Final report of UHH-KU fund for ECR program

Section 1

Applicant (at the time of application, i.e. supervisor of the visiting researcher or the visiting researcher themselves)	
Name	SHABEH UL HASSON
Job title	Interim Professor for Terrestrial Remote Sensing
University	University of Hamburg
Affiliation	HAREME Lab, Institute of Geography, UHH

Section 2

Visiting researcher (if different from the above)	
Name	
Job title	
University	
Affiliation	

Section 3

Host researcher	
Name	Prof. Takahiro Sayama
Job title	Professor
University	Kyoto University, Japan
Affiliation	Disaster Prevention Research Institute, Kyoto University, Japan

Section 4

Summary of the project (approx. 200 words)
*KU visiting researchers are required to submit a summary of the project in Japanese in addition to the English summary (approx. 400 characters).

The project aimed to synergize the working group at the Institute of Geography, University of Hamburg with the Innovative Disaster Prevention Technology and Policy Research Lab at the DPRI, Kyoto University to address the massive problem of extreme flooding in the Indus River Basin. Both groups adorn distinct skill sets, knowledge, and experience to address the problem. It has been agreed to join hands in multiple fields ranging from the development of pseudo-global warming scenarios for the monsoon margin region, their coupling with the glacial-hydrological modeling, and further, with the flood inundation modeling. The ultimate focus would be to better understand past extreme flooding events over the Indus Basin and assess whether these individual events can be attributed to climate change. How could the frequency and intensity of such individual flooding events change under future warming scenarios? What are the pathways for a more resilient society at monsoon margins?

Initial efforts made during a short stay included: 1) setting up the rainfall-runoff inundation model from the DPRI, Kyoto University over the Jhelum Basin – a subbasin of the Indus Basin, 2) simulating 2014 mega flood event discharges and flood inundation, 3) and assessing model fidelity by comparing it with remote sensing data-based flood inundation extent. The calibrated

model was then driven for in total around 900 years for factual and counterfactual climate datasets for attribution of historical climatological flood discharges and inundation changes to climate change. Further cooperation was agreed upon in the optical remote sensing and radar altimetry data and analysis for current flood inundation studies as well as in the development of pseudo global warming scenario at a convection-permitting scale for the study region.