LAUNCHING CEREMONY OF THE
MRC-LMC WATER CENTER JOINT STUDY

# JOINT STUDY

## Changing Patterns of Hydrological Conditions of the Lancang-Mekong River Basin and Adaptation Strategies

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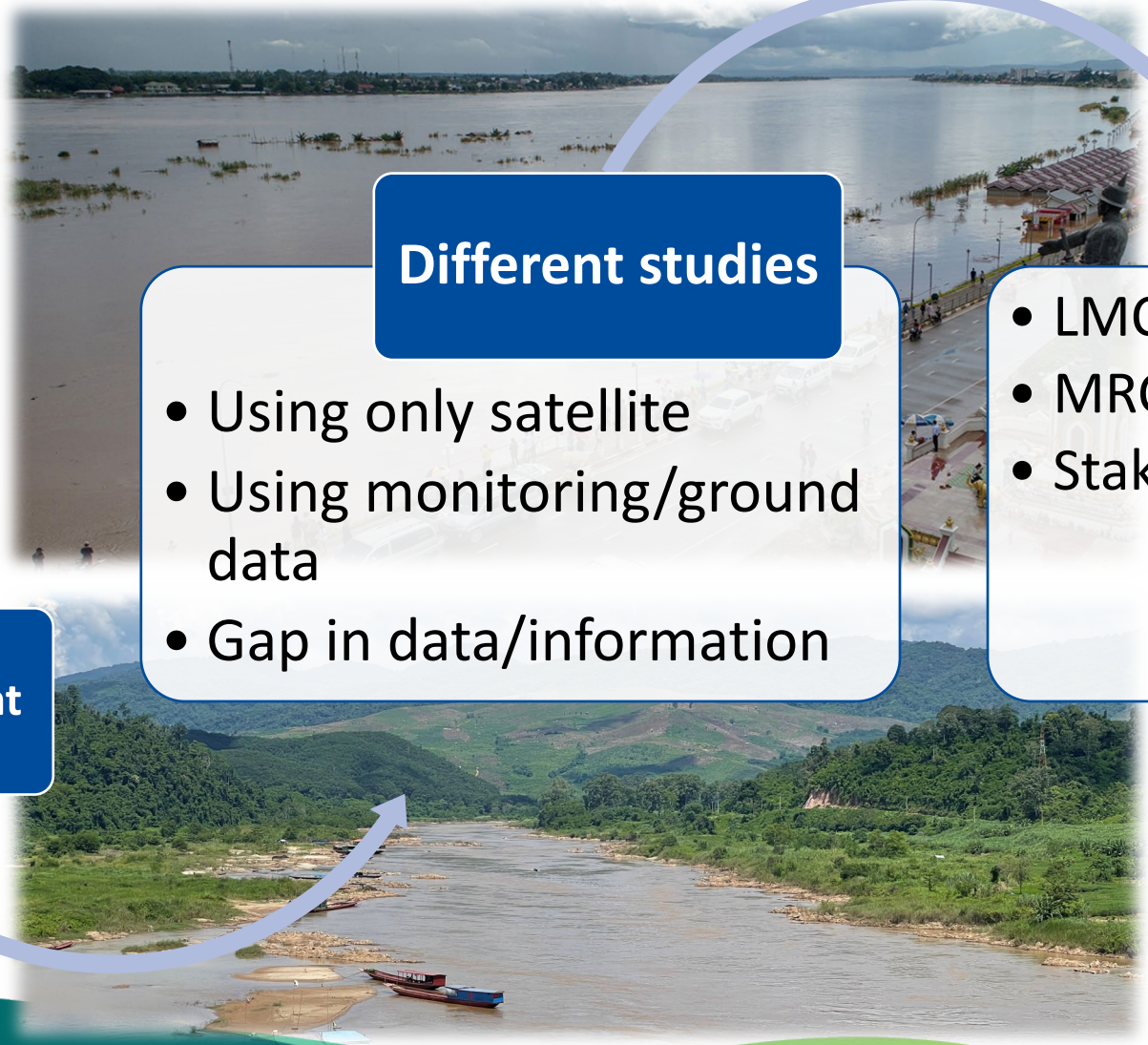
# WHAT IS THE JOINT STUDY?

# What is the Joint Study?

- Floods
- Droughts
- Critical and variable flows

**Public, media… pointing to different sources**



**Different studies**

- Using only satellite
- Using monitoring/ground data
- Gap in data/information

- LMC Water Center
- MRC
- Stakeholders

**Joint Study**

# What is the Joint Study?

Provide a better understanding on changing patterns of hydrological conditions

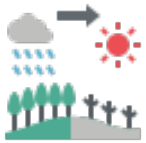
Provide adaptation strategies for hydrological changes

Advise all the riparian countries of potential strategies to mitigate basin-wide flood and drought risks

# What is the Joint Study?

## Component 1

- Historical changes in the hydrological conditions
- The causes of these changes



## Component 2

Future trends of the hydrological conditions under climate change and water resources development

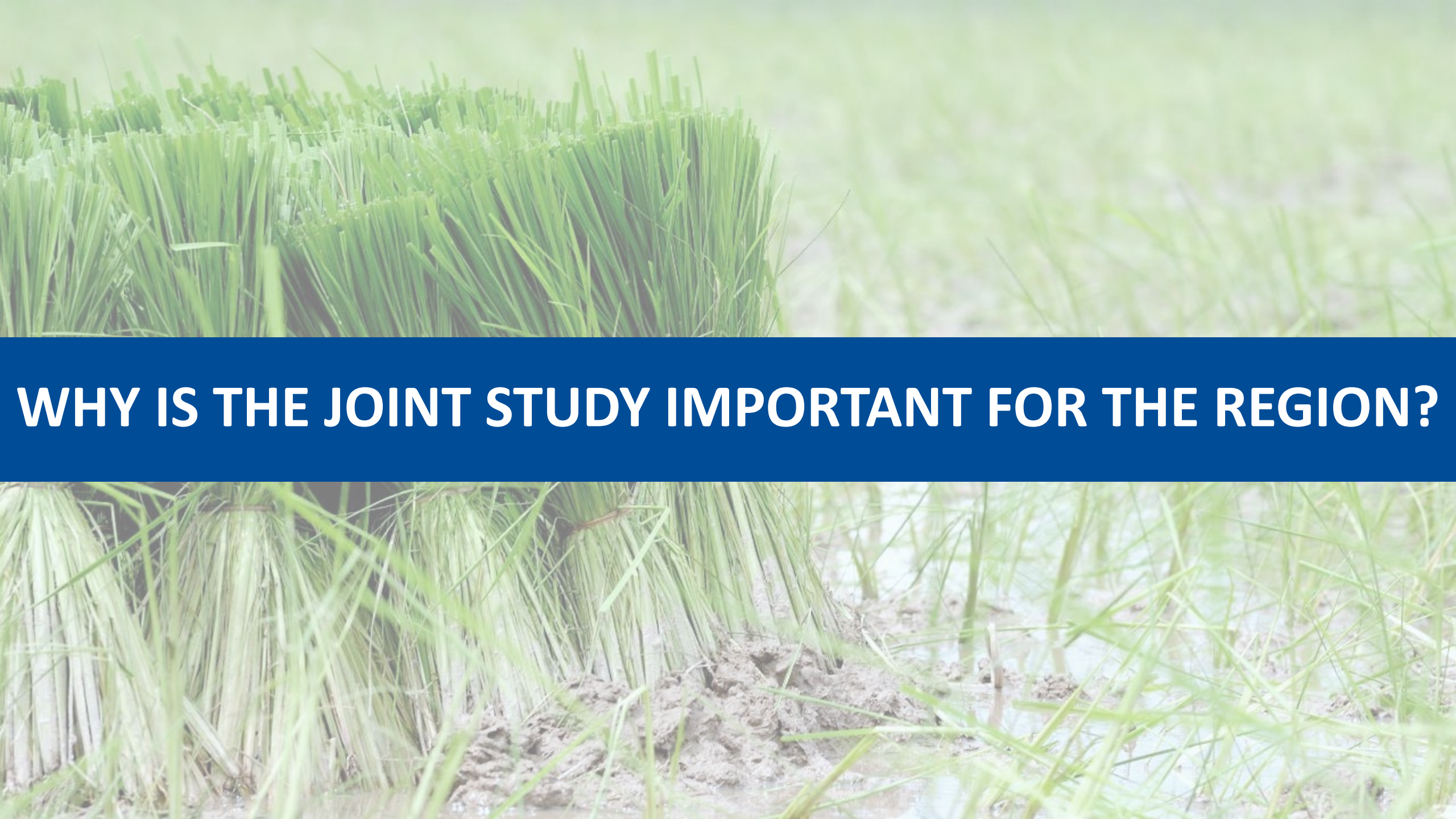
## Component 3

Adaptation strategies for the changing hydrological conditions for sustainable management and development of the LMRB

PHASE 1 (2022)

PHASE 02 (2023-2024)

**Hydrological characteristics: Natural runoff composition, Flood and drought, Reverse flow to the Tonle Sap Lake.**



# WHY IS THE JOINT STUDY IMPORTANT FOR THE REGION?

# Why is the Joint Study important for the region?

To provide recommendations for **joint actions** at river basin and country levels, which can alleviate the impacts of floods and droughts.

To **respond better to flood and drought risks** across the river basin exacerbated by climate change.

# To improve people's wellbeing in the LMRB

To propose short-, middle- and long-term **adaptation strategies** including solutions from structural and non-structural measures.

To adapt to these changing hydrological conditions.

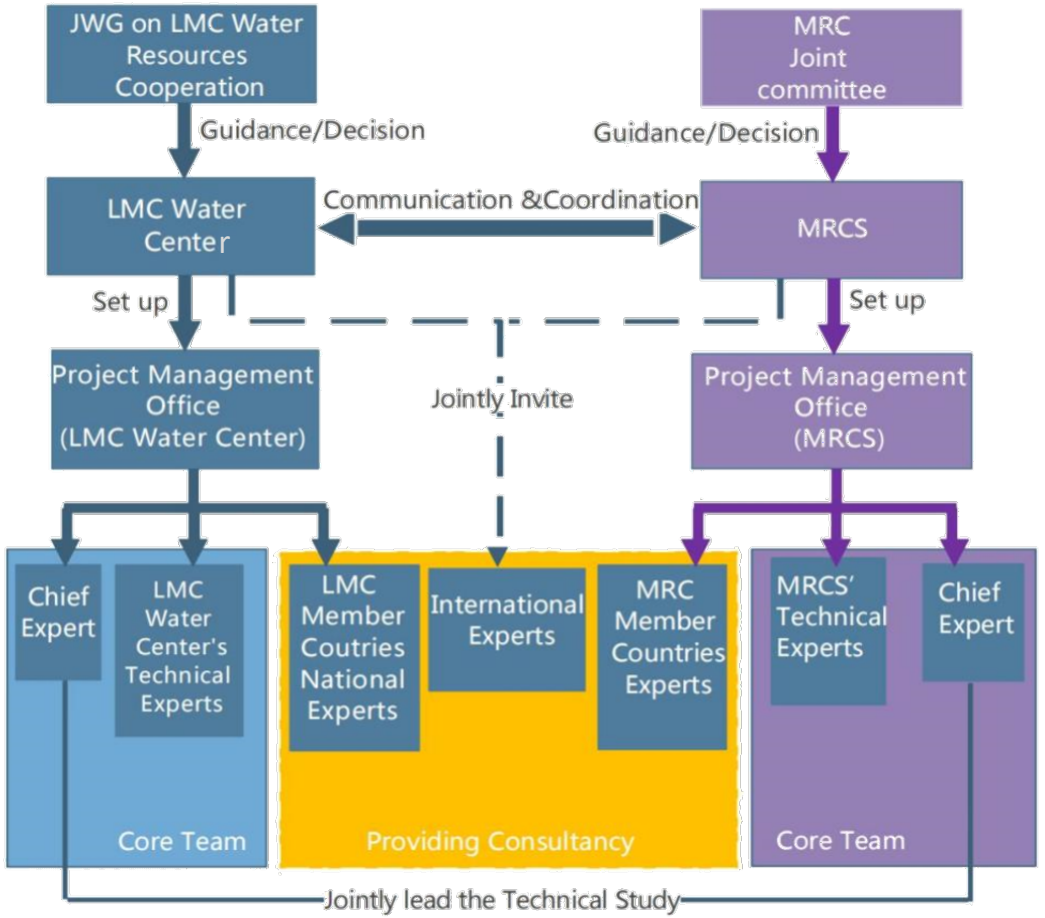
To **enhance upstream-downstream cooperation**.

To **enhance better sharing of data**, timely notifications, and opportunities for **coordination of existing water infrastructures**.

# WHO ARE INVOLVED IN THE JOINT STUDY?

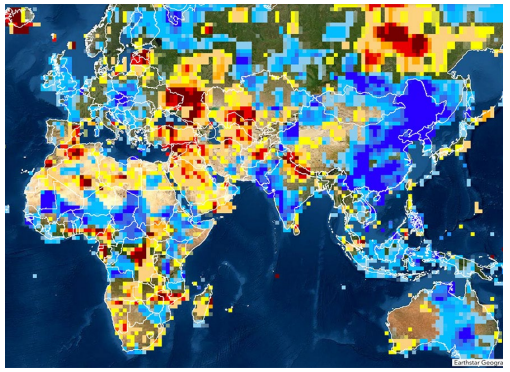
# Who are involved in the Joint Study?

- **Steering Committee:** LMC JWG and MRC JC
- **Project Management Team:** LMC Water Center and MRCS
- **Technical Study Team:** LMC Water Center and MRCS Co-chief experts and technical experts
- **National Working Groups and national experts:** Six countries



# WHAT DATA & APPROACHES ARE BEING USED?

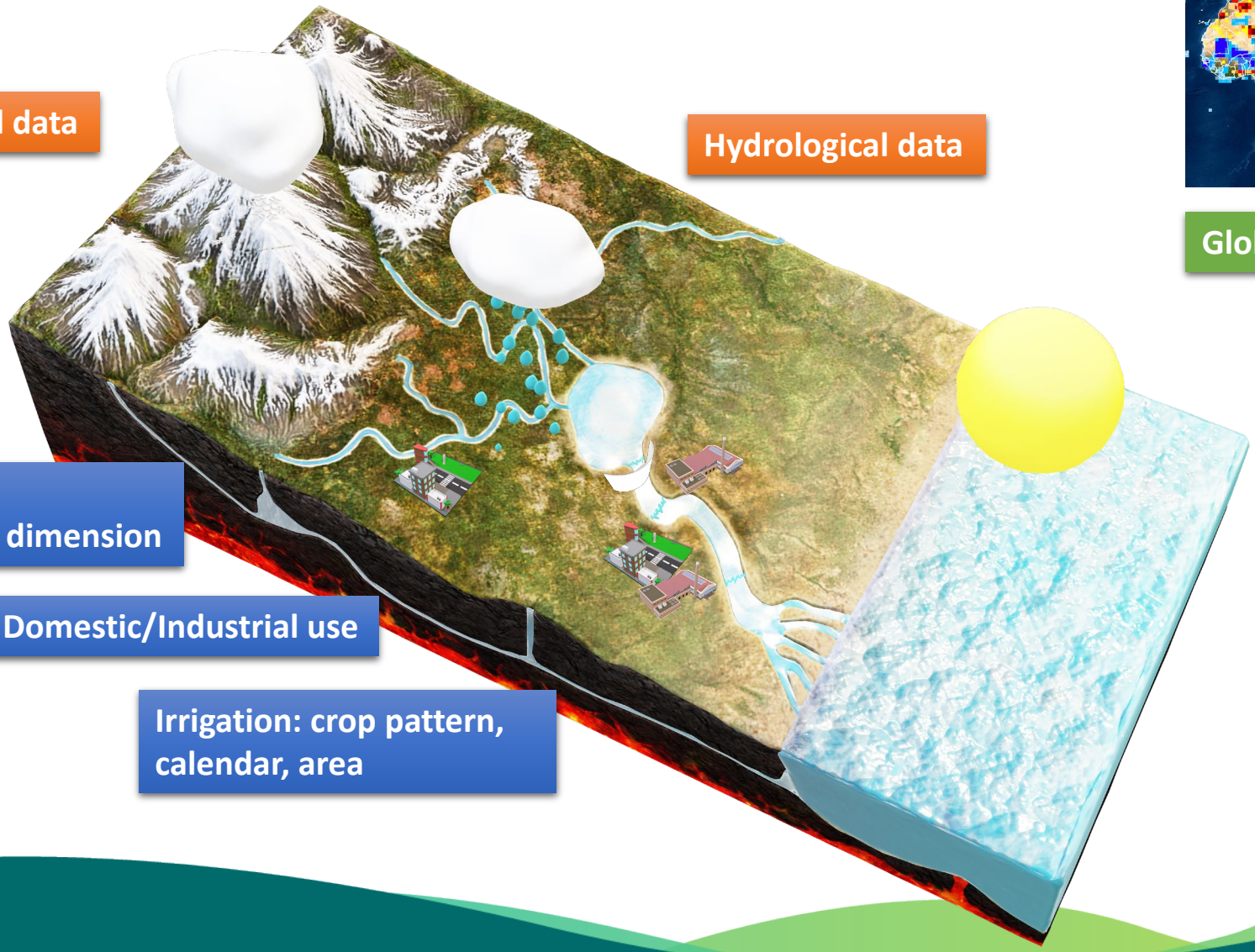
# What data are being used?



Global reanalysis dataset

Meteorological data

Hydrological data

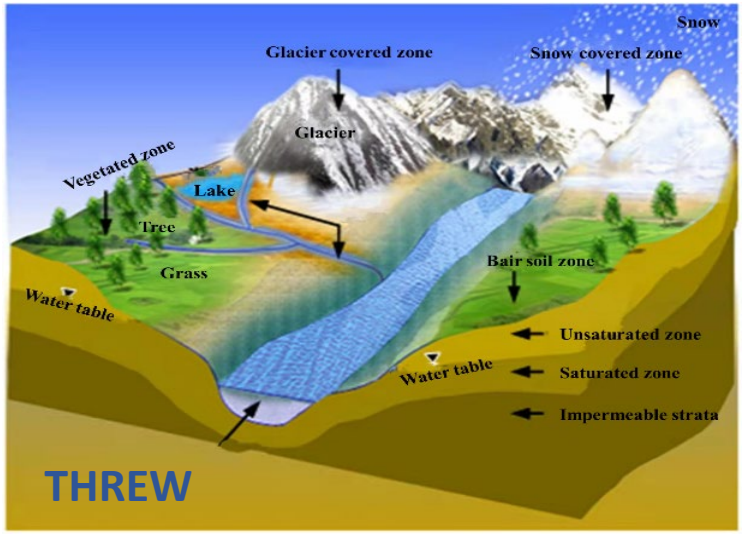


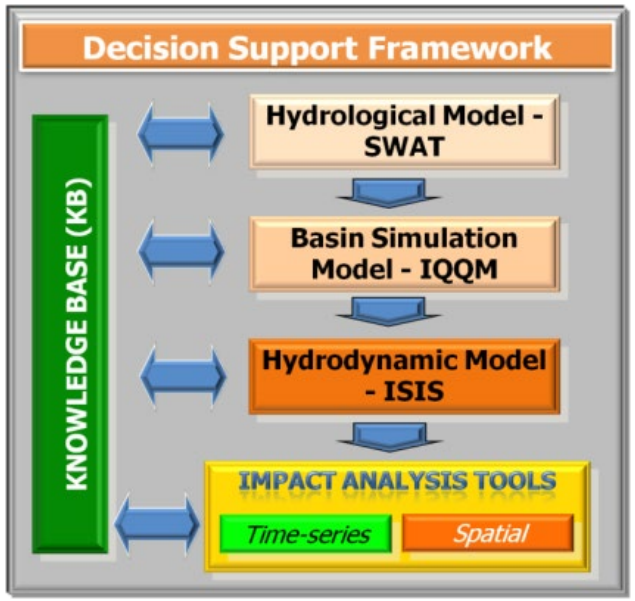
Hydropower:
storage volume, dimension

Domestic/Industrial use

Irrigation: crop pattern, calendar, area

# What approaches and models are being used?



**SPI* and SPEI**** for analysis of meteorological drought indices

**THREW**, **SWAT** and **Source** are proposed to cover *hydrological modelling* and *water system simulation*.

**Hydrodynamic model** either iSIS or Delft3D or both will be further explored in the implementation of Phase 2 (2023-2024).

* Standard Precipitation Index (SPI)

** Standard Precipitation-Evaporation Index (SPEI).

# WHAT ARE THE EXPECTED KEY DELIVERABLES?

# What are the expected key deliverables?

1

TECHNICAL REPORT FOR PHASE 1

- **Historical changes** of the hydrological conditions
- **Causes of changes**
- Preliminary recommendations about **short-term adaptation strategies**, such as enhanced sharing of data, better/timely notifications, and opportunities for coordination of existing water infrastructure.

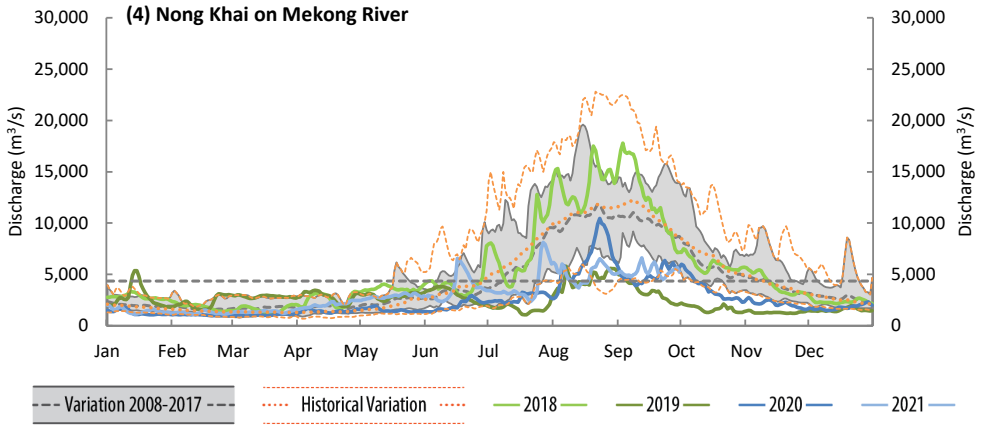
2

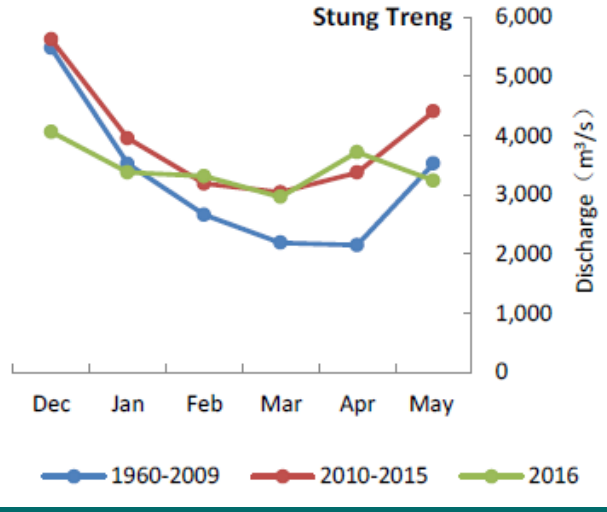
TECHNICAL REPORT FOR PHASE 2

- **Future trends** of the hydrological conditions
- **Middle- and long-term adaptation strategies**.

# What are the expected key deliverables?

## Jointly Design – many ways to present changing patterns of hydrological conditions using hydrographs, tables and maps…



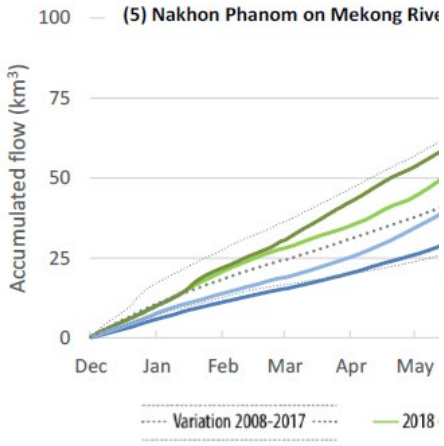
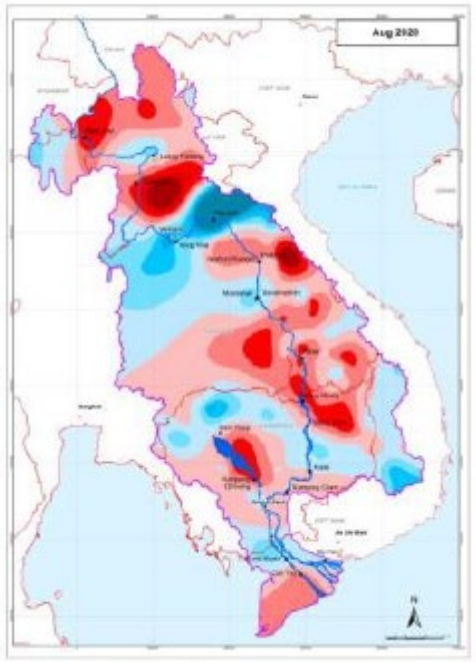
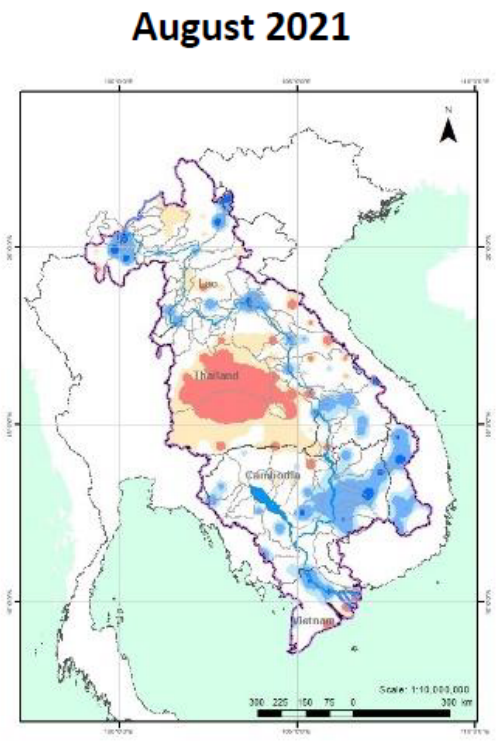




**Table 6.** Summary of accumulated reverse flows to the Tonle Sap Lake for 2008-2021.

| Year | | | | Reverse flows (km³) | Change (km³/day) |
|---|---|---|---|---|---|
| 2008 | | | | 35.51 | 0.26 L* |
| 2009 | | | | 37.66 | 0.27 |
| 2010 | | | | 29.40 | 0.28 |
| 2011 | | | | 52.36 H** | |
| 2012 | | | | 33.29 | |
| 2013 | | | | 38.28 H* | |
| 2014 | | | | 36.31 | |
| 2015 | | | | 24.06 L* | |
| 2016 | | | | 26.94 | |
| 2017 | | | | 27.28 | |
| 2018 | | | | 46.12 H** | |
| 2019 | | | | 31.46 | |
| 2020 | | | | 18.85 L** | |
| 2021 | | | | 16.50 L** | |
| Mean | 12 Jun | 28 Sep | 109 | 32.43 | |
| Min | 16 May | 20 Aug | 84 | 16.50 | |
| Max | 10 Jul | 26 Oct | 138 | 52.36 | |



# What are the expected key deliverables?

**Joint Success:** Promotion of the recommendation of the Joint Study and taking immediate actions.

**'Share Knowledge Platform'**
where data, information, models and knowledge can be exchanged to address basin-wide flood and drought risks

**Mutual commitment:** Collective objectives and benefits of the results of the Joint Study. Active participation in the analysis of trends, cause and impact.

**Trust:** Transparency and clear communication. A trustful relationship increases ownership of the results and recommendation of the Joint Study.

# WHAT ARE THE NEXT STEPS?

# What are the next steps?

***Implementation of Component 1 for 2022***

**Jan-Mar 2022**
Selecting required data/information and tools/models building

01

**Mar/May 2022**
Revising the inception report

**June 2022**
Project Launching

02

**Jun-Sep 2022**
Model development and joint analysis and exchange

**Sep-Oct 2022**
Writing technical Phase 1 report

03

**Nov 2022**
Consultation with experts

**Dec 2022**
Sharing periodic outcomes of the joint research report

04

**Dec 2022**
Disseminating technical report through Multi-Stakeholder Workshop

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# *THANK YOU*