

**Asia-Pacific Climate Change Adaptation
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**Adaptation at private investment
-Risk Management and Adaptation Services-**

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Business and Climate Change Risk

Private investment is often damaged by extreme weather.

In general,

- ✓ Mining sector is exposed to higher natural disaster risk
- ✓ Industry with long supply chain is vulnerable



**Flood in Australia
In 2010 and 2011**

Source Rio Tinto



**Flood in Thailand
In 2010**

**Source Bangkok
Weekly**



Risk management of Extreme Weather Risk

Extreme weather risk is reviewed as a part of risk management of investment.

- ✓Review of weather related risk
- ✓Consideration of countermeasures, such as physical structure, contingency reserves, insurance.
- ✓Post disaster recovery

Weather risk at project;

Coal power plant

- Optimization of feedstock at plant site preparing for delay of unloading by storm
- Shortage of cooling water preparing by lower water level by drought

Oil and gas Pipeline

- Rout selection and design change of equipment for flood and landslide risk.

Hydropower

- Heavy rain or drought at water catchment area
- Dam disaster plan as an emergency situation caused by heavy rain

Mining

- Intake water shortage

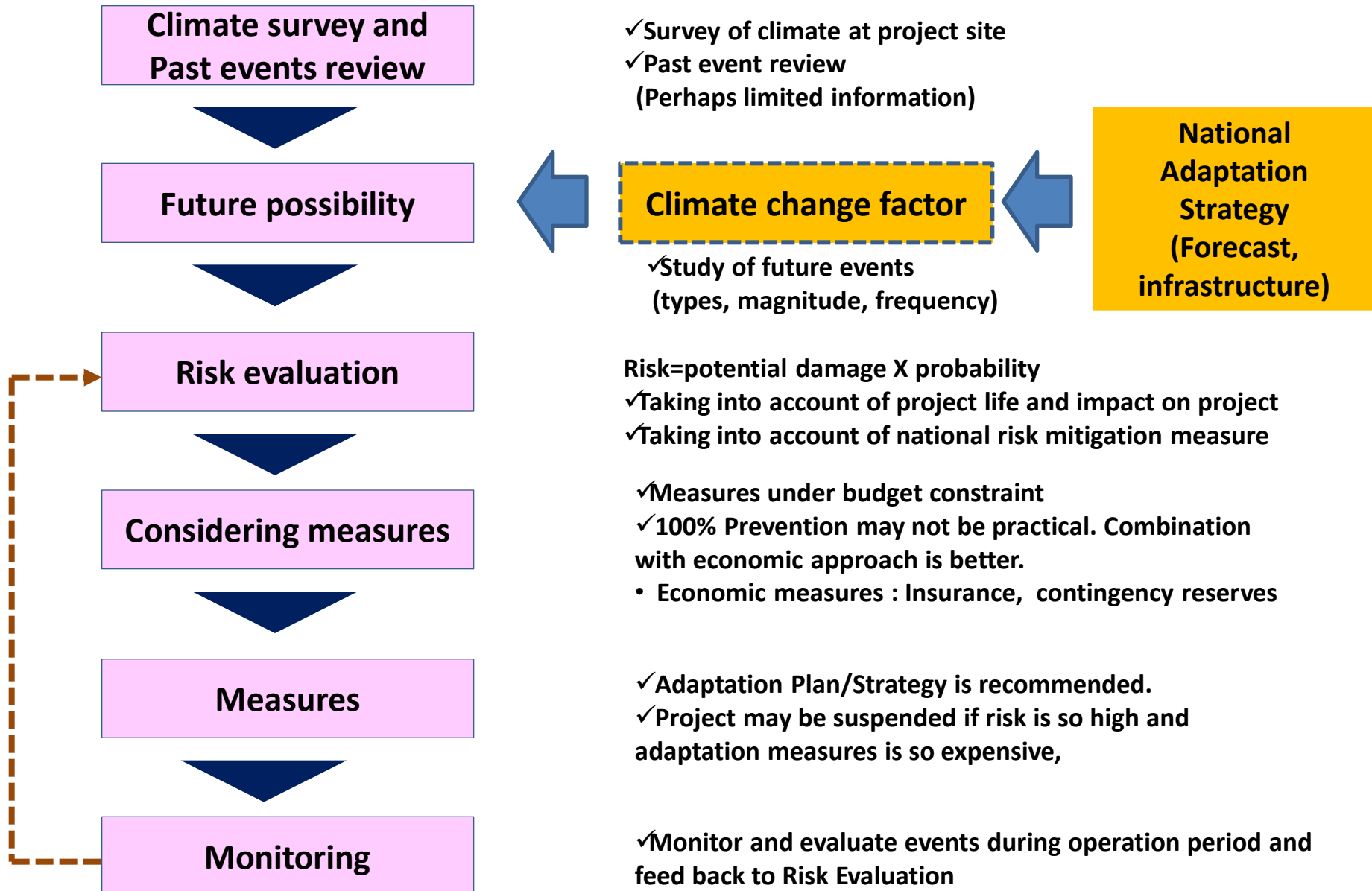
Lessons learnt from private investment

Risk = Probability X Magnitude of damage

BCP(Business Continuity Plan) under Climate Change Risk

- ◆ Extreme weather risk is evaluated based on the past 20-30 years weather events.
⇒ Climate Risk management requires future weather pattern at the project area.
- ◆ Boundary of risk management should include supply chain.

Adaptation Consideration Cycle at Projects developments



Adaptation Consideration Guideline

<Purpose>

- ◆ Encourage the adoption of “review Cycle” for project risk control
- ◆ Paying attention on the risk of supply chain

1 Review and Identification of climate related risk

- Potential risk shall be listed even though its risk seems to be not so big.
- Damage and loss at project itself.
- Community of work force
- Logistic of project including transportation.
- Supply chain of energy, material and parts etc.
- Damage at their market

2 Consideration of Adaptation measures

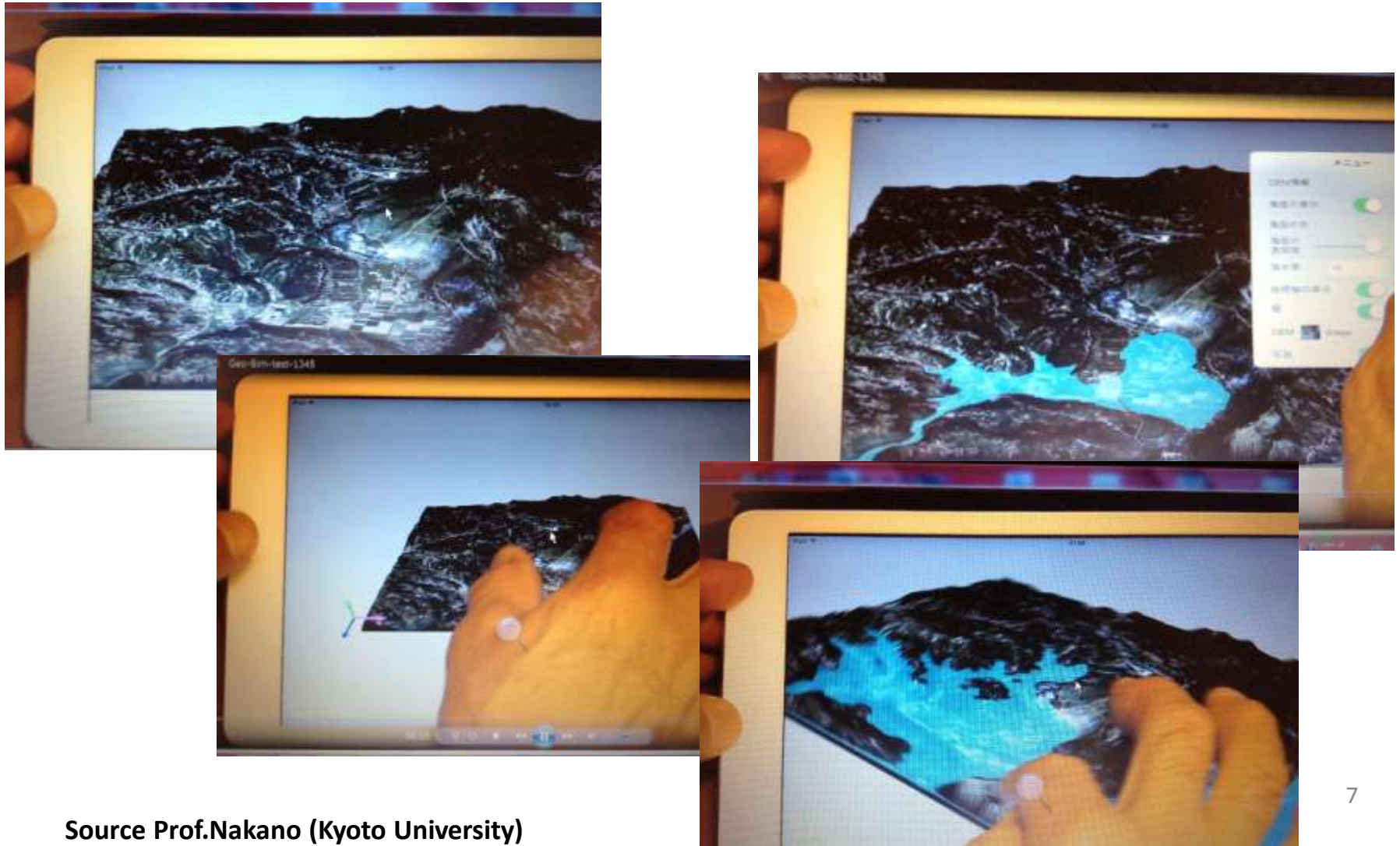
- Taking into account of risk, damage and cost, measures to be taken will be determined
- Improve physical infrastructure for preventing/mitigating future events.
- Alert and evacuation system (safeties)
- Insurance and other economic instruments (Contingency reserves)
- Diversification of market and alternative resources.

3 Implementation of Measures

4 Review and feedback

Handy Type Hazard Map

3D (3 dimension) map visualizes climate change risk
(3D map is made by using remote sensing technology)

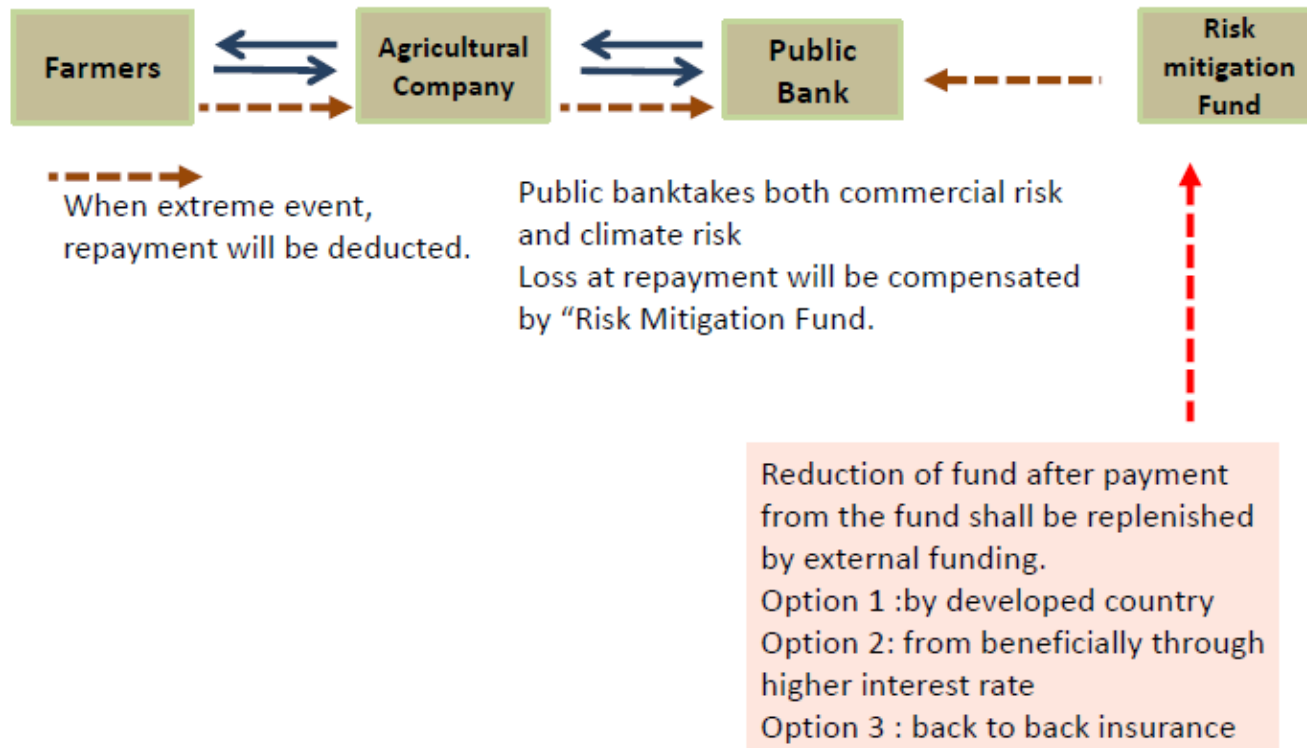


Adaptation Finance

Adaptation project

- Project intended to adaptation but additional revenue is not expected
- Projects with adaptation components in order to stabilize project cash flow

Concept of adaptation farmers loan



Conditional waiver of repayment.

- Set conditions
- Condition should be numerical or objective.
- Repayment amount will be reduced when conditions are hit.

Conclusion

We need further information for Climate Change Risk Management

- **Enough information about present situation (ground and weather)**
- **Future climate scenario by project specific area**
- **Government action (Adaptation Plan)**

**When business take proper adaptation actions,
then cost of Adaptation for government can be reduced!**