



## **Rock desertification, karst water resources, and poverty on the East Mountain Plateau, Yunnan China**

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The East Mountain Plateau is a large karst plateau with an altitude of about 2000m in Mengzi and Kaiyuan Counties of Yunnan, near China's border with Vietnam. With carbonate rocks exposed at the plateau surface over some 250 km<sup>2</sup>, serious water resource challenges occur there because of the well-developed karst. Little surface water is available during the winter dry season, associated with southwest China's monsoon climate. As is typical, during 2007 in Mengzi only 15% of the annual rainfall fell over six months, averaging less than 4 mm per week. With major support from the U.S. Agency for International Development, a consortium of Chinese and U.S. scientists is working to enhance Chinese academic infrastructure for karst water resource development, with the East Mountain Plateau as a primary demonstration site.

Extensive deforestation and associated soil loss starting in the fall of 1958 during China's Great Leap Forward has lead to serious rock desertification on the plateau, diminishing epikarstic storage, so that many villages established years ago with epikarstic springs are now without continuously reliable water supply. The process is also exacerbated today in parts of the plateau where vegetation has been killed by industrial air emissions associated with metal ore refining plants. The water table is as much as 400 m below the surface of the plateau.

The 30,000 or so residents scattered over some 100 villages on the karst plateau are largely of Hani and Yi minority nationality, and typically very poor. While in 2006

the agricultural community in the local region overall produced an annual per capita GDP of about 3,000 *yuan* (~EUR281), about four times the official Chinese poverty threshold, there is economic disparity related to varying access to water. While residents interviewed in early 2007 in Shidong Village along the Yanliu River where water is available for crop irrigation reported annual income of 6,000 *yuan* (~EUR563), villagers in Laoyan Caotang about 10 km away, beyond the point where the Yanliu River sinks into the karst aquifer and where water is instead supplied by cisterns and small muddy ponds, average about 1,200 *yuan* (~EUR113). Nearby on the plateau at the Qibudi Settlement, young men lingering in the fields reported that surface water had been generally unavailable since 1958, and that they were largely idle, because inadequate water for irrigation limits their ability to grow crops. They strongly believed that with better access to water as had been the case in the past they would be busy tending the fields and farming, and their villages would be saved from poverty.

To enhance development of solutions to water access and related quality of life challenges on the plateau, our team includes the International Institute of Rural Reconstruction, who in working with the Honghe Prefecture Minority Nationality Research Institute, is engaging local communities in direct participation in the research.