Japan International Cooperation Agency

STRENGTHENING INSTITUTIONAL AND POLICY FRAMEWORK ON DRR AND CCA INTEGRATION

Dr. Hitoshi BABA
Ph.D. Environment and Resource Engineering
Senior Advisor, Japan International Cooperation Agency
email: Baba.Hitoshi@jica.go.jp

Japan International Cooperation Agency

Integrated process of CCA and DRR

Basic Concept of CCA

Vision of society,
Basic Strategy,
Adaptive Approach;
- Observing climate change,
- Assessing CC impacts,
- Monitoring CCA measures

Institutional and Policy Framework

Unified authority,
Continuous reviewing,
Guide, adaptation criteria;
- Technical standard,
- Target level of safety,
- Adaptation in region

DRR Planning and Implementation

Mainstreaming Risk factors;
- Climate change,
- Urbanization, etc.

Latest technology,
International cooperation

Japan International Cooperation Agency

Basic Concept of CCA in Japan

National Plan for Adaptation to the Impacts of Climate Change, Cabinet Decision on 27 November 2015

◆ **Vision of society**

By promoting adaptation measures to climate change impacts, to build a secure, safe and sustainable society that is able to minimizing and avoiding damage for life of citizens, properties, economics, and natural environment due to its impacts, and to be resilient against damage.

◆ **Period**

Considered with long-term perspective till the end of 21st century, showing the basic direction in about coming 10 years.

◆ **Basic strategy**

1.Mainstreaming adaptation into government policy
2.Enhancement of scientific findings
3.Promotion of understanding and cooperation through sharing and providing information about climate-related risks
4.Promotion of adaptation in region
5.Promotion of international cooperation and contribution

◆ **Basic approach**

Adaptation will be promoted by using an adaptive approach that involves a repeated cycle of conducting ongoing observation, monitoring, and projection of climate change and its impacts, implementing regular assessments of impacts, considering and implementing adaptation measures, monitoring the state of progress, and making revisions as required.

An assessment of climate change impacts is to be implemented and formulated approximately every five years, and the Plan is to be revised as required.

Japan International Cooperation Agency

Priority Actions

National Plan for Adaptation to the Impacts of Climate Change, Cabinet Decision on 27 November 2015

◆ **Observation and Monitoring, Research and Studies**

Enhancement of observation systems (e.g. ground observation, ships, aviation, and satellites)

Advancement of modeling technologies and simulation technologies

◆ **Sharing and providing information related to climate risk**

e.g. Climate change adaptation information platform

◆ **Promotion of adaptation in region**

e.g. Implementation of model projects that assist the formulation of adaptation plans in local governments; Development of obtained results to other local governments

◆ **International measures**

Support for developing countries (e.g. assistance of climate change impact assessments and formulation of adaptation plans)

e.g. Contribution to human resource development through international networks such as the Asia Pacific Adaptation Network (APAN), Project for Assessing and Integrating Climate Change Impacts into the Water Resources Management Plan in Indonesia, etc.

Japan International Cooperation Agency

Sector Measures to be taken (1)

National Plan for Adaptation to the Impacts of Climate Change, Cabinet Decision on 27 November 2015

◆ **Agriculture, Forests/Forestry, Fisheries**

Impacts: e.g. Declining ratio of first- class rice due to high temperature ; Poor coloring of apples and other fruits

Adaptation: e.g. Development and diffusion of high-temperature-resistant varieties of rice; Switch to superior colored varieties of fruit

◆ **Water Environment / Water Resources**

Impacts: e.g. Changes in water temperatures, water quality; Increases in drought due to increases in the number of rainless days and decrease in the total amount of snowfall

Adaptation : e.g. To promote measures to reduce the loads flowing into lakes and marshes ; To promote efforts to formulate drought response timelines

◆ **Natural Ecosystems**

Impacts : e.g. Changes in vegetation distribution and expansion of wildlife distribution due to increase in temperature and shift in days of snow-melting earlier

Adaptation : e.g. To ascertain the changes in ecosystems and species by using monitoring ; To conserve and restore healthy ecosystems with high climate change resilience

Japan International Cooperation Agency

Sector Measures to be taken (2)

National Plan for Adaptation to the Impacts of Climate Change, Cabinet Decision on 27 November 2015

◆ **Natural Disasters / Coastal Areas**

Impacts: e.g. Increasing frequency and intensity of water disasters, sediment-related disasters, and storm surge disasters due to increasing heavy rainfall and typhoons

Adaptation: e.g. Steady facility improvements and maintenance; Promotion of urban development with consideration of disaster risks; Formulation of hazard maps and evacuation plans

◆ **Human Health**

Impacts: e.g. Increases in heat stroke; Expansion of the suitable habitat for vectors of infectious diseases

Adaptation: e.g. Awareness raising regarding prevention and treatment

◆ **Industrial / Economic Activity**

Impacts: e.g. Impacts on business production activities and leisure; Increasing insured losses

Adaptation: e.g. To promote efforts by businesses in collaboration between public and private sectors ; Development of adaptation technologies

◆ **Life of Citizenry and Urban Life**

Impacts: e.g. Damage to infrastructure and critical services

Adaptation: e.g. To enhance disaster prevention functions of distribution/logistics, ports and harbors, railways, airports, roads, water supply infrastructure, waste treatment facilities, and traffic safety facilities

Japan International Cooperation Agency

Integrated process of CCA and DRR

Basic Concept of CCA	Institutional and Policy Framework	DRR Planning and Implementation
Vision of society, **Basic Strategy,** **Adaptive Approach;** • Observing climate change, • Assessing CC impacts, • Monitoring CCA measures	**Unified authority,** **Continuous reviewing,** **Guide, adaptation criteria;** • Technical standard, • Target level of safety, • Adaptation in region	**Mainstreaming Risk factors;** • Climate change, • Urbanization, etc. **Latest technology,** **International cooperation**

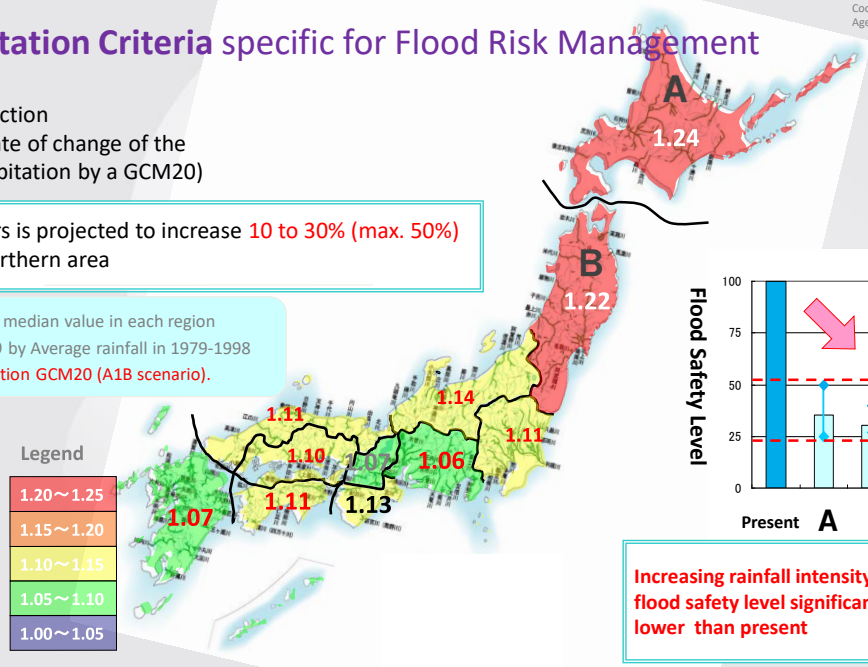
Japan International Cooperation Agency

Adaptation Criteria specific for Flood Risk Management

Climate change projection
(mean value of the rate of change of the maximum daily precipitation by a GCM20)

- Rainfall after 100years is projected to increase 10 to 30% (max. 50%)
- Severe increase in northern area

Future rainfall projected as a median value in each region
Average rainfall in 2080-2099 by Average rainfall in 1979-1998
The maximum daily precipitation GCM20 (A1B scenario).

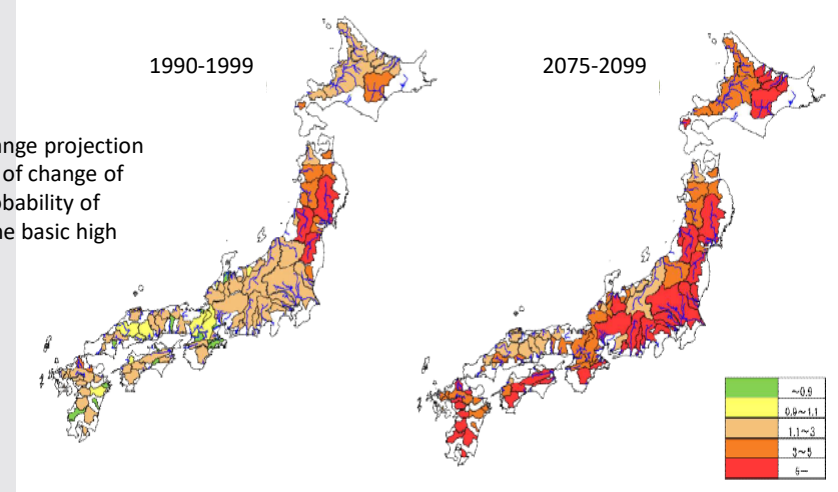


Increasing rainfall intensity makes flood safety level significantly lower than present

Japan International Cooperation Agency

Adaptation Criteria specific for Flood Risk Management

Examples of climate change projection (mean value of the rate of change of the occurrence year probability of flooding that exceeds the basic high water peak flow)

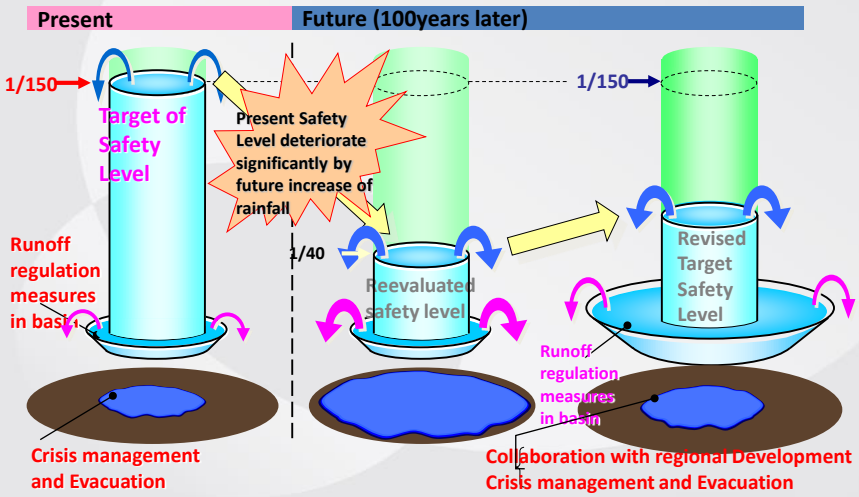


http://www.nilim.go.jp/lab/bcg/siryou/tnn/tnn0749pdf/

Japan International Cooperation Agency

Adaptation Criteria specific for Flood Risk Management

The changing Safety Level regarding flood risks is the important factor that we need to assess and reflect to the concept of adaptation measures.



Japan International Cooperation Agency

Integrated process of CCA and DRR

Basic Concept of CCA	Institutional and Policy Framework	DRR Planning and Implementation
Vision of society, **Basic Strategy,** **Adaptive Approach;** • Observing climate change, • Assessing CC impacts, • Monitoring CCA measures	**Unified authority,** **Continuous reviewing,** **Guide, adaptation criteria;** • Technical standard, • Target level of safety, • Adaptation in region	**Mainstreaming Risk factors;** • Climate change, • Urbanization, etc. **Latest technology,** **International cooperation**

Japan International Cooperation Agency

An example of international cooperation, Indonesia

"The Project for Assessing and Integrating Climate Change Impacts into the Water Resources Management Plan for Brantas and Musi River Basins" in Indonesia.

Since the process requires latest technologies and global datasets which are not acquainted nor standardized in most of the developing countries, JICA, in coordination with Tokyo University, takes a role to mobilize the resource of "State-of-the-art techniques" of Japan.

The following information in pages are provided by Prof. Toshio Koike, Daikichi Ogawada and Akiko Matsumura, in cooperation with JICA Study Team of the Project, in May. 2014

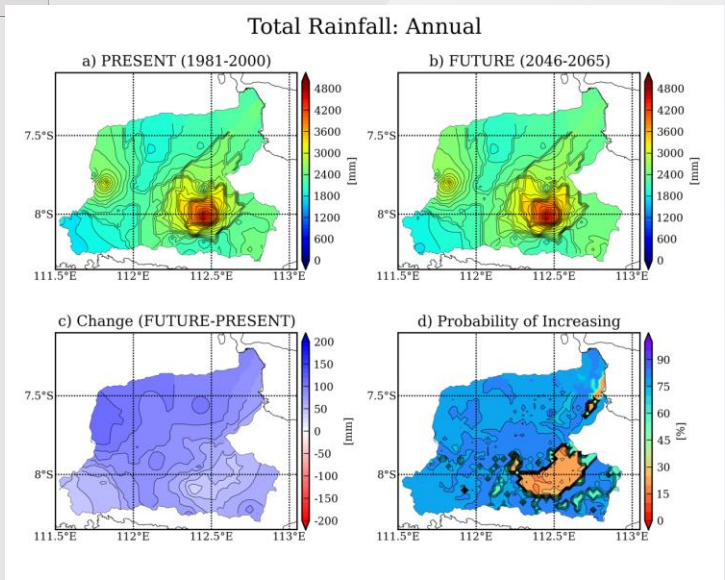
Japan International Cooperation Agency

Case study of climate change impact assessment and hydrological simulation in **Brantas River Basin**

C.A. 11,800km^2
Length 320km

Japan International Cooperation Agency

Projection of changes in Annual Rainfall

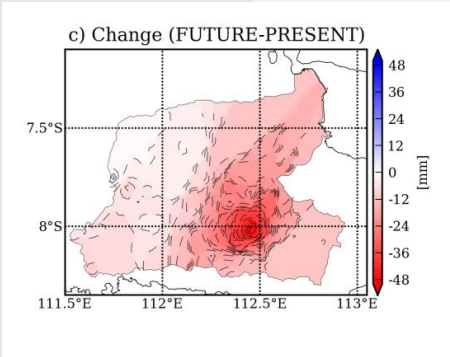


Annual rainfall will be slightly increased in the whole area.

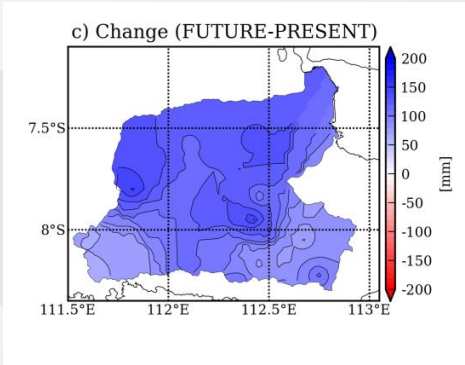
Projection of changes in Seasonal Rainfall

Dry season will be drier, Wet season will be wetter

Dry Season

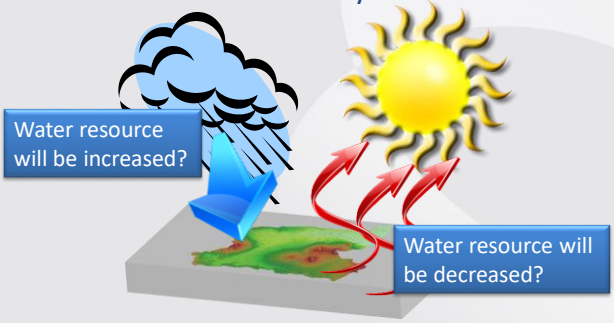


Wet Season

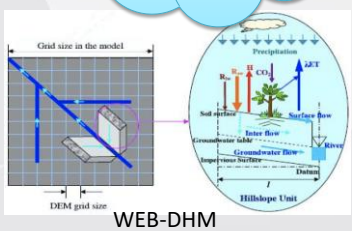


Summary of Projected Climate Change

- Surface Air Temperature will increase around1.5 degrees by 2050 with high confidence.
- Annual total rainfall will increase slightly, however, the trend is not consistent among GCMs.
- Extreme rainfall intensity will increase.



Physical based runoff model was applied for the evaluation.

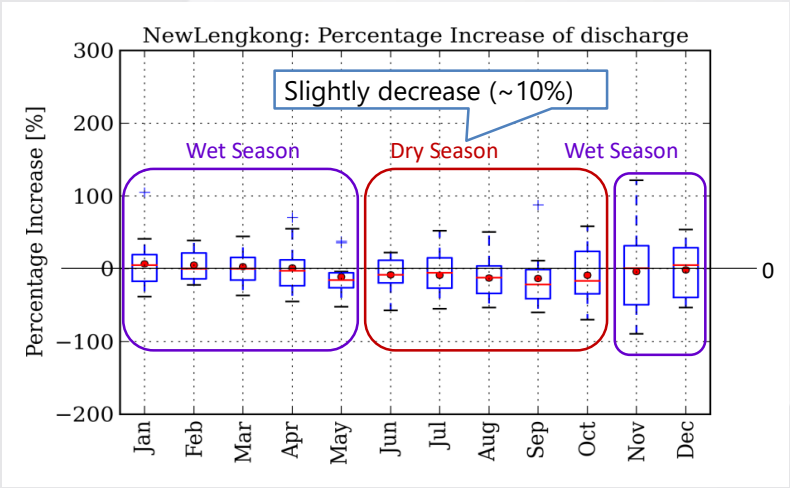


WEB-DHM

Percentage Increase of Monthly Flows

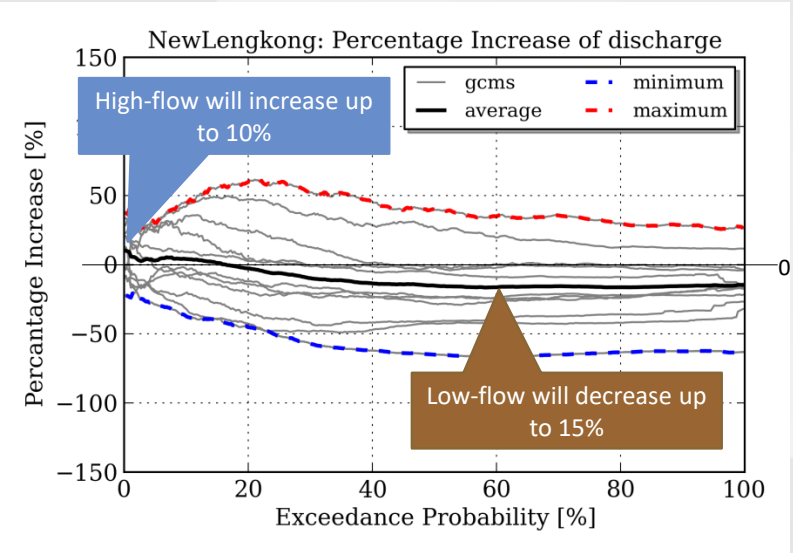
Japan International Cooperation Agency

Percentage Increase [%] = 100 * (QFuture – QPresent) / QPresent



Percentage Increase of River Discharge at New Lengkong

Japan International Cooperation Agency



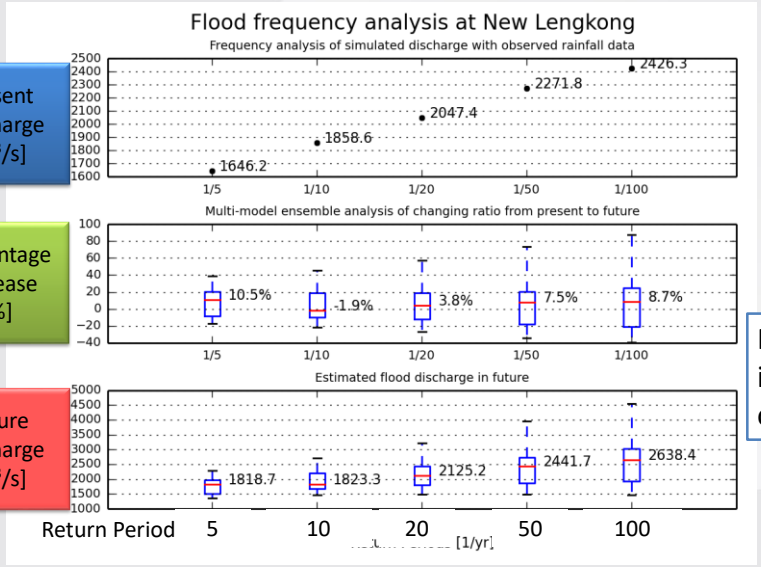
Changes in Flood Discharge

Japan International Cooperation Agency

Present Discharge [m^3/s]

Percentage Increase [%]

Future Discharge [m^3/s]



Flood Discharge will increase about 10% or less

Summary
Projected Change on Water Resources

- Wet season discharge will not change significantly, while the dry season discharge will slightly decrease, however, the trend is not consistent among the GCMs.
- More than half of climate models predict severe drought/flood conditions in the future climate.
- Annual mean P-E will slightly decrease, however, the trend is not consistent among the GCMs.

Mainstreaming DRR into Development

Japan International Cooperation Agency

"The prevention of new risk and the reduction of existing risk through the implementation of integrated and inclusive measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthens resilience." (SFDRR)

New risk: intensifying hazard by Climate Change, urbanization, population increase, …

Existing risk: exposed population and assets, vulnerable urban state, …

Mainstreaming DRR: is a systematic approach where we can scientifically assess the existing and newly arising risks and can quantitatively prospect future damages and impacts we will have, and then can strategically organize the resilient structure of society and economy that invest in sustainable development.

Integrated process of CCA and DRR

Japan International Cooperation Agency

Basic Concept of CCA	Institutional and Policy Framework	DRR Planning and Implementation
Vision of society, **Basic Strategy,** **Adaptive Approach;** • Observing climate change, • Assessing CC impacts, • Monitoring CCA measures	**Unified authority,** **Continuous reviewing,** **Guide, adaptation criteria;** • Technical standard, • Target level of safety, • Adaptation in region	**Mainstreaming Risk factors;** • Climate change, • Urbanization, etc. **Latest technology,** **International cooperation**

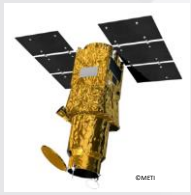
Japan International Cooperation Agency

Space Technology for CCA and DRR

Different types of satellite, with different purposes of:

- Science (GHG, Gravity etc.) / Astronomical (telescope)
- Communication / Broadcast
- Navigation / Positioning
- Earth Observation: Weather / Ocean / Ground

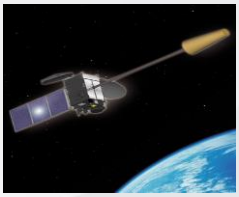
HODOYOSHI-1
(60kg)
Land Observation



ASNARO
(500kg)
Land Observation

GOSAT (1.7 tons)
GHG Observation

ALOS-2 (2 tons)
Land Observation



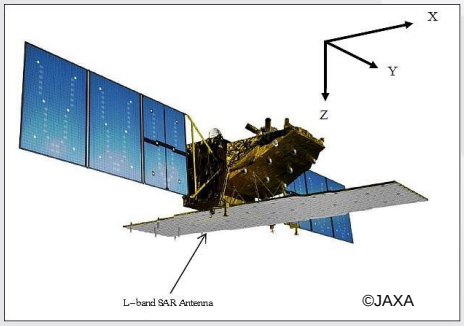
MTSAT-2 (4.7 tons)
Weather Observation

Japan International Cooperation Agency

Reference: ALOS-2

ALOS-2/PALSAR-2

The Advanced Land Observing Satellite “DAICHI-2”(ALOS-2) is the follow-on JAXA L-band SAR satellite mission of ALOS, which contributes to cartography, regional observation, disaster monitoring, and resource surveys.



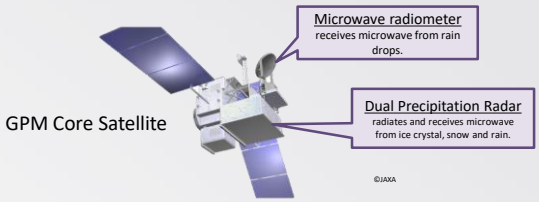
Orbit	Sun-synchronous orbit: altitude = 628km, inclination = 97.9º
	Local sun time : 12:00 ± 15 min
	Revisit time: 14 days; number of cycles/day: 15 3/14
	Orbit control: ≤ ± 500 m
Mission design life	5 years (with a goal of 7 years)
Spacecraft mass	2120 kg
Spacecraft size (deployed)	9.9 m (x) x 16.5 m (y) x 3.7 m (z)
Spacecraft power generation	5.2 kW (EOL)
Downlink communications	X-band: 800 Mbit/s (16 QAM), 400/200 Mbit/s (QPSK)
	Ka-band: 278 Mbit/s (QPSK) via the DRTS (Data Relay Technology Satellite) of JAXA
Launch	H-IIA launch vehicle from TNSC

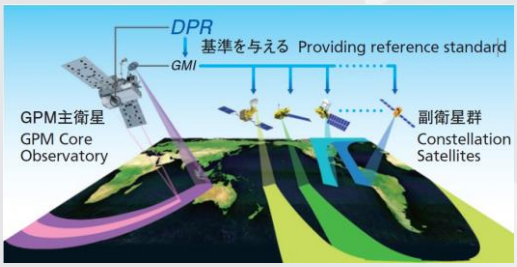
Precipitation Radar Satellite

Japan International Cooperation Agency

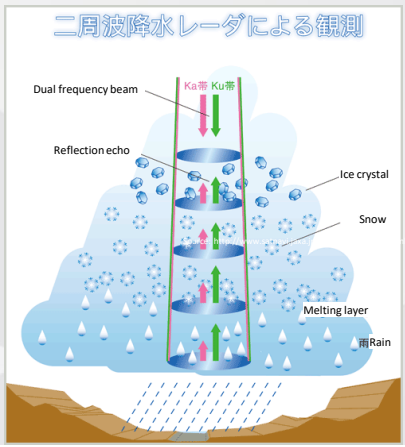
GPM's Mission

The Global Precipitation Measurement mission is an international network of satellites that provide the next-generation global observations of rain and snow to advance our understanding of Earth's water and energy cycle, improve forecasting of extreme events, and provide accurate and timely information to directly benefit society.





Source: http://global.jaxa.jp/activity/pr/brochure/files/sat04.pdf



Source: Modified by PASCO based on the website http://www.satnavi.jaxa.jp/project/gpm/sche.html

GSMaP (Global Satellite Mapping of Precipitation)

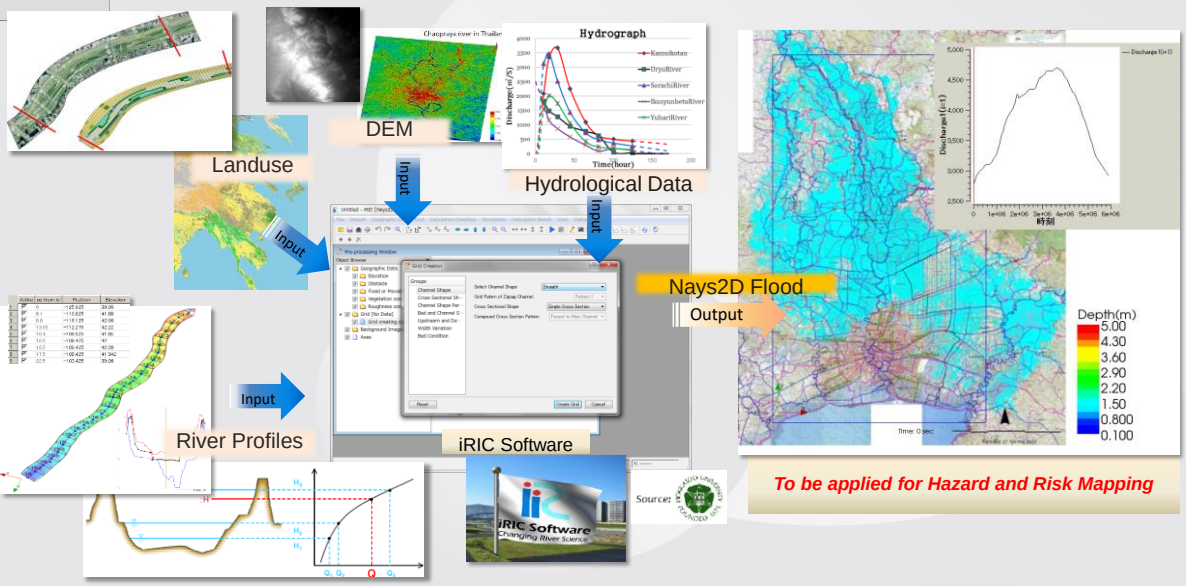
Japan International Cooperation Agency

- Products produced by MW-IR algorithm based on the information from GPM-Core GMI, TRMM TMI, GCOM-W AMSR2, DMSP series SSMIS, NOAA series AMSU, MetOp series AMSU and Geostationary IR
- Globally updated every hour and available 4 hours later for free

Source: http://sharaku.eorc.jaxa.jp/GSMaP/index.htm

Japan International Cooperation Agency

Sophisticated technology



To be applied for Hazard and Risk Mapping