

An exploration of water poverty in Lao PDR - Integrating hydrological modelling and demographic data for data mining purposes

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Water is connected to human societies in myriad ways. The relationship is complex, and its assessment requires integrated approaches and methods. This study examines water poverty (defined as lack of access to adequate amount and quality water for basic needs) in Laos. Laos is located in Monsoon Asia and thus has extreme seasonality in rainfall and water availability.

Water poverty was assessed using Water Poverty Index (WPI) which is a composite index meant as a holistic tool that integrates physical water availability, social dimensions of access and capacity to manage the water resource as well as the water requirement of the environment. WPI was calculated for 8215 villages all across the country by modelling surface water availability (Resource component of the WPI, 5km resolution grid) and combining it with demographic data from Population and Agricultural Censuses. WPI was calculated for both, dry and wet seasons separately by adjusting the indicators where seasonal data was available.

The two WPI sets were then subjected to exploratory (spatial) data analysis and spatial data mining. Significant spatial (and temporal) variation was found across the country. Wet season increased WPI approximately 8 index points on average compared to dry season. Village road access was found to be a major factor in determining "water rich" and "water poor" regions. Interestingly, a small but not insignificant number of villages in the north were found to be more water poor in the wet season than in the dry season despite a major increase in water availability. Finally, it was found that the drivers of water poverty change according to season.