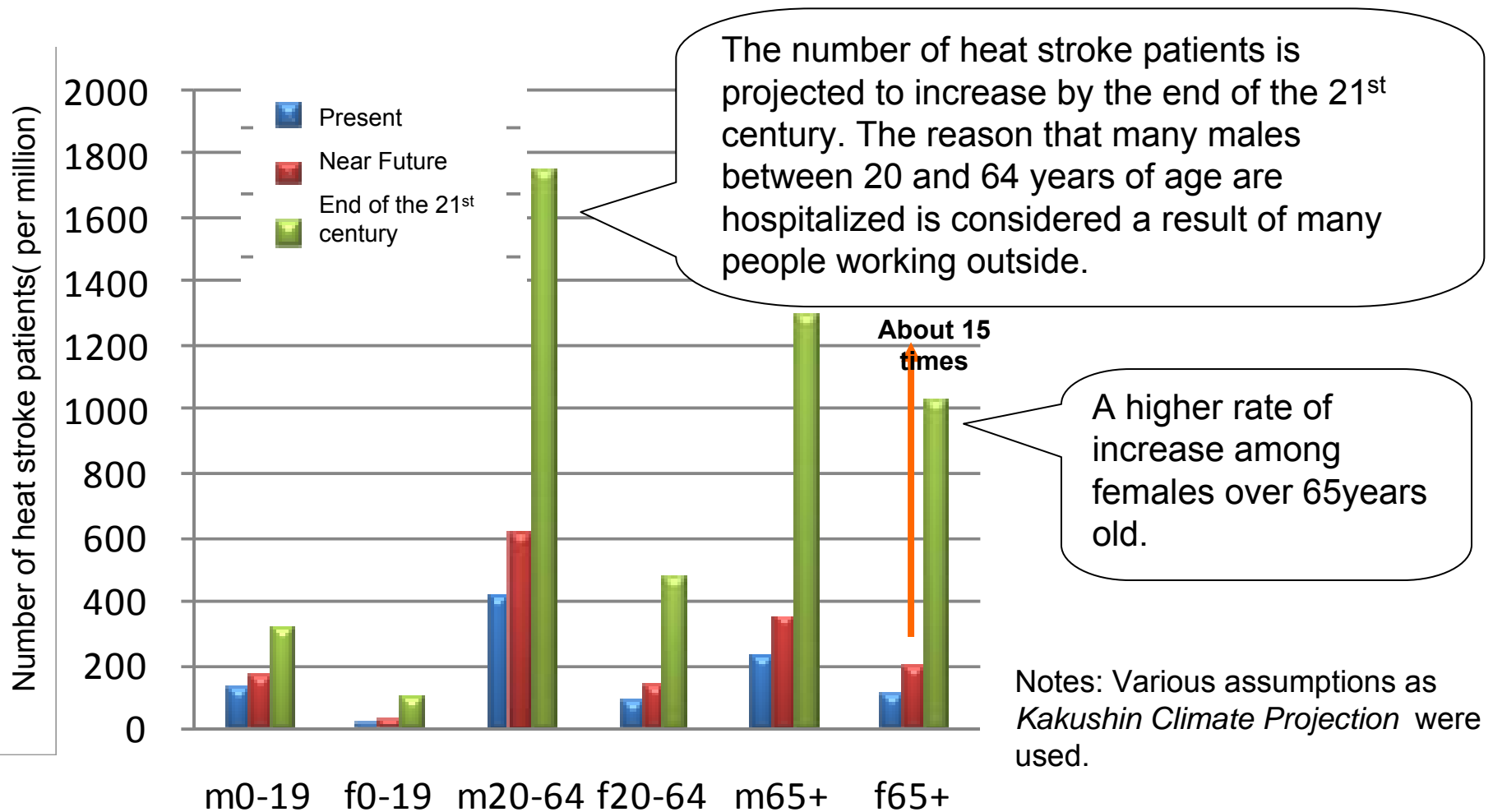
Impact Sector	Target	Impact Index	Impact Assessment measures	Notes
Water resources	River water	River flows	Quantitative	River flow model
	Groundwater	Amount of water	Quantitative	Ground water model
Disaster prevention	River water	Large river floods	Quantitative	Main rivers' flood model
		Small rivers and sewer overflow	Quantitative	Small rivers and sewer overflow model
	Landslide	Landslide	Quantitative	Landslide disaster model
	Coastal areas	Storm surge floods	Quantitative	Tidal flood model
Agriculture, forestry and fisheries	Agriculture	Fruit trees	Qualitative	
		Tea and vegetables	Qualitative	
	Livestock industry	Meat	Qualitative	
	Forestry	Artificially-established forests	Quantitative	Cedar forest change model
	Fisheries	Migratory fish	Qualitative	
		Coastal fish and algae	Qualitative	
Suitable cultivation area		Qualitative		

# A List of Sectors for Impact Assessments

Impact Sector	Target	Impact Index	Impact Assessment measures	Notes
Ecosystems	Terrestrial ecosystem	Natural forests	Quantitative	Natural forest change model (Beech tree, Oak tree, Veitch tree, Castanopsis tree)
	Coastal ecosystem	Coral reefs	Qualitative	
	Multidisciplinary fields	Changes of vegetation seasonality	Qualitative	
Changes of animal seasonality		Qualitative		
Health	Heat stress	Death toll, number of people hospitalized due to heat	Quantitative	Heat stress model Heat stroke model
		Sleep disorder	Qualitative	
	Infectious diseases	Waterborne diseases	Qualitative	
		Vector-borne diseases	Quantitative	Mosquito habitat model
	Other	Air pollution	Quantitative	Ozone assessment model
Allergy		Quantitative	Pollen product model	



# Case example of the Impact Assessment: Health Sector



# Next Step

Challenges we face:

- ◆ Communication problems
- ◆ Technical problems
- ◆ Human resources

To do now:

- ◆ Primary & simple risk assessment with extreme weather already experienced by each bureau.
- ◆ Introduce prediction for climate change to more detail assessments for each facility by each bureau.
- ◆ Add an idea of adaptation measures to existing plans which are controlled by other bureaus of TMG.