

Capturing the drivers and dynamics of adaptation strategies in mountain agriculture communities

Roopam Shukla

shukla@pik-potsdam.de. Working group: Adaptation in Agricultural Systems, RD II, Potsdam Institute for Climate Impact Research



Introduction & Motivation

- Communities inhabiting the fragile mountain regions are known to be disproportionately vulnerable
- Studies have documented that responses to agronomic risks are socially diverse and spatially distinct
- Farmers do not represent a monotypic group and there exist pervasive heterogeneity rooted in differential biophysical, social, economic, cultural and institutional factors
- Differences in resource endowment and production orientation, with a distinctive set of constraints and opportunities thereby creating diversity in their adaptive capacity and choice of adaptive action
- In addition, perception to climatic risks is also mediated through factors such as farmers' demographic assets, and farmland characteristics, such as the amount of cropland, irrigation availability

Conceptual framework & Methodology

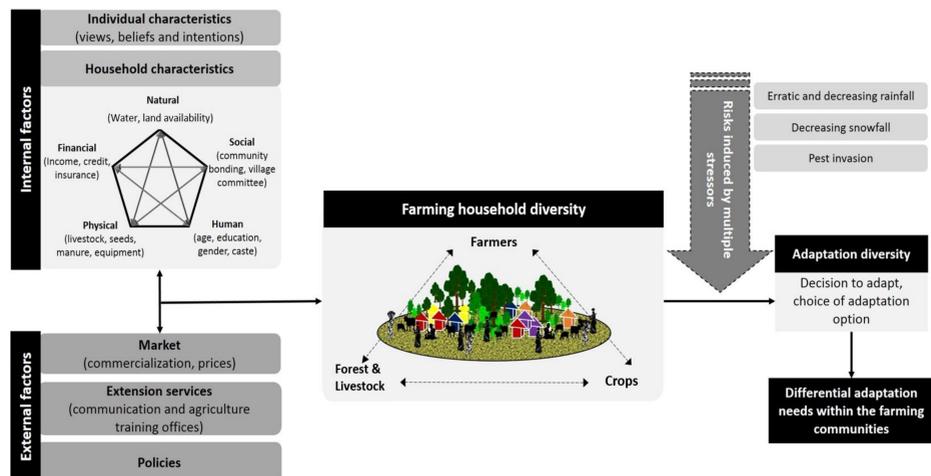
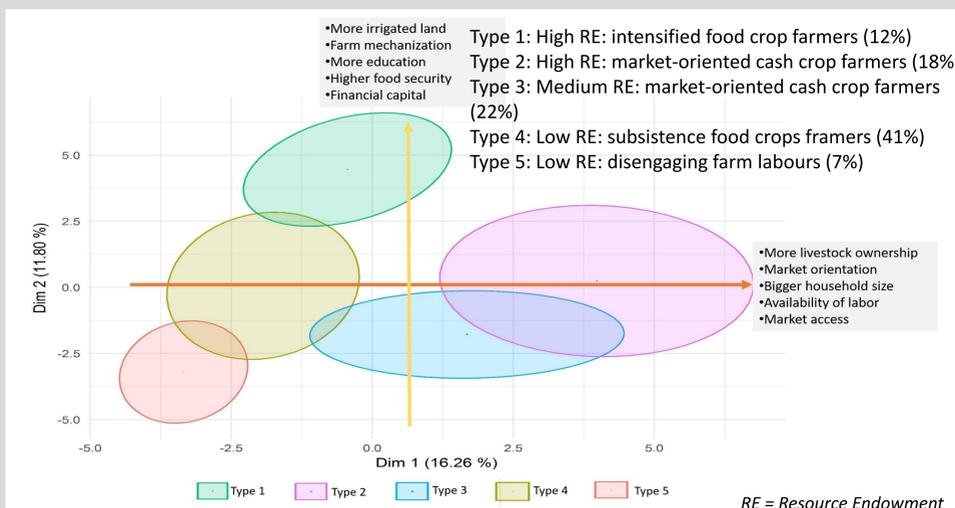


Figure: Farming household and adaptation diversity in the Himalayan region. The interplay of internal and external factors generates diversity within farming households. Further household diversity mediates adaptation diversity to agriculture risk leading to differential adaptation needs within the farming communities.

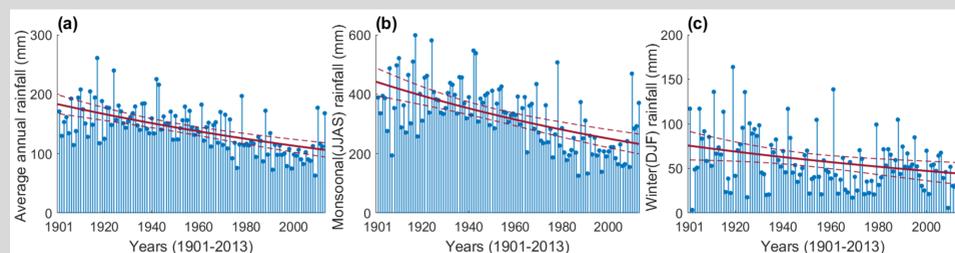
Methodology

Primary household interview were done. Information on three different sections (i) farmer's personal characteristics, household characteristics, resource endowments, and livelihood orientations; (ii) perception of climatic variables and (iii) perceived impacts of climate change was collected

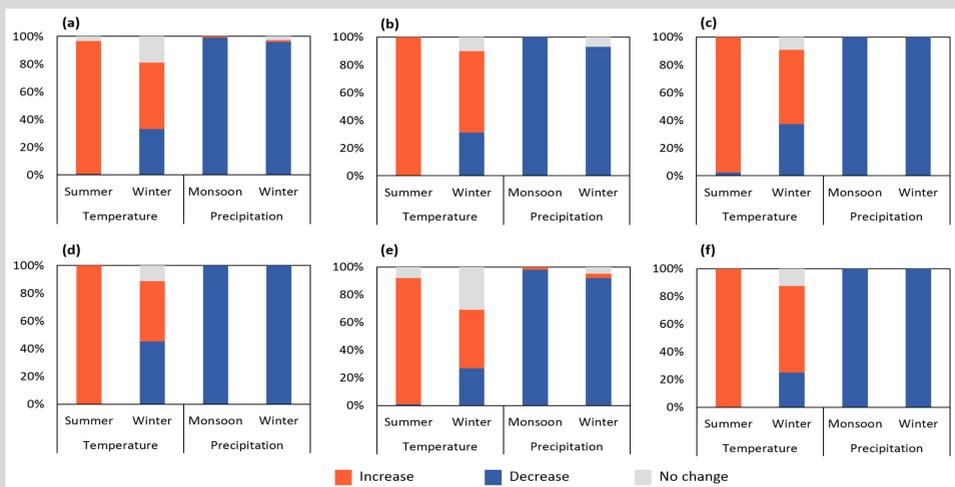
Farmer types, Rainfall trend, & climatic variables perception



Five farmer types were identified in the region, characterized on the basis of structural (resource endowment) and functional (livelihood and cropping strategies) diversity

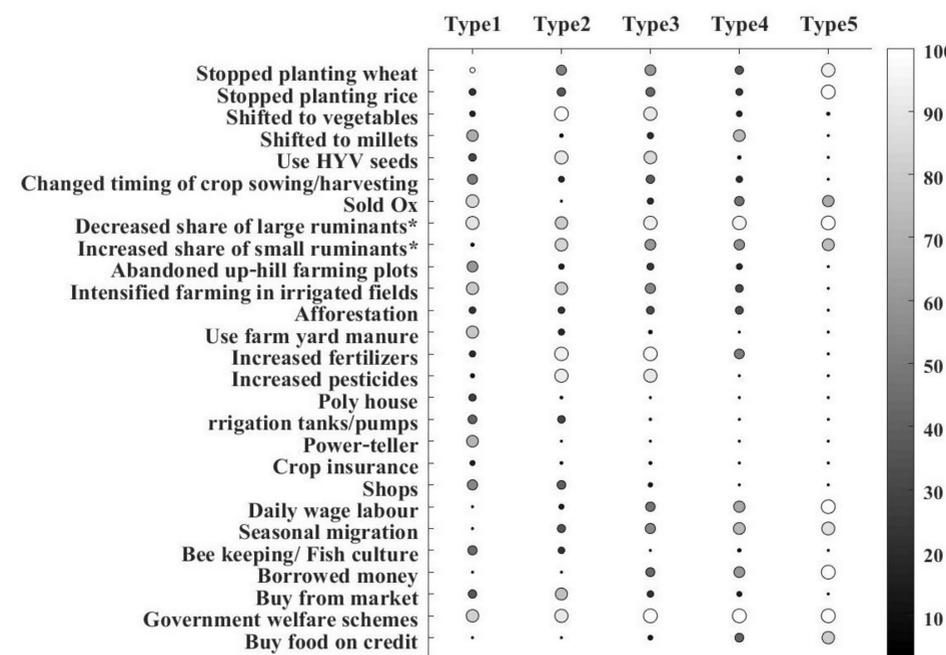


Trend analysis of annual and seasonal precipitation data in Chakrata tehsil (1901-2013). Similar trends were observed in Bhikyasain Tehsil, part of Uttarakhand state India



Perception of climatic variables. (a) perception of all farmers, (b) Type 1, (c) Type 2, (d) Type 3, (e) Type 4, (f) Type 5

Different adaptation strategies



- Farmer Type 1: 'Stepping out' – 'Stepping-up' strategy
- Farmer Type 2: 'Stepping-up' strategy
- Farmer Type 3: 'Hanging-in' strategy.
- Farmer Type 4: 'Hanging-in' – 'Dropping-out' strategy.
- Farmer Type 5: 'Dropping out' strategy.

Conclusion

- Perception of climate change acts as a driver of adaptation strategies
- Dynamics in adaptation strategies can be explained by factors such as land ownership, irrigation availability, access to subsidized food grains
- To be more equitable, climate change adaptation policies should consider the diverse types of farmers in the region



Farmer typology to understand differentiated climate change adaptation in Himalaya, Scientific Reports.



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