



**12th REGIONAL
STAKEHOLDER FORUM**

29 June 2022, Bangkok, Thailand

ASEAN Disaster Monitoring and Response System (DMRS) and MRC Flood and Drought Forecasting

Operational Linkage

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Present use case

AHA Centre Disaster Monitoring and Analysis Workflow



Monitoring and Analysis

Collecting information from NDMO, AMS geological and meteorological agencies; Monitoring hazards through DMRS and AMS websites; Analysis for any potential threat/impact to the region



Coordination

Maintain coordination and communication with ASEAN Member States' National Disaster Management Organisations' focal persons and related agencies and the ASEAN Emergency Response and Assessment Team



Recording and Updating



Maintenance of the ASEAN Disaster Information Network (ADINet) through recording and updating of disaster records using verified information from official sources

Information Dissemination



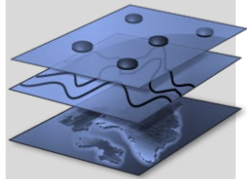
Disseminate information products and bulletins within AHA Centre for the EOC Alert Level and the units' corresponding course of action; to the AHA Centre Network (ASEC, ASEAN-SG, ACDM/AHA Centre GB), partners, donors, subscribers, etc.



Present use case

AHA Centre usage of MRC Data (Working Linkage)

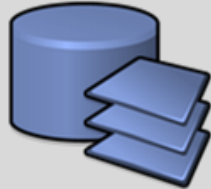
DATA



MRC API (JSON) into spatial attribute table

process raw data (shapefile, geodatabase, web map service, etc.) through GIS (ArcGIS)

LOCAL DATABASE



Input Data to Virtual Machine server (test) then publish MXD

Copy data (geodatabase) to TEST ArcGIS Server Machine and publish MXD to TEST ArcGIS Server

SERVER



Input Data to Virtual Machine server (prod) then publish MXD

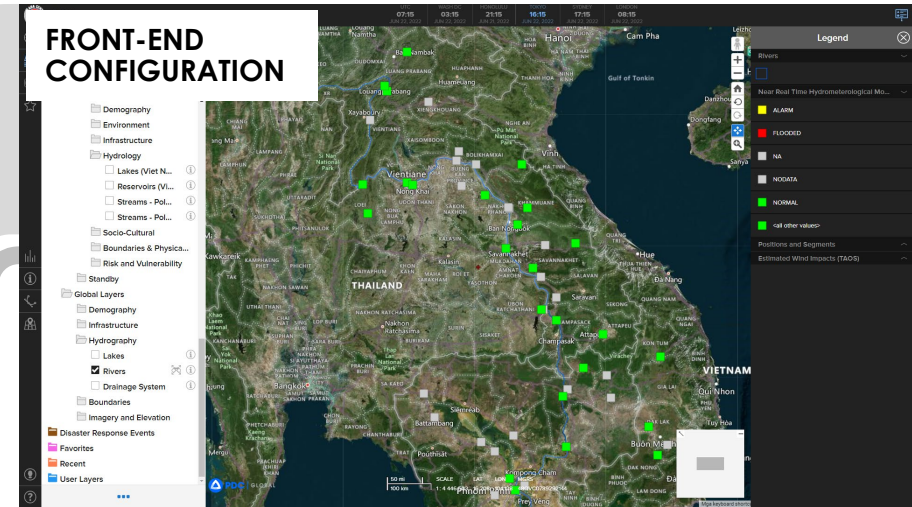
Copy data (geodatabase) to PROD ArcGIS Server Machine and publish MXD to PROD ArcGIS Server

BACK-END CONFIGURATION



Configure Layer Details

Configure Map Service via PROD Command Post



DISASTER MONITORING AND ANALYSIS

Proof of concept: MRC Near Real-time Hydrometeorological Monitoring Stations as a working layer in ASEAN DMRS*

*Main > Observations and Forecasts > Surface > Mekong River Commission > Near Real-time Hydrometeorological Monitoring Stations

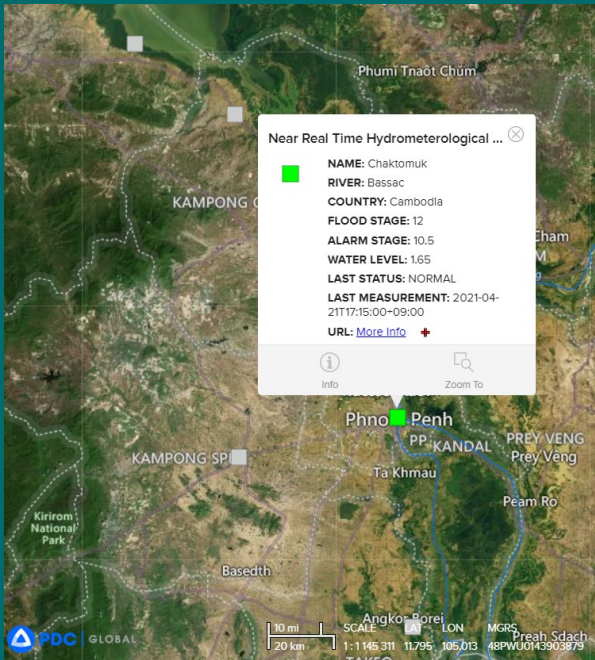


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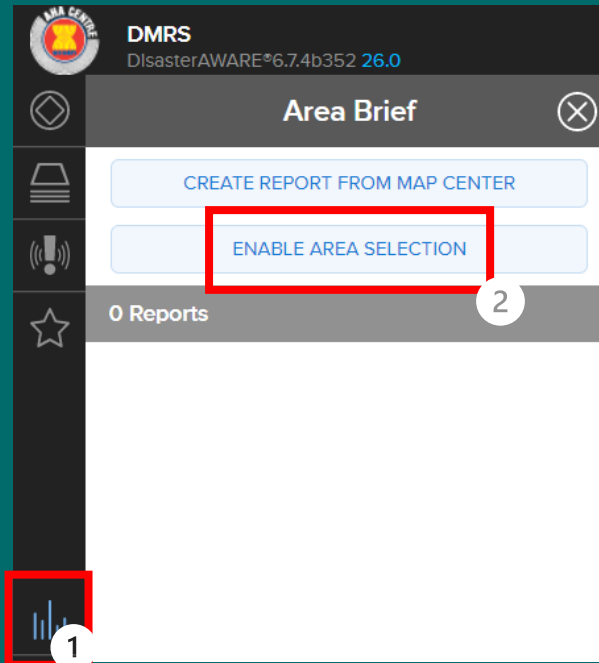
Present use case

AHA Centre usage of MRC Data (Current)

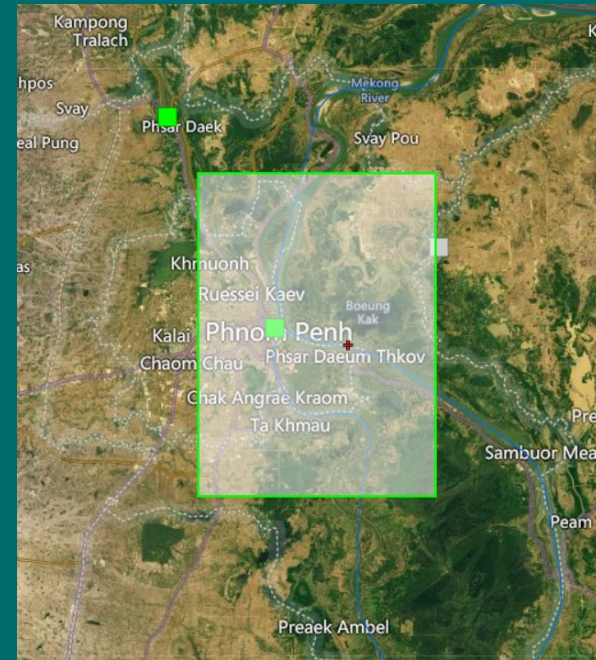
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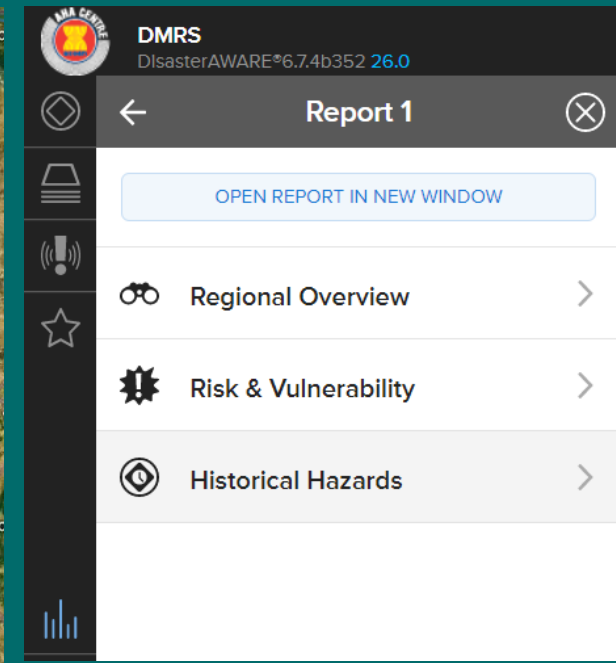
2



3



4



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Present use case

5

AHA Centre usage of MRC Data (Current)

6

Pacific Disaster Center
Area Brief: DisasterAWARE Pro
Executive Summary

HONOLULU 21:44:07 21 Jun 2022
WASH.D.C. 03:44:07 22 Jun 2022
ZULU 07:44:07 22 Jun 2022
NAIROBI 10:44:07 22 Jun 2022
BANGKOK 14:44:07 22 Jun 2022
PHNOM PENH 14:44:07 22 Jun 2022

Region Selected » Lower Left Latitude/Longitude: 11.35° N, 104.95° E
Upper Right Latitude/Longitude: 11.72° N, 105.13° E

Print Page Download PDF

Legend
Population Density (person/sqkm)
0 170,000

Regional Overview Risk & Vulnerability Bio/Health Historical Hazards

Population Data:
2011
Total: 1,589,465
Max Density: 54,020(ppi/km²)

Populated Areas:
Phnom Penh - 500,000 to 999,999

Source: iSciences

Impact/Potential Impact Assessment Matrix*

Severity	Impact/Potential Impact**					DMRS Alert Level			
	People	Assets	Displaced	Extent	NDMO directive	Info	Advisory	Watch	Warning
MINOR	100-30,000 affected	20-4,000 households	1,000 IDP	1 adm bdr level 2/3	Declared as a disaster by NDMO/local authority	Info	Advisory	Watch	Warning
MODERATE	30,000-200,000 affected	4,000-20,000 households	1,000-10,000 IDP	1 adm bdr level 2	Declared as a disaster by NDMO/local or regional authority	Info	Advisory	Watch	Warning
MAJOR	200,000-1,500,000 affected	20,000-200,000 households	10,000-100,000 IDP	1 adm bdr level 1	Declared as a disaster by NDMO/regional or national authority	Info	Advisory	Watch	Warning
CATASTROPHIC	>1,500,000 affected	>200,000 households	>100,000 IDP	More than 1 adm bdr level 1	Declaration of a national state of calamity	Info	Advisory	Watch	Warning

EOC Alert Level

* Impact/Potential impact assessment matrix is representative/for visual purposes only. This is not the actual process.

** Impact/Potential impact is based on the AHA Centre DMA Guidelines v4 of 2018



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Layers

TREE SEARCH BACKGROUNDS EDIT

Layers

- Mekong Drought and Crop Watch (SERVIR)
 - Regional Hydrological Extreme Assess...
 - Baseflow (mm/day)
 - Combined Drought Index (CDI)
 - Rainfall (mm)
 - Average Surface Temperature (C)
 - Drought Severity (%)
 - Dry Spell Events
 - Evapotranspiration (mm)
 - Potential Evapotranspiration (PE...)
 - Relative Humidity (%)
 - Root Zone Soil Moisture (mm)
 - Soil Moisture (mm)
 - Soil Moisture Deficit Index (SMDI)
 - Soil Temperature (C)
 - Standard Precipitation Index (1 ...)
 - Standard Precipitation Index (3 ...)
 - Standard Runoff Index (1 Month)
 - Standard Runoff Index (3 Month)
 - Surface Runoff (mm)
 - Satellite-Based (EO) Drought Indices
 - Mekong River Commission (MRC)
 - Near Real Time Hydrometerolo...
 - Surface Air Temperature



Legend

- Rivers
- Near Real Time Hydrometerological Mo...
 - ALARM
 - FLOODED
 - NA
 - NODATA
 - NORMAL
 - <all other values>
- Positions and Segments
- Estimated Wind Impacts (TAOS)
- PDC Active Hazards

Near Real Time Hydrometerological ...

- NAME: Chaktomuk
- RIVER: Bassac
- COUNTRY: Cambodia
- FLOOD STAGE: 12
- ALARM STAGE: 10.5
- WATER LEVEL: 3.74
- LAST STATUS: NORMAL
- LAST MEASUREMENT: 2022-06-29T23:30:00+09:00
- URL: [More Info](#)



50 mi SCALE 1:4 499 437

LAT 14.102 LON 104.264 MGRS 48PVA2057959183G



Future Use Case

Drought Early Warning System

Addressing the difficulty in detecting & recording droughts

Since the inception of the ASEAN Disaster Information Network (ADINet) there has only been 54 recorded instances/events of drought accounting for 1.51% of all disasters recorded in the ASEAN region.

Challenges

- Regionally-accepted and agreed upon drought indicators (observation-based i.e., EO data; impact-based i.e., crop loss)
- Due to the temporal and spatial extent of drought events (clear demarcation of the start but unclear demarcation of the end which could take months or even years (National Climatic Data Center, 2014))

Opportunities

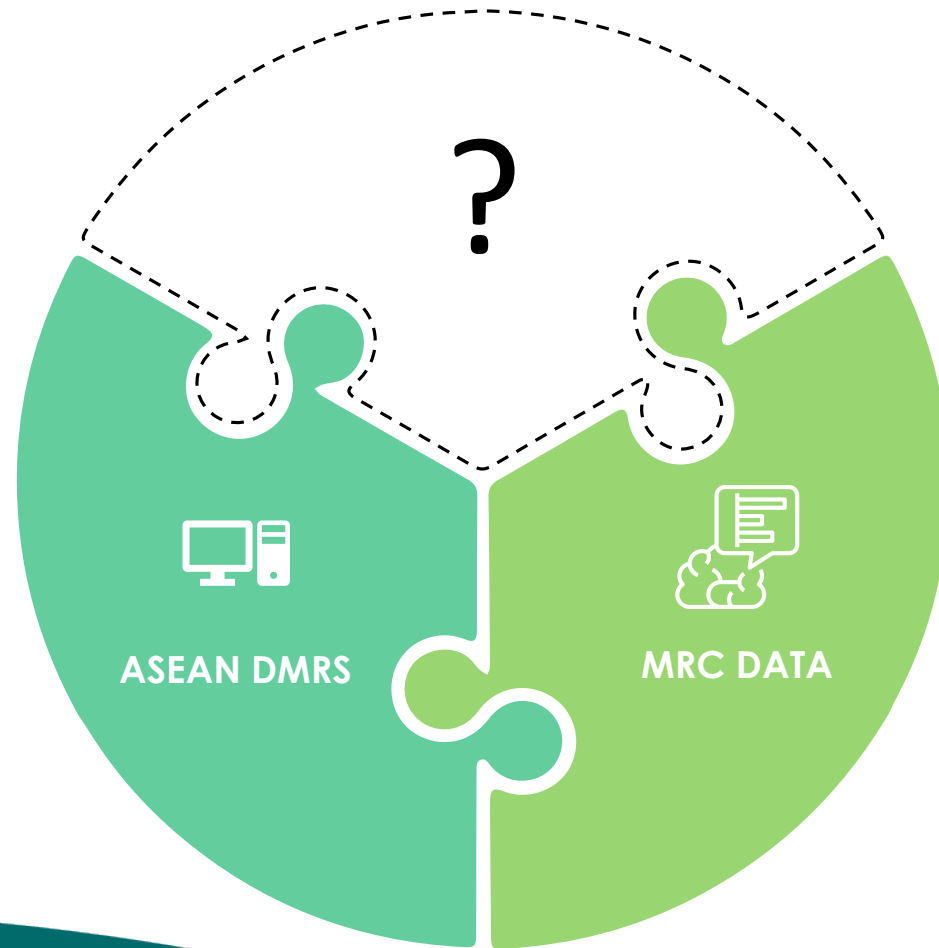
- Drought forecast of MRC as a source of official information in the regional disaster monitoring (technical merit)



Potential Collaboration in Forecasting

ASEAN Disaster Monitoring and Response System

Ability of the system to analyse baseline data to produce exposure and potential impact information as a form of decision support system

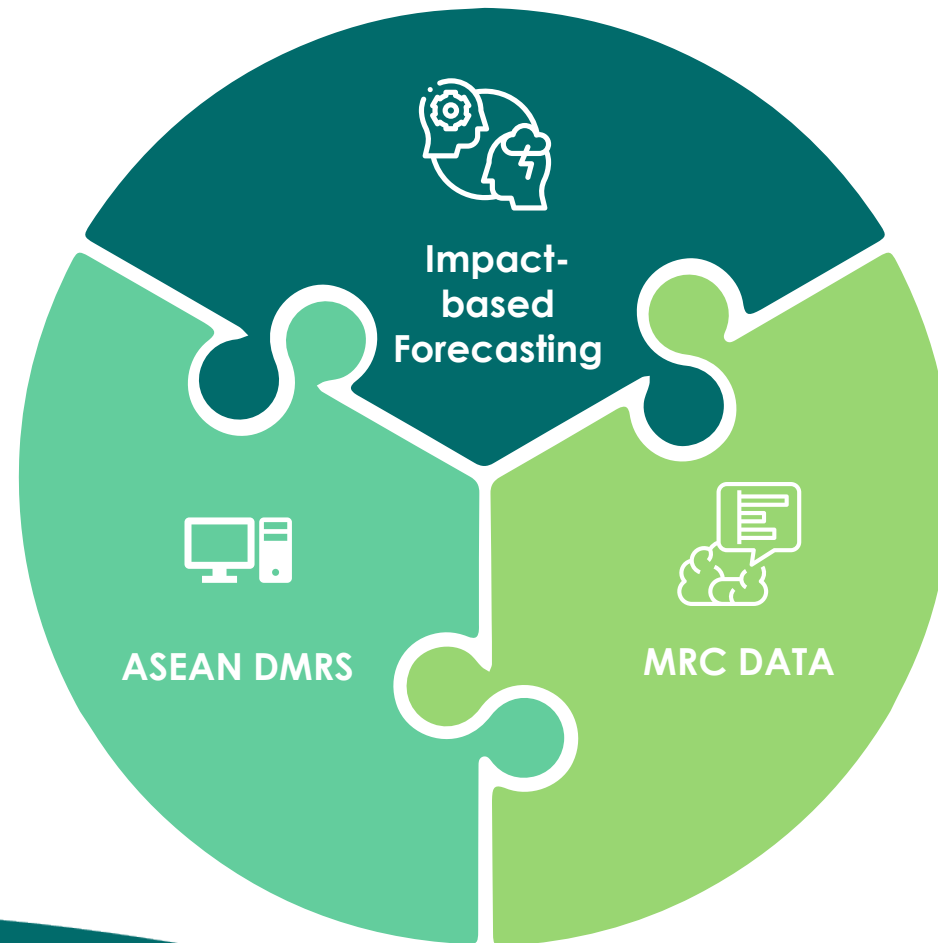


MRC Data and Local Expert Knowledge

The technical capacity and capability of MRC with the Mekong Drought and Crop Watch (SERVIR), Regional Hydrological Extreme Assessment (RHEAS) – Drought Indices, Satellite-based (EO) Drought Indices, and Mekong River Commission (MRC) Near Real-time Hydrometeorological Monitoring Stations.



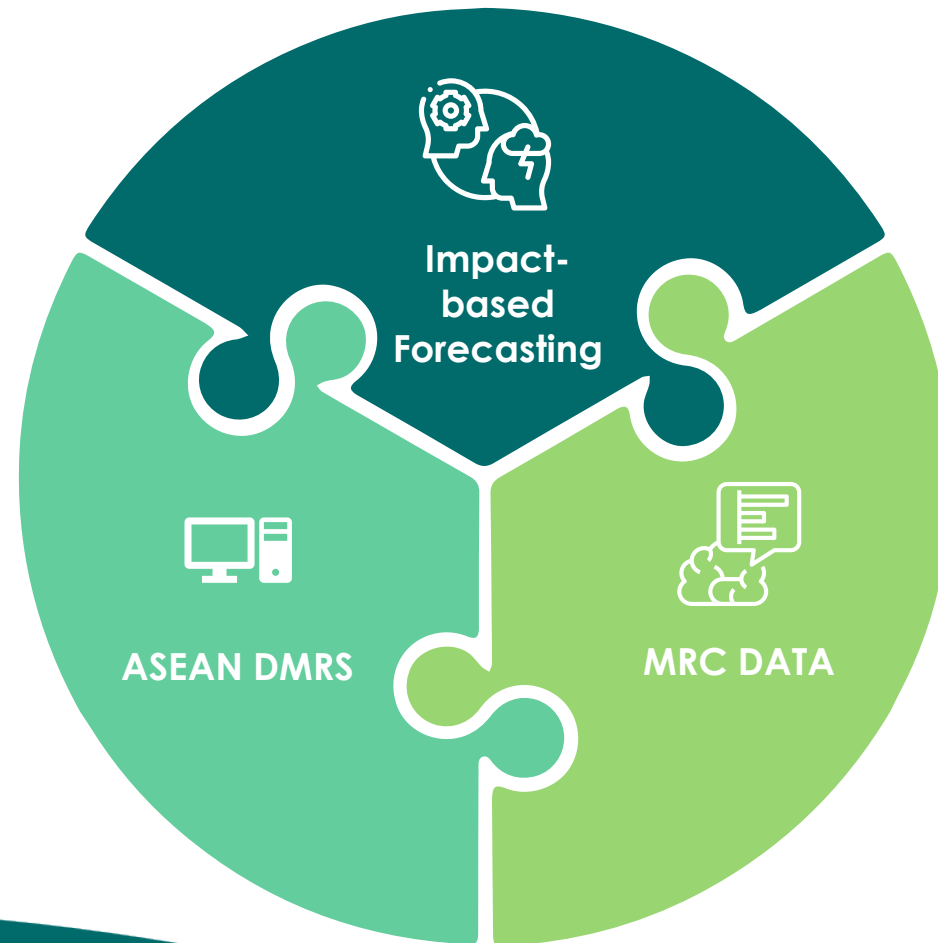
Impact-based Forecasting and Warning Services (IBFWS)



“...a structured approach for combining hazard, exposure, and vulnerability data to identify risk and support decision-making, with the ultimate objective of encouraging early action that reduces damages and loss of life from natural hazards.” (UNESCAP, 2021)

“Successful impact-based forecasting requires **collaboration with others who have the additional necessary expertise, resources and knowledge** to deliver impact services.” (WMO, 2015)

Impact-based
Forecasting
and Warning
Services
(IBFWS)



Moving from: “What the hazard will be” i.e., river water level at 10 metres

Towards: “What the hazard will do” + “Where” i.e., current river water level will flood communities in the Mekong Flood Basin in Phnom Penh in the next 24 hours.



Key Points



- The ASEAN DMRS and MRC Tools are evidently **compatible and can complement each other**. AHA Centre has the platform and MRC has the technical capacity and capability. Positively speaking, there is potential in streamlining our operational linkage and further contributing to the reduction of disaster losses in ASEAN.
- The **opportunity to collaborate and develop a regional drought early warning system** has manifested itself. Connecting the experts in ASEAN for knowledge sharing shall shine light on demarcating clearer, more advanced, and more accessible approaches in tackling drought in the region.
- Impact-based forecasting bridges the hazard experts to the disaster management professionals to the vulnerable population. **Making technical forecasts more accessible** communicably is truly a promising area of collaboration considering that disasters impact everyone but unequally affects everyone.

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29 June 2022, Bangkok, Thailand

THANK YOU

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