Mekong River Commission
For Sustainable Development

TERMS OF REFERENCE

1. CONSULTANCY SUMMARY

Title:	**Riparian Hydrology Expert as Project Officer (PO1)**
Consultancy Type:	Service Contract (SC) (full time, 21.75 days/month)
Division:	Technical Support Division (TD)
Duration:	12 months from Oct 2021 to Sep 2022 (can be extended and subject to the availability of funds)
Duty Station:	Regional Flood and Drought Management Centre (RFDMC)
Reporting to:	TD Director and Head of RFDMC
Expected Deliverables:	Methods/ models/ tools for 1- and 3-6 months flood and drought forecast, an analysis of extreme weather events and climate variability, project reports, user manuals, operational procedures

2. INTRODUCTION AND BACKGROUND

The Mekong River Commission (MRC) was established by the 1995 Agreement on Cooperation for the Sustainable Development of the Mekong River Basin, between the governments of Cambodia, Laos, Thailand, and Viet Nam. The Mission of MRC is: "to promote and coordinate sustainable management and development of water and related resources for the countries' mutual benefit and the people's well-being by implementing strategic programmes and activities and providing scientific information and policy advice."

The MRC Secretariat (MRCS) is the operational arm of the MRC. It provides technical and administrative services to the Joint Committee and the Council to achieve the MRC's mission.

The TD of the MRCS is in charge of managing the implementation of various projects and to provide technical support to the MRC Member Countries (MCs) on Hydrological River Modelling, Database Management and Information Systems, Modelling and Assessment, GIS and Remote Sensing Applications, Flood and Drought Monitoring and Forecasting, and importantly the implementation of the MRC procedures.

The RFDMC as core part of the TD performs daily, weekly, and monthly flood and drought monitoring and forecasting services, and provides early warning information including state emergencies to the four MCs for flood and drought management and preparedness.

The Government of Japan through its Official Development Assistance (ODA) has committed to support the MRC-RFDMC to enhance the institutional and technical capability of the RFDMC, enhancing the flood and drought monitoring and forecasting systems, improving the dissemination of information, warnings and alerts, and upgrading the operational room in line with modern and international good practices and thereby facilitating the integration of flood and drought management at the MRC's RFDMC in Phnom Penh, Cambodia.

According to the proposed Project Implementation Plan the Japan-ODA funded project on flood and drought management will be implemented from 2021 to 2024 and is divided in (Part 1) "Development of new operational tools for broadening flood & drought forecasting & monitoring products & services; analysis of extreme weather events & climate variability in the LMB" and (Part 2) "MRC Drought Management Strategy 2020-2025 Project for operation of drought forecasting and early warning, and formulation of Drought Adaptation Guideline for the LMB".

Part 1 of the project is divided into six Development Component (DC1 – 6):
DC1: Monthly flood & drought forecast
DC2: 3- 6 months flood & drought forecast/ outlook
DC3: Flood extent and flood depth mapping
DC4: Analysis of extreme weather events and climate variability
DC5: Experimental flood & drought website pages, operations room facilities, warning & alerts dissemination through mobile phone, social media systems
DC6: Facilitation of management support to RFDMC for flood component implementation

For the management of Part 1 of the ODA funded project, two Project Officers (PO1 and PO2) will be hired.

3. OBJECTIVES OF THE CONSULTANCY

The Project Officer (PO1) requested in this ToR will be responsible for the daily management of DC1, DC2, and DC4 delivering new methods/ models/ tools for 1 and 3-6 months flood and drought forecasting and an analysis of extreme weather events and climate variability in the Lower Mekong Basin (LMB). The PO1 will take lead of tasks in close cooperation with the MRC TD and the RFDMC in particular, a pre-selected partner organization (PAOR) and other external experts.

4. EXPECTED RESULTS

The DC1 and DC2 are two of the 'key' results of the ODA funded project, addressing new flood & drought tools for the RFDMC. DC1 will provide a one-month flood and drought forecast that may provide farmers more particularly in timing agricultural activities (planting, seeding and harvesting). DC2 develops a 3-6-months weather/ climate forecast/ outlook to serve for both flood and drought purposes.

- The 1-month flood forecast (DC1) could be developed by running the existing hydrologic model of the RFDMC for river flood forecasting with monthly rainfall forecasts from climate models or introducing a new hydrological model to the Centre. Other options could be based on climate indices application or statistic methods using historical data or statistic methods as ARIMA-models (Auto-Regressive Integrated Moving Average). Also, a hybrid option would be possible. Once a prototype for the monthly flood and drought forecasting is tested internally, it will be shared with the Line Agencies (LAs) of the Member Countries (MCs) for testing.

- The 3–6 months flood and drought outlooks (DC2) should be based on seasonal outlooks and long-term weather forecasts from multiple climate models, especially focussing on precipitation and temperature; the North American Multi-Model Ensemble (NMME) introduced by NASA is an option since it ensembles all means of the climate prediction models. The results will be downscaled to regional level, focussing on the LMB. Simulation for some potential indicators such as surface runoff and soil moisture can then be carried

out. The monitoring and trend predictions of ENSO (El Niño Southern Oscillation) are main clues to be used for the verification of the seasonal forecasts.

Once the new methods/ models/ tools have been approved, the operational procedures at the RFDMC including different ways of dissemination will be revised and adjusted to include the new tools in the daily routines.

The analysis of extreme weather and climate variability (DC4) is primarily a meteorological phenomenon, related to short-term weather conditions and long-term change of climate. Although weather bulletins, weather maps are used for flood forecasting at the RFDMC, these are generally stored after its use in the RFDMC database. However, an in-depth study of historic weather and climate data and information, tropical storms and typhoon, global weather phenomena like El Niño and La Niña, and an analysis of the character of weather patterns and of changes in climate variability could lead to a better understanding, knowledge and skills to interpret future weather and climate data and information for more accurate flood and drought forecasting and warning at both regional and national level.

The expected result of DC4 will be a technical report with the analysis of extreme weather events and climate variability in the LMB approved by the MRCS and MCs. The report will be based on information and data available at the MRC and its MCs and supported by high resolution satellite images, including results/ findings of meteorological/ climate research institutes.

5. DELIVERABLES AND CONCRETE TIMELINES

DC1, DC2 and DC4 Deliverables and Expected Quality	**Number of Month**	**Deadline**
Detailed workplan and time schedules for the implementation of DC1 and DC2 including the selection of PAOR and defining the support from international experts. Concrete workplan and time schedules for the International Expert (IE) contracted to develop the technical report under DC4. Collected inputs from MCs and its LAs for the technical report (DC4).	2 months	End of November 2021
First Project-Report (DC1 and DC2) with description on the PAOR and its approach, methods/ models/ tools selected for implementation; including progress and update of the workplan and time schedules.	2 months	End of January 2022
1st Mid Project-Report (DC1 and DC2) with first results of the testing phase at the RFDMC and recommendations for adjustments or changes of the selected methods/ models/ tools if necessary; including progress and update of the workplan and time schedules.	4 months	End of July 2022

Organized national consultation meeting to discuss the first draft technical paper (DC4). Finalized paper for printing and dissemination (DC4).		
2nd Mid Project-Report (DC1 and DC2) with results of the further testing phase at the RFDMC and at the national centres and recommendations for adjustments or changes of the selected methods/ models/ tools if necessary; including progress and update of the workplan and time schedules.	4 months	End of September 2022

6. REQUIRED TASKS AND RESPONSIBILITIES

The PO1 will provide the following services:

General Project Management:

- Manage the schedule: Report and follow-up on the project progress, prepare detailed workplans and time schedules.
- Coordinate the inputs of all stakeholders. This involves the PAOR, international consultants, relevant LAs and Nacional Mekong Committees, and of course the MRC, in particular TD and the RFDMC.
- Organize project meetings for internal and external consultations, including national meetings in the MCs. Organize and conduct 2 national trainings in each member country.
- Prepare and maintain project documentation including three project reports, meeting minutes and all correspondence.
- Identify and document progressive risks, key and emerging issues hampering the progress of the project implementation including foreseen and/ or actual deviations from the work plans, milestones, and indicators, assess consequences, select and implement appropriate response measures.

There will be similar tasks and responsibilities for the implementation of DC1 and DC2:

- Develop methods, weather model options and new tools in cooperation with the PAOR and supported through international experts. This must be done in close cooperation with the RFDMCs flood and drought experts, reviewing the existing tools and developing specific additional methods/ models/ tools as needed.
- Develop FDC (Flood Duration Curve) indices to generate the outlook of high-flow and low-flow of the Mekong mainstream. Implement and run testing phase of the new methods/ models/ tools at the RFDMC and support the National Centres in this.
- Get verification and feedback from the LAs on the testing/ application of the tools.
- Applicate the models/ tools at the RFDMC.
- Prepare user manual and operational procedures for new methods/ models/ tools with the support of the RFDMC.

For the implementation of DC4:

- Coordinate the services of an IE (Meteorologist/ Climatologist) to develop the technical report.
- Interact with MCs and its LAs to collect data and information as inputs.
- Support IE to prepare first draft paper.

- Organise national consultation meetings for comments, recommendations, and further guidance to improve the first draft paper.
- Present the second draft paper to the national and regional technical working groups for further comment before the completion of the paper.
- Prepare finalized paper for printing and dissemination (hard & soft copies).

7. PAYMENT MODALITY

Monthly payment is applied.

Note: Consultancy rate is defined by the MRCS consultancy rate policy and the level of consultancy. MRC is a tax-exempted agency for the work done for the MRC. Consultant, in case mission is required, will be covered with a return ticket to and from the assigned duty stations with a daily related subsistence allowance of 75% of the UN for the mission days.

8. INTELLECTUAL PROPERTY RIGHTS

Intellectual property rights - IPR: Information, data, database, knowledge resources in the forms of briefings, reports, proceedings, articles, essays, etc. issued by and for the MRCS will be the MRCS property.

Any utility, announcement and disclosure that are without MRCS highest levels of authority' permission is considered illegal and will be charged by relevant local and international legal procedures.

9. DECLARATION OF NON-FRAUDULENCE AND PROTECTION OF PERSONAL DATA

The Subscriber shall adhere to the MRC's relevant rules and regulations of the MRC on personal data protection, business exclusion, and fraud prevention and anti-corruption principles, and shall be under strict disciplinary measures should any violation occurs.

10. WORKING ARRANGEMENT

In order to secure the most reliable, up to date and high standard solutions for DC1 and DC2, the PO1 will be supported by a technical cooperation of the MRC/RFDMC with a national, regional or international PAOR to be established for the development of both components. For DC4 the PO1 will support an IE in developing the technical report and coordinate the inputs from the MCs. Additional IEs can be hired on demand. The PO1 will take lead of tasks for DC1, DC2 and DC4. The Head of the RFDMC will coordinate and supervise the overall process.

Communication Line:

- The PO1 will communicate with and report directly to the Head of the RFDMC for verification of the products and compliance with ToR.
- Close guidance will be given by the TD Director and the Head of the RFDMC.

11. QUALIFICATIONS AND REQUIREMENTS (*select or add as appropriate***)**

- Master or higher degree(s) in hydrology or (hydro-)meteorology, or related relevant discipline with at least 15 years of work experience.
- Excellent knowledge on climate predictions and numerical weather models is strongly required and knowledge on flood and drought forecasts and hydrology is essential.
- Professional experience in applied hydrological/ hydrodynamic modelling or computer modelling techniques as applied to river-system or basin simulation and flood and drought

forecasting.

- Demonstrated skills in project/ programme management (project planning, coordination, report writing) is a must.
- Previous experience in the Mekong basin, preferably working with or for the MRC
- Fluency in English, both written and spoken, is required. Working knowledge of one more riparian language is an advantage.
- Good knowledge on Microsoft Office and Microsoft Project is a must.

12. SIGNATURE BLOCK

MRCS:

Full Name: _____

Title: _____

Signature: _____

Date: _____

Incumbent's Full Name: _____

Incumbent's Signature: _____

Date: _____