

ANNEX: Assignment for Local Consultant

I. Research Topic	Case Study and Technology Sharing of AI & Big Data-based Flood and Drought Warning System
II. Korean Expert	Joo-Heon Lee
III. MRC Researchers	Local Consultant

IV. Research Outline and Team

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3-2 KMA's AI-based Drought Forecasting System	Joo-Heon Lee	
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6. Conclusions and Suggestions for Basic Design of	Joo-Heon Lee Local Consultant	

V. Main Contents
(to be explained)

ANNEX: Assignment for Local Consultant

I. Research Topic	Basic Design of Flood Forecasting-Warning System(FFWS) using AI-Bigdata
II. Korean Expert	Joonseok Lee, Jonghee, Kim
III. MRC Researchers	Local Consultant

IV. Research Outline and Team

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1.1 Background and Objectives	Korean Exp.	
1.2 Research Outlines	Korean Exp.	
1.3 Expectation Effectiveness	Korean Exp.	
2. Analysis of FFWS Status using AI-Bigdata	Korean Exp. Local Cons.	
2.1 Analysis of FFWS Status in Korea and Abroad	Korean Exp. Local Cons.	
2.2 Proposal of FFWS Application Plan for Mekong River basin	Korean Exp. Local Cons.	
3. Proposal of the FFWS Basic Design Plan	Korean Exp. Local Cons.	
3.1 Basic Design of the H/W in FFWS	Korean Exp. Local Cons.	
3.2 Basic Design of the S/W and Data Display in FFWS	Korean Exp. Local Cons.	
4. Application of AI Flood Forecasting Algorithm	Korean Exp. Local Cons.	
4.1 Selection of the Target Basin	Local Cons.	
4.2 Application of System Unit Module with AI-based Flood	Korean Exp.	

Forecasting Algorithm		
5. Conclusion	Korean Exp.	

V. Main Contents

1. Introduction

This part describes the necessity and purpose of an AI-Bigdata based flood forecasting-warning system. Also, It explains the outlines and explains the expectation effectiveness of this study.

2. Analysis of FFWS Status using AI-Bigdata

This part analyzes the current status of the AI-Bigdata based flood forecasting-warning system and suggests ways to apply it to the Mekong River basin.

3. Proposal of the FFWS Basic Design Plan

This part proposes a basic design plan for H/W and S/W of AI-Bigdata based flood forecasting-warning system. The current status of flood forecasting-warning systems managed by MRC is analyzed with a local consultant. The process of collecting, storing, processing, utilizing, and disseminating hydrological data is checked in detail. And based on flood forecasting-warning system in Korea, a basic design plan proposes for MRC

4. Application of AI Flood Forecasting Algorithm

This part is the step of applying an AI-based flood forecasting algorithm. If a local consensus determines the target basin, the AI-based flood forecasting unit module is applied to the basin to analyze and display the data. With research team of Topic 3, we select the optimal AI flood forecasting algorithm for the Mekong River basin and apply it to display the flood forecasting results.

5. Conclusion

This part describes the results of this study.

ANNEX: Assignment for Local Consultant

I. Research Topic	Suggestions for developing AI-based flood forecasting algorithm and capacity-building of relevant stakeholders	
II. Korean Expert	Seokhwan Hwang	
III. (Partner Country) Researchers	Local Consultant	
IV. Research Outline and Team		
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1. Introduction	Korean (Hwang)	
1.1 Research Background	Korean (Hwang) and Local Consultant	Reference reports must be collected by Local Consultant
1.2 Research Objectives and Outlines	"	
2. Selection of Mekong River Test-Basin for flood forecasting application using AI-big data	Korean (Hwang) and Local Consultant	
2.1 Investigation of observational infrastructure of Mekong River Test-Basin for flood forecasting and warning systems	Local Consultant	Detail requests refer to Supplementary
2.2 Analysis of the observation infrastructure to which AI big data technology can be applied	Korean (Hwang)	
2.3 Selecting an appropriate test basin for the Mekong River for AI-based flood forecasting and warning system application	Korean (Hwang)	
3. Review and suggestion 「AI-based flood forecasting algorithm」 applicable for Mekong River Test-Basin	Korean (Hwang)	
3.1 Review AI-based flood forecasting algorithms and data collection for a test	Korean (Hwang) and Local Consultant	Data necessary for testing must be collected by Local Consultant
3.2 A test AI-based flood forecasting algorithm for Test-Basin if data existed	Korean (Hwang)	Test may be complemented in Korea site for examples, if impossible in application of

		MRC Test-Basin
3.3 Propose an AI-based flood forecasting algorithm for Test-Basin	Korean (Hwang)	
4. 「AI Flood Forecasting Algorithm Training and Capacity Building」 Plan for Mekong River Basin Flood Forecasting Officers	Korean (Hwang)	
4.1 Propose R&Ds for AI-based flood forecasting algorithm development and advancement	Korean (Hwang)	
4.2 AI-based flood forecasting algorithm and plan to strengthen local officials' capacity for efficient operation of the system	Korean (Hwang)	''

Supplementary

- Detailed information on hydrological observations in the Mekong River basin for the selection of the Mekong River test basin
 - Hydrological observation station (water level, rainfall, radar, etc.) location (longitude, latitude, altitude), observation and data production cycle, observation data type, data transmission and reception cycle and method
 - Dam location, specifications, inflow and discharge data, spillway operation rules, water level-volume-outflow curve, dam water level
 - Detailed Mekong River basin information (digitized watershed map and watershed map, basin DEM, soil map, land cover map of ESRI shp format, etc.)
 - Rainy season hydrological observation data for at least 3 years for test basin candidate points
 - * Data on water level, rainfall, and flow rate at least upstream and downstream of the test basin (section)
 - Mekong River basin flood forecasting and warning model (rainfall prediction, rainfall runoff, dam operation model)
 - Mekong River basin flood forecasting and warning points and flood forecasting standards (levels and standard water levels)
 - Report on Mekong River flood forecasting and warning for the last 5 years

V. Main Contents

1. Introduction

This part explains the research background and objectives. The purpose of this part are suggestions for developing AI-based flood forecasting algorithm and capacity-building of relevant stakeholders

2. Selection of Mekong River Test-Basin for flood forecasting application using AI-big data

In this context, this part shows the investigation results of observational infrastructure of Mekong River Test-Basin for flood forecasting and warning systems. And then shows the analysis of the observation infrastructure to which AI big data technology can be applied. Finally, this part selects an appropriate test basin for the Mekong River for AI-based flood forecasting and warning system application

3. Review and suggestion 「AI-based flood forecasting algorithm」 applicable for Mekong River Test-Basin

This part proposes the AI-based flood forecasting algorithm applicable for Mekong River Test-Basin. first this part reviews AI-based flood forecasting algorithms and data collection for a test, and then shows a test AI-based flood forecasting algorithm for Test-Basin if data existed. Finally proposes an AI-based flood forecasting algorithm for Test-Basin.

4. 「AI Flood Forecasting Algorithm Training and Capacity Building」 Plan for Mekong River Basin Flood Forecasting Officers

This part seeks to establish an AI-based flood forecasting algorithm development plan and an operating system construction plan. In addition, when the project is completed in the future, we plan to devise a plan to strengthen the capacity of local officials for the efficient operation of AI-based flood prediction algorithms and systems.