

Public Abstract

First Name:Krishna

Middle Name: Lal

Last Name:Poudel

Adviser's First Name:Thomas

Adviser's Last Name:Johnson

Co-Adviser's First Name:

Co-Adviser's Last Name:

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This dissertation is composed of three papers relating to upriver-downriver farming system efficiency, water resources adaptations and irrigation water use efficiency in Nepal. First essay consists of two steps. First, Technical Efficiency (TE) index is estimated for upriver and downriver ecoregions employing DEA technique. In the second stage, we censored the TE index and run the Tobit regression model to assess the socio-economic factors responsible for explaining technical efficiency of smallholder farming practices. The median technical efficiency values were 0.606 and 0.756 in upriver and downriver respectively. Tobit model indicates lower productivity of small scale farming units are due to inadequate water availability, lack of reliable inputs and poor market services. Access to farm credit and electricity are significant and positive factors explaining technical efficiency in both regions. The second essay examines the on-going consequences of climate change on water resources availability and how adaptation practices and strategies have developed in agricultural practices. Results indicate increasing temperatures, prolonged drought followed by intense precipitation, and greater frequency of flooding than in the past. About two-thirds of small creeks and springs have disappeared and others will soon disappear if current trends continue. Respondents prefer collective water management. Logistic regression analysis shows that farm income, market access, access to extension services, and market distance are significant predictors of adaptive behavior. Essay-3 deals the conveyance, economic and agronomic efficiency of water used, and factors affecting aggregate water use efficiency in the study regions. Farmers in the Mountain region were found relatively more effective at reducing water loss than farmers in the Hill and Terai regions. Water use efficiency scores regressed on farm related socio-economic variables shows that farm size, distance to water source, government agricultural extension services and access to credit positively affect water use efficiency in all regions.