



India
Punjab State

Diversifying Punjab's agricultural landscape could add USD 3 billion to farmers' incomes while improving environmental outcomes

The short-term costs of a transition to regenerative practices are offset by an average 30% increase in long-term farm profitability⁴

Current state of agricultural landscape

Agronomic & Environmental

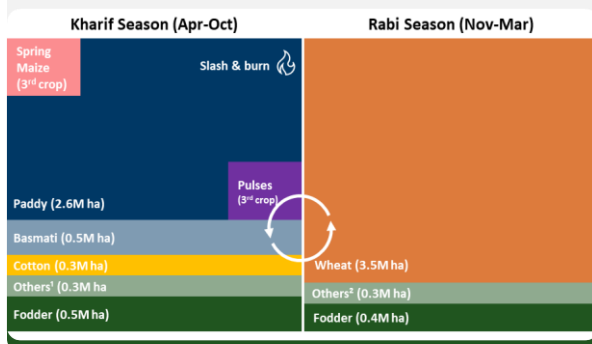
- Land use is dominated by a mono-crop rice-wheat system known for intensive underground water usage, high inputs and burning practices.

Economic

- Punjab's farmers face high debt with volatile revenues from few crops, reliant on subsidies and government purchases.

Social

- Political tensions over water rights persist with neighboring states; hidden health costs; Younger generations favor non-farm jobs.



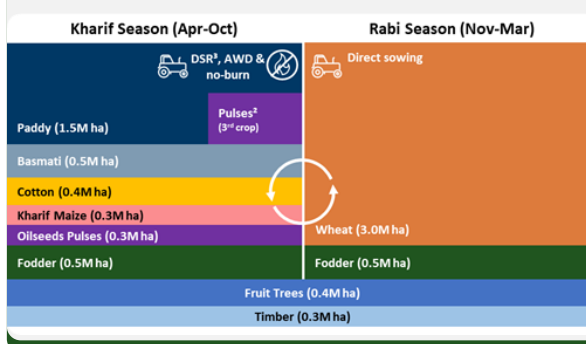
Transition pathway hypothesis

Crop diversification

- Decrease area for water intensive paddy and diversify landscape with cotton, maize and oilseeds pulses.
- Widespread adoption of direct rice and wheat sowing, alternate wetting drying, and stubble management for better water usage and lower air pollution.

Forestry/trees

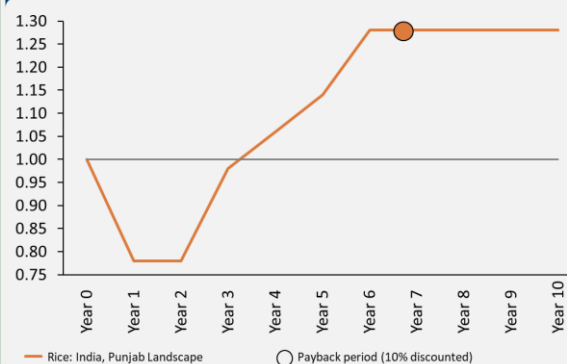
- Implement perennials (fruit and native trees for timber) to increase carbon sequestration, increase biodiversity and further income diversification.



Results of economic modeling

- \$3 billion Net Present Value (NPV – 10% discount) could be generated in the landscape with payback in year 7.
- Over 10 years, the cumulative effect of transition is positive with an average added NPV of 710 USD/ha.²
- Average farm profitability lowers during an interim period and reaches a point of equilibrium ~30% higher after year 6.
- Cost savings on cash crops and higher revenues from perennials are the main contributors to the positive net change.

Change in net profitability over a 10 years period for proposed transition pathway (alternative state/current state) Indicated in relative terms



Implications and recommendations

- Transition lifts farmer income by 6% in NPV and benefits the environment over the next decade.
- Diversification makes revenues more resilient and less affected by economic and climate market shifts.
- Regenerative agricultural practices reduce social tensions over water and enhance community health.

For transition to be possible, we need:

- Public procurement, including MSP¹, to help alternative crops be competitive with paddy.
- Public and private players to develop infrastructure and demand signals for sustainably produced rice and diversified agricultural products.
- Farmers to be provided with affordable technical aid and appropriate financial support, on top of current public incentives, during first years of transition.
- Longer-term land agreements for perennials.