Adapting Agronomic Management Practices for Enhancing Rice Yields: The Spread of SRI Practices in Mountain Farms of Uttarakhand, India

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We Investigated

Farmers' adaptations in response to introduction of System of Rice Intensification (SRI) in mountain farms of Uttarakhand, India

- how farmers adjust SRI elements to create various management combinations on rice farms
- how farm and household level management decisions are taken affecting G (Genotype) X E (Environment) interactions

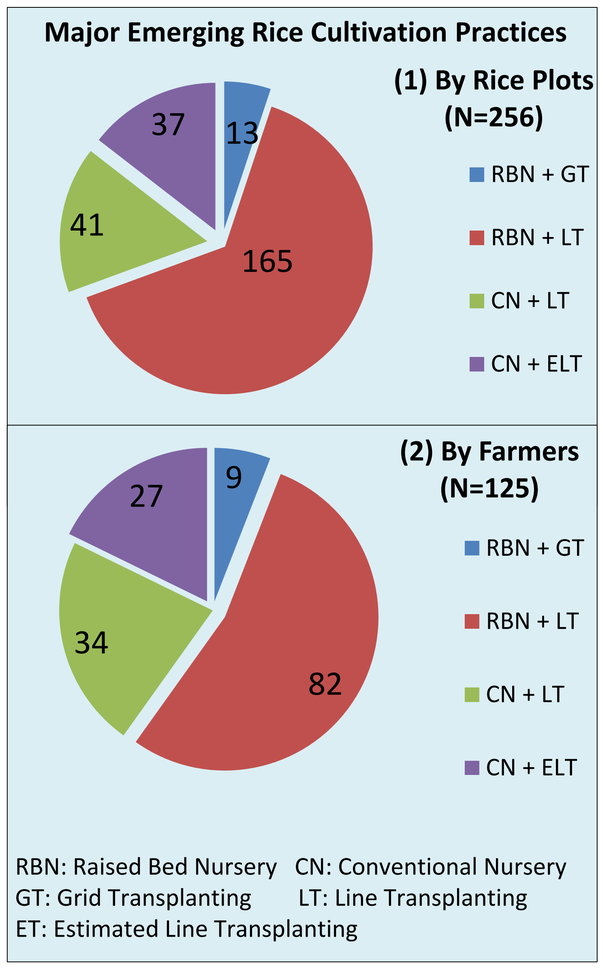
We Used

A technographic approach using combination of ethnographic tools including observations, field measurements, discussions and interviews to understand complexities of socio-technical interactions in rice farming situating SRI within diversity of mountain farming systems

- Chose 25 villages from Bhilangana and Jaunpur blocks of Tehri Garhwal district of Uttarakhand, India
- Pursued rice season of 2011 in 4 agro-ecologically diverse villages
- Monitored 2524 rice plots of 256 farmers to identify variations and inter linkages in management practices amongst farmers and fields
- Measured yields from 205 rice plots under different combinations of management practices

We Hypothesize

- Farmers based on their needs, knowledge, experience, and resources apply diverse practices across different rice plots
- Household and farm level decisions (i.e. M factor) play a critical role in farmers' choices resulting in hybridization of SRI elements with conventional management practices
- Elements of SRI can be applied even in resource poor areas to achieve sustainable intensification and food security
- User inclusive approach for diffusion of innovations gives ample scope for farmers to experiment, learn and adapt



We Recommend

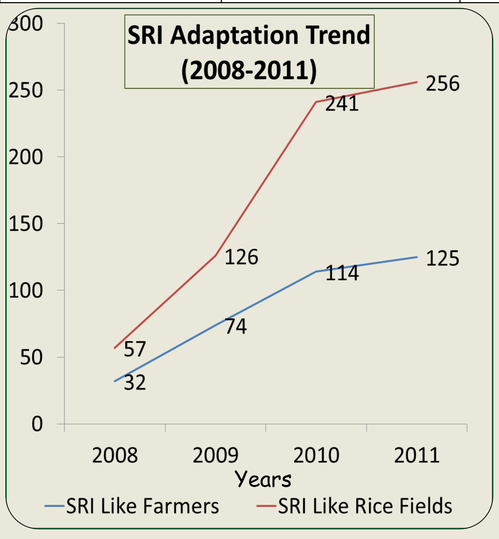
- Future research to determine various combinations of rice management practices which will give best results under varying agro-ecological and institutional settings
- Considering G X E X M interactions, even beyond rice, while developing modified packages of practices and reorganizing institutions to cope with location specific socio-economic and bio-technical conditions that would enable productivity enhancements to meet increased food demands in sustainable ways

We Found

Predominant rice cultivation methods in irrigated rice plots included direct seeding, transplanting and modified SRI practices

Table 1: Features of Conventional Rice Cultivation Methods and Farmers' Modified SRI

Parameters \ Method	*Saindha* (Direct Seeded)	*Bina /Bijwad* (Transplanting)	Transplanting from *Saindha*	*Prominent Farmers' Modified SRI*
Seedling Age at Transplanting	-	40 - 75 days	25 – 75 days	16-25 days
Seedlings/Hill	-	6 - 10	3 - 6	2-3
Plant Spacing	-	Random 10 – 22.5 cms	Random 10 – 22.5 cms	Row: 20-25 cms Plant: 10-15 cms
Water Management	Flooded	Flooded	Flooded	Flooded
Weed Management (No. of weeding)	4 at 15-25 days interval by hand	2 at 20-30 days interval by hand/hoe	3 at 15-25 days interval by hand	1-2 at 10-20 days interval by weeder
Organic Nutrient Management	0-3.5 T/ha before seeding	0-3 T/ha before transplanting	0-3 T/ha before transplanting	0-0.05 T/ha as per availability



About 50 % of farmers applied SRI elements to varying extents in 10 % of rice plots

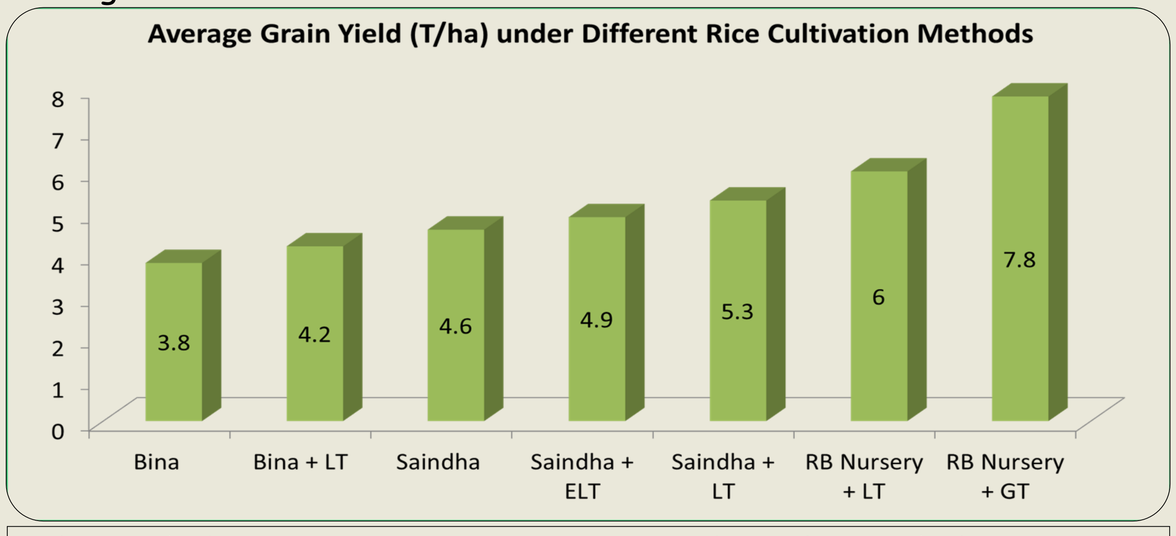
Resource poor mountain farmers, largely women

- were open to SRI and tested its suitability to their farm environments
- learnt through experiments and experiences over seasons
- selected elements that could fit into their diverse systems
- benefited through enhanced household food security, reduced vulnerability, and better livelihoods
- were even applying certain SRI aspects to wheat in *rabi* season

Farmers not only adopted but significantly adapted specific elements of SRI, preferring

- ❖ two to three 16-25 days' old seedlings
- ❖ row spacing of 20-25 cm with closely spaced hills within rows
- ❖ adding number of seedlings with increase in age of seedlings
- ❖ 1-2 mechanical weeding (even hand weeding in absence of marking)

- ❖ flooding rather than alternate wetting and drying due to cascade irrigation



LT: Line Transplanting ELT: Estimated Line Transplanting
GT: Grid Transplanting RB: Raised Bed

Even with limited incorporation of SRI management practices farmers were able to increase grain yields by 15 % to 50 %

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Also refer other posters under the same project :

P 4.25 – Glover and Maat
P 1.43 – Adusumilli et al.
P 4.30 – Berkhout