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SCI – Building Climate Resilience for Achieving Food and Livelihood Security – Experience from Contrasting

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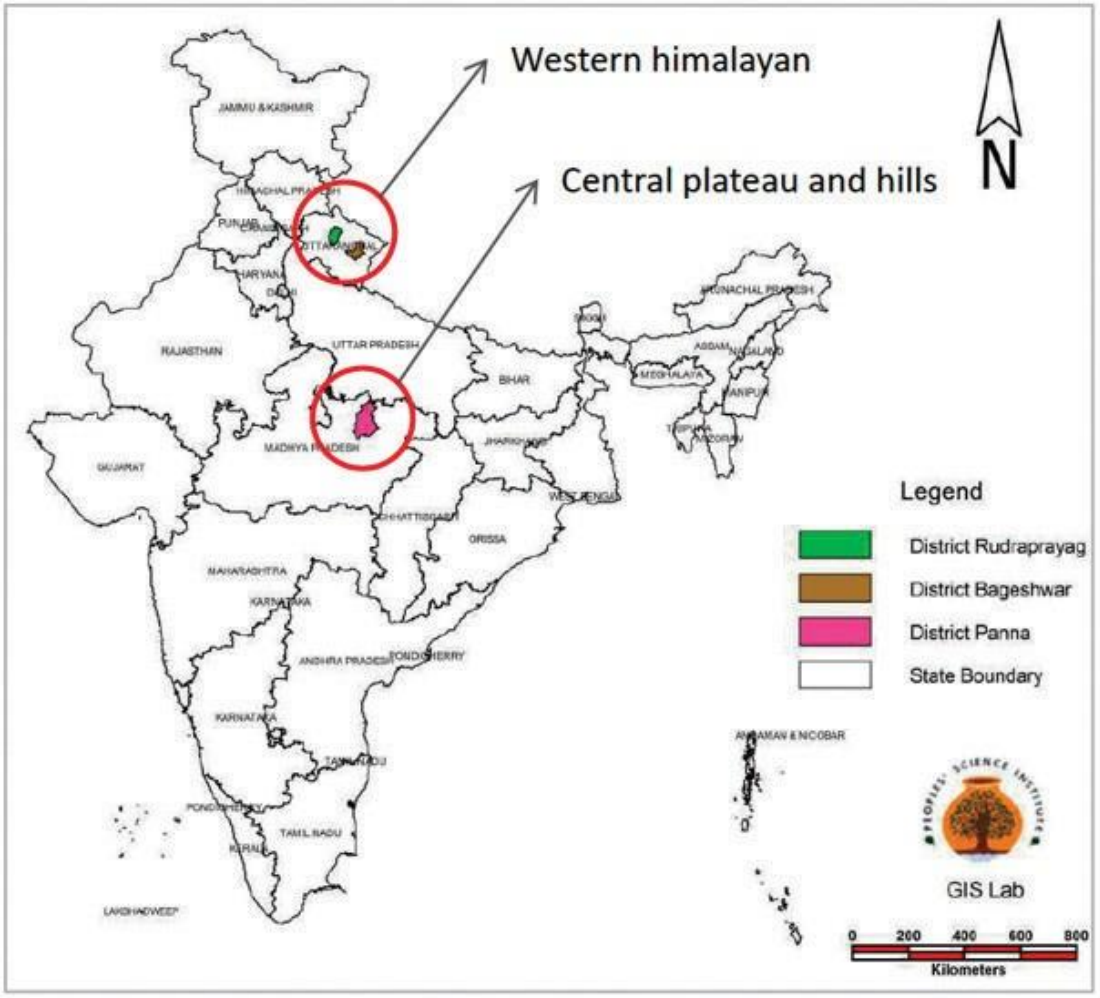
Introduction

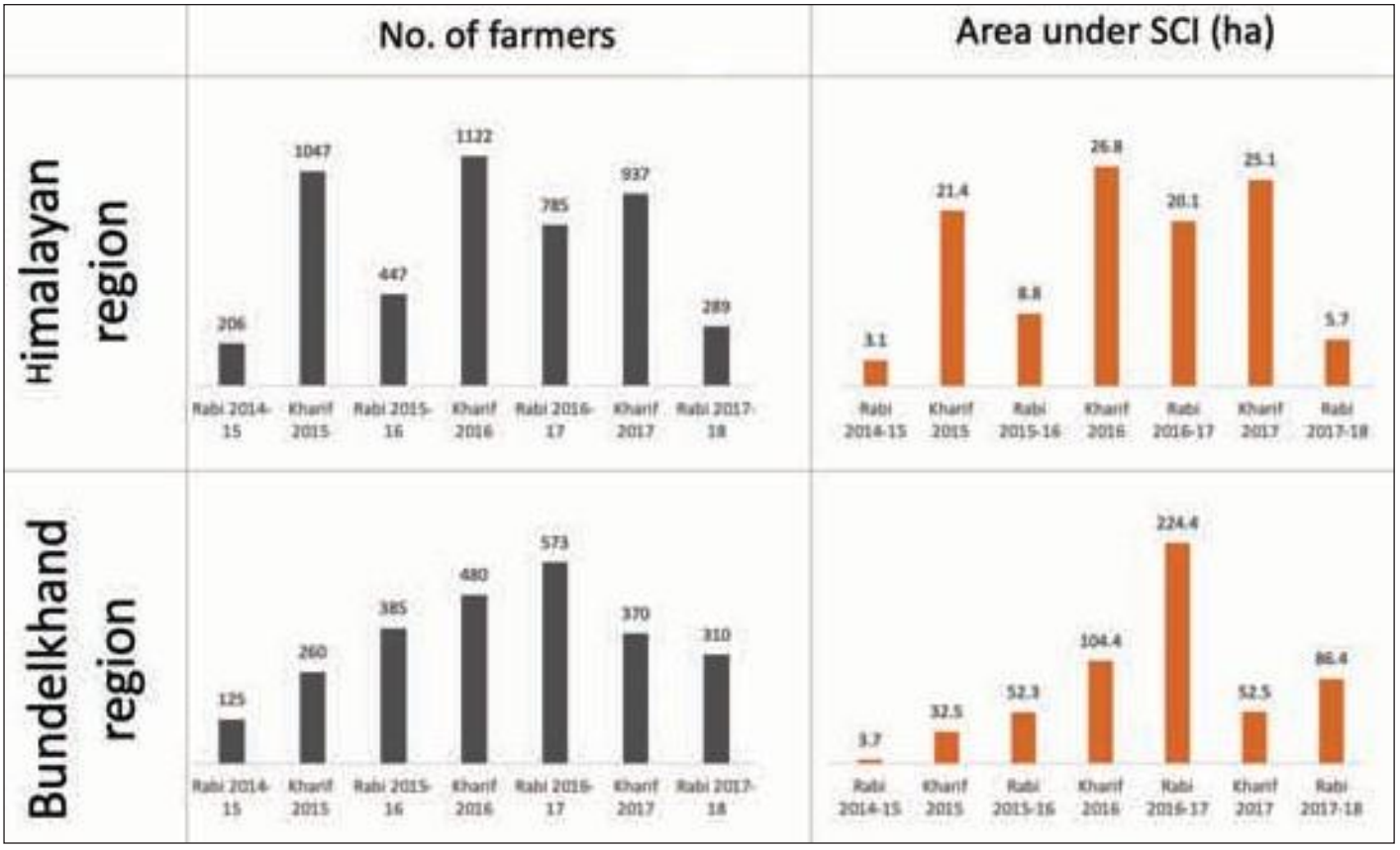
The Bundelkhand and Himalayan regions of India, representing two stark contrasting agro-ecological conditions with different climate change effects, bear similar vulnerability characteristics in terms of fragility, marginality, and inaccessibility. Climatic effects are further exacerbated by specific socio-economic factors like gender inequalities in the Himalayan region whereas a vicious cycle of indebtedness in Bundelkhand. Based on a decadal experience with System of Rice Intensification (SCI) and its applications on other crops by more than 50,000 farmers under varying agro-climatic conditions that include drought and flooding, this paper reports how agro-ecological methods help build climate-resilience for farmers in contrasting agro-ecological zones. The socio-technical approach building upon the experience and innovative capacities of farmers has proved to be effective in bringing multi-dimensional sustainability at household level.



Study area – Rudraprayag, Bageshwar in Uttarakhand and Panna, Madhya Pradesh

Methodology

This paper is based on action-research conducted in the given project locations. The timely empirical data over the period of 2014-2017 was collected at farmers' field level. The data for more than 1000 farmers from Himalayan region and 500 farmers have been collected through-out the cropping cycles of all the crops mentioned. The crop.



Summary of seasonal sample data collected from 2014-2017

Result and discussion

Analysis of 100 years' rainfall data for both regions shows high spatial and temporal disparity, increasing rainfall intensities and longer dry spells. In last decade, Himalayan region has witnessed frequent floods and cloudbursts. Bundelkhand has witnessed recurring droughts between 2000 and 2010 and erratic, high-intensity rainfall in 2011 and 2016. Despite extreme climatic conditions, SCI with appropriate variations proved to be promising climate-smart technique helping farmers minimize crop failure risks as well enhance yields.

Even in droughts and floods, average enhancement in grain yields has been in the range of 30 to 50 percent for rice (direct seeded and transplanted), wheat, kidney beans, chickpea, maize, etc. based on standard crop cutting exercise. Reduced production costs and increased production provided food security for an additional 3-6 months annually for small and marginal farmers. For Himalayan region, it was found that SCI practiced on only 0.5ha land on crops rice and wheat could bring the year-round food sufficiency (in terms of cereals). SCI practiced on cash crop like Kidney bean on 0.2ha per family can increased the annual income by Rs.50000 plus. Additional income was earned by farmers by reducing the production cost by 30%.

These experiences highlight the need to recognize and build upon farmers' innovative capacities to enhance their cropping resilience under varying climatic conditions. Experiments conducted by farmers illustrate that introduction of SCI involves many socio-technical

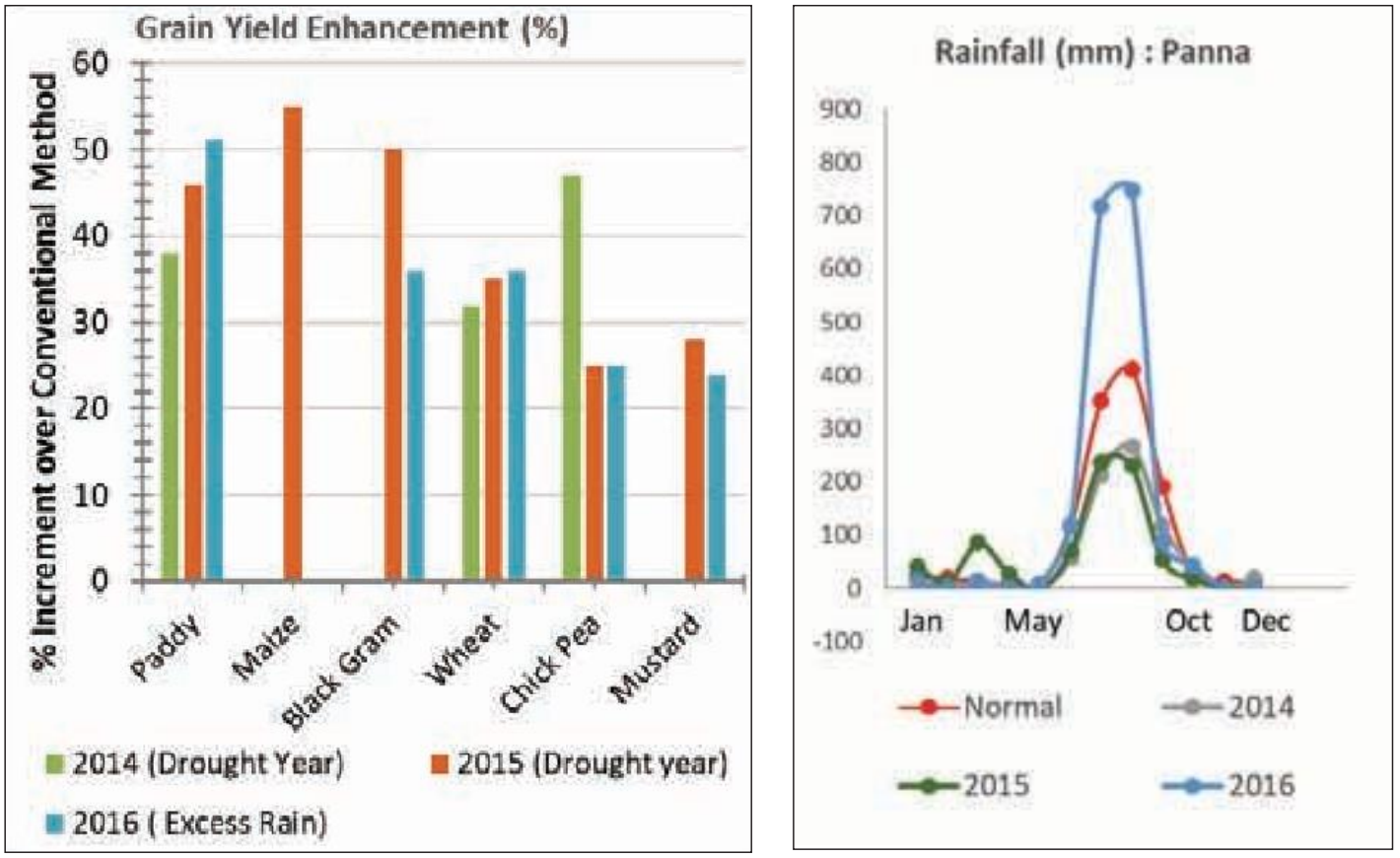


Figure 2: Grain yield enhancement from Bundelkhand region against the rainfall in those years

adaptation processes that are highly location-and farmer-specific. Any agricultural intervention needs to account farmers' existing practices and build upon their knowledge, experience, and skills. The **socio-technical approach of SCI** provides a foundation which with appropriate policy support can achieve the national goal of food and livelihood security.