



SPRINGS, STORAGE AND SENSITIVITY TO CHANGE – GROUNDWATER IN NEPAL'S MIDDLE HILLS

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Résumé/Abstract

The valleys in the foothills of the Himalayas may be some of the most sensitive areas to environmental and societal changes in Asia. Changes to the Asian monsoon and increasing temperatures could lead to variations in snow melt and runoff, and forecasts of increasingly inhospitable temperatures for lowland areas of Nepal and northern India (up to 60 °C) are already leading to migration to the cooler middle-hills. The use of groundwater within these catchments (from spring flows, tube wells and indirectly through baseflow) is vital for continued secure water supply for the growing populations and increased agricultural production. However groundwater resources in these valleys are poorly characterised and the resilience of water supplies dependant on these resources largely unknown.

Two catchments have been monitored throughout a hydrological year to investigate both the supply of groundwater and the demand for it. Weekly measurements of stable isotopes and flow from four sources in each catchment, and campaign sampling for CFC and SF₆ is helping unravel the residence time of groundwater within the springs, and coupling to recent rainfall. Participatory community surveys are indicating a high dependency on groundwater fed springs issuing from highly-weathered fractured bedrock, and a growing demand for groundwater as a result of population growth and increased use for irrigation. Preliminary field results are indicative of a highly responsive system with short groundwater residence times. A growing trend to drill tube wells in the valley bottoms is increasing the resilience of supply, but introducing groundwater depletion and water quality issues.