

# Does household capital mediate the uptake of agricultural land, crop, and livestock adaptations? Evidence from the Indo-Gangetic Plains (India)

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**Abstract**

Farmers in the Indo-Gangetic Plains produce much of the wheat and rice grown in India. However, food production and millions of farm-based livelihoods in this region will continue to be adversely affected by hydro-climatic change and variation, reduced land productivity, and declining groundwater levels. Thus, agricultural adaptations are essential for protecting and improving upon intersecting goals of food security, poverty alleviation, and wellbeing. Household “capital” (e.g., natural, human, financial, physical, and social) is commonly cited as an indicator of livelihood adaptability and innovation. We develop a series of mediated structural equation models to empirically evaluate the validity of capital as a suitable indicator for adaptation and adaptive capacity. These models assess the extent to which household capital mediates the relationship between over 1,000 socio-economically differentiated and randomly selected farm households, and their crop, livestock, and land management adaptations in the states of Haryana and Bihar. Central to our models is a single household capital variable, constructed by aggregating 80 different measurements of households’ i) physical/infrastructural capital, ii) owned or accessed assets, iii) livelihood diversity, iv) ability to reach market or commercialize, v) access to weather information, and vi) social capital. We find household capital is a significant predictor in adopting crop, land management, and livestock-related adaptation strategies across both states. Second, and in certain cases, lower castes and less educated households engaged in fewer agricultural adaptations – an outcome mediated by their lower composition of capital. Further, and across almost all contexts, household capital mediated the effect of owning a greater proportion of land, and the higher uptake of agricultural adaptation activities. While improvements in any capital category can improve adoption, we recommend programs that improve i) access to public and private agricultural infrastructure for lower castes; ii) education and shared knowledge spaces for less-educated households; and iii) the availability of low-interest loans and the more efficient legal transfer of land for agriculturalists owning a smaller proportion of their land. Through this novel and large-scale analysis of household data, we provide short-term and immediate recommendations for more equitable agricultural adaptation in this breadbasket region of northern India.

Read the article in [Frontiers in Sustainable Food Systems](#) [1].

**Associated Project:**

[Agrarian Adaptation](#) [2]

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