

Kiguchi LAB.

[Monsoon Climate & its Variability's Impact on Society]

Department of Human and Social Systems

Monsoon Variation Climatology

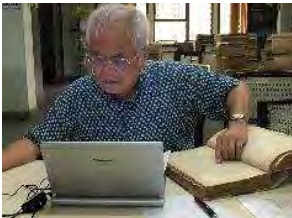
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Kiguchi Lab. studies hydro-meteorological phenomena such as rainfall in terms of monsoon circulation with an important role on the global water cycle. Asian monsoon which provides abundant rainfall, plays a part of global water cycle, and is important to human activities like rice cropping, domestic water for a large population, and industrial water which supports rapid economic growth. Its seasonal and annual variabilities are big impact on our society. To make clear a impact on society by its variability through the research on monsoon variation from the viewpoint of climatology and hydrology provides the scientific knowledge for the issues how should society cope or which kind of policy is effective.

We often use observation data for understanding of monsoon circulation, but it is insufficient density of observation in actually. We utilizes numerical simulation instead of poor observation data, but eventually it is necessary the observation data to evaluate the results of numerical simulation. Accordingly, we choose the important region for better understanding of monsoon circulation, and actually conduct into the spot and observe it. Moreover, we rescue the historical and analog data, and try to grasp the characteristics of monsoon variation using a longer data set.

Based on the knowledge provided by observational research, we develop an understanding of historical monsoon variation through the analysis of human impact on rainfall, extreme events like flood and drought which actually occurred. And we promote the research of qualitative and quantitative evaluation about how monsoon changes and how monsoon variation impacts on our society in future.



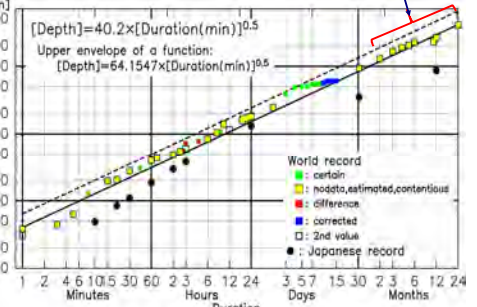
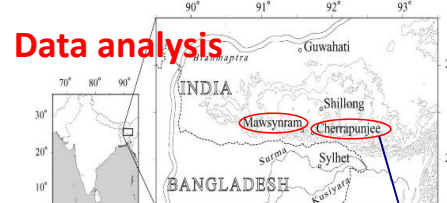
Rescue data of British India period @ Institute of Indian Tropical Meteorology.



Survey of environmental field at observation site measured extreme events.



Conducting upper balloon observation in Bangladesh.



Cross section of depth and duration of precipitation extremes. (Kiguchi & Oki, 2010)

Collecting meteorological data at Megharaya Plateau of India where is most annual rainfall record.

Data rescue

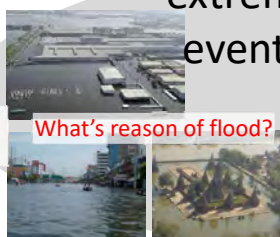
Observation

Rain mechanism

Human activities & extreme events

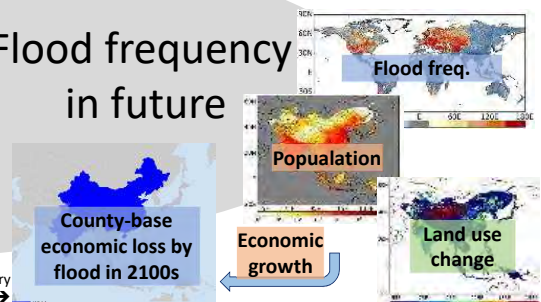


Effects of land use change from paddy field to housing land on rainfall phenomena or recent change of frequency of extreme events?



What's reason of flood?

Flood frequency in future



Prediction of country-base economic loss by flood in the end of 21st century using future flood frequency, population, land use, and economic.

