Earth Observations to Enhance MRC Flood and Drought Services:

Riverine Flood Forecasting (GPM-BICO and CHIRPS-GEFS)
Flash flood decision support system (Rainstorm tracker and Mekong X-Ray)
Reservoir Monitoring and Water Resource Management (RAT-Mekong)
Mekong Drought and Crop Watch (MDCW)
Introduction: SERVIR-Mekong

https://servir.adpc.net/
Supporting Better Riverine Flood Forecasting in the Mekong Countries

### GPM-IMERG

<table>
<thead>
<tr>
<th>Product</th>
<th>Spatial Res.</th>
<th>Temporal Res.</th>
<th>Lead Time</th>
<th>Latency</th>
</tr>
</thead>
<tbody>
<tr>
<td>GFAS</td>
<td>25 km.</td>
<td>Daily</td>
<td>7 days forecast</td>
<td>1 day</td>
</tr>
<tr>
<td>CHIRPS-GEFS</td>
<td>5 km.</td>
<td>Daily</td>
<td>Daily, 5 days, 10 day and 15 days forecast</td>
<td>1 day</td>
</tr>
</tbody>
</table>

**Forecast precipitation**
Supporting Better Riverine Flood Forecasting in the Mekong Countries

**SHORT RIVERINE FORECAST**

- **GPM IMERG-E**
- **HYDROmet**
- Daily Rain gauges

**Bias correction tool for GPM**

**GPM-BICO**

**NRT Rainfall Bias corrected**

**MRC-FEWS**

**GEFS**

**CHIRPS-GEFS**

**MEDIUM RIVERINE FORECAST**

- Bias corrected rainfall forecast
- **CHIRPS-GEFS 0.05 res (15/10 days)**

Bias-corrected and downscaled version of NCEP Global Ensemble Forecast System precipitation forecasts.

Improve the accuracy and lead time from 7 days to 15 days
Improving the Flash Flood Guidance System

Operational rainstorm monitoring tool for severity assessment in near and real-time

multidimensional flash flood vulnerability framework for critical infrastructure assessment
To a better decision-making process on flash flood early warnings

1. Better understanding of the extreme weather process
2. Better evaluation of the flash flood potential index
3. Better decision-making process on flash flood response
Enhancing Reservoir Monitoring and Water Resource Management of the Mekong River Basin

Monitoring of Reservoirs
- Limited in-situ data
- Spatiotemporal inconsistency
- Data-sharing policy

48% alteration of rivers
Predicted to increase to 93% (Grill et al., 2015)
How Earth Observation helps to monitor reservoir extent changed

Biswas et al. 2021
Mekong Drought and Crop Watch (MDCW) System

This integrated web-based information system is intended to:

- Improve the operational, technological, and institutional capabilities to prepare for and respond to droughts in the Lower Mekong region;
- Support local decision-makers in drought monitoring, analysis, and forecasting;
- Provide policy makers and growers with current and forecast drought and crop yield to facilitate decision-making within the current growing season.

More convenient access to data products

- 5km resolution products
  - Daily/Weekly
- 500m res. EO-based drought indicators integrated

Country-wise drought summary in the text mode

- Climatological drought Risk Levels, Possible Observe Conditions and impacts, etc. for different drought categories

Upgraded interactive map visualizer featured with map comparisons, flexible timeseries generation, area filtering, etc.

Climate scenario-based drought related products for long-term planning and decision making

Customized weekly drought report generation
Use Cases and Capacity Developments

- **MRC:** Improving Drought Information System
- **VAWR:** Drought Bulletin for Ninh Thuan and Binh Dinh provinces/Improving Water Resources Information System
- **FAO Laos:** Improving Laos Climate Services for Agriculture (LaCSA) Platform
- **WFP:** Improving PRISM Platform
- **PDC:** Improving DisasterAWARE Platform
- **FAO:** Developing a Regional Drought Risk Management Program

Highlighting the collaboration with SERVIR-Mekong and use of RDCYS/MDCW products for drought monitoring and forecasting by MRC in their “Drought Management Strategy for the LMB 2020-2025”. (Page 47)
THANK YOU