

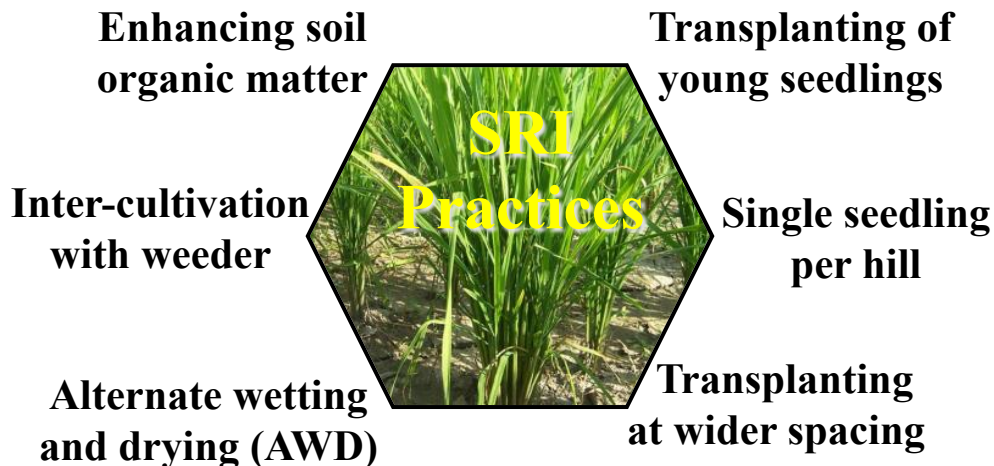
# What Does System of Rice Intensification (SRI) Bring? Improved Yields or Increased Agronomic-Bandwidth?



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# Research Background & Research Objective

- **Green Revolution and its Pros n Cons**
- **Evolution of SRI as a knowledge and skill intensive innovation**
- **Contested by mainstream agriculture science establishments**
- **Spread in more than 50 countries and practised by as many as 5 million farmers**
- **Numerous studies on its adoption, dis-adoption and non-adoption**



**What do farmers do when sustainable intensification methods like SRI open up several newer options in rice cultivation practices?**



# Methodology: Location and Tools



## 40 villages in three contrasting rice farming systems of India

- (1) Mountain systems in the North Western Himalayas in Uttarakhand
- (2) Rainfed systems in the Eastern Coastal Plains and Hills in Odisha
- (3) Groundwater-based systems in the Deccan Plateau region in Telangana

## Rice Seasons : 2011 to 2013

- Rapid Rural Appraisal Exercises
- Participant Observations
- Field Measurements
- Focus Group Discussions
- Semi-Structured Interviews

**Concept: Rice Farming as a Socio-Technical System**

# Characteristics of Studied Farming Systems

<div> <div>Rice- Farming System</div> <div>Characteristics</div> </div>	Mountain Systems in NW Himalayas (in Uttarakhand)	Rainfed systems in Eastern Coastal Plains and Hills (in Odisha)	Groundwater based systems in Deccan Plateau (in Telangana)
	Farming System	Farming System	Farming System
	Mixed crop farming + livestock rearing & forestry	Rainfed farming system + forestry	Rice based farming system supported by ground water irrigation
Rice Growing Season	Kharif (May to October)	Kharif (June to December)	Kharif and Rabi (Groundwater irrigated )
Average Landholding Size	About one acre per household	Less than one hectare per household	About two hectare per household
Major form of Ag. Labour	Mostly family and exchange labour	Family, exchange and hired labour	Mostly hired labour
Major source of irrigation	Irrig. canals fed by mountain springs and streams	Mainly rainfed + tanks & bore wells for suppl. irrig. in coastal plain	Bore wells
Other crops grown during rice season	Millet and pulses	Millet, pulses, oilseeds in uplands & only rice in coastal plains	Millet, cotton, pulses and oilseed



# SRI Demands New Performative Skills



**Raised Bed Nurseries (RBNs)**



**Properly Marked Fields**



**Water : Not Too Much nor Too Little**



**Precise Transplanting of Seedlings**

# Nursery Management

## In Uttarakhand

- Under limited water availability and at higher elevations - older seedlings from conventional nurseries preferred

## In Odisha

- Besides RBNs, also small nurseries in corners of wet puddled rice plots
- RBNs established when conventional nurseries delayed or damaged due to incessant rains or flooding

## In Telengana

- Mostly RBNs due to assured water supply



**RBNs alongside conventional seedling sources, helped farmers to :**

**(1) use and exchange inputs and seedlings between different rice systems (2) manage risks such as delayed nursery establishment, vagaries of weather (delayed rain or flooding) or unforeseen seedling mortality due to insect infestation**



# Crop Establishment

## In Uttarakhand

- Two different ways of transplanting evolved: line transplanting in rows only (where water availability was assured after marking) and line transplanting by eye estimation without the use of markers (where water supply was uncertain)

## In Odisha

- Roller marker replaced by rope marker
- Rectangular and square patterns of planting were observed

## In Telengana

- Irrigation, synchronisation of labour operations, and field conditions influenced marking



**No. of seedlings/hill varied depending upon seedling age, variety (indigenous/ hybrid/ HYV), seedling source (RBN/conventional), plot location (near/away from habitat) and even part of plot (border/middle) being transplanted**

**Reduction of planting density in the customary practices along with SRI plots**



# Water Management

## In Uttarakhand

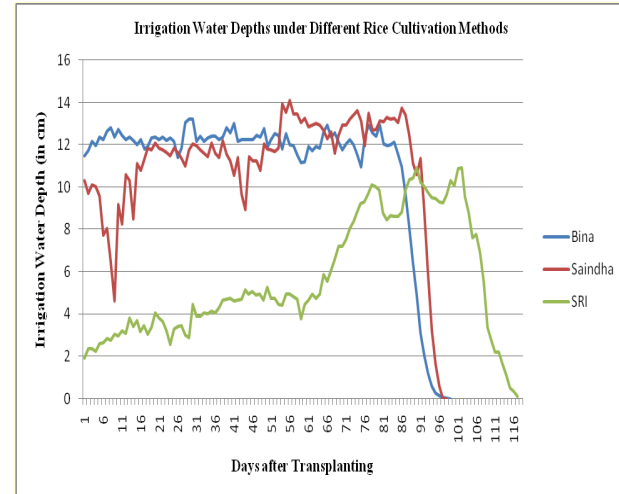
- Shift from traditional liberal flooding to shallow flooding, increasing water depth from transplanting to maturity stage in SRI plots

## In Odisha

- SRI plot selection depended upon possibility of better drainage and availability of water at frequent intervals
- Reduced practice of retaining water in conventionally grown rice plots

## In Telengana

- Limited hours of electricity limits AWD – encouraged maintaining thin film of water



Layout of canals, reliability of water supply, location of farms relative to habitats, and plot characteristics (size, shape, soil-moisture conditions, and biota) influenced application of SRI to particular plots

# Weed Management

## In Uttarakhand

- One way use of Mandva weeder along with supplementary hand weeding predominant in SRI plots

## In Odisha

- Cono weeders replaced by Mandva weeder
- Women expressed reduced work load and better health conditions while using Mandva weeders

## In Telengana

- No incentive for mechanical weeding for hired labour
- Mechanical weeding mostly limited to family labour



Farmers shifted to line transplanting discarding grid plantation as the latter required weeding on both sides. Also resulted in switching over to transplantation by using marked ropes as against mechanical markers.

# Labour Management

## In Uttarakhand

- Farmers preferred establishing and collectively raising multiple nurseries on a common plot
- Transplanting groups were transformed with young girls joining line and grid transplanting

## In Odisha

- Transplanting group size reduced and managed mostly by family members and exchange labour relatively young

## In Telengana

- Farmers having family labour do marking ahead of the transplanting labor group, while those externally dependent on labor for marking opted for transplanting with ropes operated by the transplanting labor



Transformation in gender division of labour was observed, more visible in weeding



# Conclusions and Implications

- New technologies are often assumed to fit automatically into any farming system overlooking local complexities, uncertainties and constraints
- Agricultural interventions involve complex socio-technical adaptation processes
- Farmers try to integrate practices according to local context, leading to extension and diversification of the repertoire of methods
- Issues pertaining to labour use, water management, livelihoods and ecological services have to be integrated instead of focusing on farm productivity and individual households



**Need to build upon farmers' adaptive capacities to maximize exploitation of agro-ecological niches, minimize uncertainty in farm production and rationalize employment of available work force**



**THANK  
YOU !**

