



Incorporating Climate Change Effects into River Basin Management

Cases of JICA's International Cooperation

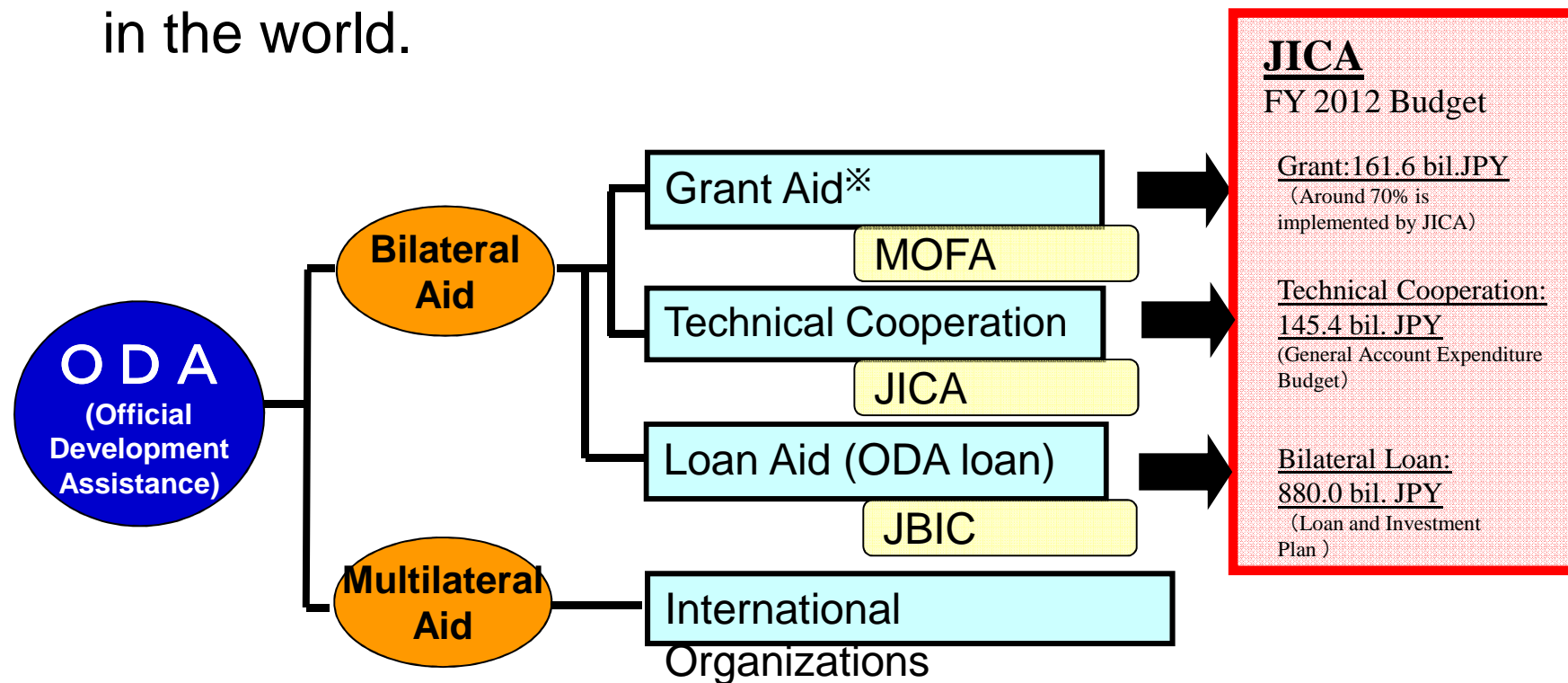
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Japanese ODA and JICA

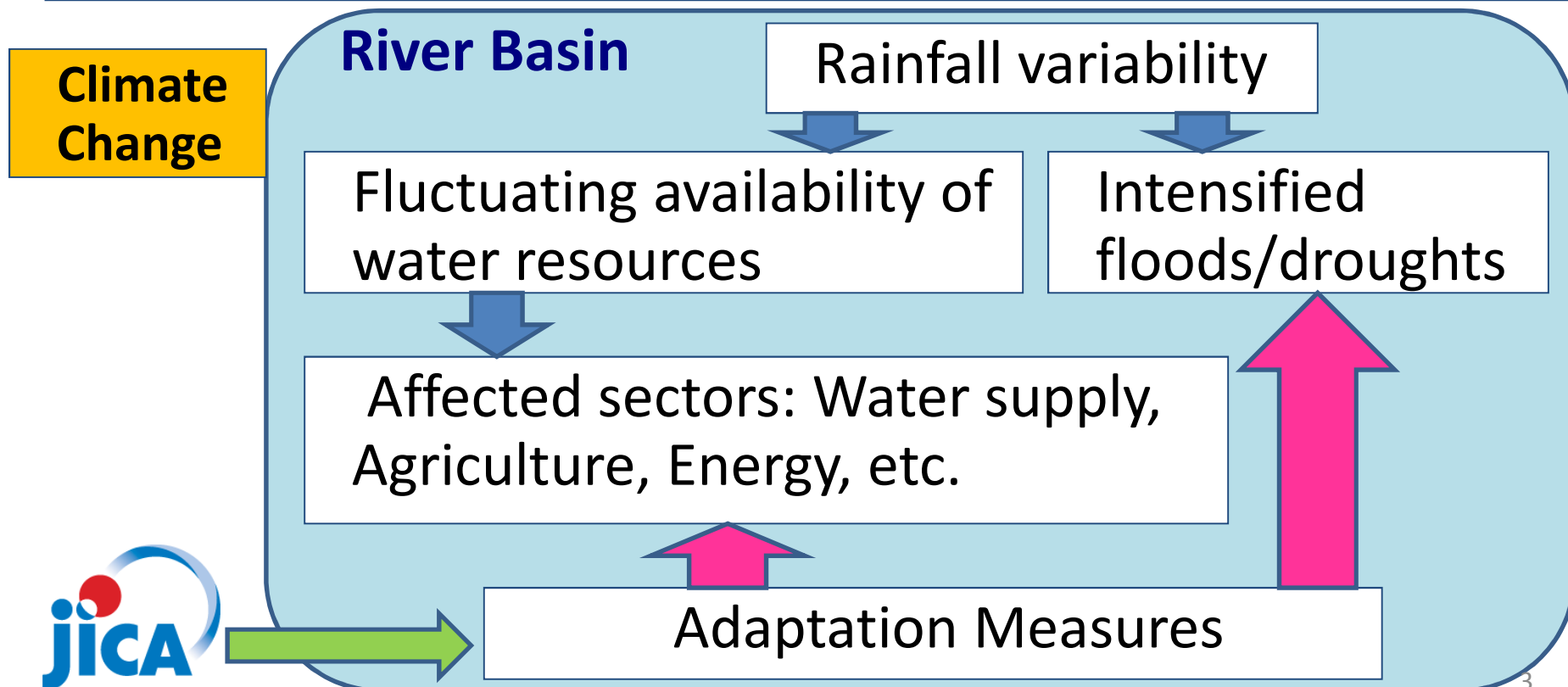
- JICA provides strategic and effective ODA through integrated, comprehensive and seamless implementation of Technical Cooperation, Loan Aid and Grant Aid as one of the largest ODA executing agency in the world.



※Non-project Assistance and Emergency Grant Assistance remain with MOFA

JICA's Support to RBM

JICA is supporting developing countries' efforts for improving river basin management, particularly on formulation and implementation of **adaptation measures to climate change**



Utilizing Earth Observations

Climate change prediction and vulnerability assessment based on **earth observation** are basis for planning of adaptation measures

Assessment of
Climate Change
Impacts on
Water Cycle

Future rainfall

Future availability
of water resources

Future probability
and magnitude of
floods/droughts

Earth Observations

Vulnerability
Assessment

Vulnerability of
water resources

Vulnerability of society
to floods/droughts

Adaptation Measures

Case Studies

Case1

Indonesia: Brantas and Musi River Basins

Incorporating climate change impacts into river basin management plans

Case 2

Malaysia: Pahang River Basin

Reflecting climate change impacts on flood management plans

Case 3

The Philippines: Angat, Kaliwa and Panpanga River Basins

Assessing vulnerability of the water supply sector to climate change and evaluate effectiveness of water resources development projects

Case 1: Indonesia

“The Project for Assessing and Integrating Climate Change Impacts into the Water Resources Management Plans for Brantas and Musi River Basins”

Concept of the project

Data collection and observation in pilot two river basins

Collection of natural condition data including rainfall, air temperature, discharge, and water table, etc., and additional field observation.

Simulation of climate change impacts in the pilot two river basins

Simulating future rainfall for hydrological modeling considering climate change impacts in the Brantas and Musi river basins

Future safety level assessment in the pilot two river basins

Assessing water resources vulnerability and resilience under the climate change (Effect of mitigation in terms of CO₂ reduction from peat lands also to be examined in the Musi river basin)

Recommendations for water resources management with climate change impacts in the pilot two river basins

Recommendations for reflecting climate change impacts on water resources management plans* (POLA and RENCANA)

Preparation of guidelines for measures

Preparing guidelines to be applicable to POLA and RENCANA in other river basins in Indonesia, taking climate change issues into account

Dissemination for other basins in Indonesia

Disseminating outputs on the pilot two river basins to other river basins using prepared guidelines by Indonesia side

Pilot project site



Strengthening the capability of Indonesia Side

Strengthening the capability of Indonesia side to formulate water resource management plans considering climate change

*Water resources management plan in Indonesia

POLA
(Water Resources Management Strategic Plan)

RENCANA
(Water Resources Management Implementation Plan)

Case 2: Malaysia

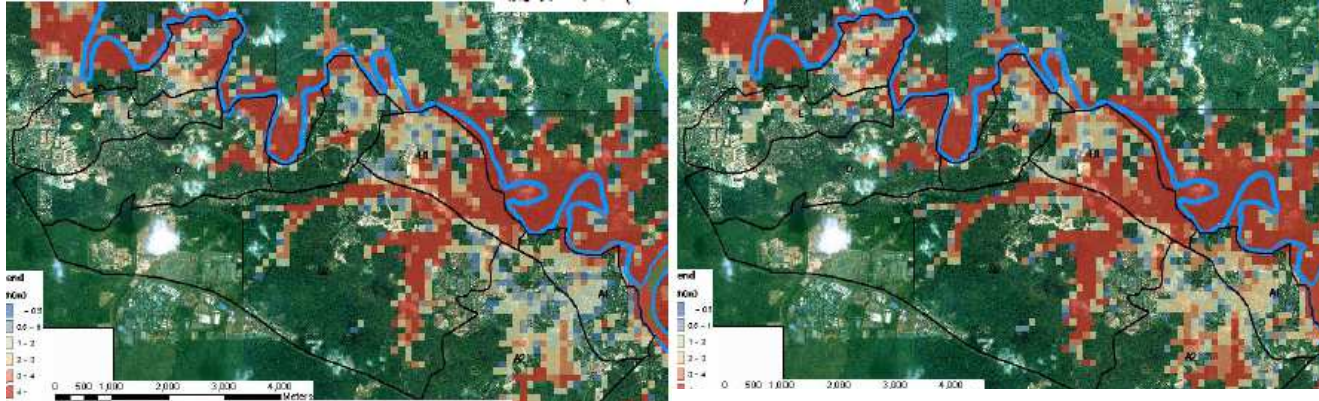
Flood Control Plans for the Pahang Basin

Formulation of an Integrated Flood Management Plan taking climate change effects into account (target year: 2025)

1. Estimation of future rainfall

- Selection of GCMs
- Collection of climate prediction simulation results (outputs of the selected GCMs)
- Evaluation of climate change effects

2. Inundation analysis



Present inundation area with 50-year rainfall event

Future inundation area with 50-year rainfall event

3. Risk evaluation

- Potential victims
- Potential evacuees

4. Adaptation measures proposed

- Hardware (construction of dikes)
- Software (Hazard map, Early warning, Evacuation system, Land use control, etc.)

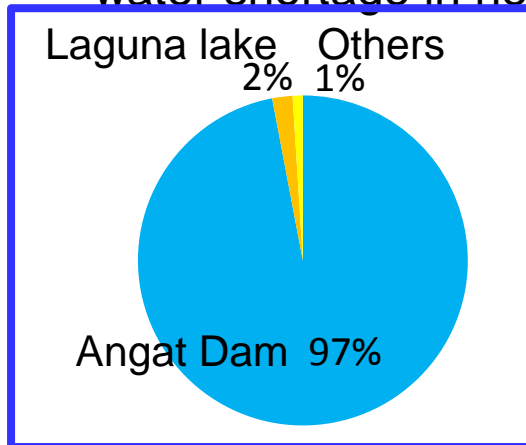
Case 3: The Philippines

Study for Water Security Master Plan in Metro Manila

1. Background

New development of water resources is the crucial issue on the water supply in Metro Manila because:

- 97% of water comes from one water source (Angat Dam)
- Metro Manila is rapidly growing, which may cause severe water shortage in near future

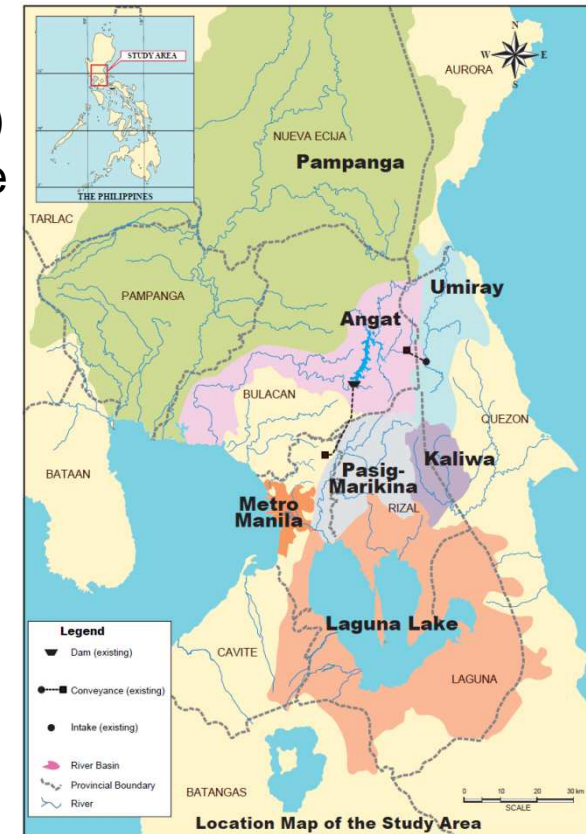


2. Objective of the Study

Evaluation of water development projects proposed by WB based on the water balance analysis and vulnerability assessment taking climate change effect into account (target year: 2040)

3. Outline of the Study

- River runoff simulation based on WEB-DHM (Water and Energy Budget-based Distributed Hydrological Model)
- Vulnerability assessment of water resources
- Water balance analysis in the target year
- Evaluation of effectiveness of the proposed projects
- Proposal for optimization of the water facilities operation



Metro Manila and Adjoining Areas

Effective adaptation measures are identified based on scientific grounds

*Thank you very much
for your kind attention.*

For any queries, please contact by emailing to:
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