

Assessing climate change impacts and agro-climatic indices of potato cultivars in Far-Western Nepal

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Introduction

Climate change severely impacts agriculture, including potato cultivation, in Nepal's agro-ecological regions. Assessing the impact of climate change on potato cultivation is crucial for identifying its effects on potato tuber yield and agro-climatic indices of potato. The result will help to promote adaptation measures in different agro-ecological regions.

Research questions

- How do farmers perceive the impact of climate change on potato yield and does it match the climatic trend?
- What are the impacts of agro-climatic indices on potato phenology and yield?

Methodology

A mixed method approach was used to identify effective climate change adaptation measures for potato production. The questionnaire survey (90), climate trend analysis (1990-2024) and field experimentation (one season) were done in three agro-climatic regions: high hills (Budhinanda Municipality, Bajura), mid-hills (Naumule Rural Municipality, Dailekh), and Terai (Godawari Municipality, Kailali).

Key findings

About 80% of respondents noticed long-term shifts in temperature and precipitation, which aligned with the climate trend analysis and field experiment across three study sites (Figure 1). Potato tuber yield and physiological maturity were significantly influenced by the variation in cultivar and planting dates across the study sites (Figure 2).

Figure 1 Trend analysis of average seasonal total rainfall (mm) in Bajura, Dailekh and Kailali from 1990 to 2024.

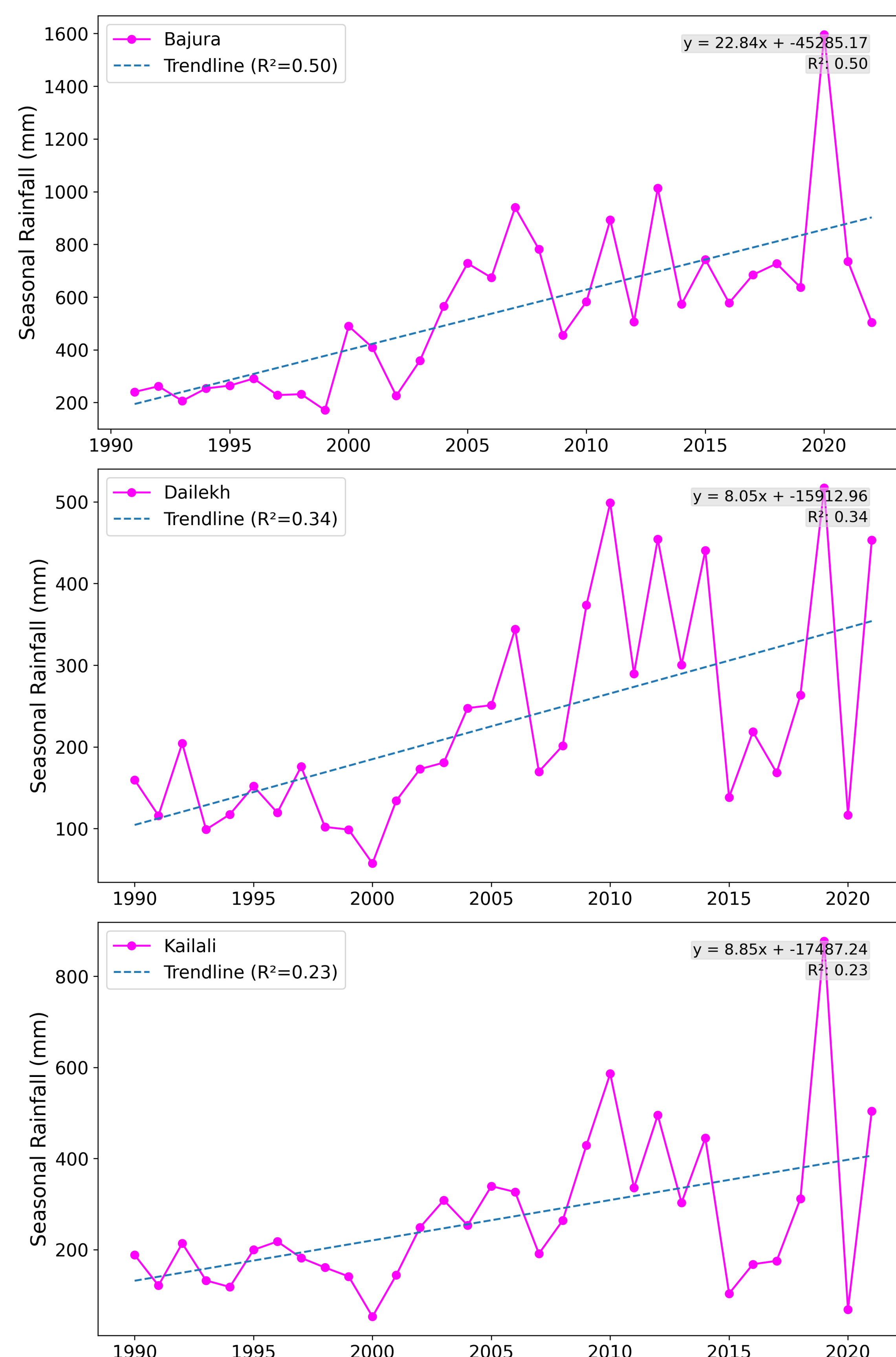
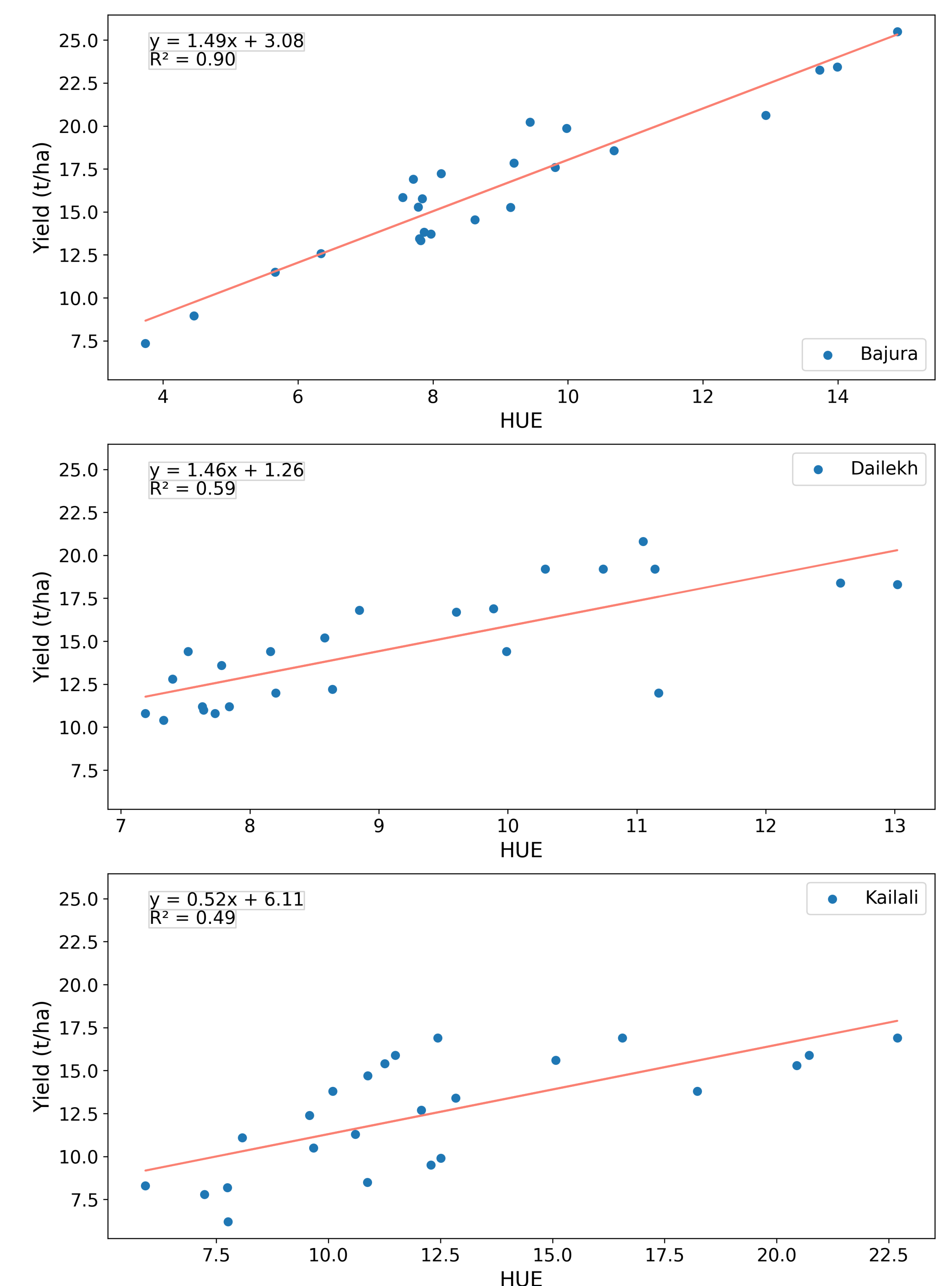


Figure 1 Correlation and regression analysis of potato tuber yield (t/ha) and HUE in Bajura, Dailekh and Kailali during 2023/2024



Conclusion

The reduction in potato tuber yield for high-yielding, early-planted cultivars highlighted significant yield gaps, which were more pronounced with changes in planting dates than with changes in potato cultivars. The mid-hill agro-ecology of Dailekh showed consistent yield gaps, suggesting its suitability for potato cultivation.

