

COST - BENEFIT ANALYSIS OF SRI TECHNIQUE IN PADDY CULTIVATION

M. ANJUGAM, Assoc. Professor

S.VARADHA RAJ, Asst. Professor

S. PADMARANI, Asst. Professor

Dept. of Agricultural Economics, TNAU,
Coimbatore

TAMIL NADU ECONOMY

- ✓ > 60% of **state population** depend on agriculture
- ✓ 13% of **state income** is contributed by agriculture
- ✓ **Net sown area** is 62.59 lakh ha, which accounts for 37.5% of the geographical area
- ✓ 85-90% of the farming community, in terms of numbers and area, are **marginal and small farmers**
- ✓ **Area under paddy** is 20 lakh ha with average yield of 2,777 kg/ha
- ✓ Paddy production accounts for 3/4 of the state's total food grain production

SRI INITIATIVES IN TAMIL NADU

- ◆ Experiments started in Coimbatore (TNAU) in 2000-2002; continued at Killikulam AC&RI (TNAU) in 2003-2004
- ◆ On average, 53% less irrigation water was used, with grain yield of 3,892 kg/ha, 28% higher than conventional methods
- ◆ On-farm trials in Tamiraparani basin in southern Tamil Nadu (N=100): mean SRI grain yields were 1.57t/ha higher; grain yields over 8 t/ha recorded by 31 farmers (Thiyagarajan, 2006)

Contd..

- ◆ TNAU has recommended SRI as a technology in Tamil Nadu to increase rice productivity and save irrigation water
- ◆ The State Department of Agriculture held demonstration trials in all rice-growing areas of the state beginning in 2004
- ◆ Government plans to bring an additional area of 7.5 lakh ha under SRI cultivation in Tamil Nadu during 2008-09 (according to *Policy Note, 2007-08*)

Objectives of Study

- ◆ To identify the reasons for adoption of SRI technique by farmers
- ◆ To assess the economic feasibility of SRI technique over conventional paddy cultivation, and
- ◆ To identify the constraints to adoption of SRI technique and to suggest suitable policy measures to enhance rice productivity in Tamil Nadu

Sampling

- ◆ Western Zone of Tamil Nadu was selected
- ◆ One block per district was selected, namely Pollachi and Sathyamangalam blocks in Coimbatore and Erode, respectively
- ◆ Structured interviews scheduled - information on cost, income, reasons for adoption, and the constraints in adoption of the technology was collected.
- ◆ This information was collected from 30 farmers who adopted the technique (adopters) and 30 farmers who are not adopting the technique (non-adopters)
- ◆ Data pertained to the crop year 2007-08

Tools of Analysis

- ◆ Average and percentage analysis
- ◆ Reasons for adoption of SRI technique and the constraints encountered by farmers were measured by the **Garrett Ranking Technique**

$$\text{Per cent position} = \sum_{j=1}^n \frac{(R_{ij} - 0.5)}{N_j} \times 100$$

Where:

R_{ij} = Rank given for i^{th} item by the j^{th} individual

N_j = Number of items ranked by the j^{th} individual

Partial budgeting:

- ◆ To estimate the cost and returns of making changes in the existing farm business
- ◆ In the present study, data were gathered to evaluate the efficiency of adopting SRI techniques (changing the method of planting) by replacing the conventional methods of planting in paddy cultivation
- ◆ If the net gain is positive, this gives incentives to farmers to decide on adopting SRI techniques

RESULTS AND DISCUSSION.....

General characteristics of sample farmers

	Non – adopters (n=30)		Adopters (n=30)	
	No.	Frequency	No.	Frequency
i. Age of the farmer (years)				
< 40	8	0.27	2	0.07
41-60	10	0.33	24	0.80
>60	12	0.40	4	0.13
ii. Educational status				
Illiterates	2	6.67
Literates : i) School educ.	26	86.67	10	33.33
ii) Degree	2	6.67	20	66.67
iii. Family size (number)	4.13		3.66	

Dept

tural Economics,
oimbatore

Contd.

- ◆ Majority of SRI farmers fall in the age group of 41-60 years, whereas above 60 years old were higher in non-adopters.
- ◆ 67 % of SRI adopters were degree holders.
- ◆ Size of the family in non-adopters (4.13) is higher than adopters (3.66).

The results indicated that farmers who are in an active age group and more highly educated are more likely to adopt the technique.

Operational holding

Operational holding	Non-adopters		Adopters	
	No.	% to total	No.	% to total
Marginal farmers (< 1 ha)	2	6.67	6	20.00
Small farmers (1-2ha)	12	40.00	4	13.33
Medium farmers (2-4 ha)	14	46.66	6	20.00
Semi-medium farmers (4 -10 ha)	2	6.67	14	46.67
Large farmers (> 10ha)
Mean	2.11		3.5	
% of paddy area to total operational area		62.50		45.50

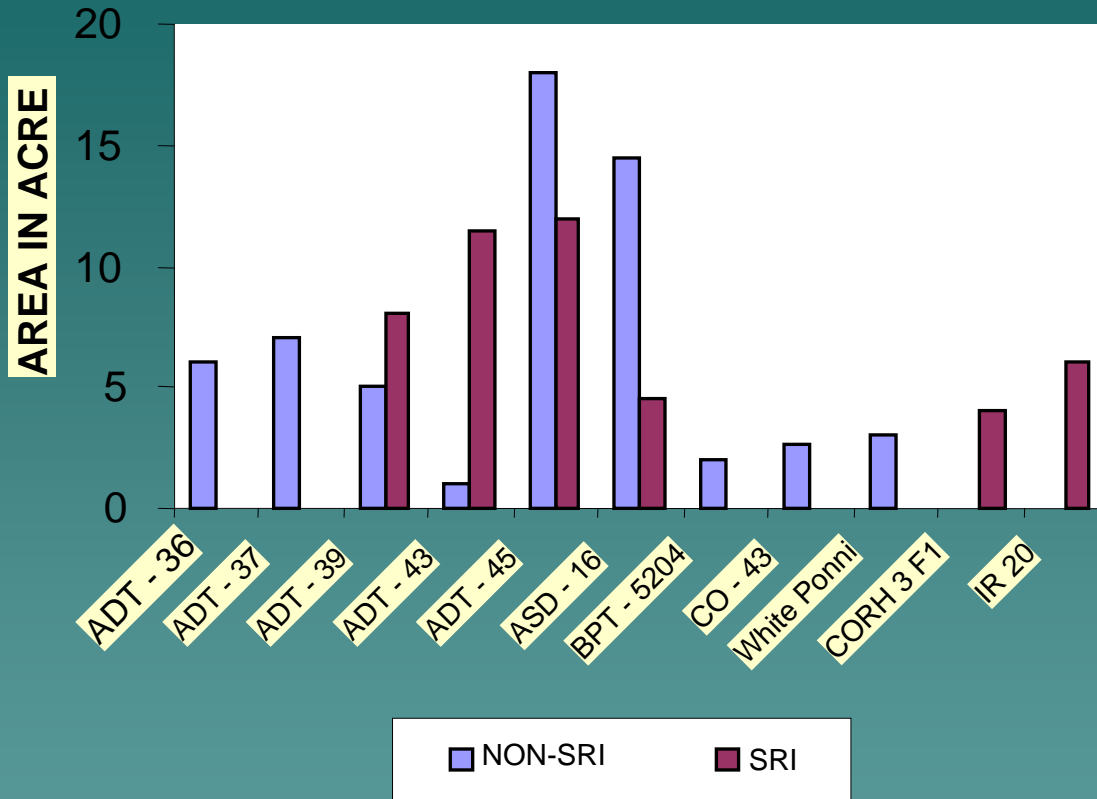
Contd..

- ◆ Canal and well irrigation
- ◆ Size of the holding is 2.11 and 3.5 ha in non-adopters and adopters respectively
- ◆ Medium to semi medium farmers accounted for the 2/3rd in the total sample i.e. 67% in case of SRI adopters
- ◆ % of area under to paddy to the total land holding was 62.5 and 45.50 in case of non-adopters and adopters respectively

Small and medium sized farmers are showing willingness to adopt new techniques and allocate more area for new technique if it suits the local condition.

Adoption of SRI practices

- ◆ 66.67 % of farmers adopted SRI technique from the training offered by the **Dept. of Agriculture** followed by the **Agricultural University (20%)** & **IAMWARM Project**.
- ◆ 60% of farmers adopted SRI only in the **past 6 months (one season)** and 20% of the farmers adopted this technique for the past 2 years.
- ◆ 60% of farmers adopted SRI technique in the **2nd season (Nov to Feb)** - No assured irrigation from the canal during the **1st season (kuruvai)**.



Varietal Adoption in Study area

Contd..

The major preferred paddy varieties adopted were:

- **ADT45 (30.5%) and ASD16 (24.5%) in the case of Non-adopters**
- **ADT45 (26.1%) and ADT43 (25%) in the case of Adopters**
- **CORH3 hybrid is also cultivated in many SRI farms.**

SRI farmer practices vs. conventional paddy cultivation - A comparison

Input	Conventional Paddy	SRI technique – recommended	SRI – Farmer practice
Seed	20-30 kg per acre	2 kg per acre	21 kg per acre
Spacing	Closer spacing 15X10, 20X10, 20X20	25 X 25 cm	Not all of them practiced
Transplanting	Seedlings about 30 days old	8-14 days old	20-25 th day
No. of seedlings per hill	2-3 seedlings	Only one seedling	1-2 seedlings

Input	Conventional Paddy	SRI technique – recommended	SRI – Farmer practice
Fertilizers	Application of chemical fertilizers, insecticides and herbicides	Preference given to organic fertilization, insecticides and herbicides	Mostly chemical fertilizers are used
Plant protection	Application of insecticides and herbicides, 2-3 times spray	Insecticides, pesticides are not necessary	One time spray is followed when required
Weeding	Manual weeding, herbicide application	Non-chemical means of weed control by cono-weeder (2 times)	Cono-weeder (2 times) + manual weeding (2 times)

(Source: Primary Survey)

Factors influencing Adoption of SRI technique

Reasons for adoption	Score	Rank
Minimum seed requirement	74	I
Low nursery duration	57	II
To obtain subsidy	52	III
Low nursery cost	51	IV
Less cost of cultivation	43	V
Low labour requirement	37	VI
Motivation by Extension officials	35	VII

Operational cost	SRI adopters		Non –adopters		T-value
	Cost (ha)	%	Cost (ha)	%	
Nursery preparation	688	2.05	1,083	3.00	1.51 ***
Main field preparation & transplanting	9,612	28.60	10,521	29.10	0.98
Seed	301	0.90	1,447	4.00	26.19*
Fertilizers	3,643	10.84	4,025	11.13	1.25
Irrigation	1,600	4.76	1,890	5.23	1.66**
Weeding	4,769	14.19	2,866	7.93	-3.30*
Plant protection chemicals	642	1.91	985	2.73	2.07**
Harvesting and threshing	11,589	34.48	12,511	34.61	0.64
Interest on working capital	766	2.28	824	2.28	
Operational cost	33,610	100	36,153	100	1.20

Dept. of Agricultural Economics,

TNAR, Coimbatore

*significant at 1 %, ** significant at 5%; *** significant at 10%

Comparative Analysis of Income – SRI Technique over Conventional Paddy Cultivation (Rs. per ha)

	SRI adopters	Non – adopters	T-value
Grain product (Qtls)	67.23	54.00	4.42 *
Price realized by the farmer (Rs.)	842.67	811.33	
Value of grain product (Rs.)	57,034.93	43,643.48	
Straw by-product (Qtls)	50.83	48.95	
Price realized by the farmer (Rs.)	159.33	124.33	
Value of straw by-product	7,871.07	5,471.44	
Gross income	64,906.00	49,114.92	4.22*
Operational cost	33,609.54	36,153.06	
Net income over operational cost	31,296.46	12,961.86	4.05*
Output: input ratio	1.93	1.36	

Analysis of economic impact of SRI technique: Partial budgeting

Credit (Gains)	Amount (Rs.)	Debit (Loss)	Amount (Rs.)
Increased Return		Additional Cost	
Grain product: 13 Q/ha @ Rs. 842 /Q By-product: 2 Q/ha @ Rs. 150/Qt	11,140.00 100.00	Weeding	1,903.00
Sub total	11,240.00		
Reductions in Cost			
Nursery preparation	396.00		
Main field preparation & transplanting	909.00		
Seed	1,146.00		
Fertilizers	382.00		
Irrigation	290.00		
Plant protection	344.00		
Harvesting	922.00		
Sub total	4,388.00	Sub total	1,903.00
Total Gain	15,628.00	Minus additional cost	1,903.00

Net benefit (total gain – additional cost) = Rs. 13,725

Constraints in adoption of SRI techniques

Constraints	Scores	Rank
Difficulty in use of conoweeder	58.06	I
Lack of technical support from the extension officials	57.67	II
Health problems due to operation of conoweeder	47.06	III
Lack of awareness among the labourers about SRI technique	37.22	IV

Conclusions

- ◆ Power-operated cono-weeder using either battery or diesel may be supplied to farmers for more efficient weeding so as to increase the productivity of labourers
- ◆ Skill-oriented training should be given to agricultural labourers regarding SRI practices
- ◆ This will definitely help farmers to adopt the new techniques in a larger way to increase the productivity and net income at farm level Also, this technique will be a better solution to meeting food demand

THANK YOU