Geomorphology and Hydrogeology of the Belum Karst Aquifer, Southern Andhra Pradesh, India.

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The main purpose of this study is to contribute to the understanding of the karst aquifer structure, karstification history, and the hydrogeological functioning of the karst systems in southern Andhra Pradesh, India. The karst aquifers belong to the Proterozoic carbonate rocks of the Cuddapah Basin and contain an assemblage of karst landforms. The main carbonated geological units in this Basin are the Vempalle Dolomite of the Cuddapah Supergroup, the Narji Limestone and the Koilkuntla Limestone of the Kurnool Group. The Narji Limestone is one such karstified aquifer that is spreads over an extensive part of the Kurnool district and some parts of Cuddapah and Anantapur districts of Andhra Pradesh. This formation accommodates the longest limestone cave of southern India, known as Belum Cave. Groundwater data is sparse for this area, thus making it difficult to quantitatively investigate groundwater flow in this karst system. Therefore, there is a crucial need to study these aquifers in this drought prone area. An analysis of the recharge area, karst features, hydraulic characteristics of the aquifer and development of a conceptual model of the aquifer are underway.

First results show that the Narji limestone aquifer is highly karstified and responds sharply to precipitation events. The karst aquifer emerges in the form of several seasonal springs. One such spring-cum-well is located in the Belum village. The spring is the only available source of groundwater for more than 5000 population. It flows actively only during the monsoon period. A network of sinkholes, temporary losing streams and large solution channels rapidly transmit surface drainage to the spring.

Keywords: Karst aquifer, Karstification, Narji Limestone, Cuddapah Basin, Southern India.