SRI

System Of Rice Intensification

AN EXPERIENCE IN PUNJAB

UNDER EXTENSION REFORM (ATMA)

Department Of Agriculture, Punjab

Dr Amrik Singh
Agriculture Dev. Officer cum
Dy Project Director ATMA
Gurdaspur (Punjab)
E mail :- pansotradpd@rediffmail.com
Tel. No, :- +91-9872211194

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" System of Rice Intensification(SRI)in India

Progress and Prospectus

Dated 3rd – 5th Oct , 2007

Agartala (Tripura)

BASIC DATA OF PUNJAB

- Total Geographical Area :-5 0.33 lac hectares
- Net area sown :- 42.01 lac Hec
- Area under cultivation (%) :- 84
- Area under irrigation (%) :- 96
- Cropping intensity (%) :- 188
- Area under Rice:-25.75 lac ha.
- Cropping pattern :- Rice – Wheat
- Decrease in water level during
- 1993-2003 = 55 cm
- 2004 – 2005 = 74 cm
- Contribution of rice from Punjab to central pool is keep reducing

Would it be the future of Punjab?

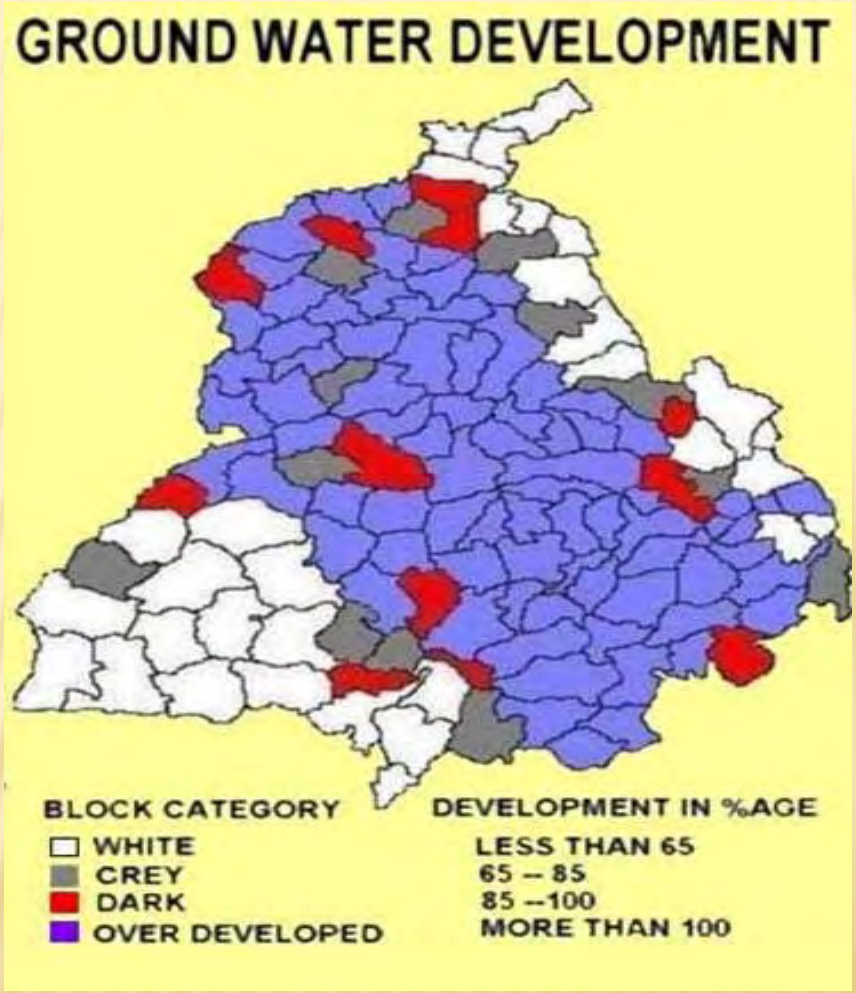
FUTURE OF PUNJAB

SAVE WATER SAVE LIFE
TO SUSTAIN UNIVERSAL PROSPERITY

BIN JAL NAHIN KAL

First, there is life in the water, by which everything else is made green

AVERAGE FALL/RISE OF WATER TABLE IN PUNJAB DURING 1993 - 2003



Average Fall/Rise of water table in Punjab during 1993 - 2003

CAUSES OF WATER TABLE FALL

SHIFT IN CROPPING PATTERAN

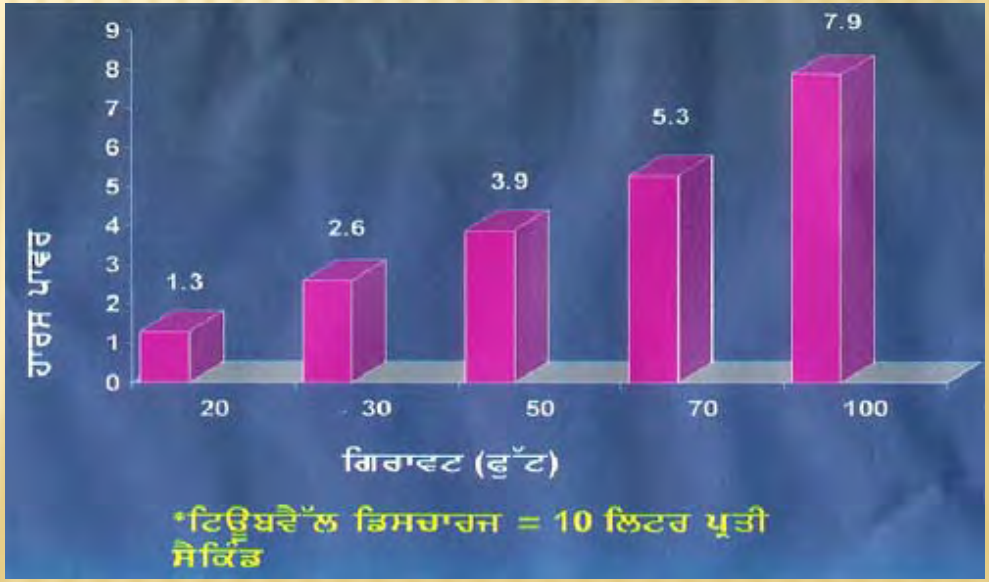
Crop	Pre Green revolution	Present day
Wheat	37%	78%
Rice	6%	60%
Gram	22%	0.4%
Other pulses	24%	1.3

CONT....

- EARLY RICE CULTIVATION
- FREE ELECTRICITY AND CANAL WATER FOR IRRIGATION
- WANING AWAY NATURAL LOW LYEING AREAS ,COMMON VILLAGE PONDS.
- CONTINOUS STANDING OF WATER IN RICE FIELD RESULTED IN RELEASE OF 0.45 TONE OF METHANE AND CO_2 IN 90 DAYS WHICH LEADS TO GLOBAL WARMING

CONT..

- SHIFT IN INSTALLING SUBMERSIBLE PUMPS FROM THE CONVENTIONAL CENTRIFUGAL PUMPS
- Results in
- 1.HIGH INSTALLATION COST.
- 2. INCREASED POWER REQUIREMENT AGAIN & MORE INPUT COST.



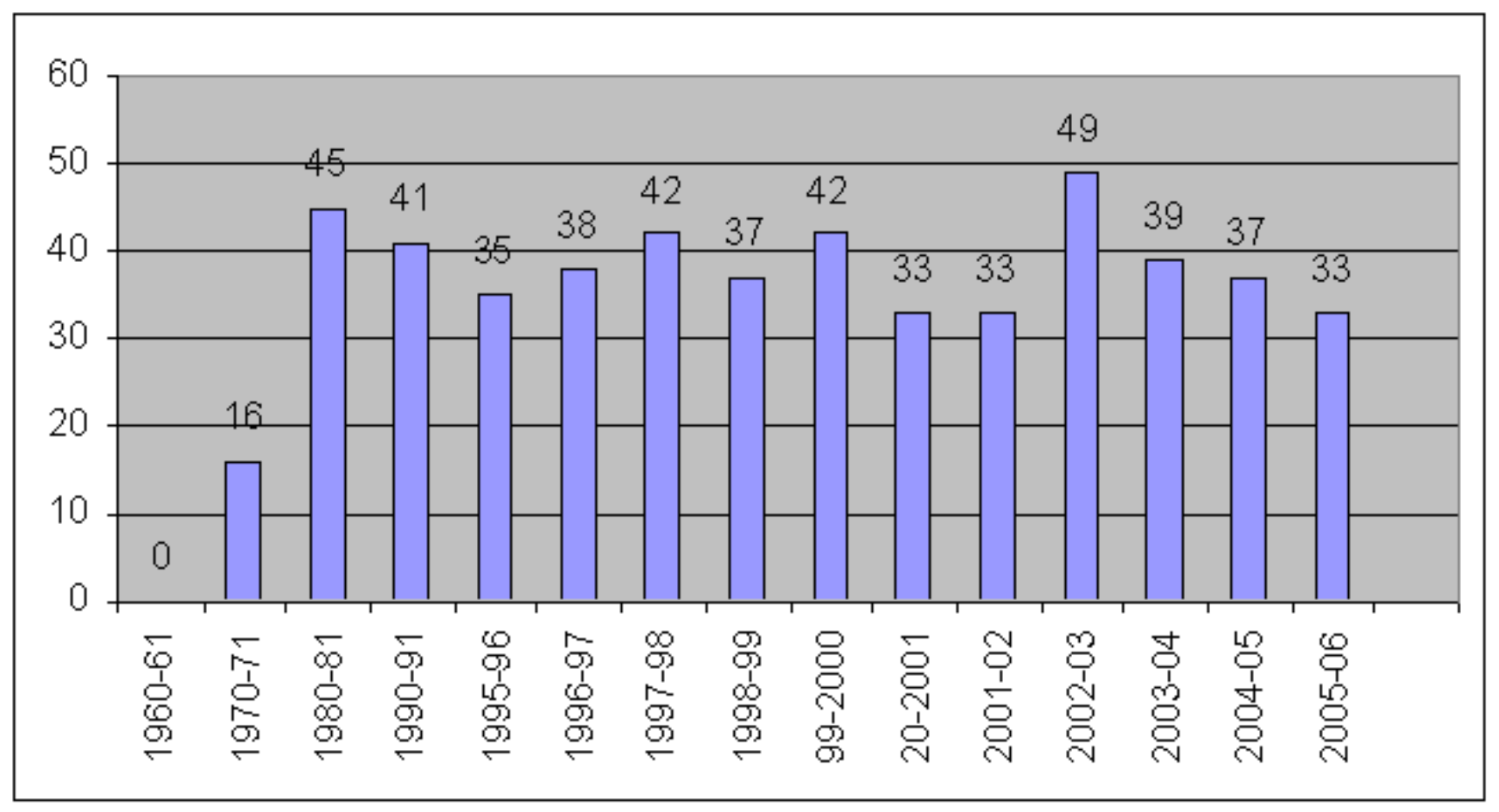
DETERIRATION OF GROUND WATER QUALITY

EFFECT OF SODIC SUB SOIL WATER IRRIGATION ON RICE

TREND IN DECLINING IN AGRICULTURE GROWTH RATE

5 Year plan	Growth Rate (%)
1992-97	4.7
1997-02	2.1
2002-06	1.5
2007-12	4.1

Contribution of Rice to the central pool from Punjab



Static of DOA Punjab

REMEDIAL MEASURES:

1. Increasing ground water recharge.

- Maintenance of soil health for sustainable tapping of under ground water.
- Renovation of existing village ponds and excavation of new ponds For tapping ground water flow
- Increase in canal water supply.

2.Crop Diversification

3. Delaying rice transplanting

4. Increase area under Hybrid rice.

5. Popularize the System Of Rice Intensification for increasing productivity of rice per unit of area & water saving.

NEED OF SRI IN PUNJAB

- Depletion of under ground water table.
- Degrading Soil Fertility.
- Shrinkage of size of land holding.
- Rise in cost of cultivation.
- Deficiency of micro nutrient.
- Developing pest resistance.
- Decrease in production and productivity.

Methodology

- Nursery was sown on raised beds
- young seedling of 10-12 day old seedling used for transplanting.
- Single seedling per hill.
- Planting at wider spacing(25x25 cm) .
- Weed control with conoweeder as well as manually .
- Irrigation was given 2.5cm depth up to PI after surface crack developed.
- 65 kg urea was used in addition of 4 tone FYM.

PREPRATION OF NURSERY BED

Seed Treatment

- 10 gm ceresin wet
- I gm Streptocyclin

Per 8kg seed

- Broadcast the seed on nursery bed

- Application of thin layer of FYM
- Broadcasting of sprouted seeds on nursery beds

COVERING THE NURSERY BED WITH RICE STRAW

SEEDLING AFTER 10 DAYS

UP ROOTING OF SEEDLING

SRI

CONVENTIONAL METHOD

TRANSFER OF SEEDLINGS FOR TRANSPLANTING

SRI

CONVENTIONAL METHOD

Application of fertilizer

- 35 Kg urea at the time of field preparation
- 4 tone well rotten FYM per acre
- 15kg Urea at 25 DAT
- 15 Kg Urea at 45 DAT

PREPARATION OF CHANNELS FOR DRAINAGE OF EXCESS WATER

Flooding the Main Field

Marking with Marker

Transplanting of young seedling

INITIAL GROWTH UNDER MINIMUM IRRIGATION (SRI)

INITIAL GROWTH UNDER MAXIMUM IRRIGATION (CONVENTIONAL METHOD)

WEEDING WITH ROTARY CONO WEEDER

DR GURDIAL SINGH JOINT DIRECTOR OF AGRICULTURE (HYVP) & DR B.S. KAHLON CHIEF AGRI. OFFICER ARE INTERACTING WITH THE FARMERS

APPLICATION OF IPM TO MINIMISE THE USE OF INSECTICIDE

Difference between SRI and conventional method of rice cultivation (PAU 201)

SRI

Conventional method

PUSA 1121, UNDER SRI

HYBRID VARIETY OF RICE 26P26 UNDER SRI

HYBRID VARIETY OF BASMATI , RH 10 UNDER SRI

Profuse Productive Tillers

REDUCTION IN HEIGHT OF PLANT

SRI

NON-SRI

STONGER ROOT SYSTEM

MORE GRAIN PER PANICLE

IMPROVEMENT IN SOIL HEALTH THROUGH BIOLOGICAL ACTIVITIES

Milli Pedes in SRI field

Productive tillers

VIEW OF FIELD DAY ON SRI

Farmers counting the tillers of SRI rice plant in an exhibition

SRI farmer presenting panicles of SRI rice to S. Sucha Singh Langah, Minister of Agriculture, Punjab

SRI IN MEDIA

पानी की बढ़ती मांग तथा भविष्य में पानी की कमी को देखते हुए धान की खेती की एक नई विधि विकसित

एसआरआई पद्धति से बढ़ती है धान की उपज

नर्सरी की तैयारी और बीज बोआई

एसआरआई तकनीक के लाभ

एसआरआई के सिद्धांत

धान रोपाईकरण विधि का इतिहास

खेत की तैयारी

सिंचाई एवं जल प्रबंधन

तकनीक | एसआरआई विधि से धान की खेती किसानों के लिए वरदान

कम लागत में लाभ की संभावना

खेती-बाड़ी

खेत की तैयारी

खाद की जरूरत नामात्र

पनीरी की तैयारी

खर्च आता है कम

Economics of SRI cultivation vs. Conventional method (kharif 2007)

	Non SRI		SRI	
Item	Quantity	Value (Rs)	Quantity	Value (Rs)
Production of paddy Product (per acre)	31.80 qt/acre	21465/-	49.80 qt/acre	33615/-
Variable costs			-	-
1. Seed & Seed Treatment				
i. Seed (Kg)	8kg	120/-	2kg	30/-
ii. Seed Treatment	10	6/-	10gm	6/-
(a) Emisan (gm)	1	5/-	1gm	5/-
(b) Streptomycin (gm)				
Sub Total		131/-		41/-
2. Manure and fertilizers				
(a) Urea	110kg	499/-	65kg	278/-
(b) DAP	50kg	467/-		
(c) Zinc Sulphate	-	-	-	-

CONT....

Item	Quantity	Value (Rs)	Quantity	Value (Rs)
FYM	-	-	4 ton	1200/-
(d) Muriate Of Potash	-	-	-	-
a.Sub Total		966/-	-	1478/-
(3) Pesticides, Fungicide &Insecticide				
(a) Nuvacron	-		-	-
(b) Blitox	-		-	-
(C)Butachlore	1200 ml	180/-	-	-
(d) Caldan	-	-	-	-
Sub Total		180/-	-	-
(4) Irrigation	26	675/- (Diesal charges)	14	215/-
(5) Human Labour(transplanting, spray, weeding, extra)		1200/-		2125/- per acre

CONT....

(6) Tractor (hrs)	3T Harrow 2 Tiller Puddling	900/- 500/- 650/-	3T Harrow 2T Tiller Leveler	900/- 500/- 100/-
(7) Harvesting		600/-		700/- per acre
(8) Marketing Charges		146.55/-		229.08/-
Sub Total		3996.55/-		4554.04/-
Total Variable Cost		5948.55		7288.04/-
Interest@ 9% for half year		535.32/-		655.42/-
Total Cost		6483.87/-		7943.46/-
Total Return		1498I.13/-		25671.50/-

REPORT ON SRI CULTIVATION

NAME OF THE FARMER : BHAGWAN SINGH
ADDRESS : VILLAGE DEHRIWAL DAROGA : DISTRICT GURDASPUR
SEASON : KHARIF SEASON 2007-08
AREA UNDER SRI : 3 kanal
VARIETY : PAU 201

S.No.	Parameter	Farmers method	SRI
1.	Date of Nursery sowing	18 /5/2007	18/5/2007
2	Date of Transplanting	16/6/2007	27/5/2007
3	Weed Control	1200 ml Butachlor	2 T weeding with CW+ 1HW
4	FYM	NIL	1 MT
3	Fertilizer (Urea in Kg per acre)	115	45 kg
4	No. of productive tillers/m2	345	425
5	No. of grains/panicle	225	297
6	Length of panicle (cm)	25	28
8	Chaffy grain (%)	16	12
9	Grain yield (kg/acre)	28.400 qt/ acre	38.680 qt/ acre
10	Yield per sq mt (gm)	710	967
11	Duration (days)	145	137

REPORT ON SRI CULTIVATION

NAME OF THE FARMER : KAPIL BEHAL
ADDRESS : VILLAGE HAYATNAGAR : DISTRICT GURDASPUR
SEASON : KHARIF SEASON 2007-08
AREA UNDER SRI : 0.5 ACRE
VARIETY : PAU 201

S.No.	Parameter	Farmers method	SRI
1.	Date of Nursery sowing	12/5/2007	12/5/2007
2	Date of Transplanting	13/6/2007	24/5/2007
3	Weed Control	1200 ml Butachlor	3 T weeding with CW
4	FYM	NIL	4 MT
5	Fertilizer (Urea in Kg per acre)	115	65 kg
6	No. of productive tillers/m2	245	315
7	No. of grains/panicle	212	302
8	Length of panicle (cm)	25	32
10	Chaffy grain (%)	16	13
11	Grain yield (kg/acre)	31.80 qt/ acre	49.80 qt/ acre
12	Yield per sq mt (gm)	795	1250
13	Duration (days)	145	141

SAVING OF WATER FOR IRRIGATION WITH SRI

Method Of Cultivation	No. Of Irrigation per acre	Time to irrigate one acre	Saving Of Water under SRI	
Conventional Method	26	4 Hour (5 cm)	45-50 %	
SRI	14	2.15 hour (2.5cm intermittent drying and wetting)		

- If we apply SRI method of Rice cultivation in 26 lakh hectare area of Rice in Punjab then it is estimated that 50% water and electricity can be saved.

YEAR WISE ADOPTION OF SRI IN PUNJAB UNDER PROGRAMME REPORTED ON

Year	No. of farmers	Area covered (acres)
2005-06	10	3
2006-07	25	30
2007-08	150	175

BENEFITS OF SRI AS OBSERVED BY FARMERS

Seed requirement	75% less
Water requirement	45-50 % less & resist water stress
Fertilizer requirement	25%-40 %less
Head rice recovery	71-74%
Maturity period	Uniform
Duration	8-10 less
Yield	25% -40% more
Root and tillering system	Strong & profuse resulted in lodging resistant
Pest & disease management	Development of resistance against foot rot in Basmati
Soil health	Increase the microbiological activities

FARMER'S OBSERVATIONS FOR IMPROVEMENT

- Required GM /compost & good land preparation
- Drain the field before transplanting to get thicker mud
- Experiment with different planting distance
- Need for motorized mechanical weeding for soil aeration
- Need for research on chemical weed control due to shortage of labour

CONSTRAINTS

- Psychology and attitude.
- Transplanting.
- Water Management.
- Lack of labour for transplanting & weeding
- Scooping of seedling
- Lack of equipment for marking & weeding
- Some time cono weeder not working
- Non availability of organic manures
- More labour intensity with SRI

Unsolved Problem in SRI plot

LEARNING

- Irrigating field up to the flowering stage to a depth of 2.5 cm after surface cracks developed
- Afterwards conventional irrigation - give a similar yield with a 45-50% saving of water
- Incorporation of weeds is more beneficial for increasing the grain yield than removing them from the field
- SRI could reduce seed cost especially for hybrid seed

PROSPECTS

SRI methods offer scope for considerable reduction in the water, Electricity and seed requirements with an increase in yield attributable in large part to the incorporation of weeds in the soil & to soil aeration along with different plant management practices

SUGGESTIONS

- Demonstrations on Government farms
- Need for appointing a Nodal Officer in the State for SRI coordination and promotion
- Study tours for farmers, to see SRI for themselves
- Training to field staff
- Creating awareness among farmers by using print media as well as electronic media

CONT.....

- Assured irrigation facilities for farmers using SRI, as they need smaller but reliable issues
- Implementation of SRI technique through schemes
- Providing markers and conoweeders with 50% subsidy; need to assure good quality
- Agriculture Extension staff need to be trained in this method, and incentives may be announced for rewarding district-wise those who motivate the highest no. of farmers
- Organization of demonstrations on a large scale in the state

THANKS

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