Abstract

Keywords: climate variability, floods, hydrological drought, organisational capacity

With its high spatial heterogeneity in terms of climate, Namibia is an arid country with highly variable and erratic rainfall and surface water. The dryness in the country is very sunny with approximately 300 days of sunshine per year. It is predicted that Namibia will become hotter in coming years. However, the expected effects of climate change and climate variability have largely affected the country. During 1980s and 1990s, rainfall and river flows were in general below average and above average since roundabout 2000. During 2010/11, Windhoek’s rainfall exceeded the average by more than three times and was the highest in ‘recorded’ history for the area. In 2009 Namibia River recorded its highest flood peak since 1896, while 2010 and 2011 recorded relatively lower peaks but longer durations and higher volumes. Komati River recorded its highest flood in 2010. Similarly, 2009/10 recorded the highest flood peaks since 1896 for Orange River, while a lower peak but longer duration and volume was observed in 2010.

The exceptionally high rainfall and recurrent floods received in 2008, 2009, 2010 and 2011, further encouraged the Namibian Hydrological Services (NHS) to rethink in flood and hydrological drought monitoring and warning systems, especially by taking advantage of the satellite products such as TRMM, MODIS, ESA Sentinel 1A and platforms as G-WADI & NASA SensorWebs among many others, to monitor floods and rainfall potential from convective clouds. This called for an even greater need to strengthen collaborations with our international cooperating partners such as NASA and the University of Namibia among others who have the technical expertise and easy access to such data.

Platforms that aid in indirect monitoring of flood widths such as IRC GDACS, or in direct monitoring of flood widths with connection to water levels/discharge such as ESA’s TigerNet WOIS are utilized for flood warning purposes. After analyzing these products together with in-situ data when available, a daily flood/hydrological drought bulletin is compiled. The daily bulletin is disseminated to the stakeholders, and also uploaded on NASA’s Namibia Flood Dashboard. Some of the products mentioned earlier are also found in one location, on the Dashboard, making it easier to access and utilise the products. Currently the NHS is experiencing two major shortcomings: one with a short record of data or large gaps in the data hinder meaningful climate analyses. This probably makes it more necessary to incorporate anthropogenic data into analyses. Lastly, organisational capacity, a foundation on which strong flood mitigation programs may need to assure the effectiveness of our early warning systems, is insufficient. Though various models and assessment software can help in flood and hydrological drought monitoring, technical modeling capability is not well established in the NHS making it particularly become a major concern after the floods in relatively recent years. There is a need to encourage for capacity building, as well as communication and information sharing with partners.

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