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

Joint Study
- LMC Water Center
- MRC
- Stakeholders
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?
To improve people’s wellbeing in the LMRB

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 enhance upstream-downstream cooperation.

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

To adapt to these changing hydrological conditions.

Why is the Joint Study important for the region?

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

- Meteorological data
- Hydrological data
- Global reanalysis dataset

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...


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<thead>
<tr>
<th>Year</th>
<th>Reverse flows (km³)</th>
<th>Change (km³/day)</th>
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<td>0.26 **</td>
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<tr>
<td>2009</td>
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<td>29.40</td>
<td>0.28</td>
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<tr>
<td>2011</td>
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<tr>
<td>2012</td>
<td>33.29</td>
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</tr>
<tr>
<td>2013</td>
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<td>2015</td>
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August 2021

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**

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

2. **June 2022**
   - Project Launching

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

4. **Dec 2022**
   - Sharing periodic outcomes of the joint research report

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

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

- **Nov 2022**
  - Consultation with experts

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