UNESCO Pakistan Flood Project
“Strategic Strengthening of Flood Warning and Management Capacity (Phase 2)”

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Takanori Miyoshi

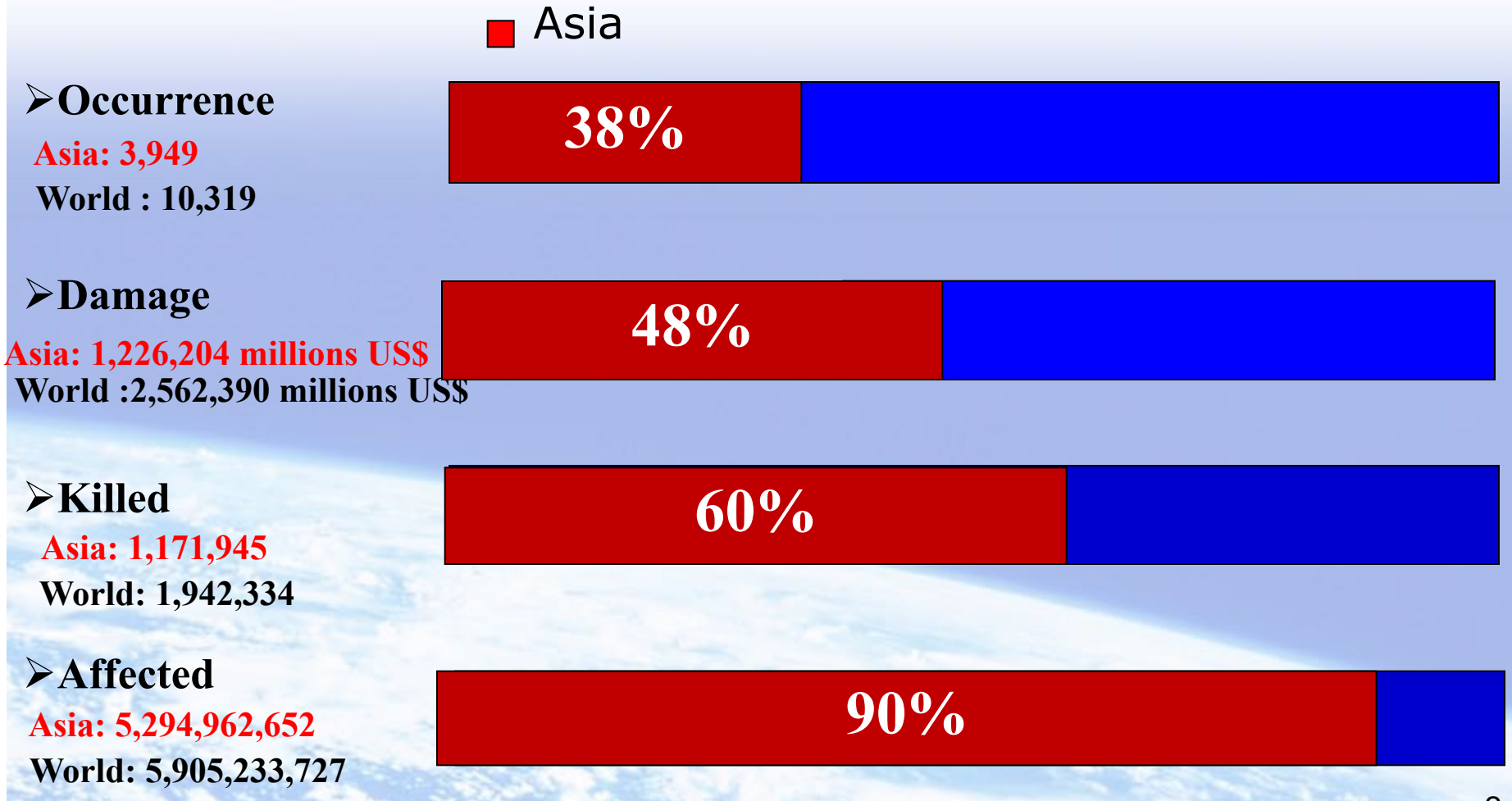
Satellite Applications and Operation Center (SAOC)
Japan Aerospace Exploration Agency (JAXA)

Background

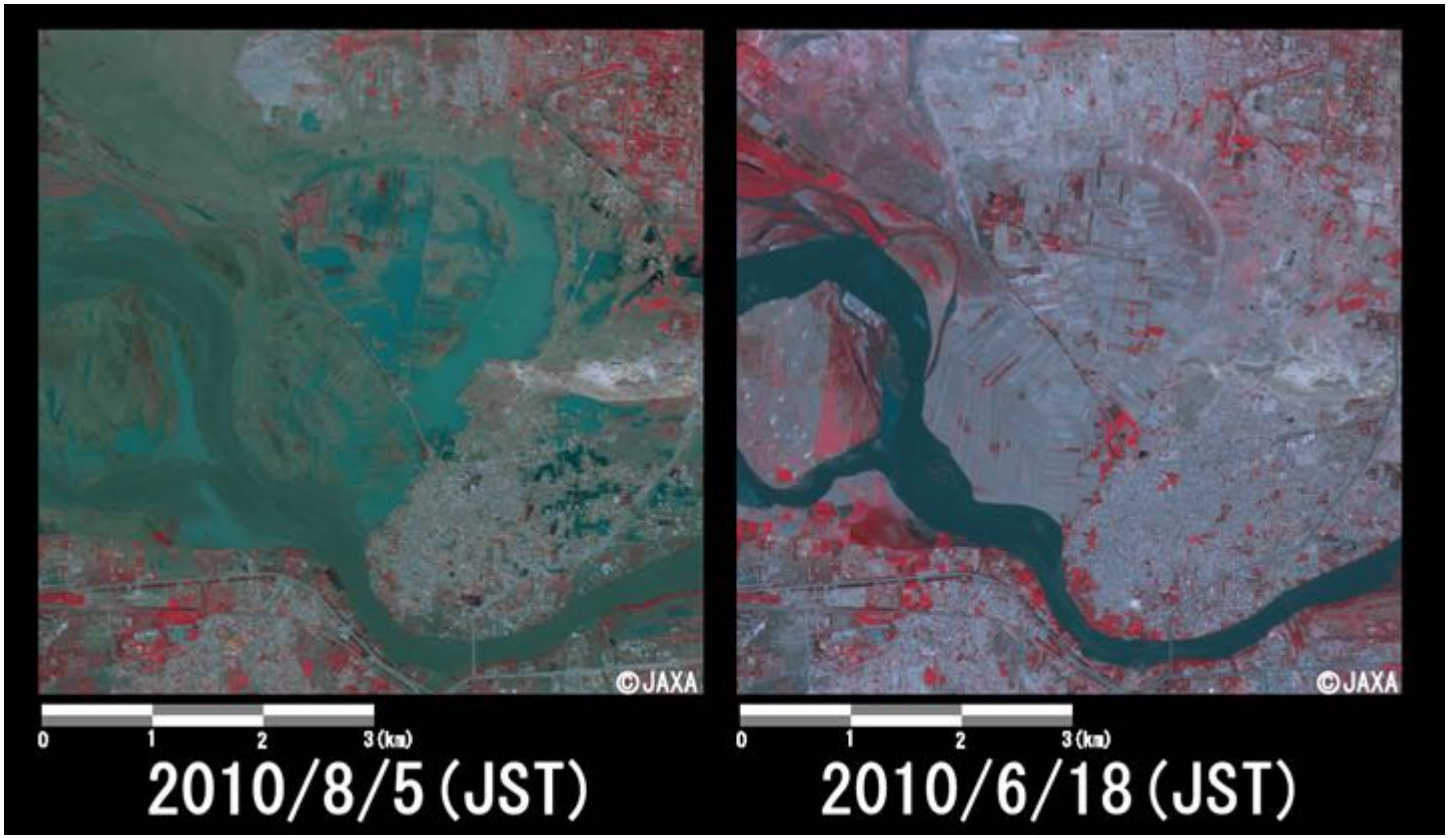
Asia and natural disasters

Asia has been seriously damaged by natural disasters over the last 30 years (1985-2014).

Source: 'ADRC-Natural Disasters Data Book 2014' originated in EM-DAT: The OFDA/CRED International Disaster Database – http://www.emdat.be/, Université Catholique de Louvain, Brussels (Belgium)



2010 Floods in Pakistan



Images of the swollen rivers in Nowshera District
(36 square kilometers, left: August 5, 2010; right: June 18, 2010)
Taken by AVNIR-2 onboard ALOS

- Began in late July 2010
- Caused by heavy monsoon rains
- Affected the Indus River basin in Pakistan
- Caused more than 1700 deaths
- Affected about 20 million people
- Property damages are estimated to amount more than $40 billion.

2010 Floods in Pakistan

Copyright: BBC

Had there been for

- **Information about heavy rains**
- **Hazard map for preparation and evacuation**
- **The flood warning and management capacity**

The damages might have been avoided or alleviated.

UNESCO Pakistan Project

UNESCO Pakistan flood project

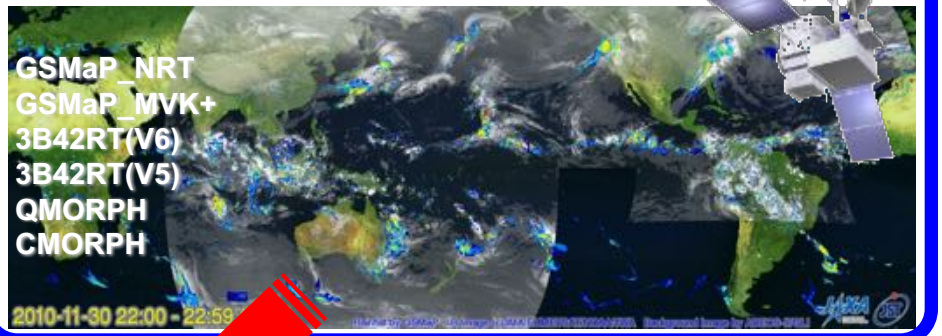
"Strategic Strengthening of Flood Warning and Management Capacity"

- **Funded by the Government of Japan (the Ministry of Foreign Affairs, the Japan International Cooperation Agency (JICA))**
- **Implementing Agency: UNESCO**
- **Partner Agencies: Pakistani agencies (Pakistan Meteorological Department (PMD), Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), Federal Flood Commission (FFC), Pakistan Water and Power Development Authority (WAPDA), National Disaster Management Authority Pakistan (NDMA)), International Centre for Water Hazard and Risk Management (ICHARM), and JAXA**
- **Main Activities:**
- **(a) flood early warning system development using ICHARM's Integrated Flood Analysis System (IFAS)**
- **(b) capacity-bulding in Pakistan to manage the floods**

Overview -Integrated Flood Analysis System (IFAS) - Flood forecasting system using satellite data

Global Geological data for modeling Elevation data, Land use data, etc.

Ground rainfall and Satellite-based rainfall



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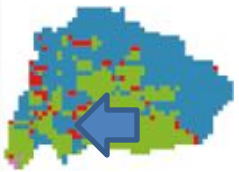
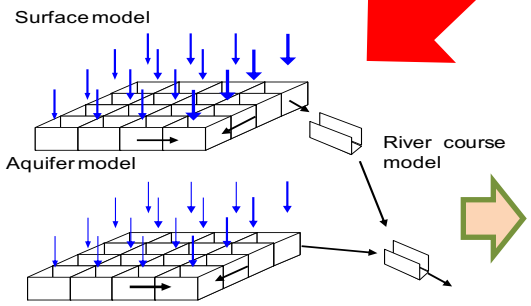
IFAS

Integrated Flood Analysis System

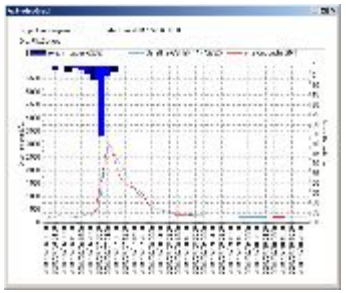
Model creation

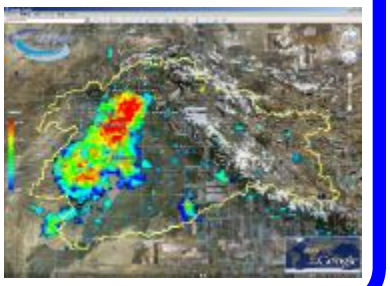


Run-off analysis



River discharge, Water level, Rainfall distribution





Calculation

Flow/water level

Flood forecasting/warning

Promoting safe evacuation

Reduce/Prevent flood damage

UNESCO Pakistan flood project

"Strategic Strengthening of Flood Warning and Management Capacity"

<Phase 1 (August 2011- September 2014)>

Achievements:

- **Practical model for flood forecast in upper Indus and Kabul river basin was established using GSMaP and IFAS**
- **Flood and inundation simulation lower Indus basis was developed with IFAS and RRI**

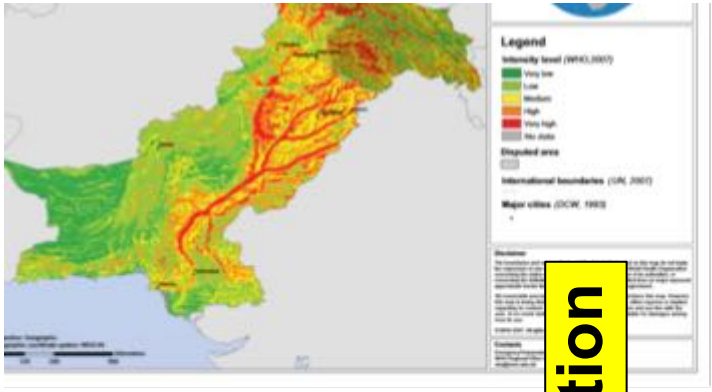
<Phase 2 (April 2015 – September 2018: current phase)>

Objectives:

- **To establish technical foundation for sustainable capacity development on the flood management, forecasting, early warning and flood hazard analysis in Pakistan agencies**
- **Technical studies to promote strengthening of cooperation with Indus river basin countries for transboundary flood management and data sharing**
- **Capacity-building and education to community on flood management for proper utilization of flood hazard information and tools**

JAXA's contribution to UNESCO Pakistan project

Flood Hazard Mapping using Space Based Technologies



http://reliefweb.int/sites/reliefweb.int/files/resources/FE18739F7107DEF285257773006EA67E-map.pdf

Contribution

Integration

LULC map

Database of historic events

River inventory

…and more

Including methodology development

GSMaP: Global Satellite Mapping of Precipitation

Developed for GPM (global precipitation measurement) mission.
High precipitation and high resolution global precipitation map by using multiple satellite-borne microwave radiometers.

TRMM PR/TMI
GPM DPR/GMI

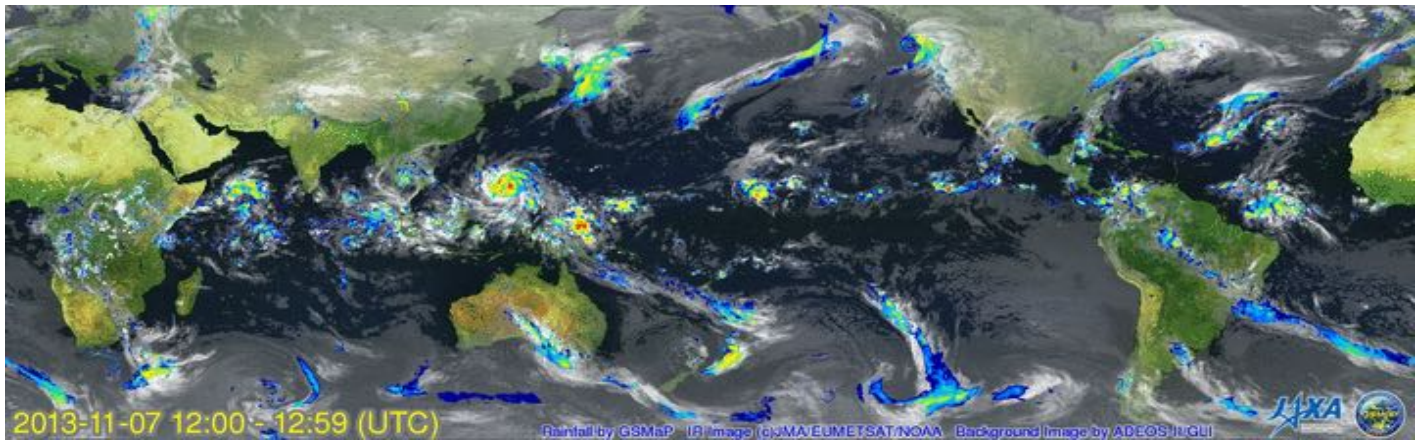
Aqua AMSR-E
GCOM-W AMSR2

DMSP
SSM/I, SSMIS

NOAA&MetOp
AMSU-A/MHS

Geostationary Satellite

Calculate cloud moving vectors



GSMaP rainfall in 0.1-deg grid and hourly

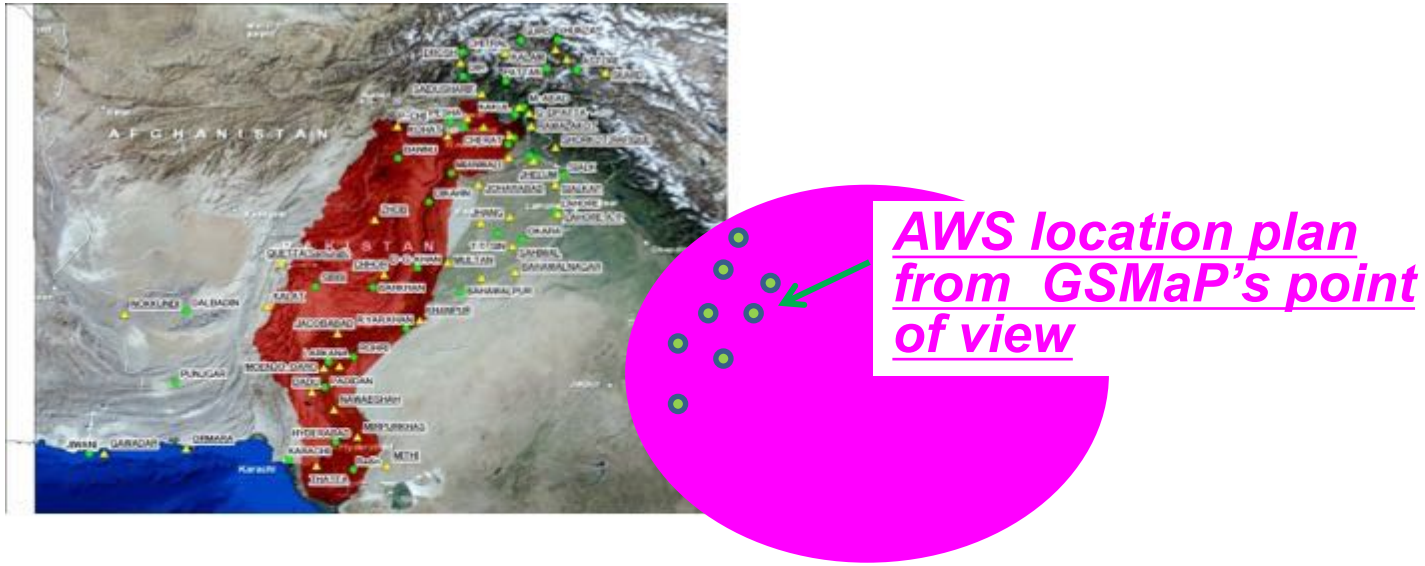
Real-time correction

- Location planning of PMD's new AWS

Aspect of efficient combination of ground and satellite observation

- Real-time connection to AWS network

Adding connection function to GSMaP-IF



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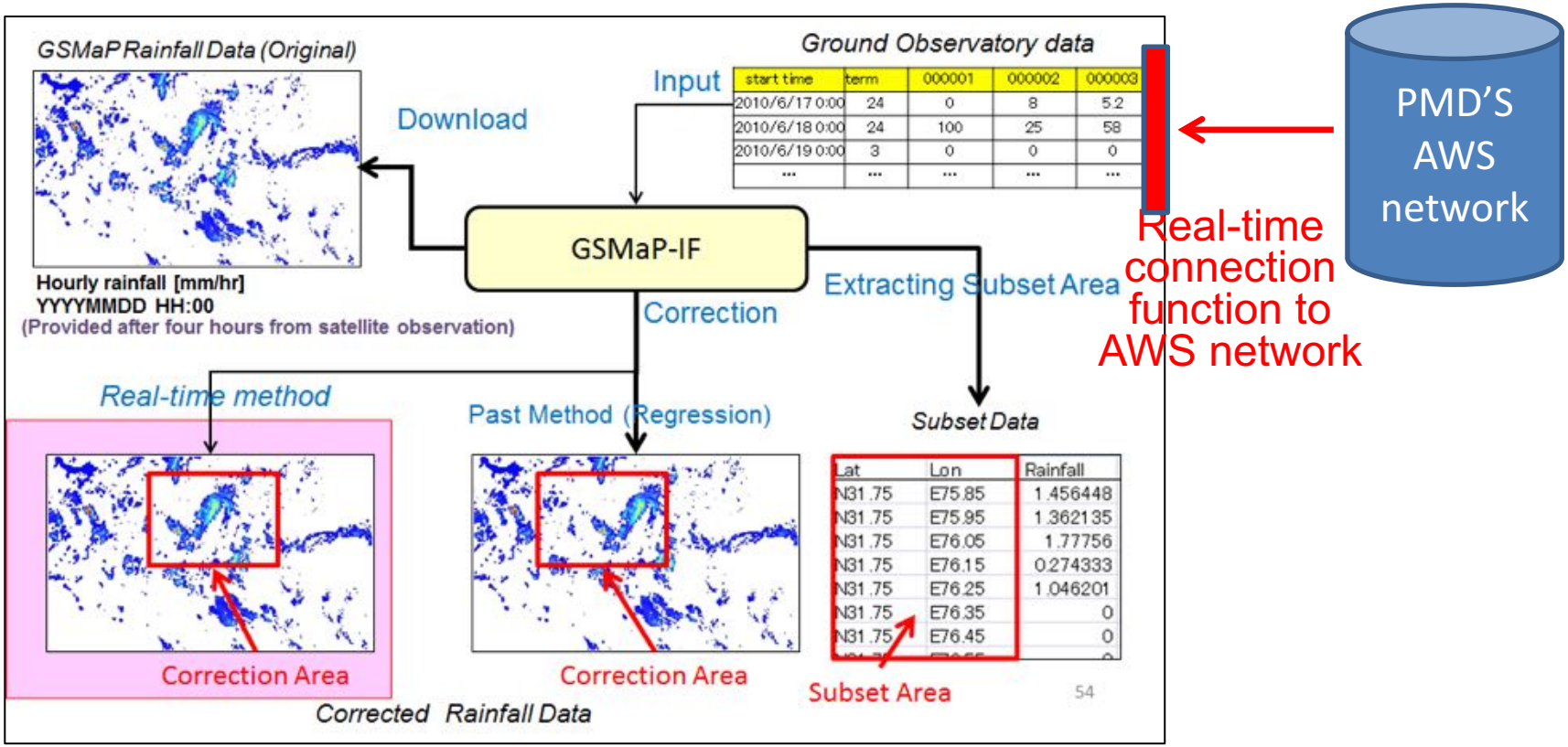

UNISPACE+50 thematic prioirities and the UNESCO Pakistan project

The year 2018 will mark the 50th anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space

7 Thematic priorities were approved by COPUOS in June 2016

Among the seven Thematic priorities (TPs), UNESCO project contributes significantly to TP 6 and TP.

(1) Global partnership in space exploration and innovation
(2) Legal regime of outer space and global space governance: current and future perspectives
(3) Enhanced information exchange on space objects and events
(4) International framework for space weather services
(5) Strengthened space cooperation for global health
(6) International cooperation towards low-emission and resilient societies
(7) Capacity-building for the 21st Century

Future plan

- Further upgrading of the IF software to improve the accuracy of GSMaP.
- Capacity-building for local authorities to effectively utilize the flood monitoring and warning system
- International Workshop (in 2018, place to be determined)

Those who are interested in this project are welcome to attend the workshop.

Those who are interested in contributing to this project are more than welcome!

Thank you!