Keynote

Flash Floods in Oman

E. Holzbecher

German University of Technology in Oman

E-mail: ekkehard.holzbecher@gutech.edu.om

Keywords: Flash Flood, Damage Mitigation

In Oman flash floods regularly cause damages to buildings, infrastructure and cost lives. Oman is subjected to flood events that differ concerning location, affected area, intensity and duration. Most severe flash floods are caused by cyclones that approach the Omani coastline from the Indian peninsula as tails of monsoon depression. The most severe cyclones that hit Oman were Gonu and Phet. In 2007 the cyclone Gonu hit Muscat and Al-Sharqiyah and caused the most ever damage to Muscat properties and infrastructure (up to 714 mm of rainfall in 24 hours and more than 900 mm in 36 hours, and about 8160 m3/s flood peak). In 2010 cyclone Phet caused heavy damage to Al- Sharqiyah (Al-Qurashi 2013).

Concerning climatic zonation Oman is classified as arid and semi-arid. Arid areas are known for high temporal and spatial variability of precipitation, absence or very low base flow, sparsity of plant cover, high transmission losses and high amounts of evaporation and evapotranspiration. These features are of high influence on the effective rainfall and flood characteristics. The problem of understanding flood generation and propagation is aggravated in Oman, not only due to geographical conditions, but also due to rapid urban development and climate change.

As flash floods in Oman can cause considerable damage to both lives and properties, there is an urgent need for floodplain development planning and management. Moreover, prediction of flood routing by numerical modeling can be a valuable tool to mitigate the effects of extreme precipitation events. Such tools can be part of an early warning system and can be utilized for risk maps in urban planning. However, the task is challenging due to severe uncertainties, the lack of hydrological parameters as well as the unfrequent occurrence of hydrological extremes.

In 2015 the project entitled ‘Towards a flood-resilient Omani society: improved tools for flood management‘ has started working to investigate the problem of flash floods in Oman. The general objective of the research is to develop improved methods for flood risk management. This includes on one hand improving the scientific knowledge for analysing and assessing flood hazards and flood risks, and on the other hand developing a set of decision support tools for flood risk management as well as a public flood information platform. The project is funded by The Research Council (TRC) of Oman. There is a close co-operation with the Ministry of Regional Municipalities and Water Resources (MRMWR). First project results were presented by Holzbecher et al. (2016). In this contribution we report about the further progress of the project.

REFERENCES

Al-Qurashi, A. 2013. An overview on flood studies in Oman, in: UNESCO, Int. Seminar on Natural Disaster Risk Reduction, Proceedings, 25-35.

Holzbecher E., Al Qurashi A., Maude F., Paredes-Morales M., 2016. Flash Flood Prediction - Case Study: Oman, 4th IAHR Europe Congress, Liege (Belgium), Proceedings