

# UP-SCALING SRI IN MOUNTAIN STATES OF UTTARAKHAND & H.P.



**People's Science Institute  
Dehradun**

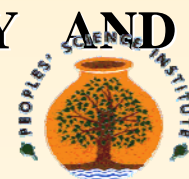


# SRI – A Boon for Mountain Farmers

Particulars	Uttarakhand	Himachal Pradesh	Total
Total geographical area (in Lakh ha)	53.49	55.67	109.16
Average rainfall (mm)	1547	1469	1508
Net sown area (in Lakh ha)	5.78	5.58	11.36
Irrigated area (as % of net sown area)	19	35	27
Area under paddy (in Lakh ha)	2.80	0.79	3.59
Total paddy production (Lakh tons)	8.3	1.9	10.2
Average yield of paddy (tons/ha)	2.96	2.40	<b>2.84</b>

- Small farm holdings: about 0.4 ha (1 acre) per family
- Rice is the staple food of the resident populace
- Higher stalk volume means more fodder for the cattle
- More farmyard manure and possibly increased milk yields resulting
- Promotes a sustainable and more equitable mode of paddy cultivation

**SRI HAS POTENTIAL TO ADDRESS THE FOOD SECURITY AND LIVELIHOOD NEEDS OF SMALL AND MARGINAL FARMERS**



# The Beginning (2006-07)

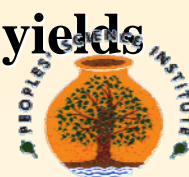
- Orientation workshops – briefings on benefits for mobilisation (covering > 1000 farmers)
- Training and demonstration programmes - preparation of field, nursery, seed sowing, transplanting, weeding, and organic composting
- Field support at transplanting, tillering & milk-rice stages
- District-level experience-sharing workshops - ~500 farmers, 25 NGOs, and 50 government officials



# Coverage and Results for SRI and Conventional Methods of Paddy for UK and HP, 2006-07

Particulars	2006		2007	
	Conventional	SRI	Conventional	SRI
No. of farmers (villages)	40 (25 villages)		591 (133 villages)	
Area (ha)	-	0.95		15
Total tillers (min-max)	1-14	5-35	4-13	15-21
Average plant height (cm)	93	106	104	104
Panicles/plant (min-max)	1-14	5-40	4-13	9-21
Average panicle length (cm)	18	22	17	20
No. of grains/panicle	99	155	105	145
Yield (Q/ha)	32	53	29	54

While non-SRI yields stood close to 30 quintals per ha, the SRI yields were around 54 quintals per ha (average increase of 74%).



# Moving Forward (2008)

**Goal** - To enable mountain farmers of U.K. and H.P. to enhance food and livelihood security through adoption of SRI techniques

## **Objectives** -

- Undertake capacity-building of farmers to adopt SRI techniques for paddy cultivation
- Build the capacities of voluntary organizations by creating a talent pool of master-trainers for promoting SRI
- Help formulate State agricultural policy for promoting the extension of SRI techniques



# Strategy for Up-caling

- Selection of basins and partner organizations (POs)
- Selection of villages and farmers
- Capacity-building of master-trainers, farmers, and extension personnel
- Information dissemination through print and electronic media
- Research on other crops and equipment
- Networking
- Programme monitoring
- Policy advocacy



# Outreach

- About 500 village clusters were selected in different sub-basins so that the impact is more visible.
- Expansion was made in sub-basins where the success of SRI had initially been demonstrated
- Additional valleys where paddy is widely cultivated were selected for further extension
- Covering all 13 districts of U.K. and 5 districts of H.P. (Bilaspur, Chamba, Kangra, Mandi and Sirmour)
- 30 people's organizations in U.K. and 10 POs in H.P. selected 81 master-trainers, including progressive farmers and experienced workers who know farming



# Training of Master Trainers

Day 1: Constraints in conventional method; concepts, principles and benefits of SRI; steps of SRI; practical exercise on seed treatment, nursery raising, etc.

Day 2: Practical exercises on marking, transplanting, weeding; organic farming practices; precautions for SRI

Day 3: Farmers' mobilization, field support services, monitoring, data collection, and analysis methods





# Selection and Capacity-Building of Farmers

## Selection Criteria

- Farmers who had earlier adopted SRI
- Farmers who had expressed willingness to adopt SRI in previously conducted experience-sharing workshops
- Farmers who were ready to contribute towards weeder and marker sets
- 25% of farmers from SC/ST

## Capacity-Building

- 334 orientation workshops
- 40-50 farmers/batch from a cluster of 2-3 villages
- Workshops focused on:
  - Educating farmers about procedures of SRI
  - Conducting demonstrations to explain equipment use.
  - Do's and don'ts
- Field support & trouble shooting



# Orientation Workshops for Farmers



# Field Support Activities



Nursery raising



Mulching



Land preparation



Transplanting

# Capacity-Building of Extension Personnel

- Orientation workshops for Chief Agriculture Officers and Deputy Director Agriculture (district-level)
- Training programmes for ADOs and SMS (block-level)
- Exposure visits for In-Charge Officers and trainers from KVKs



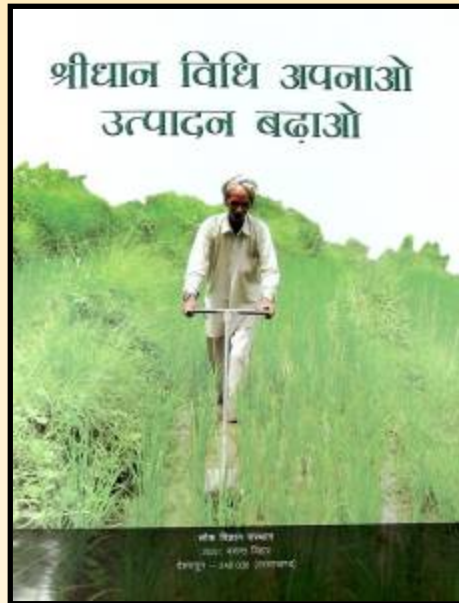
Classroom Session



Field Training

# Preparation of Communication Materials & Information Dissemination

- Advertisements in popular dailies and advertisement spots on ETV channel
- User-friendly manual on SRI (in Hindi)
- Film on SRI (in Hindi)



श्रीविधि से धान लगाओ, वर्ष भर का खाद्यान्न पाओ ।

- कम बीज
- कम पानी
- कम श्रम
- कम लागत



“श्रीविधि द्वारा धान उगाने से अनाज व पुराल भरपूर प्राप्त हुआ”- श्रीमति मीना देवी, मथामाली, टिहरी गढ़वाल, उत्तराखण्ड

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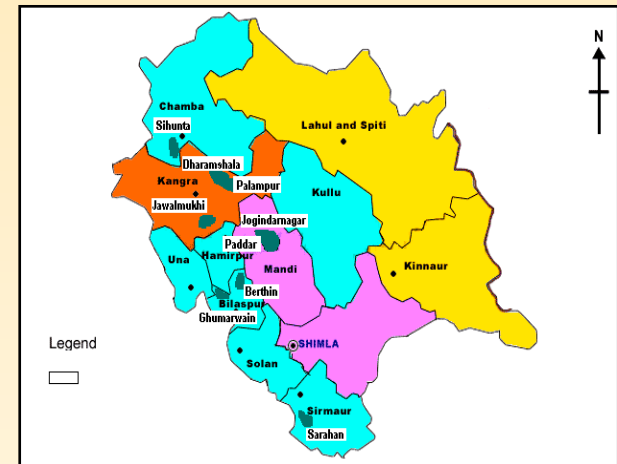
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# Programme Coverage (2008)

	U.K.	H.P.	TOTAL
Total no. of districts	13	12	25
Districts covered	13	5	<b>18</b>
Total no. of blocks	95	75	170
Blocks covered	27	16	43
Total no. of villages	15,761	20,118	35,879
Villages covered	358	138	<b>496</b>
Farmers trained	11,377	3,733	15,110
SRI farmers	8,996	3,013	<b>12,009</b>
Area under SRI (ha)	181.14	57.55	238.69



# Exposure Visits of Farmers



# Experience-Sharing Workshops

18 Workshops conducted -- one each at the district level



State	Non-SRI Farmers	NGO Personnel	Agriculture Dept. & KVK	Others	Total
Uttarakhand	661	97	54	91	903
Himachal Pradesh	545	36	29	13	623
<b>Total</b>	<b>1,206</b>	<b>136</b>	<b>83</b>	<b>104</b>	<b>1,526</b>



# Crop-Cutting Results of 2008

Particulars	Uttarakhand		Himachal Pradesh	
	Conven- tional	SRI	Conven- tional	SRI
<b>No. of farmers (villages)</b>	8,996 (358 villages)		3,013 (138 villages)	
<b>SRI area (ha)</b>	-	181.14	-	57.55
<b>Total tillers/ plant</b>	8	21	6	20
<b>Productive tillers/plant</b>	7	18	5	18
<b>Average plant height (cm)</b>	99	122	82	96
<b>Average panicle length (cm)</b>	18	23	18	24
<b>Grains/panicle</b>	95	175	87	183
<b>Grain yield (Q/ha)</b>	<b>34</b>	<b>56</b>	<b>38</b>	<b>53</b>

**While non-SRI yields stood close to 36 quintals per ha, the SRI yields were around 54 quintals per ha (average increase of 50%).**



# Research

- Comparative study of inputs and benefits obtained by conventional and SRI methods
- Trials on other crops like wheat, *mandwa* and *rajma*
- Design and fabrication of equipment like marker, weeder, and seed drill



# Research on Other Crops

	Crop	No. of Farmers	Area (ha)	Grain Yield (Q/ha)		% Incr.
				Conv.	SRI	
<b>2006</b>						
1	<b>Rajma</b>	5	0.4	14	20	43
2	<b>Mandwa</b>	5	0.4	18	24	33
3	<b>Wheat</b>	Research Farm	5.0	16	22	38
<b>2007</b>						
1	<b>Rajma</b>	113	2.26	18	30	67
2	<b>Mandwa</b>	43	0.8	15	24	60
3	<b>Wheat (I)</b>	25	0.23	22	43	95
4	<b>Wheat (UI)</b>	25	0.09	16	26	63



Rajma



Manduwa

# Cost-Benefit Analysis for SCI and Conventional Methods of Paddy & Wheat Cultivation

Method	Conventional				SCI			
	Total expenditure (Rs./ha)	Gross income (Rs./ha)	Net profit (Rs./ha)	C-B ratio	Total expenditure (Rs./ha)	Gross income (Rs./ha)	Net profit (Rs./ha)	C-B ratio
Transplanting (Local paddy)	26,250	34,700	8,450	1:1.3	23,750	56,125	32,375	1:2.4
Transplanting (Paddy -- Basmati Type-3)	28,000	63,125	35,125	1:2.3	25,500	96,875	71,375	1:3.8
Direct seed sowing (Wheat)	22,720	30,600	7,880	1:1.3	25,850	51,600	25,750	1:2.0

**Organic Basmati Type 3 variety is the most profitable for mountain regions having altitude less than 1500 m**



# Lessons & Recommendations for SRI Paddy for Mountainous Regions

## Seed Sowing Time for Nursery

- (i) High Altitude (>1500 m) : 1-7 June
- (ii) Medium Altitude (1000-1500 m): 10-20 June
- (iii) Low Altitude (<1000 m) : 25 June-5 July

## Transplanting Time

- (i) 10-15 days: Yield = 70-75Q/Ha
- (ii) 16-23 days: Yield = 55-60 Q/Ha
- (iii) > 23 days: Yield = 40-45 Q/Ha

## Weeding

- (i) Three Times: Yield = 70-75Q/Ha
- (ii) Two Times: Yield = 60-65 Q/Ha
- (iii) One Time: Yield = 50-55 Q/Ha



# Institutional Networking

- Vivekanand Parvatiya Krishi Anushandhan Sansthan (VPKAS), Almora, Uttarakhand
- Gobind Ballabh Pant University of Agriculture and Technology (GBPUAT), Pantnagar, Uttarakhand
- Rice and Wheat Research Centre (RWRC), Malan, HP
- CSKHP Agriculture University, Palampur, Kangra, HP.



# Programme Monitoring

- State-level panels (PMCs) of experienced persons constituted, including experts, government officials, scientists, etc.
- PMCs review the programme through field visits as well as holding meetings with the programme staff
- Programme feedback provided to top government officials like Chief Secretary, Agriculture Secretary, Rural Development Commissioner, and Agriculture Directorate



# Policy Advocacy

- **Linkage with Agriculture Department:** Support for capacity-building, subsidy for equipment and manures
- **Convergence with other programmes:** ATMA, Ajeevika Programme, Uttarakhand Decentralised Watershed Development Programme, BRGF
- **Linkage with other institutes:** Research institutions, state agricultural universities (SAUs), KVKs, Uttarakhand Organic Commodity Board, etc.
- **Media advocacy:** Popularisation of SRI through newsletters, local newspapers, magazines, national journals, radio, TV, etc.
- **State-level workshops:** In December 2008, state-level workshops will be conducted where senior state-level officials and policy makers will participate with farmers and NGOs





# **SRI: Farmers' Perceived Benefits & Constraints**

## **A. BENEFITS of SRI**

- **Less seed requirement**
- **Saving in water**
- **Decreased workload**
- **Less disease occurrence**
- **Less lodging**
- **High grain yields**
- **High grain quality**
- **Increased biomass**
- **Improves soil fertility**

## **B. CONSTRAINTS for SRI**

- **Time-bound operations**
- **Labour-intensive**
- **Accessibility to weeders and markers**
- **Accessibility to manure**
- **More effort required in operating Mandava weeder for small terraces & clay soils**
- **Unavailability of water under rainfed conditions, especially after milk-rice stage**



# Concerns

- Lack of adequate, trained, and committed master-trainers for capacity-building and field support activities
- One-time training inadequate (continued and timely field support required)
- Selection of villages (villages scattered & approach is difficult, also limited water availability)
- Rainfall aberrations (during transplanting and drainage periods)
- Timely availability of quality equipment (inadequate outlets) and inadequate compost material (cow dung and urine)
- Limited adoption (ubiquity of small plots, poor quality land)
- Variability in adoption (seedling age, seedling spacing, water management, nutrient and weeder use)



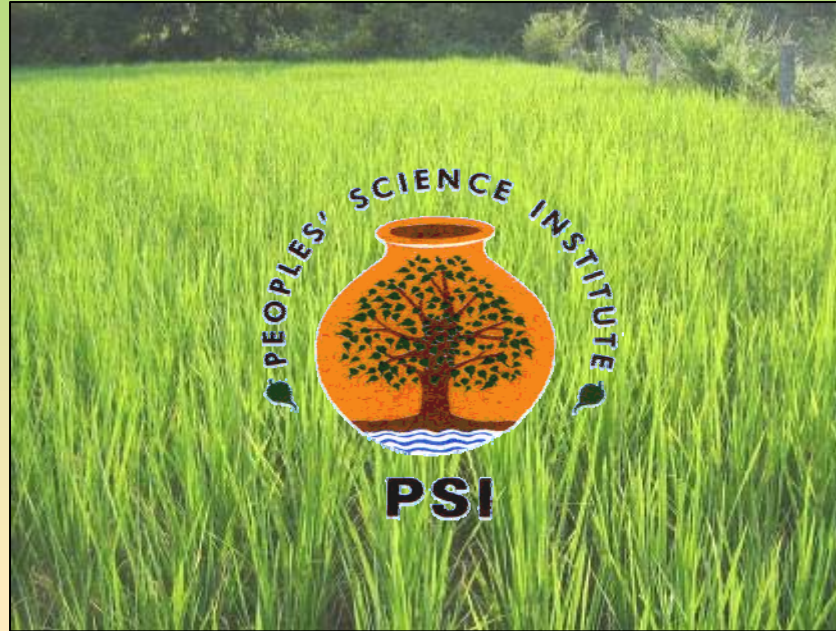
# Areas for Improvement

- Improvements in package of practices (water, nutrient, and labour, management, cost effective equipment, etc.)
- Capacity-building strategy (village-level resource persons and regular quality training)
- Research on other crops, disease-resistant and tillering varieties, equipment, etc.
- Networking among stakeholders (farmers, CSOs, government, research institutions, agriculture universities, media, etc.)
- Policy framework (incentives, assured irrigation, outlets for equipments, market, etc.)



**Farmers should be provided flexibility for adoption of different principles under SRI**





# Thank You

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