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Characteristics of Disaster Occurrence and Their Resilient Strategy in ASEAN Countries

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Recent Trend of Occurrence of Natural Disasters in ASEAN Countries

1. Intensification of typhoon and river flood disasters in urban area due to global warming

2. Increase of storm surge and tsunami disasters in densely populated lowland area

3. Full activity of earthquake and volcano eruption with geo-hazard until around 2100

Urban Population in The World

	1970	2000	2030(Estimated)
Global	36. 0%	47. 1%	60. 8%
Developed Area	64. 7	73. 9	81. 7
Developing Area	25. 2	40. 5	57. 1
Asia	22. 7	37. 1	54. 5

China	17. 4%	31. 4%	60. 5%
India	19. 8	26. 6	41. 4
Bangladesh	7. 6	21. 5	39. 3
Indonesia	17. 1	35. 6	67. 7
Philippines	33. 0	54. 0	76. 1
Thailand	20. 9	30. 3	47. 0
Vietnam	18. 3	22. 2	43. 2

Cities with more than one million population have increased in Asea.

- In 2015(estimated)

  The number of cities with more than one million population

  : In Asia 253

  : In Africa 59

  : In Latin America and Caribbean countries 65

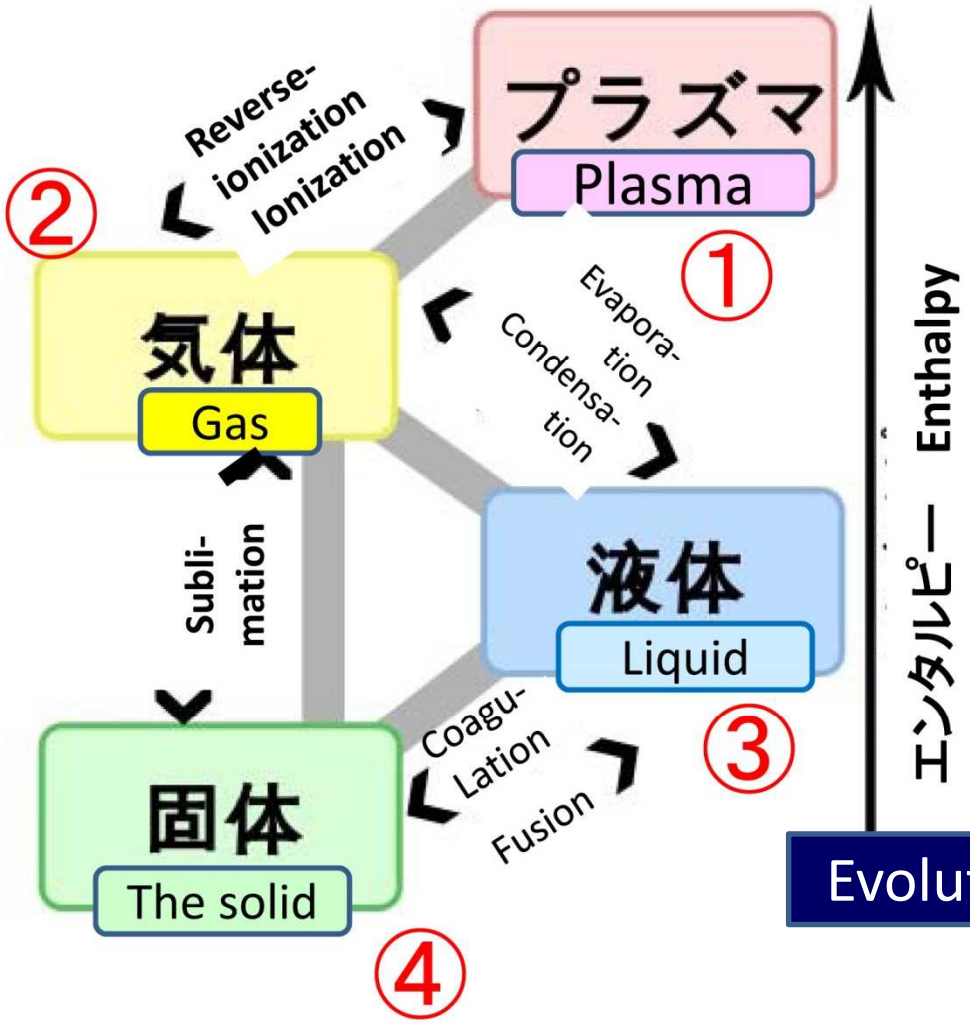
Characteristics of Disasters In Urban Area

1. Disasters in urban area have evolved in accompany with increase of population.
2. Our society has a vicious cycle with large city and around rural area, and disaster vulnerability becomes large in both areas.

Japan：Vicious cycle of Tokyo overconcentration （precedence) and local impoverishment （population decrease)

Developing country in Asia：Vicious cycle of local impoverishment (population increase) (precedence) and overconcentration in capital

都市で起こる災害の相転移現象
Phase transition in urban area



①スーパー都市災害
Super-urban disaster

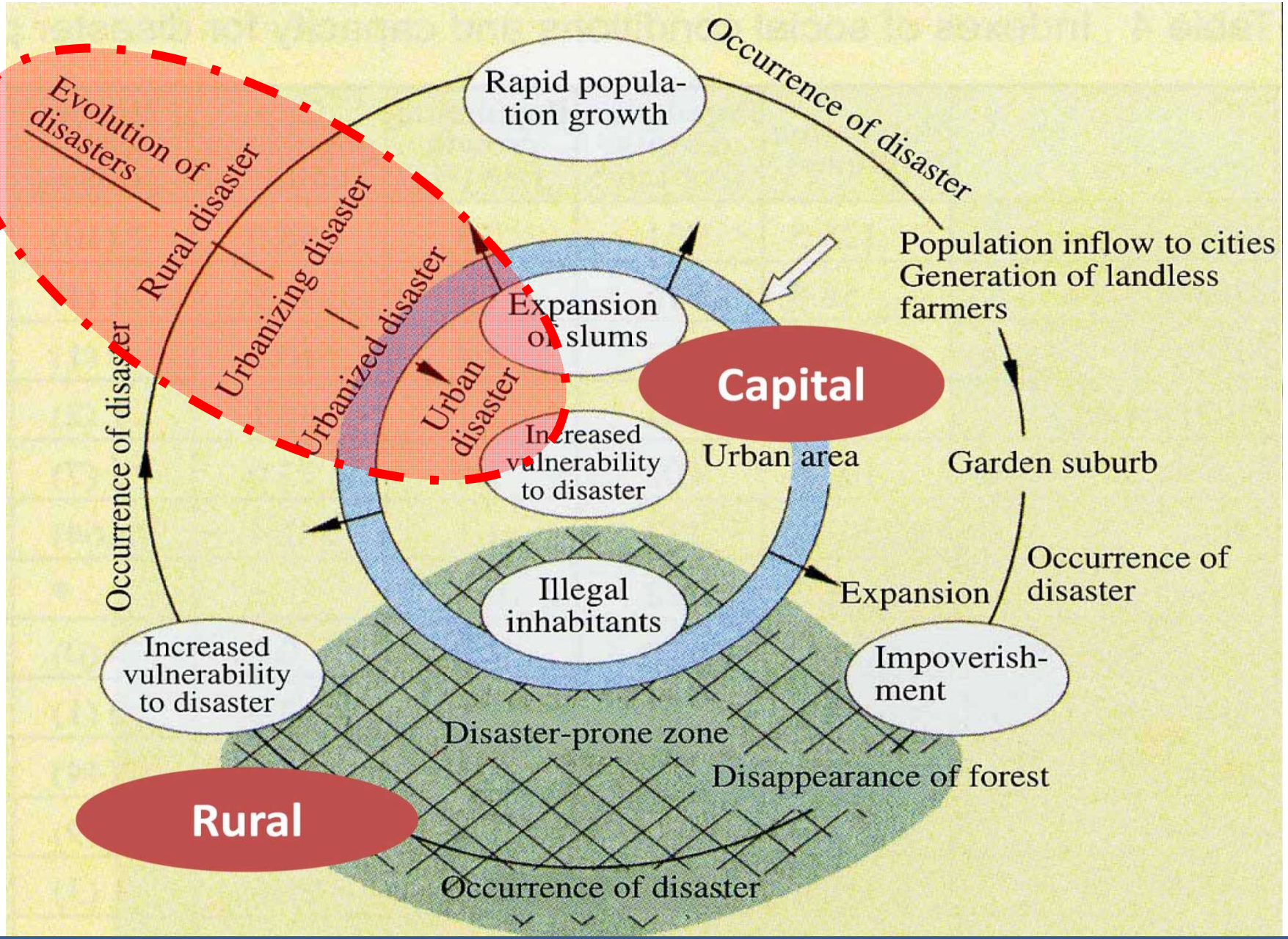
②都市災害
Urban disaster

③都市型災害
Urbanized disaster

④都市化災害
Urbanizing disaster

Evolution of disaster with population

Rural disaster

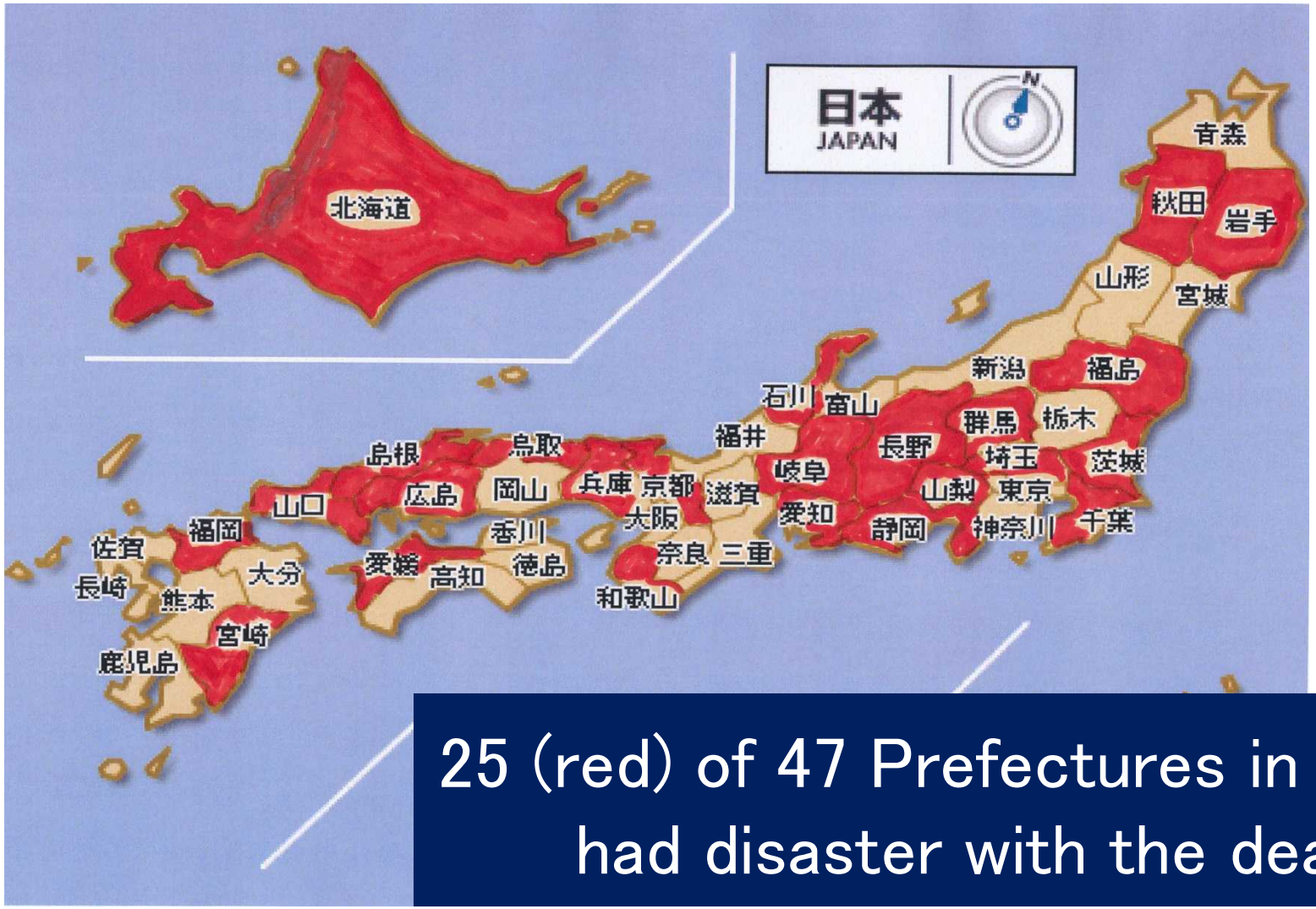


Vicious Cycle with Population Increase and Disaster Occurrence

Japanese society has become vulnerable against natural disasters.

1. Marked lowering of disaster resilience in elderly people society with broken communication
2. Diversification of damage in highly complicated society in urban area
3. Increased scale of natural hazard such as earthquake and tsunami and intensified damage such as river flooding and debris flow

Occurrence of Natural Disasters In 2014



25 (red) of 47 Prefectures in Japan had disaster with the dead.

Why Disaster Resilient Works Delay (1)

- Poor ability of social leader for politics, economics and decision making———he/she can not believe that social security in living level has top priority in any government.
- Responsible person in charge of disasters has over/unfair evaluation for scientific and engineering technology.
- Disaster reduction is forgotten, and remains unsolved under rapid changes of modern society.

Why Disaster Resilient Works Delay (2)

- Political leaders can not believe that destruction due to disaster enlarges recession of economics.
- Society is immature because people can not understand that democracy depends on principle of self-responsibility.
- Simple apply of cost benefit analysis for public works
- No disaster resilient strategy or mis-understanding of strategy goal setting

How to get resilient society ?

1. Disaster reduction such as mitigation and preparedness at the moment of unexpected gigantic disasters

2. Control of damage enlargement and shortening of recovery process after disasters

3. Intensification and maintenance of social infrastructures such as lifelines and ICT and activation of local community

We are much anxious about next "National Catastrophe (*Crisis*)".

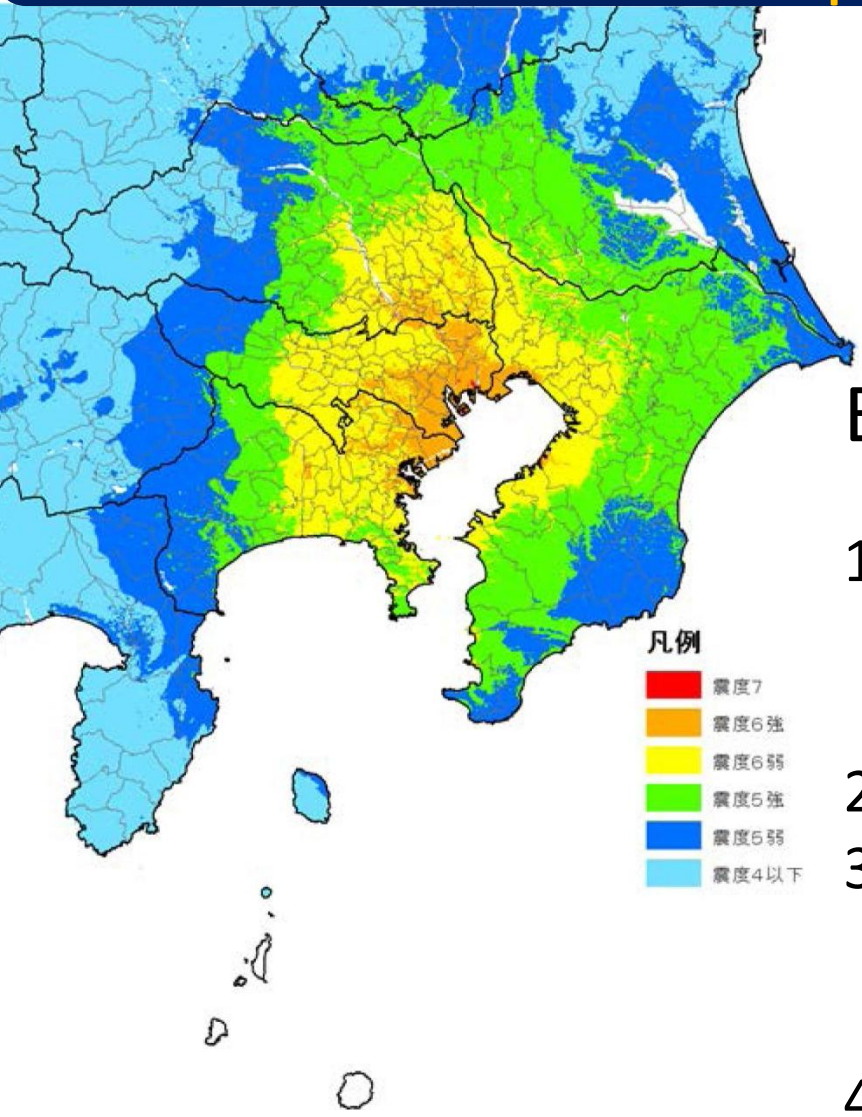
- **Tokyo Metropolitan Earthquake**

(M7.3, Occurrence probability within 30 years:70%, Seismic Intensity: 7, Population in seismic intensity 6- or larger: 30million, The dead estimated: About 23,000 (more than 100,000 with city fire), Debris: 98million ton, Economic damage:$950billion, Super-Urban disaster

- **Nankai Trough Gigantic Earthquake**

(M9.0, , Occurrence probability within 30 years:60 to 70%, Seismic Intensity: 7, Population in seismic intensity 6- or larger: 61million, The dead estimated: About 320,000, Debris: 310million ton, Economic loss : $2,200billion, Super-Extensive disaster

Damage Estimation Due to Tokyo Metropolitan Earthquake of M7.3



Tsunami height will be less than 1m when Tokyo-to heart southern earthquake (M7.3)

Estimated maximum damage

1. The number of collapsed and burnt down houses: About 610,000
2. The dead: 23,000
3. The people of an escape of efforts due to a difficult linchpin savior: 72,000
4. Economic loss : About ￥9.5billion

Ex. 1: Resilient Strategy on Tokyo Metropolitan earthquake (M7.3)

1. 地震や津波から命を守る Survive from earthquake and tsunami

2. 過密都市空間の安全確保 Keep safety in densely urban area

3. 被災者・避難者の安全確保 Safe treatment for damaged people and evacuated people

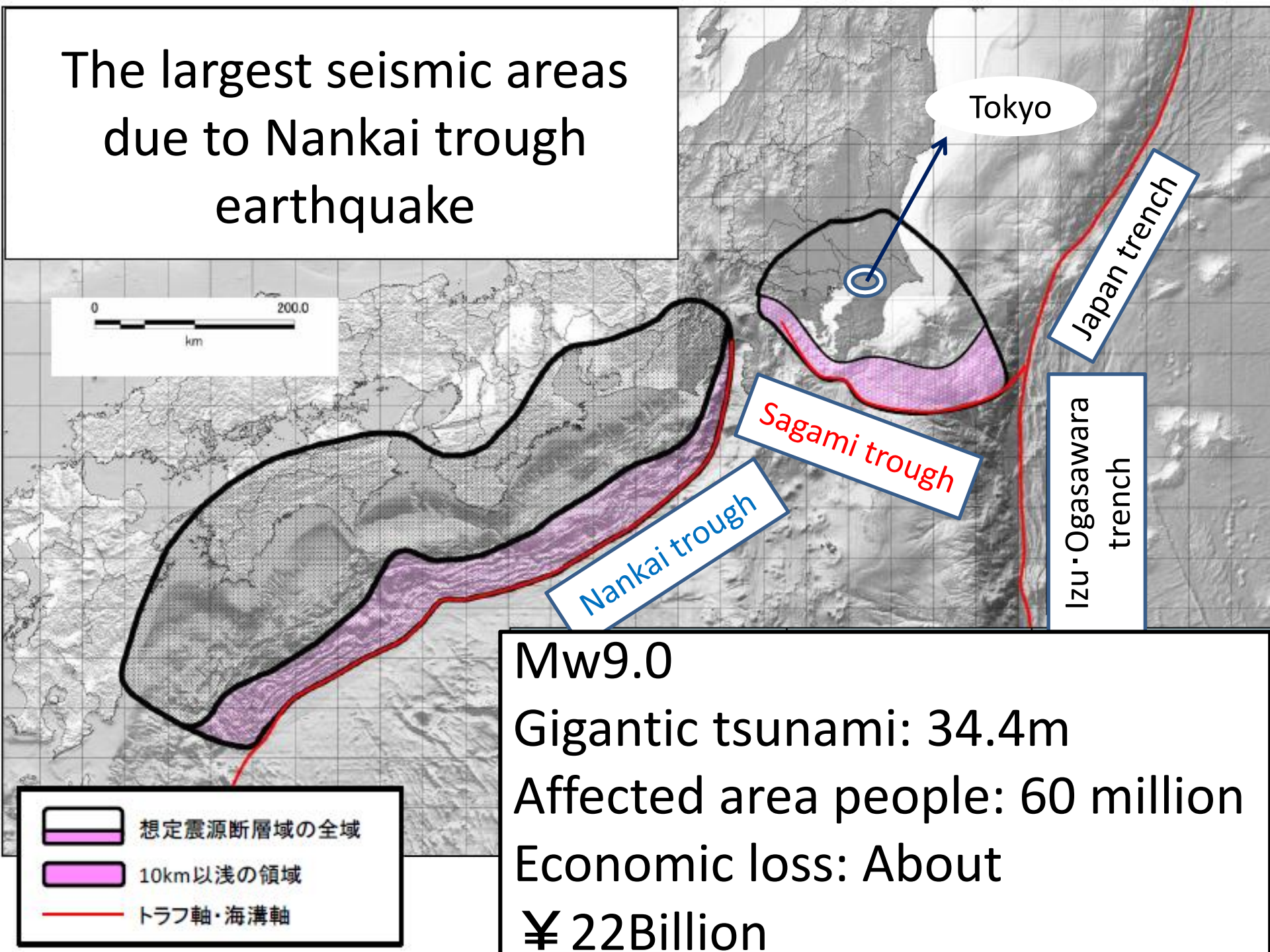
4. 地震後の二次災害や複合災害阻止 Stop the second disaster and compound disaster after earthquake

5. 首都中枢機能の維持 Maintenance for capital functions such as political, economic, financial ,manufacturing and culture activities

6. 首都中枢機能の迅速な回復 Disaster resilience for quick recovery of capital functions

7. 首都圏の望ましい復興 Sustainable and resilient reconstruction of Tokyo Metropolitan area

The largest seismic areas due to Nankai trough earthquake



Mw9.0

Gigantic tsunami: 34.4m

Affected area people: 60 million

Economic loss: About

￥22Billion

Ex. 2: Resilient Strategy on Nankai Trough Earthquake (M9.0)

1. **素早い津波避難を支援** Support for quick tsunami evacuation
2. **ライフラインの安全・利用確保** Establishment of lifeline systems with passengers
3. **情報の収集・伝達・共有化** Smooth management of information systems
4. **広域被災地での救助活動支援** Support for search and rescue activities in widely damaged area
5. **被害の拡大阻止** Stop of damage enlargement
6. **民間事業者の協力の下、被災者・被災自治体の支援** Support for damaged people and damaged local government with public sectors
7. **被害の早期回復** Promoted disaster resilience

Basic Attitude Toward Disaster Countermeasures In Japan After 3.11

- To construct A Disaster-Resilient Society -

1. Protecting the people and the country from disasters is the ultimate responsibility of the government.
2. Awareness of large-scale disasters at the "national crises" level
3. Make every possible effort for preparation through "mainstreaming of disaster reduction"

Continued:

4. Mass/concentrated provision of resources upon disaster occurrence with the coordination of public and private sectors
5. Turning the disaster experience into hopes for suitable restructuring for the local community
6. Disaster management is the frontier of the revitalization of Japan
7. Presenting the "disaster management leader Japan" to the world