

Japan's Countermeasures for Global Warming and Activities of Asian Regional Task Force on C.C.

12th October, 2010
 Shinsuke OTA
 Chairman of ARTF-CC

I. Japan's Countermeasures for Global Warming

1. Background of Discussions on Global Warming Countermeasures in Rural Development

- After the 4th Assessment Report from Intergovernmental Panel on Climate Control (IPCC), Ministry of Agriculture, Forestry and Fisheries formulated the "Comprehensive Strategy to Mitigate Global Warming" in June of 2007.
- Rural Development Bureau established "Review Committee on Global Warming Countermeasures in Rural Development" in September 2007 to examine countermeasures to be employed in rural development.
- In January 2008, Rural Development Bureau released "Global Warming Countermeasures in Rural Development" as a policy proposal of global warming countermeasures.

May 2007: IPCC's "4th Assessment Report" was released

June 2007: Ministry of Agriculture, Forestry and Fisheries formulated "Comprehensive Strategy to Mitigate Global Warming"

September 2007: "Review Committee on Global Warming Countermeasures in Rural Development" was established

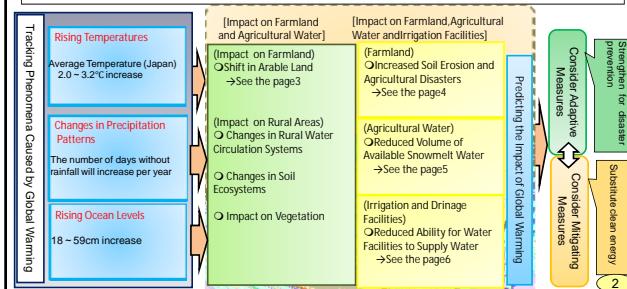
January 2008: "Global Warming Countermeasures in Rural Development" was issued

1

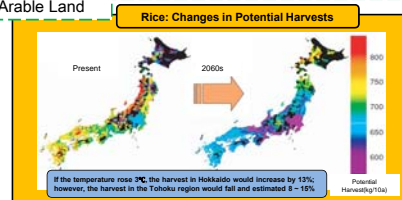
2. Actual Global Warming Countermeasures in Rural Development

(1) Ideas Underlying the Examination of Global Warming Countermeasures

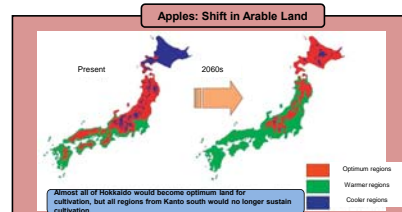
- Global warming will cause the average temperature at 100 years later from now to rise 2.0 - 3.2 degrees and ocean levels are expected to rise as precipitation patterns change, including frequent torrential rains.
- Going forward changes in climates will effect rural areas by causing shifts in arable land.
- At the same time, increased soil erosion and agricultural disasters could have an impact on farmland, agricultural water and irrigation and drainage facilities.
- We must consider adaptive measures to alleviate the effects of global warming and mitigating measures to reduce greenhouse gas emissions.



○ Shift in Arable Land



* Black sections are regions where rice is not cultivated



Drafted by MAFF

3

(2) The Impact of Global Warming [Impact on Farmland]

- Changed precipitation patterns by torrential rains may worsen farmland soil erosion.
- Increased soil erosion within watersheds could lead to increased dam silting and the organic matter in soil could adversely affect water quality in reservoirs.

• Incidences and forecasts of torrential rains are both on the rise

• Increased frequency of torrential rains could increase the risk of soil erosion and runoff

Trend towards short-term heavy rains

Occurrence of hourly precipitation exceeding 50mm (at one hour point per year)

Occurrence of daily rainfall exceeding 400mm (one hour point per year)

Number of Summer Days with Heavy Rainfall Forecast to Exceed 100mm per day

(Source: National Agriculture and Food Research Organization, National Institute for Rural Engineering)

Illustration of Japan's Farmland Soil Erosion Risk

Soil runoff volume = Rain factor * (Product of various factors on the shape and slope of land)

(Source: National Institute for Agro-Environmental Sciences)

4

[Impact on Agricultural Water]

- We calculated the impact of rainfall and snowmelt on the Shinano River, the most longest river in Japan, and Tone River, the most biggest watersheds in Japan, and estimated the changes in each river flow rates.
- Results: Snowmelt in the snowy Shinano River region will decrease, having a potential impact on early spring agricultural water acquisition.

① Changes in the Percentage of Snowfall in Winter Precipitation Due to Global Warming in Shinano and Tone Rivers watershed

② Global Warming and the Estimated Maximum Depth of Snow in Winter

③ Predicted Change in River Flow Rates by Period (Shinano and Tone Rivers)

Impact on early spring agricultural water acquisition

(Source: National Agriculture and Food Research Organization, National Institute for Rural Engineering. Citation: INQUE Sabashi et al., (DEPPY005), 1998; CHIKYU KANRYO(2), 2007)

5

[Impact on Facilities for Irrigation and Drainage]

- Referring to the IPCC's 4th Assessment Report, the impact was estimated that rising sea level would have on the capacity of drainage pump stations located on estuaries. (Pertains to main pump stations located in the Echigo, Nobi and Chikushi Plains)
- If sea levels rose by 0.59m, pump capacity would fall by an estimated 10 ~ 20%, leading to longer times that paddy fields lay submerged and expanded areas submerged.

Sea-Level rise due to Global Warming

Scenario	BS	ATF	90	A1B	A2	A1FI
Scenario	0.13	0.30	0.30	0.51	0.53	0.58
Min Forecast	0.08	0.43	0.43	0.48	0.53	0.59
Max Forecast	0.18	0.43	0.43	0.48	0.53	0.59

The average global sea-level rise by the end of the 21st century (2090 ~ 2099) based on the SRES scenario (not including the impact of the mechanical changes in iceberg flow) (Unit: m) Values of rise over the period from 1990 ~ 2099

Sea level will rise 0.59m according to the SRES scenario

Sea-Level Rise will Increase Pump Lift

Increased Pump Lift will Reduce Drainage Capacity

6

(3) Measures to Adapt to Global Warming [Monitoring Risk Level and Observing Phenomena]

- Predict the scope of flood damage from global warming-induced rising sea levels.
- In addition to rising sea levels from global warming, typhoons are predicted to be 10 ~ 20% stronger, and there are concerns about abnormal increases in sea level at high tide.
- There could be large-scale damage especially to farmland in low-lying plains and on reclaimed land.

Sea embankment destroyed, Water facility destroyed, Sediment inflow to farmland

Flood Damage Map

Reclaimed Land in the Yatsushiro Plain, Kumamoto Prefecture (1650-)

(Source: National Agriculture and Food Research Organization, National Institute for Rural Engineering)

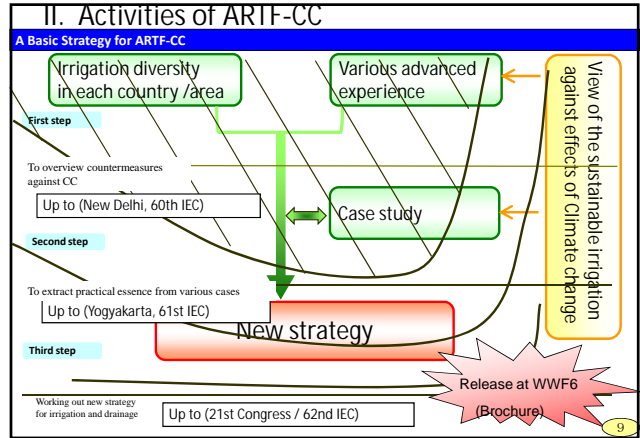
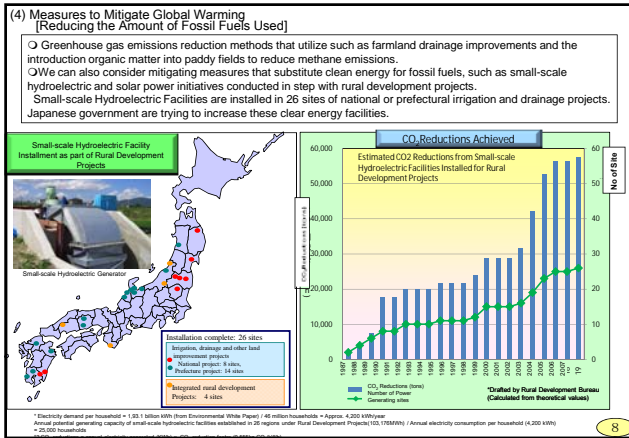
○ We divided the Ariake Sea with 200m of mesh to analyze sea level at high tide.

○ From the volume of water that flowed over the embankment, we mapped the flooded area with 250m of mesh using the level flooding method.

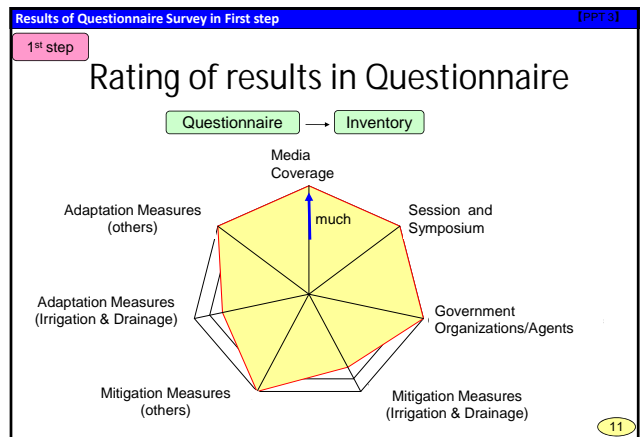
*The level flooding method is used to find the flooded area by assuming the water that flows over an embankment evenly covers the land behind the embankment.

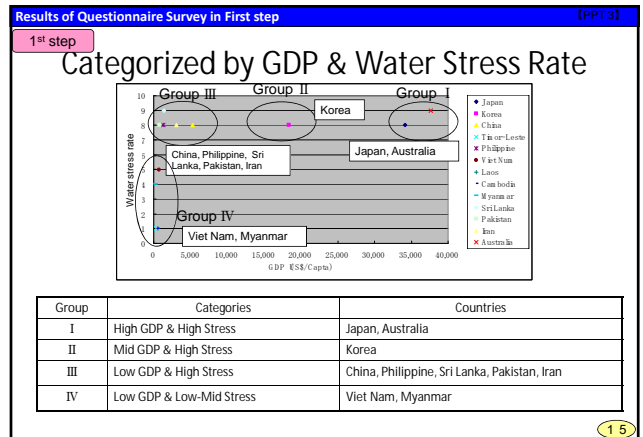
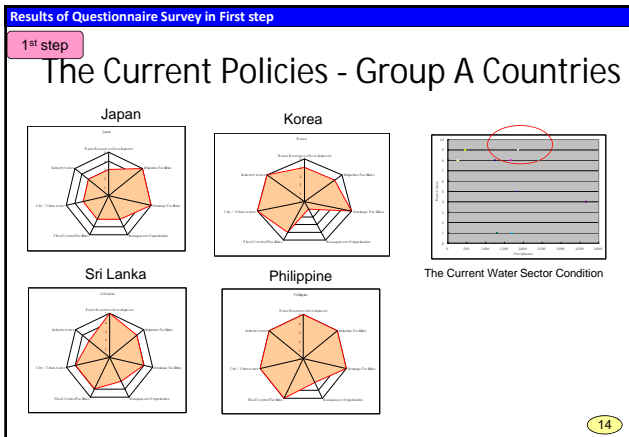
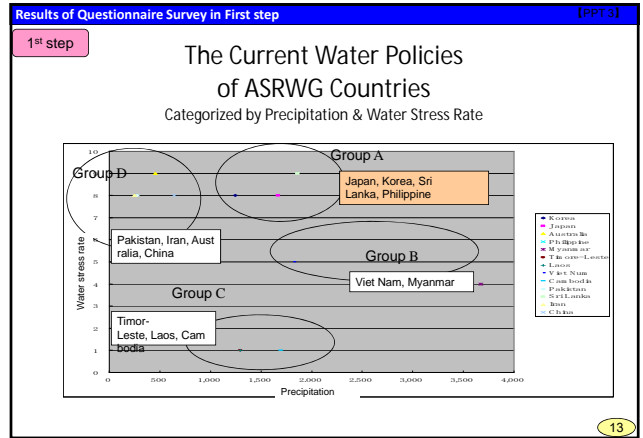
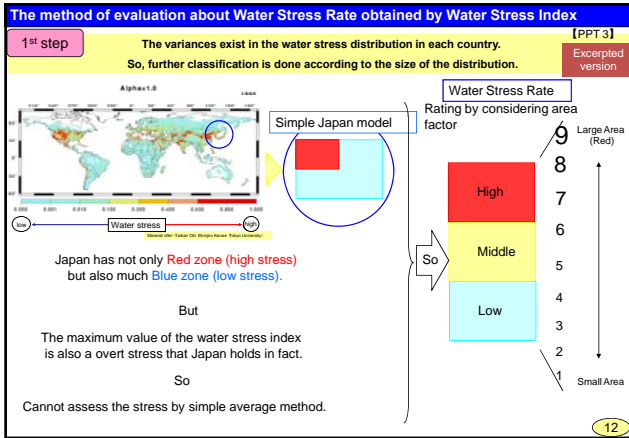
○ Possible adaptive measure are to improve some function such as height and strength of sea embankment.

7



- Contents of Questionnaire in First step [PPT 3]**
- 1st step Contents of the Questionnaire**
- Q1 : Basic data** regarding irrigated agriculture
ex. average precipitation, agricultural area
 - Q2 : Existing policies** regarding irrigation, drainage and flood control
ex. source development and establishment of facilities
 - Q3 : General recognition and assessment** of the effects of climate change
ex. media coverage, government session, governmental organizations
 - Q4 : Examples of the effects** that seem to be caused by climate change
 - Q5 : National strategy or the basic direction** for measures to cope with climate change
ex. mitigation or adaptation measures for climate change and other fields
 - Q6 : Studies and research results** concerning climate change
 - Q7 : Other comments**





Case Study Format [PPT 0]

2nd step

Case Study Format

Lessons from actual case
 - Focused on sustainable agriculture and irrigation and drainage-

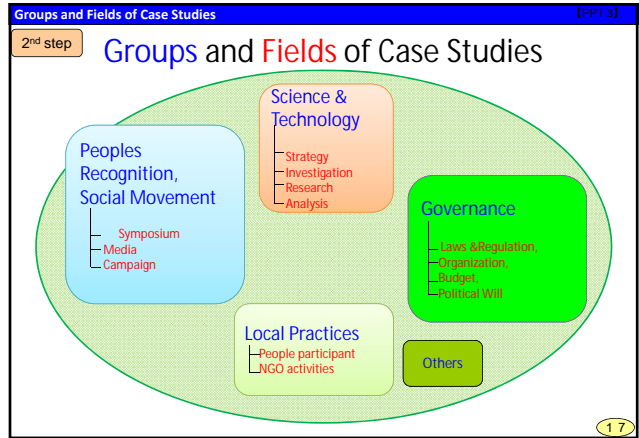
Group of Case Studies :
 (please check one) Science & Technology Peoples Recognition or Social Movement
 Governance Local Practices Others

Field of Case Studies :
 (please check one) (If you check "Science & Technology" in the Group)
 Strategy Investigation Research Analysis
 (If you check "Peoples Recognition or Social Movement" in the Group)
 Symposium Media Campaign
 (If you check "Governance" in the Group)
 Law & Regulation Organization Budget Political Will
 (If you check "Local Practices" in the Group)
 People participant NGO activities
 Country :

I. Outline of the activity

Title of Case Studies	.....	II. Key findings from failure
Implementing Organization	.....	Experienced trouble →How to overcome (Assumed risks →possible solution (in case of on-going case))
Operating members	.....	Key points or requirements for success
Active term of this Case Study	.....
Contact person	.....
Background :	.....
Purpose and Goal :	.....
Goal :	.....
Step 1 : , Step 2 , Step 3 :		
Present situation :	.....
Effect and Result :	.....

16



Example of Filled Case Study [PPT 3]

2nd step

Title : Formulation of strategy for enhancing research related to global environment established

Background :
 Recently many member of JSIDRE (The Japanese Society of Irrigation, Drainage and Rural Engineering) have interest about global environmental issues. Moreover, they start recognizing strongly that irrigation, drainage and rural engineering approaches have importance and possibility of contribution for improving global environmental issues. However, these approaches had not been integrated in Japan. Motivated by various international events like G8 Hokkaido Toyako Summit held in Japan in 2008, JSIDRE started reviewing the present situation and discussing how to coordinate irrigation, drainage and rural engineering approaches for global environmental issues in Japan.

Purpose and Goal :
 Goal: The resources of human and budget of JSIDRE can be utilized effectively for concerning global environment issue.
 Step1: To review the present situation of irrigation, drainage and rural engineering researches concerning global environmental issues in Japan.
 Step2: To understand specific problem and theme of global environment to be tackled by the field of irrigation, drainage, and rural engineering
 Step3: To sort out research themes to be tackled by JSIDRE members and to prioritized them.

18

Example of Filled Case Study [PPT 3]

2nd step

Title : Formulation of strategy for enhancing research related global environment established

II. Keys for Success
 i) Initial design of activities

Experienced trouble →How to overcome

Imbalanced proportion regarding field of specialty :
 When it comes to the level of summarize and examine the issue of global environment synthetically, the committee needed the member who has the wider specialty.
 → The committee has chosen the additional members of ecologist and social scientist.

The method for setting of 7 fields :
 Because core members of the committee are researchers, it was difficult for the committee to get the situation in perspective for global environmental issues
 → The JSIDRE decided to extend duration of committee's activity for 1 year and try to include more opinion from professors or government officials to reconsider the 7 fields categorized huge issues by the committee.

19

