

Tackling Extreme Precipitation Events Workshop

-Indo-Pacific region-

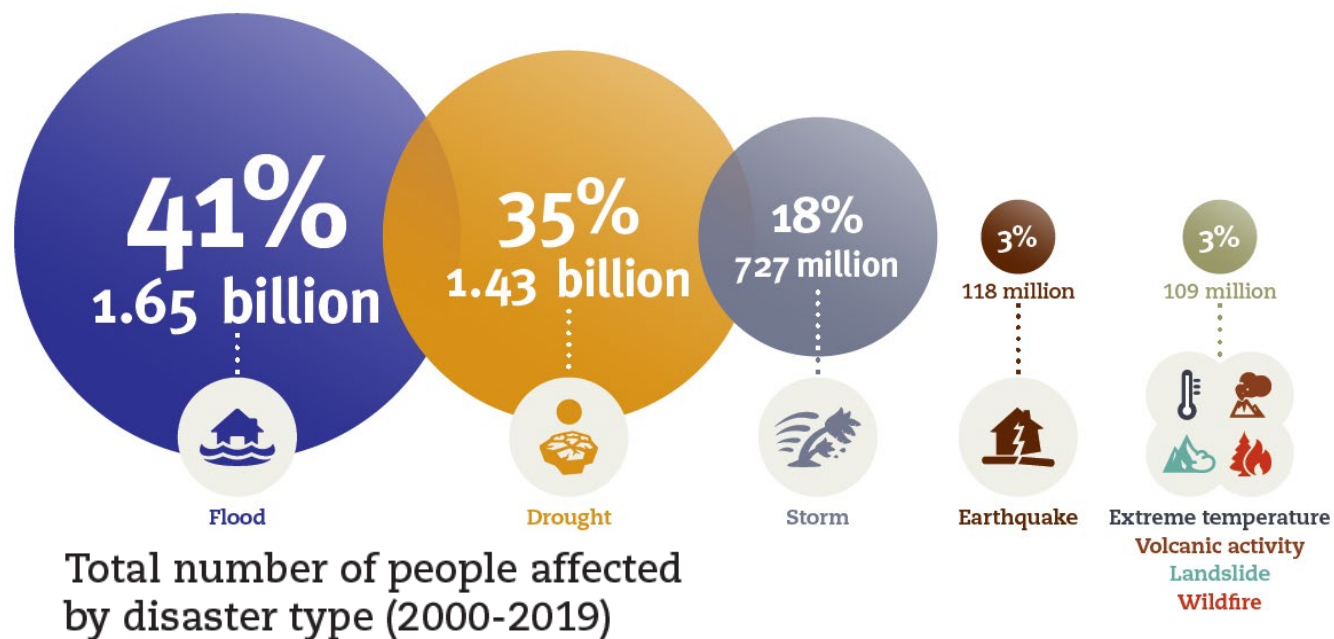
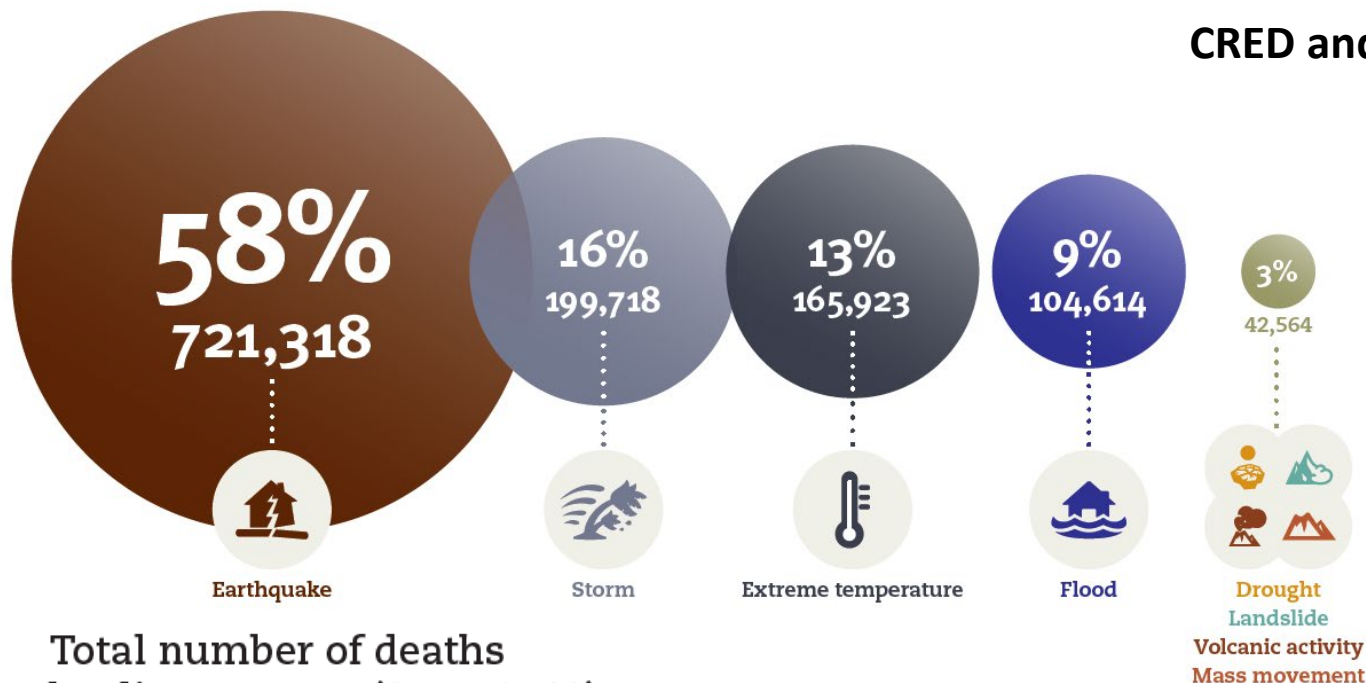
Transformative Steps

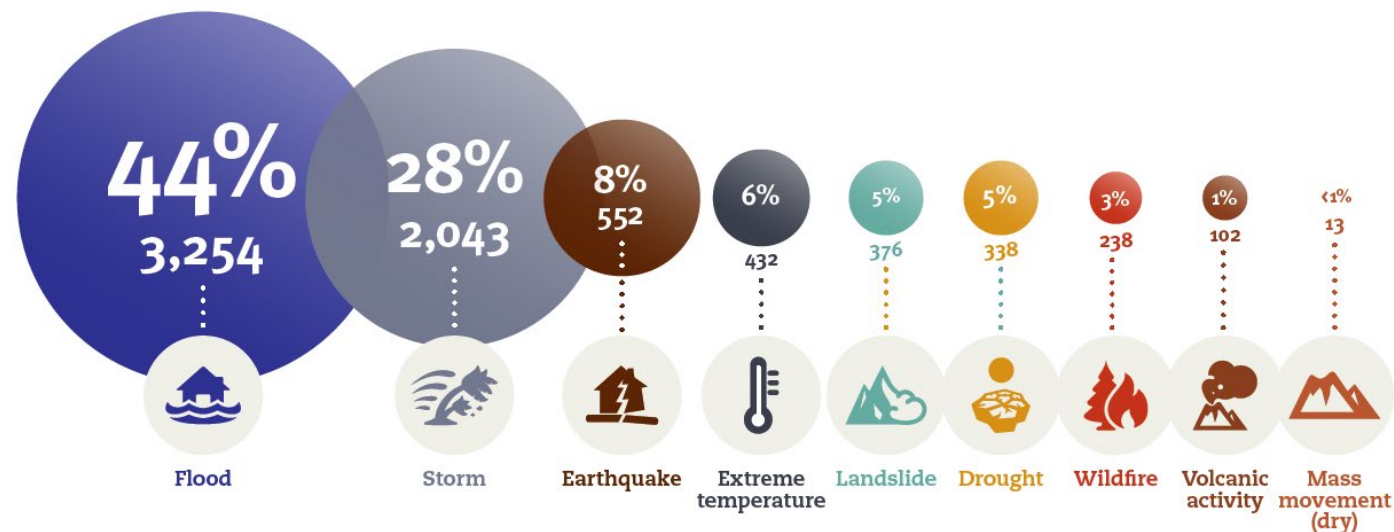
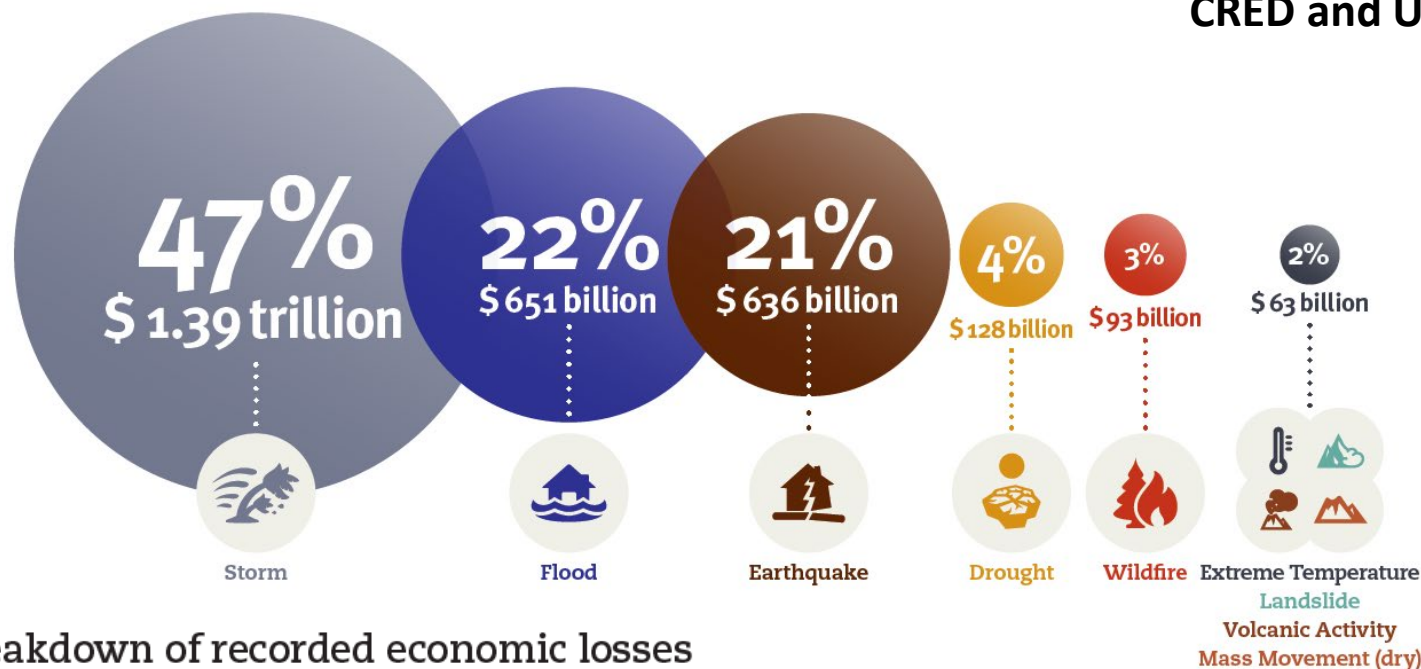
to shift the world onto a sustainable and resilient path

Toshio KOIKE

Executive director, International Centre for Water Hazards and Risk Management (ICHARM)
Public Works Research Institute (PWRI)
Professor Emeritus, the University of Tokyo
Chair, River Council of Japan, National Land Development Council
Council Member, Science Council of Japan, Cabinet Office of Japan

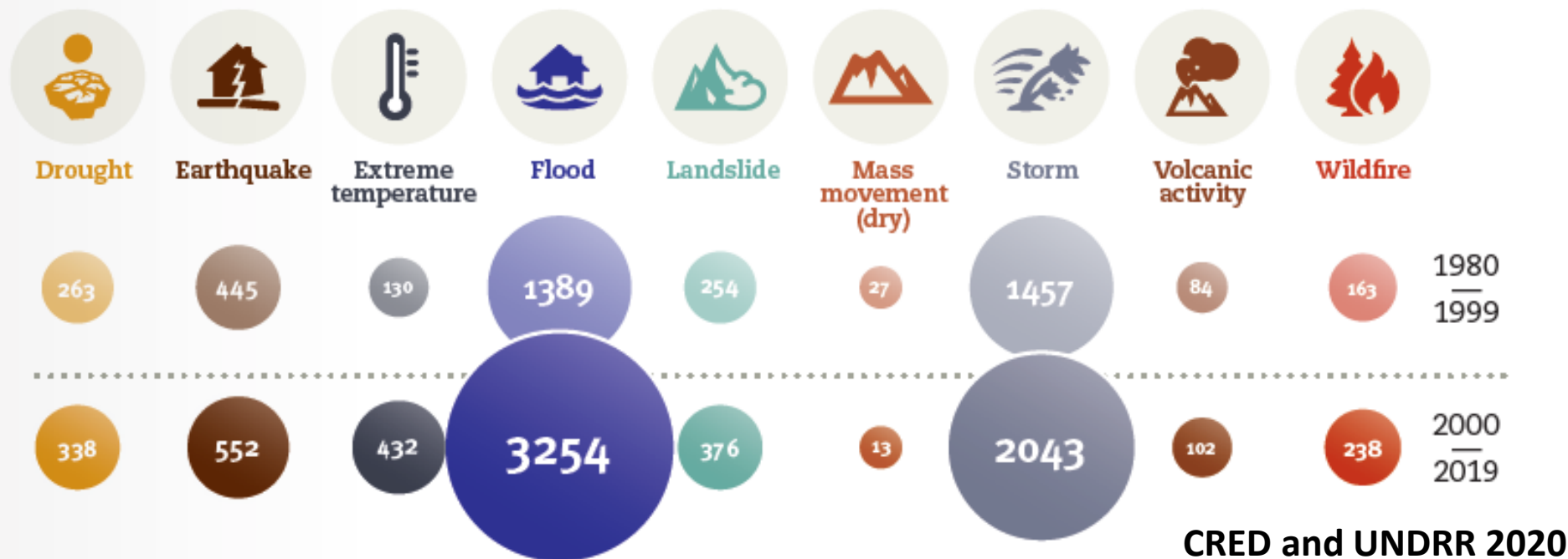






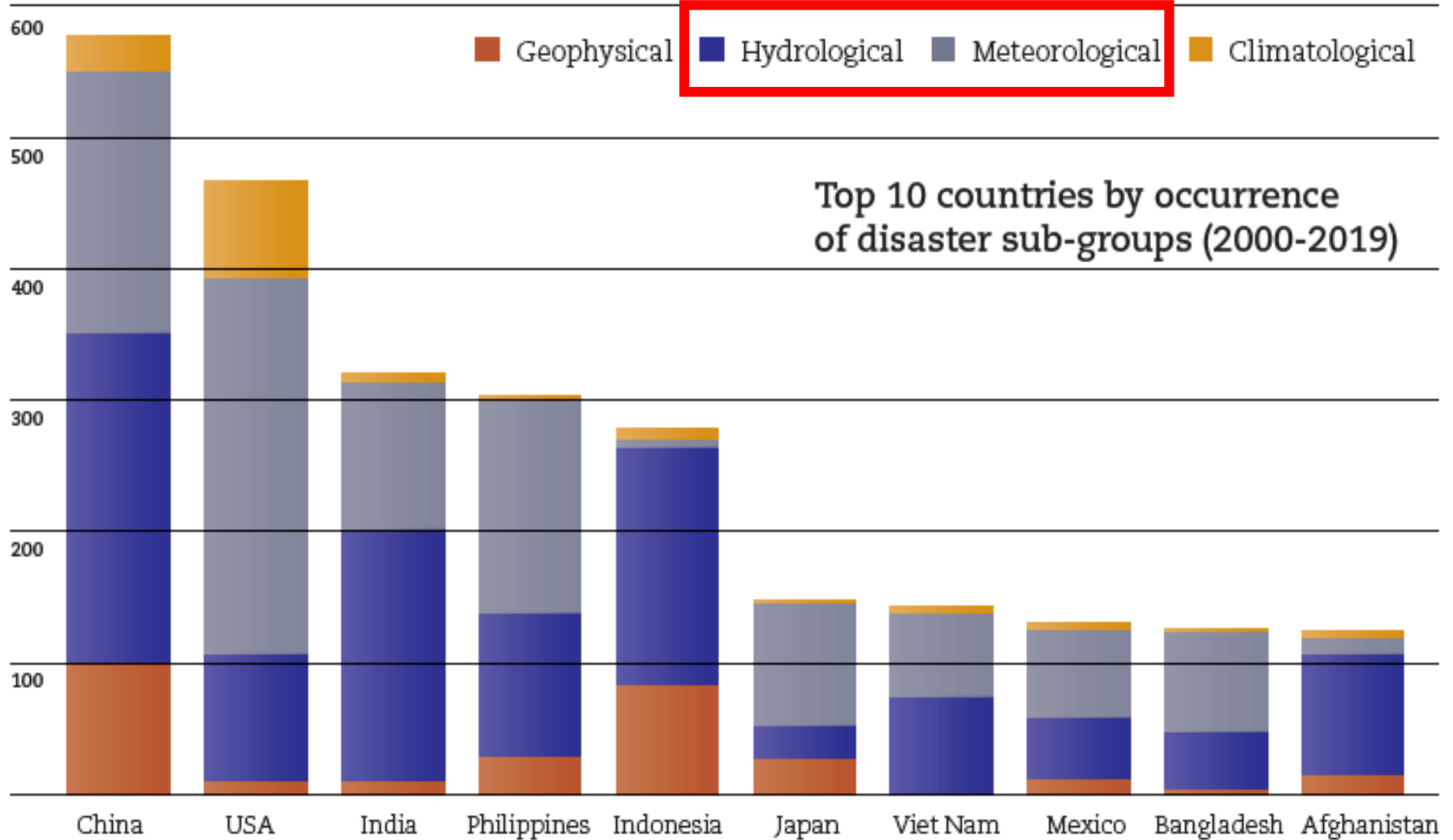
Percentage of occurrences of disasters by disaster type (2000-2019)

Total disaster events by type: 1980-1999 vs. 2000-2019



The **frequency and intensity of heavy precipitation events** have increased since the 1950s over most land area for which observational data are sufficient for trend analysis. It is very likely that **heavy precipitation events** will **intensify** and become **more frequent** in most regions with additional global warming. At the global scale, extreme daily precipitation events are projected to intensify by **about 7% for each 1 °C of global warming**.

(by IPCC/AR6/WG1, 2021)

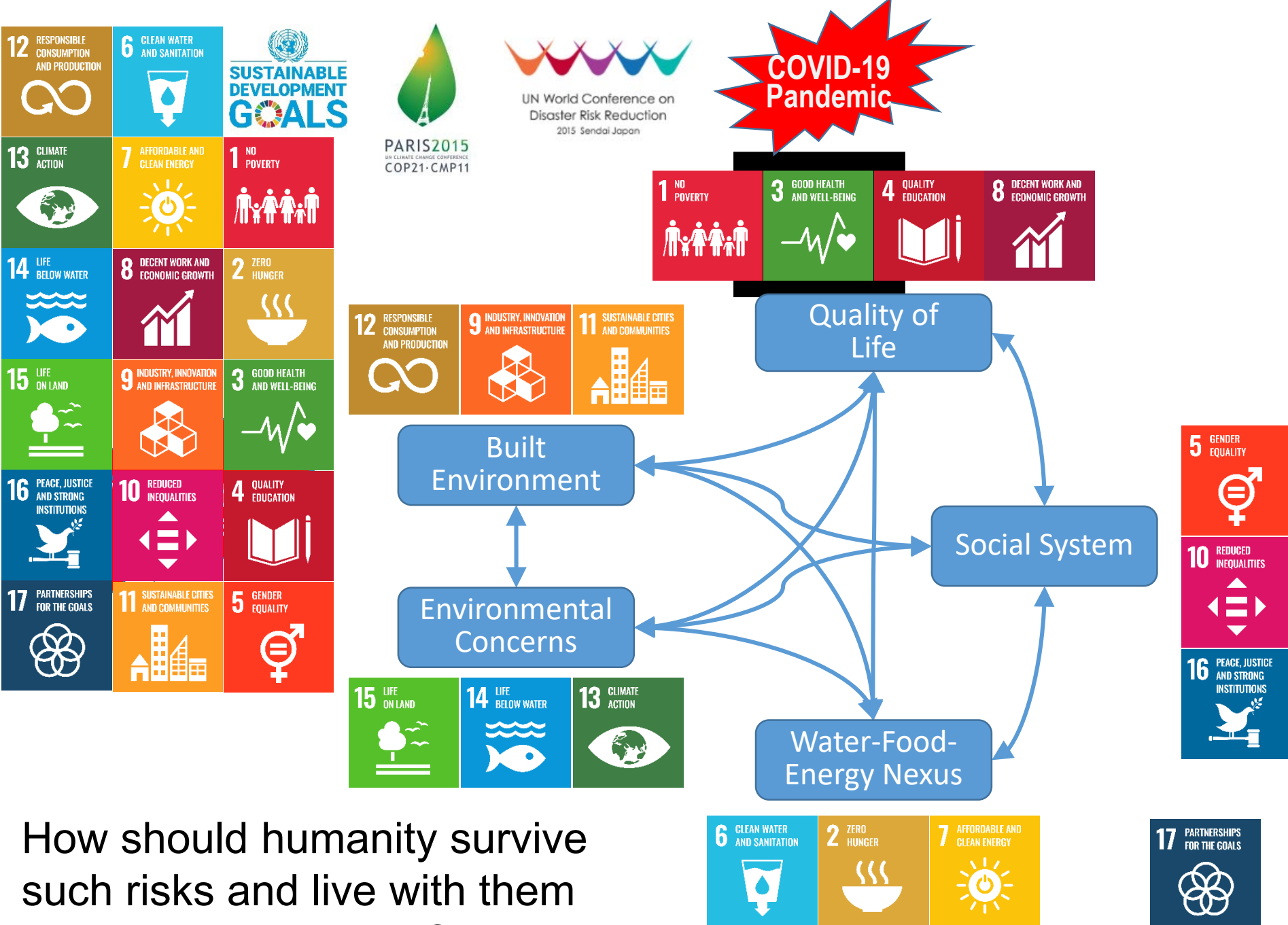




The 2030 Agenda

We are determined to take the bold and **transformative steps** which are urgently needed to shift the world onto a **sustainable** and **resilient** path.

As we embark on this collective journey, we pledge that **no one will be left behind**.



How should humanity survive such risks and live with them in a sustainable way ?

The Fourth Asia Pacific Water Summit

Kumamoto. Japan, April 23-24, 2022



Yoshiro Mori, President of the APWF and former Prime Minister, Japan



Emperor and Empress of JAPAN



Antonio Guterres, UNSG



Fumio Kishida, Prime Minister, Japan

18 Heads of State and Government, including Presidents, Prime Ministers and Deputy Presidents, as well as **19 government ministers**, who attended either in person, virtually, or via video message.

Kumamoto Declaration

- Require transformation into **quality-oriented societies** that are **resilient**, **sustainable**, and **inclusive**.
- Improve **governance**, close the **financial** gap and appeal to the **science and technology** community.
- Explore what role science and technology should play in the **cross-sectoral decision-making of leaders**.

Chair's Summary

- Promote water cycle **consilience** by accelerating the Open Science policy, particularly focusing on observation, modeling and data integration;
- Foster "**Facilitators**," that is, catalytic beings who can lead the way toward resolving problems by providing professional advice on-site using a broad range of scientific and indigenous knowledge;
- Work together beyond disciplines and sectors among different levels while taking an **end-to-end approach**.



How should humanity survive such risks and live with them in a sustainable way ?



4th Asia-Pacific Water Summit Kumamoto Initiative for Water

[4th Asia-Pacific Water Summit] Kumamoto Initiative for Water (Outline)

- Proactive Contribution to the Development of “Quality Infrastructure” based on a “New Form of Capitalism” -

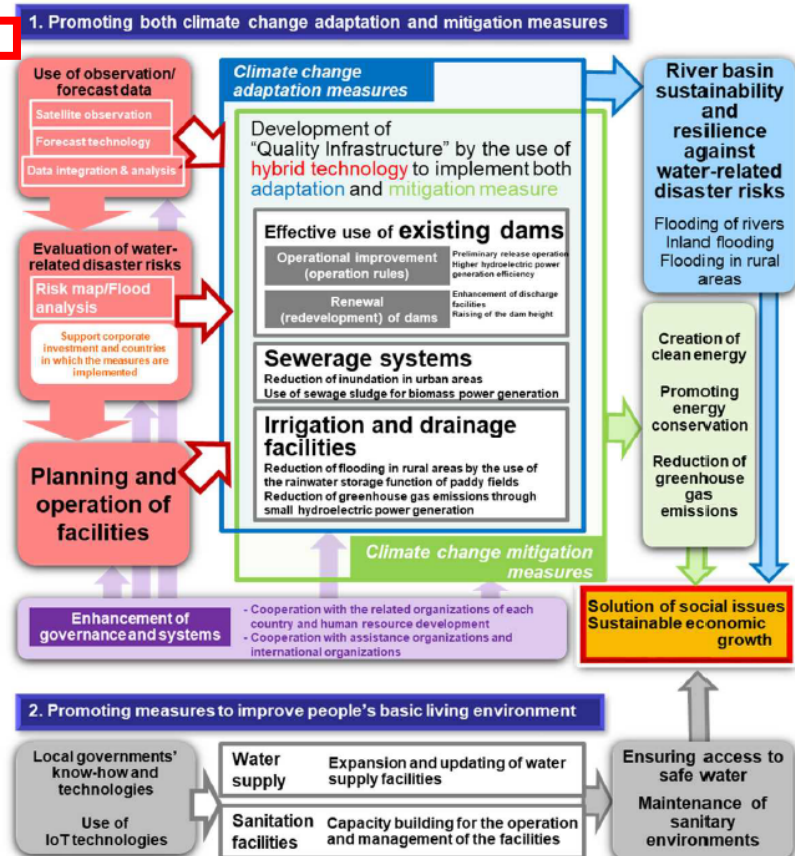
Japan will proactively contribute to the solution of water-related social issues faced by the Asia-Pacific region by developing “Quality Infrastructure” capitalizing on Japan’s advanced technologies, and based on a “New Form of Capitalism”, which means promoting public-private partnerships and fostering digitization and innovation to solve social issues as a growth engine for sustainable development and the formation of a resilient society and economy.

1. Promoting both climate change adaptation and mitigation measures

- (1) Promoting the development of “Quality Infrastructure”
 - Develop and provide hybrid technology to develop dams, sewerage systems and agricultural facilities to reduce the damage caused by flooding for river basin sustainability and resilience against water-related disaster risks for climate change adaptation and also to reduce greenhouse gas emissions for climate change mitigation (Improve and renew existing dams to bring about the effects more speedily)
 - Propose the introduction of “Quality Infrastructure” through public-private partnership
- (2) Contribution to fill gaps of observation data
 - Provide satellite data obtained from the meteorological satellite “Himawari” and Advanced Land Observing Satellite-2 (ALOS-2), “Daichi-2” as well as from the core satellite of the Global Precipitation Measurement (GPM) mission
- (3) Contribution to governance (systems, human resources and capacity)
 - Sophisticate the evaluation of water-related disaster risks by the use of AI/IoT-based forecast and analysis technologies
 - Support human resource development through the Asia-Pacific Climate Change Adaptation Information Platform (AP-PLAT) and the Data Integration and Analysis System (DIAS)
- (4) Utilization and expansion of the Joint Crediting Mechanism (JCM)

2. Promoting measures to improve people’s basic living environment

- (1) Promoting the development of “Quality Water Supply Systems”
 - Introduce advanced technologies, including IoT technologies for the development of water supply facilities
- (2) Promoting the development of “Quality Sanitation Facilities”
 - Develop sewerage systems and on-site treatment facilities and enhance abilities to operate comprehensive treatment facilities

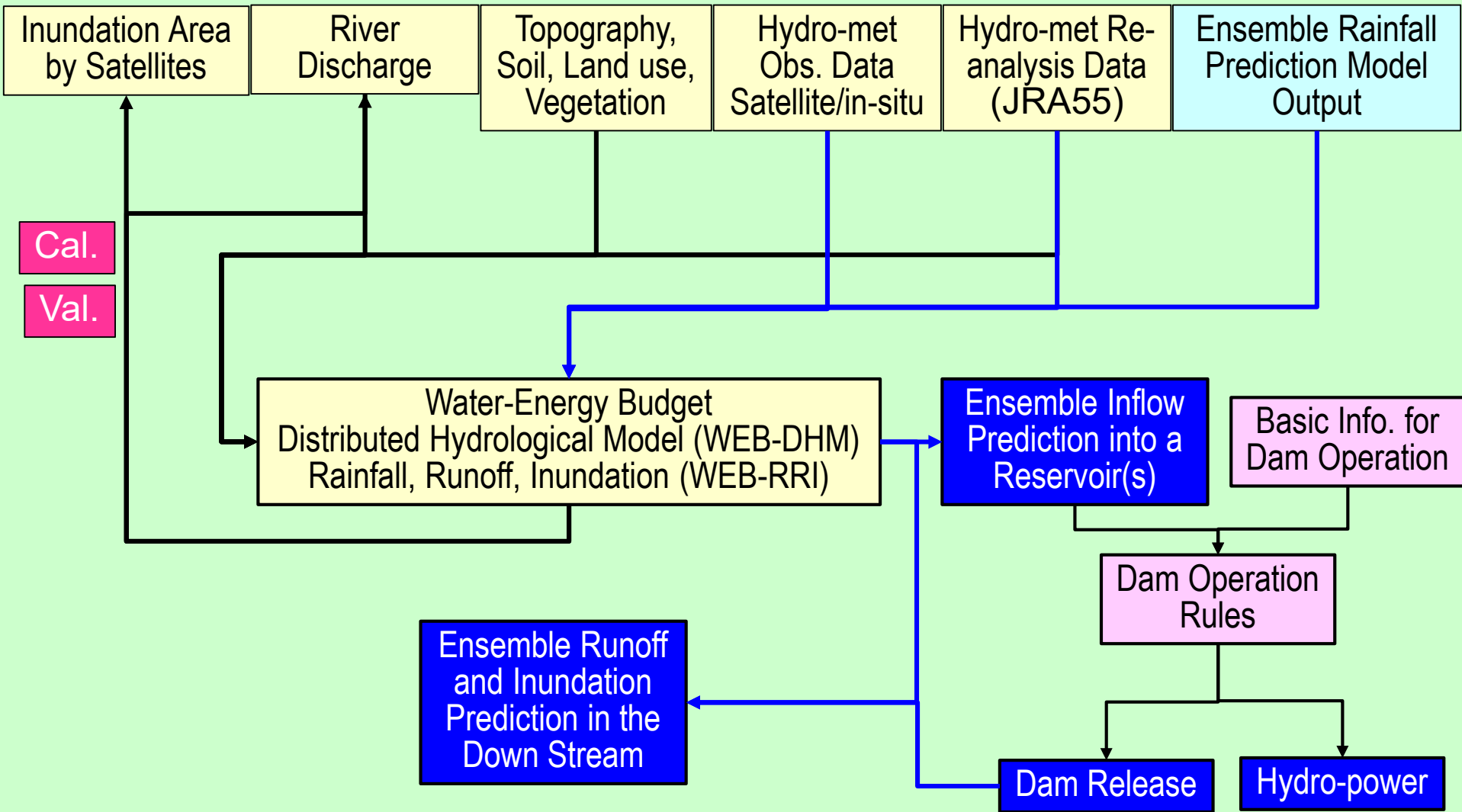


Providing financial assistance worth approximately 500 billion yen over the next five years

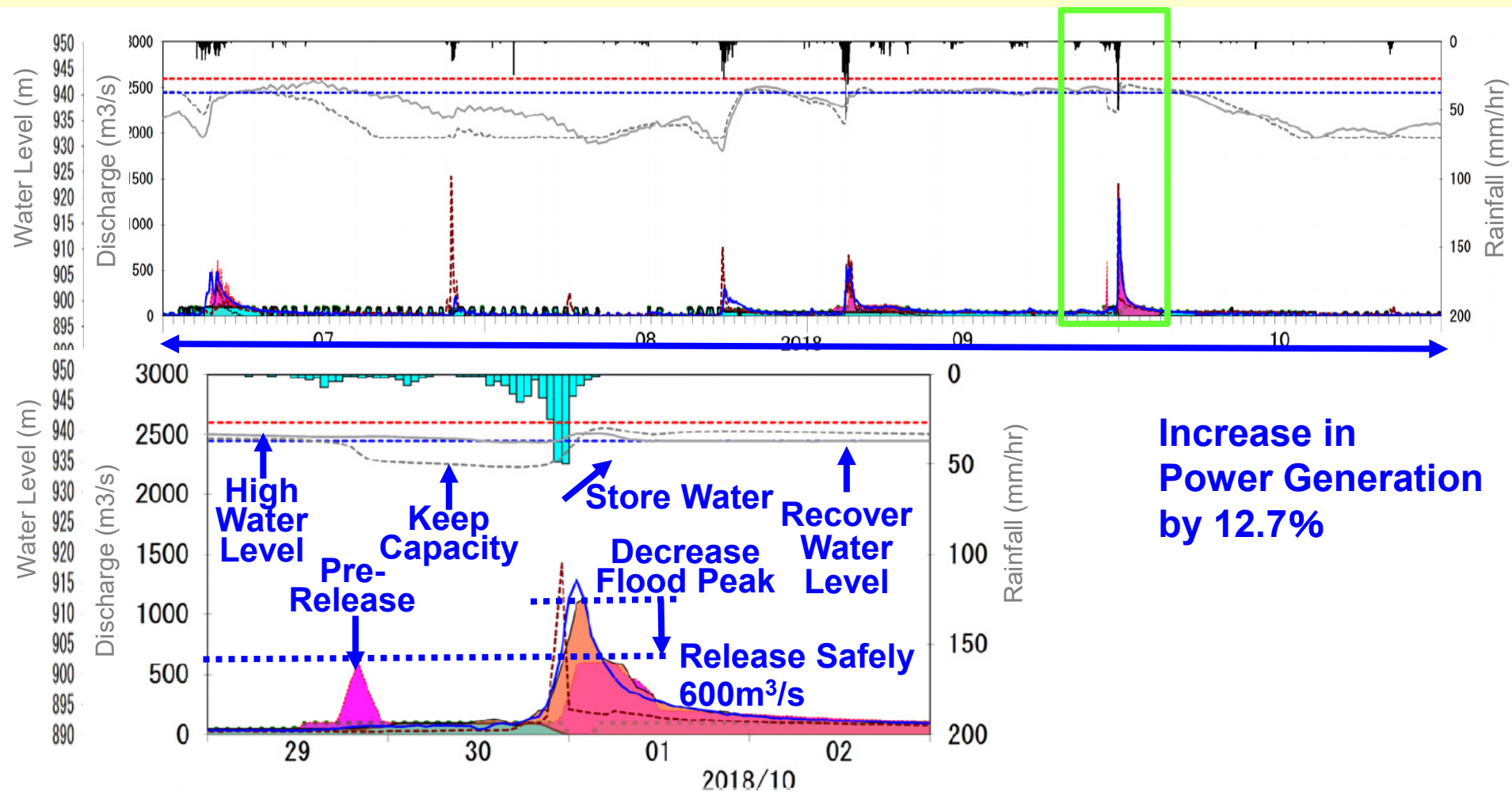
OPERATION SUPPORTING SYSTEM FOR HYDROELECTRIC DAMS TO IMPROVE FLOOD CONTROL AND POWER GENERATION

Runoff Simulation

Rainfall Prediction



System Evaluation: Dam Operation Supports 12



**Increase in
Power Generation
by 12.7%**

Observed

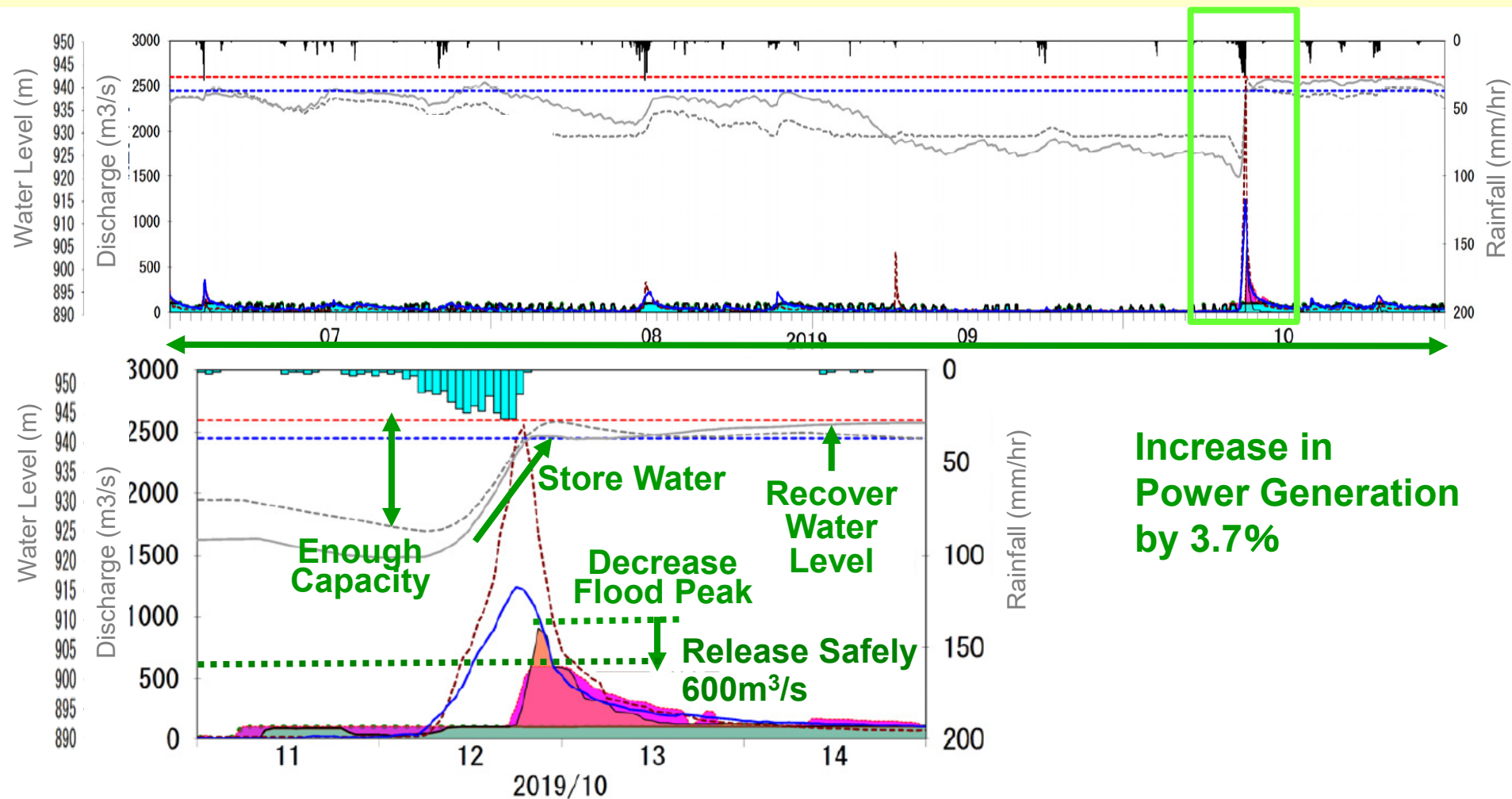
- rainfall
- inflow
- reservoir water level
- gate discharge
- discharge for power generation

Outputs from the support system

- forecasted inflow
- reservoir water level
- gate discharge
- additional discharge for power generation

- Full reservoir level
- Safe water use level

System Evaluation: Dam Operation Supports 13



**Increase in
Power Generation
by 3.7%**

Observed

- rainfall
- inflow
- reservoir water level
- gate discharge
- discharge for power generation

Outputs from the support system

- - - forecasted inflow
- - - reservoir water level
- gate discharge
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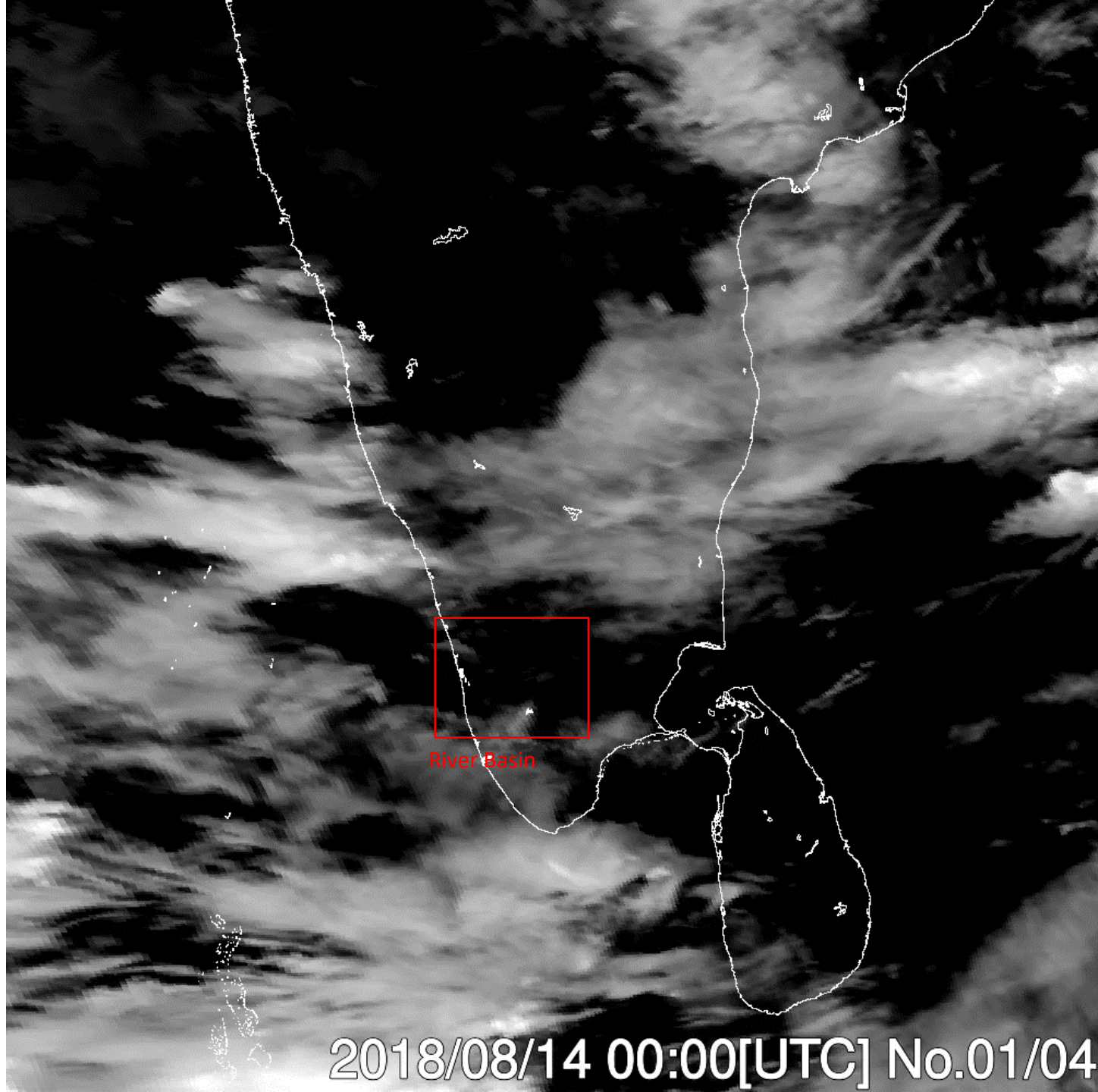
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Himawari 8
IR (CH13)

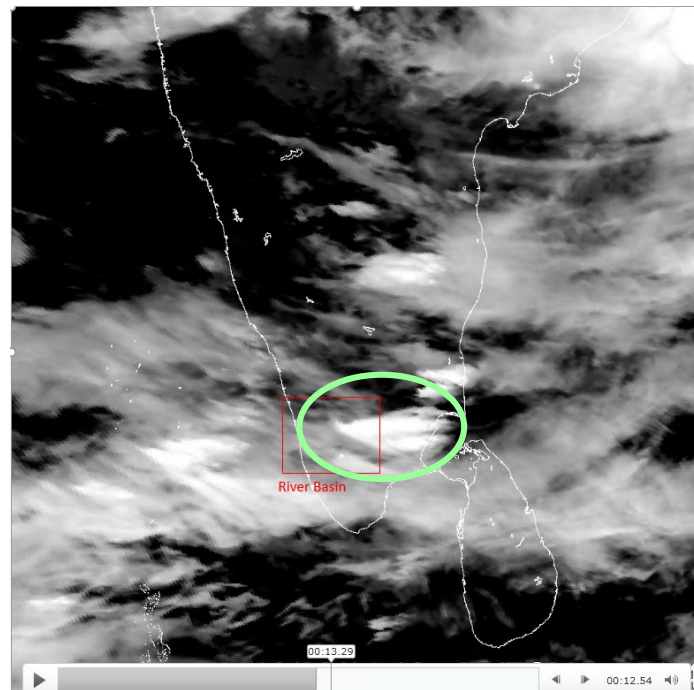
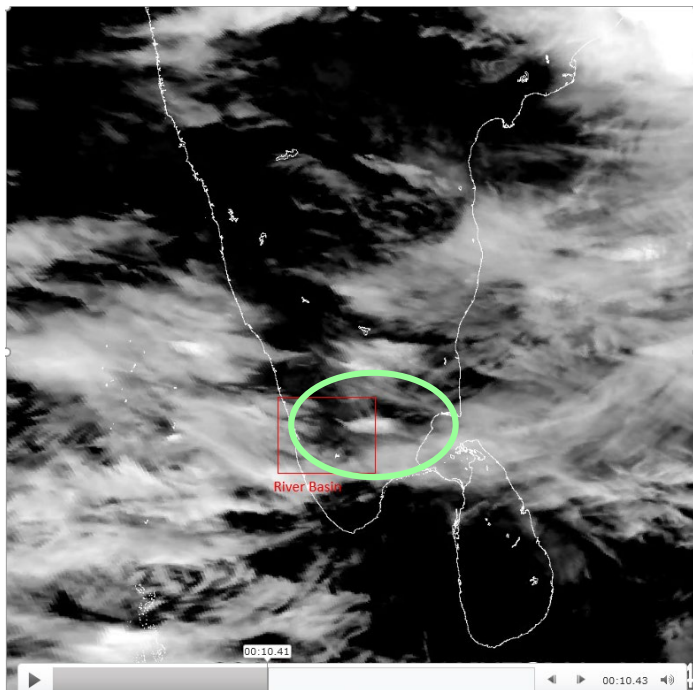
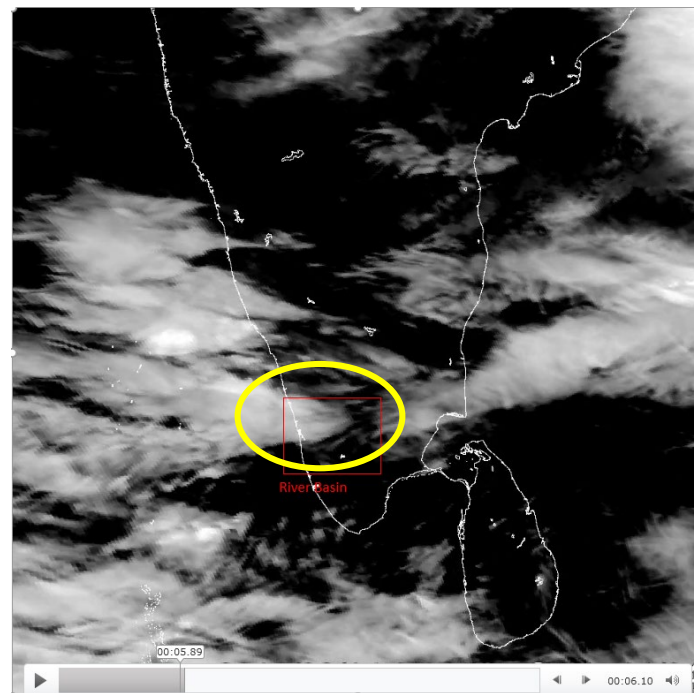
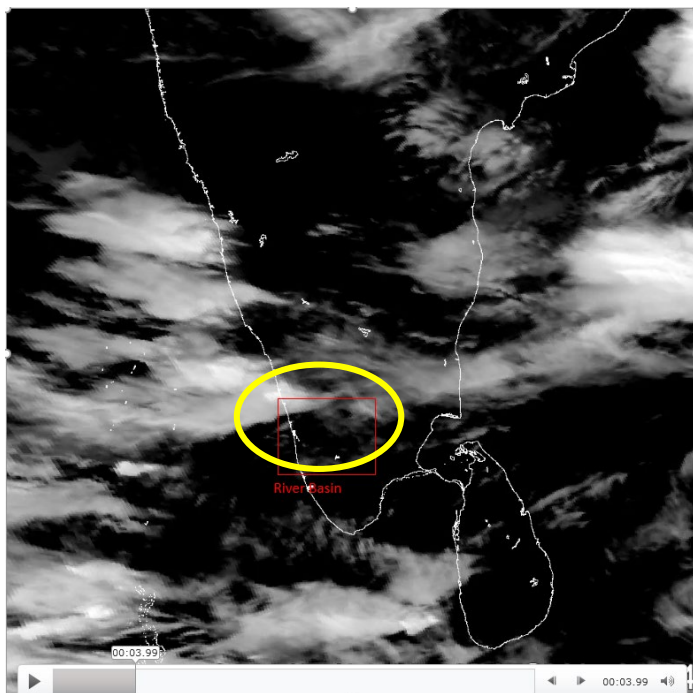
2018/08/14
00:00 - 24:00
UTC

5N - 18N
70E - 85E

250K- 200K



2018/08/14 00:00[UTC] No.01/04



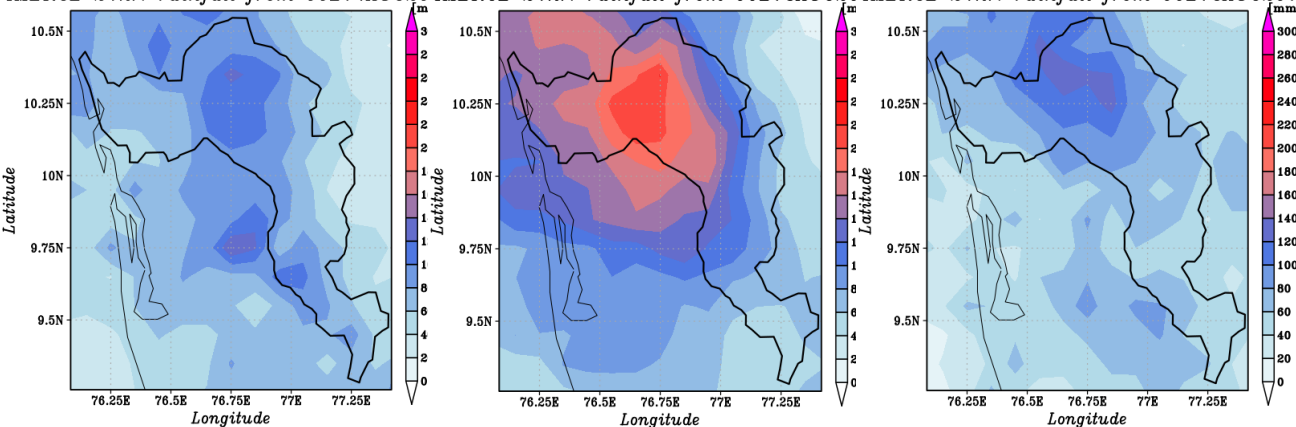
SATELLITE RAINFALL PRODUCTS:

Aug 14

Aug 15

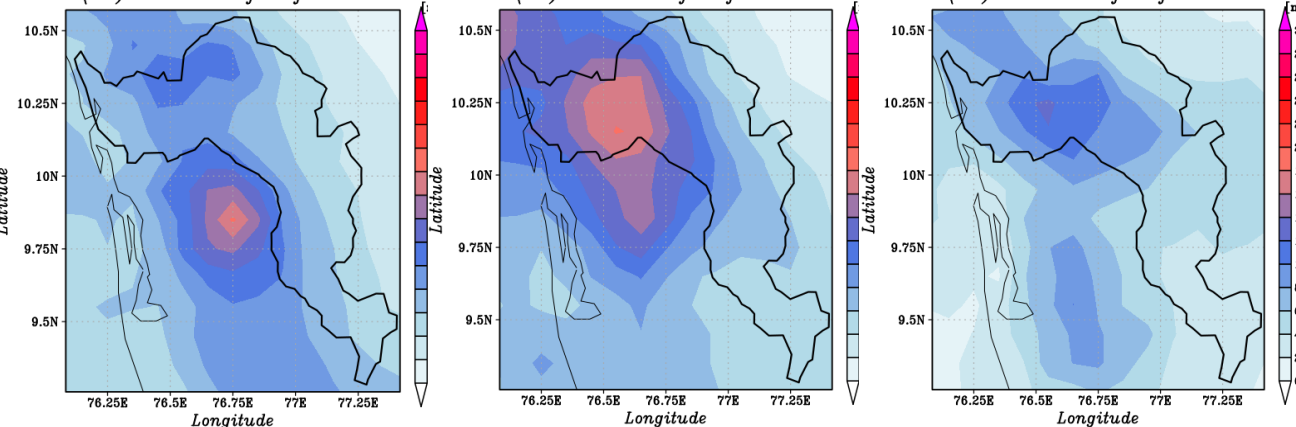
Aug 16

IMERGE 24hr. rainfall from 00Z14AUG2018 IMERGE 24hr. rainfall from 00Z15AUG2018 IMERGE 24hr. rainfall from 00Z16AUG2018

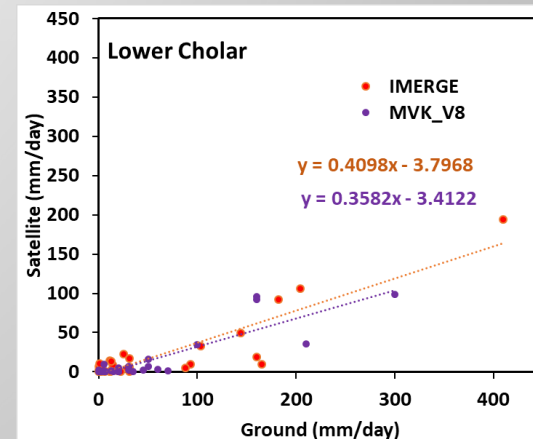
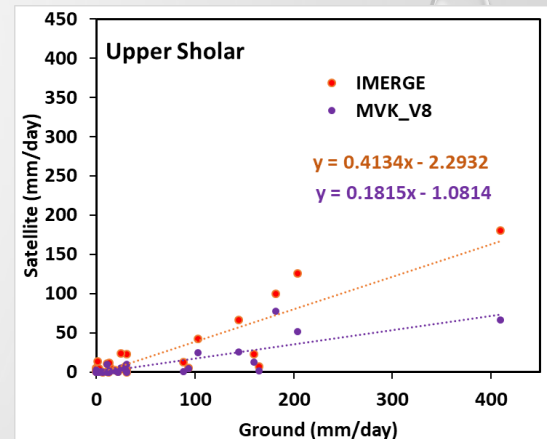


IMERG

AP-MVK(V8) 24hr. rainfall from 00Z14AUG2018 AP-MVK(V8) 24hr. rainfall from 00Z15AUG2018 AP-MVK(V8) 24hr. rainfall from 00Z16AUG2018

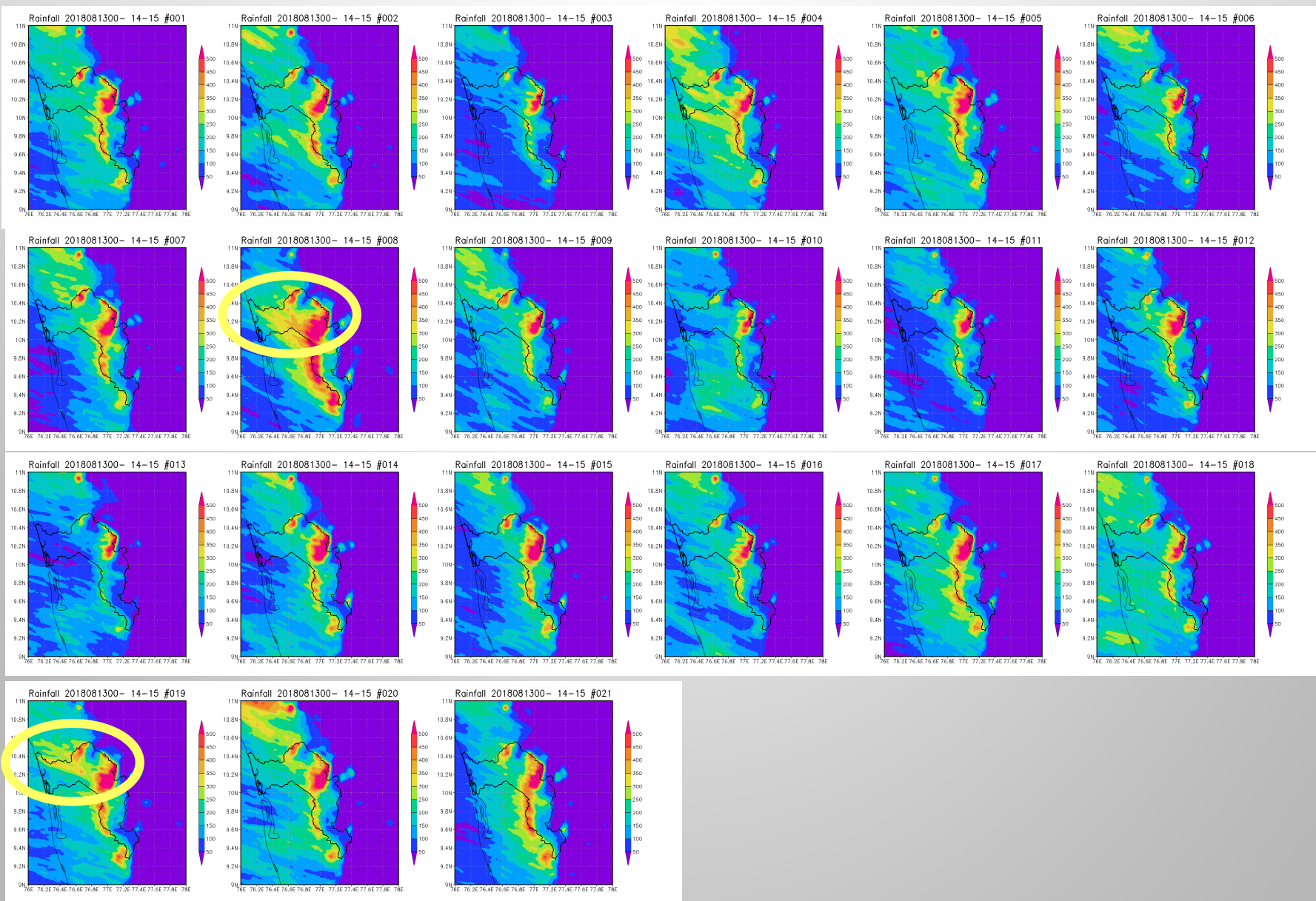


GSMaP



| Corr. Factor | Upper | Lower |
|--------------|-------|-------|
| IMERGE | 2.42 | 2.44 |
| MVK | 5.56 | 2.86 |

ACCUMULATED RAINFALL IN AUG.14-15 FORECAST FROM 13AUG.





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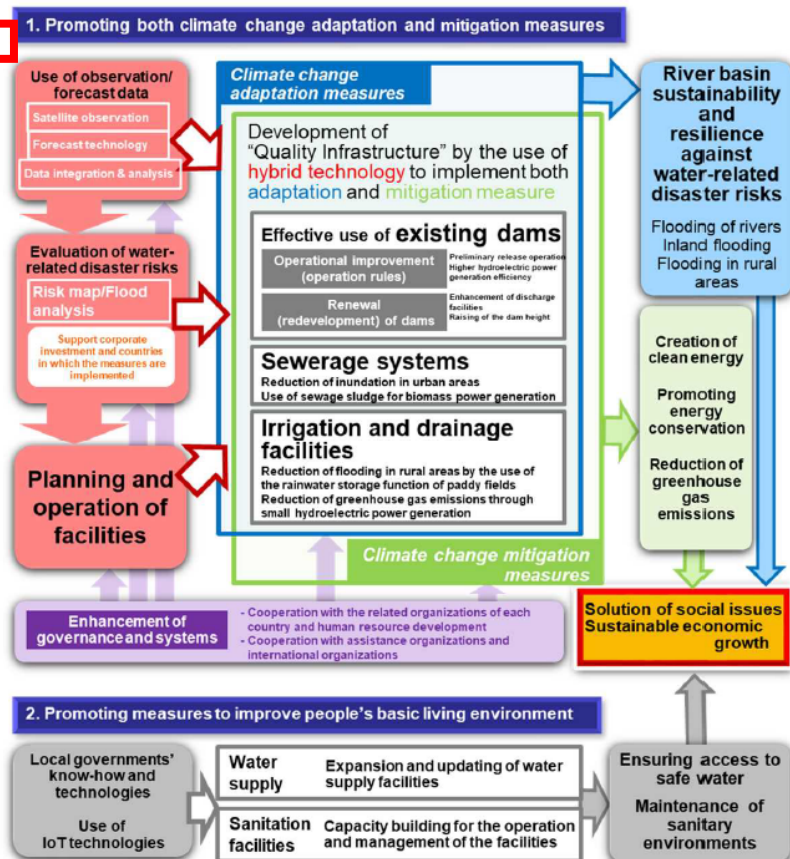
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