

System of Rice Intensification

Experiences of **Farmers in India**



System of Rice Intensification

Experiences of

Farmers in India



ICRISAT - WWF Project
International Crops Research Institute
for the Semi-Arid Tropics
Patancheru 502 324, Andhra Pradesh, India



No. of copies: 1000

November, 2008

Disclaimer:

The opinions expressed in this publication are those of the authors and do not necessarily reflect those endorsed by WWF, ICRISAT or the institutions with which the contributors are affiliated.

Editors: Dr. Biksham Gujja, Dr. N. Loganandhan, Dr. V. Vinod Goud

Publication Production : V.V.S. Satyanarayana and K. Chandrasekhar Rao
of Communication Office, ICRISAT

For copies contact:

WWF-ICRISAT Project

ICRISAT, Patancheru– 502 324

Andhra Pradesh, India

Ph: 040-30713762

E-mail: p.reddy@cgiar.org

Printed at:

Suneetha Art Printers

#3-5-94/5/1/A, Rajmohalla,

Ramkote, Hyderabad – 500 027.

Andhra Pradesh, India.

Ph: +91-4-24657269, 24761780

Cell: 92463 9595 1/2/3/4.

Preface

The System of Rice Intensification (SRI) is a national phenomenon in India. Rice-cultivating farmers, particularly those who have less than one hectare of land, have experimented, refined, adopted and are promoting SRI. It is their hard work and trust that have spread this unknown method into all rice-growing states. Out of 564 rice-growing districts in India, SRI is being practiced by the farmers in about 216 districts. While many individuals, civil society organizations and government agencies have played a major role, ultimately it is the farmers who confirmed its merit by practising it on the ground. This has been now incorporated in the agenda of the National Food Security Mission (NFSM) to improve rice productivity in the country.

SRI is truly a farmers' movement. Like any other movement there are leaders, pioneers and risk-takers. Listening to the farmers and their experiences has been an important aspect of SRI from the beginning. This book is a small effort to compile the experiences of those farmers who pioneered the SRI method in their regions. They experimented in their own way, articulating their point of view on the method. These articles included in this book provide information on a) SRI can work in many agro-climatic zones of India b) it can improve yields c) it can reduce water input d) it can provide more income and e) there is a scope for further improving and refining it to suit local conditions. The last point is very important. Farmers' contribution to the knowledge of SRI is significant and is often ignored. By publishing their views on SRI, our effort is to help the established research institutes, government-funded extension organizations, civil societies and aid agencies that are committed to food security, to come out with solutions and assist farmers in further improving and promoting SRI.

Some of the case studies are very inspiring and show the determination of farmers, for example, Anil Changmai from Jorhat district of Assam, tried SRI on his own after reading about it in the newspapers and listening to the radio. His failure did not stop his determination to try it again. He tried SRI in 0.48 acre (1.5 *bhiga*) of his total 3.7 acres of paddy area that he usually cultivates. His grandmother, who is

about 100 years old, too noticed the potential of SRI and jokingly suggested him to build another granary next year before planting all his 3.7 acres. Of course, when he was planting 10-day old seedlings, others laughed at his madness, but those who ridiculed him are now to go for SRI next year.

In Uttarakhand, in the hills, landholdings are small. Food security of the poorest of the poor in the hills can only be met by improving the productivity of their land. Chain Singh from Tehri Gharwal district tried SRI in 0.05 acre (one *nali*) last year and 0.13 acre (2.5 *nali*) this year. With SRI method he doubled the yields. His 0.13 acre area has given him 220 kg, which works out 4.4 t/acre. In Himachal Pradesh, another mountain terrain, Chamaru Ram started SRI with 0.05 acre and is practicing now in his entire area of 0.8 acre (8 *karnals*) improving the yields from 1.1 to 1.8 t/acre, again improving his household food security. Merugu Naryana of Mahabubnagar district in A.P could improve yields under bore-well irrigation by nearly 30 percent by practicing SRI. Tapan Sen from Tripura has an experience of nine seasons with SRI since 2003. He gradually increased the area under SRI from 0.4 acre to 1.2 acre. He demonstrated that yields could be obtained up to 3.8 t/acre.

The story of V.K.V. Ravichandran, from Thiruvarur district of Tamil Nadu, is somewhat different. He is a farmer with 60 acres, educated and well-informed. He not only improvised SRI practice to suite his specific agro-climatic conditions but also became a regular contributor to the SRI Newsletter, SRI India website and Google groups.

Most of these farmers do have problems and issues. But they come out with suggestions for improving the situation. For example, for Chamaru Ram if the weeder is an issue, for Tapan Sen labour and difficulty in weeding. For Ravichandran, field preparation, particularly to drain excess water, is an important issue. Planting young seedlings could be risky during the rainy season. For Chain Singh, transplanting is very easy.

Earlier we have published Andhra Pradesh SRI Farmers' Experiences in Telugu, but this book is a national effort. The purpose of publishing it in English is to put farmers' experiences in SRI on the national and international sphere so that researchers, scientists and policy-makers can have access to the information. By no means is this complete or representative of all SRI experiences in India. But an effort has been taken to cover most of the prominent SRI states, in spite of the time constraint in compiling the case studies. We request other organizations and

agencies to bring out similar farmers' experiences from their regions, in order to address some of the issues, bottlenecks and policy changes required to promote SRI even more extensively.

Paddy cultivation is not the same in India after SRI. Farmers are trying, experimenting and modifying the method to suit local conditions; it can be either age of seedlings or the design of weeders. What is SRI and what is not SRI is not important, what is more important is that SRI has changed the way farmers look at the Rice plant. This is only the beginning. Millions of Indian farmers with this knowledge and experience in SRI will not only change their practice of using the resources but will force the establishment to invest in such methods that will lead to achieving food security and promoting efficient use of land and water.

We thank all the farmers who have shared their experiences and those people who have taken great effort to help us in collecting and compiling their case studies, without which this book would not have been possible.

I would like to express my appreciation for Dr. N. Loganandhan, my colleague who has undertaken this task of compiling the information as his first assignment after joining the team at Hyderabad and other staff members for putting in long hours.

We invite organizations and individuals to take time to compile such information and put it on websites facilitating the flow of information. We hope the farmers' experiences presented in this book are going to inspire everyone, particularly researchers to re-visit their own methods of evaluating agriculture in general and SRI in particular.

Our suggestion to policy-makers is the same as the 100 year old grandmother of SRI farmer Anil Changmai said: build more granaries to store the increased production of paddy by adopting SRI. So instead of spending money on large and expensive irrigation projects to divert water, we need to produce more rice with less water. These farmers are showing the way.

Dr Biksham Gujja
Policy Advisor
WWF International, Switzerland

Acknowledgement

Our sincere thanks to all the farmers who have shared their experiences and below mentioned persons who have helped us in compiling their case studies

Andhra Pradesh

Dr.Madhu babu, Coordinator, DAATTC
Mr.Anil Kumar, AMEF

Assam

Dr.Pradip Kumar Bora, Scientist (Engg), AAU
Mr.Aswini Bhattacharya, PRADAN

Chhattisgarh

Mr.Jacob Nellithanam, Coordinator, Richaria Campaign

Gujarat

Mr.Sachin Patwardhan, BAIF

Himachal Pradesh & Uttarakhand

Mr.Debashish, Director, PSI

Jammu & Kashmir

Ms.Anuradha Saha, Asst. Professor, SKUAST-J

Jharkhand

Mr.Manoj Kumar Singh, Vikas Sahyog Kendra, Jharkhand

Kerala

Dr.Balachandran, ADR, KAU
Dr.Shanmuga Sundaram, Assistant Professor (Extn), KAU
Mr.John Jo Varghese, SMS (Agronomy), MKVK

Madhya Pradesh

Mr.Sandeep Khanwalkar, State Coordinator, MPRLP

Orissa

Dr.C.Shambu Prasad, Associate Professor, XIMB
Mr.Biswanath Sinha, Programme Officer, SDTT
Dr.A.Ghosh, Sr. Scientist (Agronomy), CRRRI
Mr.Mitan Kumar Mohapatra, BOJBP
Mr.Prabhakar Adhikari, Pragati

Pondicherry

Ms.S.Puspalatha, Chairperson, Ekoventure

Punjab

Dr.Amrik Singh, Deputy Project Director, ATMA

Tamil Nadu

Mr.Ramasubramaniyan, Chief, Samanvaya

Tripura

Mr.Baharul. I. Mazumdar, Senior Agronomist, Dept. of Agriculture
and all others for their support

Contents

Abbreviations	ix
System of Rice Intensification – A glance	x
Andhra Pradesh	
Gullani Mahesh	1
Marri Venkanna	3
Merugu Narayana	5
Assam	
Anil Changmai.....	8
Dinesh Chandra Ray.....	11
Chhattisgarh	
Amar Singh Patel	14
Gujarat	
Girish Mansirav Chaudhary.....	16
Himachal Pradesh	
Chamaru Ram	20
Damyanti Devi	23
Saraswati Devi	26
Tilak Raj	28
Jammu & Kashmir	
Bharat Bhusan	31
Jharkhand	
Janeshwar Singh.....	34
Kerala	
A.Sasidharan Pillai	36
C.Mohan	39
Mohammed K.P.	41

Madhya Pradesh

Ramprasad Kartikey	43
Shivji Kushram	46
Suresh Kushwaha	49

Orissa

Debahari Gouda	52
Debraj Das	54
Madhu Pradhan	56
Surendra Masti	58

Pondicherry

Ramasamy	62
Selvanathan	64

Punjab

Kapil Behal	66
-------------------	----

Tamil Nadu

Jagathambal	70
K.Swaminathan	72
V.K.V.Ravichandran	76

Tripura

Hriday Ranjan Debnath	81
Tapan Sen	85

Uttarakhand

Chain Singh	88
Rikeshwar Prasad	91
Sarla Devi	94
Taro Devi	97

Resource materials on SRI	100
--	------------

Abbreviations

AME	Agriculture Man and Ecology
ANGRAU	Acharya N G Ranga Agricultural University
BAIF	Bharatiya Agro Industries Development Research Foundation
BOJBP	Bruksha O Jeevar Bandhu Parisad
BPH	Brown Plant Hopper
DAATTC	District Agricultural Advisory and Transfer of Technology Centre
DAP	Di Ammonium Phosphate
FFS	Farmers' Field School
FYM	Farm Yard Manure
HYV	High Yielding Varieties
ICRISAT	International Crops Research Institute for the Semi Arid Tropics
MoP	Murate of Potash
MPRLP	Madhya Pradesh Rural Livelihoods Project
NGO	Non Governmental Organization
NPK	Nitrogen Phosphorus and Potassium
NREGS	National Rural Employment Guarantee Scheme
PSB	Phosphorus Solubilising Bacteria
SKUAST-J	Sher-e- Kashmir University of Agricultural Sciences & Technology-Jammu
SRI	System of Rice Intensification
SSP	Single Super Phosphate
TNAU	Tamil Nadu Agricultural University
VLW	Village Level Workers
WWF	World Wide Fund for Nature

Units

cm	centi meter
g	gram
ha	hectare
kg	kilo gram
l	litre
ml	milli litre
q	quintal
Rs	Rupees
t	tonnes
sq.ft	square feet
sq.m	square meter
wt	weight

System of Rice Intensification – A glance

System of Rice Intensification (SRI) emerged in the 1980's as a synthesis of locally advantageous rice production practices encountered in Madagascar by Fr Henri de Laulanie, a Jesuit Priest who had been working there since 1961. But, it is Dr. Norman Uphoff from Cornell International Institute for Food and Agriculture, Ithaca, USA, who had brought this method to the notice of outside world in the late 1990s. Today SRI is being adopted in many states in India and the response from farmers has been overwhelming seeing the benefits of the method, notwithstanding the constraints.

SRI is a combination of several practices those include changes in nursery management, time of transplanting, water and weed management. Its different way of cultivating rice crop though the fundamental practices remain more or less same like in the conventional method; it just emphasizes altering of certain agronomic practices of the conventional way of rice cultivation. All these new practices are together known as System of Rice Intensification (SRI).

SRI is not a fixed package of technical specifications, but a system of production with four main components, viz., soil fertility management, planting method, weed control and water (irrigation) management. Several field practices have been developed around these components. Of them, the key cultural practices followed in most cases are:



Preparing high-quality land

SRI requires careful leveling and raking, with drainage facilitated by 30 cm wide channels at two-meter intervals across the field.

Preferring compost or farmyard manure to synthetic fertilizers

It is better to use organic nutrients, as they are better at promoting the abundance and diversity of microorganisms, starting with beneficial bacteria and fungi in the soil. This will promote proper microbial activity, thereby improving production.



Developing nutrient-rich and un-flooded nurseries

The seedbeds have to be nutrient-rich and established as close to the main field as possible. This will enable quicker and easier transportation between the nurseries and the fields, minimizing both transport time and costs so that the seedlings are efficiently transplanted.



Using young seedlings for early transplantation

This has to take place when the seedlings are just 8 to 12 days old, soon after they have two leaves, and at least before the 15th day after sowing.

Ensuring wider spacing between seedlings

The seedlings should be planted at precise spacing, usually 25 X 25 cm², about 16 plants per square meter. Rice plant roots and canopies grow better if spaced widely, rather than densely.



Transplanting the seedlings singly



The seedlings must be transplanted singly with their roots intact, while the seed sac is still attached. They must not be plunged too deep into the soil, but placed at 1-2 cm on the ground at the appropriate point on the planting grid.

Frequent intercultivation with weeder

A manual weeder is to be operated perpendicularly in both directions in between the hills within 10 to 12 days of transplantation, and at intervals of 10-12 days afterwards. This operation not only controls the weeds but churns the soil which causes a lot of changes in the soil which favours better growth of the crop.



Managing water carefully so that the plants' root zones moisten, but are not continuously submerged



SRI requires the root zone to be kept moist, not submerged. Water applications can be intermittent, leaving plant roots with sufficiency, rather than surfeit of water.

Rice grown under SRI has larger root system, profuse and strong tillers with big panicles and well-filled spikelets with higher grain weight.

The rice plants develop about 30 – 80 tillers and the yields are reported to be higher. The secret behind this is that rice plants do best when young seedlings are transplanted carefully at wider spacing; their roots grow larger on soil that is kept well aerated with abundant and diverse soil micro-organisms.

This book presents the experiences of some farmers who have tried out SRI method to cultivate rice in different agro-climatic regions of India.

Gullani Mahesh

Chikatimamidi
Bommalaramaram (Mandal)
Nalgonda (D.t)
Andhra Pradesh

Contact: Mr. Madhu babu,
DAATTC, Nalgonda, A.P
Ph: 9989623815

Age: 22 years
Education: B.Sc.
Occupation(s): Agriculture
No. of years in farming: Six

Paddy cultivation

Gulani Mahesh has 4 acres of agricultural land in which paddy is cultivated in 3 acres. His source of water is bore well. He applies DAP 75 kg, Urea 75 kg and MoP 25 kg/acre. He gets 2.2 t/acre of yield in flooding method.

SRI adoption

He came to know about SRI through Department of Agriculture, News Paper & Etv. He adopted SRI in *kharif* – 2006 with the guidance provided by the local Agricultural Officer. Initially he took SRI in 1 acre. He used varieties like IR-64, MTU-1010 and MTU-1081. He applied inputs like DAP (20 kg), Vermicompost (7 q/acre), Azolla (4 tonnes), Pancha Gavya (once in 15 days from 15 days after planting up to flowering). Seed treatment with Carbendazim, ZnSO₄ spray (0.2%) were also followed. This farmer uses Conoweeder for weeding. For plant protection he uses Cartap Hydrochloride @ 2.5 g/l and Profenophos 2ml/l. He obtained a yield of 2.8 t/acre.

Innovations and modifications

Weeder was operated every time soon after applying FYM in between rows, which facilitated more tillering and reduced the effect of salinity. He used rope for transplanting instead of Marker.

Benefits

- ❖ Less seed requirement.
- ❖ Weeding facilitated good aeration to roots and gave more number of tillers.
- ❖ Increased production (from 2.2 to 2.8 t/acre).
- ❖ Early maturity (10-15 days.)
- ❖ Reduced chemical fertilizers.

Lessons learnt

- ❖ Reduction of input cost
- ❖ Increased production
- ❖ Up to 2-3 acres can be easily cultivated
- ❖ Quality of grain is good when compared to conventional method
- ❖ Use of organics increased the weight of grains
- ❖ More straw yield facilitated sufficient fodder to cattle.

Comparative study

Particulars	Cost of cultivation (1 acre)	
	Conventional method (Rs.)	SRI method (Rs.)
Operations		
Ploughing	1,800	1,800
Seed	400	50
Transplanting	1,000	800
Weeding	1,200	500
Plant protection chemicals	800	400
Harvesting & Threshing	2,000	2,000
Total	7,200	5,550
Yield and Income		
Yields (t/acre)	2.24	2.80
Gross Income @ (Rs. 930/-per q)	20,832	26,040
Net Income	13,632	20,490

Suggestions

- ❖ Formation of Farmers' Groups in villages will facilitate expansion of area
- ❖ Mechanical (power) weeders may be provided for easy operation to adopt SRI in larger area.
- ❖ Under NREGS (Government of India) this may be included for area expansion.

Marri Venkanna

Mamidala
Thipparthi (Mandal)
Nalgonda (D.t)
Andhra Pradesh
Contact: Mr. Madhu babu, DAATTC,
Nalgonda, A.P
Ph: 9989623815

Age: 30 years
Education: Illiterate
Occupation(s): Agriculture
No. of years in farming: 12

Paddy cultivation

Marri Venkanna possesses nine acres of land, in all of this he grows paddy in two acres. He uses the bore well to meet all his irrigation needs. The yield using the flooding method comes to 2.4 t/ acre.

SRI adoption

He came to know about the SRI cultivation through DAATTC and neighbouring farmers. Following the training by DAATTC officials, he took it up during the 2004 *khari* crop. He has been practicing SRI on one acre for six seasons now with the yield touching 3.1 t/acre. He grows BPT-5204, MTU-1010 and Krishnahamsa with the application of DAP 50 kg, Urea 100 kg and ZnSo₄ 10 kg and 2.5 t of FYM. He follows all the SRI practices and uses both Conoweeder and Marker. With regard to pests and diseases, he sprayed Acephate 1.5 g/l to control Leaf-folder. To control Stem-borer, he used Cartap hydrochloride @ 2.5 g/l. For BPH he used Imidachloprid 0.5 ml/l.

Benefits

He is happy with the benefits he has received through SRI and sums these up as: overall reduction of input cost coupled with increased production, highlighting the individual gains, he cites them as follows.

- ❖ Quality of grain better than that of conventional method.
- ❖ More yield using less seed.
- ❖ Low water requirement.

- ❖ Low labour cost for raising nursery and transplanting.
- ❖ Weeding facilitated good aeration to roots and provided larger number of tillers. This resulted in increased production.
- ❖ Early maturity within 10-15 days.
- ❖ Greater straw yield provided sufficient fodder for cattle.

Constraints in adoption

- ❖ Use of the Conoweeder is very hard; and
- ❖ Use of the Marker is very difficult.

Lessons learnt

- ❖ Using fertilizers at the appropriate time results in a good crop with higher yields, without wastage of fertilizers.
- ❖ The practice of weeding at regular intervals also results in good crop growth.

Comparative study

Particulars	Cost of cultivation (1 acre)	
	Conventional method (Rs.)	SRI method (Rs.)
Operations		
Ploughing	1,200	1,500
Seed	450	50
Transplanting	1,000	700
Weeding	1,200	500
Fertilizers & Plant protection chemicals	1,600	1,000
Harvesting & Thrashing	2,000	2,000
Total	7,450	5,750
Yield and Income		
Yield (t/acre)	2.45	3.15
Gross Income @ (Rs. 930/-per q)	23,030	29,610
Net Income	15,580	23,860

Suggestions

- ❖ Mechanical (power) weeders should be provided for easy operation which will make it easier to adopt SRI over a larger area.
- ❖ Special grants in the form of inputs may be provided to farmers adopting SRI.

Merugu Narayana

Gaddegudem
Devarakadra (Mandal)
Mahabubnagar (D.t)
Andhra Pradesh
Contact: Mr. Anil Kumar, AME,
Mahabubnagar, A.P.
Ph: 9885682301.

Age: 62 years
Education: Matriculate
Occupation(s): Agriculture
No. of years in farming: 30

Paddy cultivation

Merugu Narayana has 11 acres of total agricultural land; of which four acres is paddy land. His water sources are the well and bore well and the inputs that he uses include chemical fertilizers (Urea, DAP), and pesticides (Phorate granules, Chloropyriphos, Mancozeb). Yields obtained by the flooding method are 18.60 q/acre.

SRI adoption

He came to know about the SRI from AME Foundation, Mahabubnagar Area Unit. He is very much curious about SRI cultivation, started it as an experiment initially in 0.5 acre of land. The AME staff provided timely technical advice. Some of the cultivation practices he followed in the SRI plot were:

- ❖ green manuring with *daincha* and incorporation before flowering;
- ❖ raised bed nursery prepared with FYM and organic manures;
- ❖ used the Rope Marker for marking;
- ❖ transplanted 11 day-old seedlings;
- ❖ weeding with Rotary Weeder (three times);
- ❖ implements procured from the Department of Agriculture with AMEF's support; and
- ❖ no chemicals were applied against the pests and diseases, only Neem Seed Kernal Extract (NSKE) solution was sprayed twice.

With the above efforts the yield has been increased to 25.9 q/acre.

Innovations and modifications

He has been using locally-made markers using rope in place of the mechanical marker.

Benefits

- ❖ In place of 12 labourers for transplanting and 12 for weeding in one acre, which costs Rs.1200/- for wages, SRI cultivation requires only eight labourers for transplanting and eight for weeding, reducing the cost of cultivation by Rs.280/.
- ❖ Narayana was himself able to use the Rotary Weeder for weeding which reduced dependence on labourers at a crucial stage – due to greater demand for labour at critical stages, manual weeding increases the cost of cultivation. In some cases women did weeding with the Rotary Weeder.
- ❖ Pest incidence was less and he experienced good results with the application of NSKE solution for the control of Leaf-folder.
- ❖ With heavy rains, conventional paddy fields were affected by lodging which did not occur in SRI cultivation.
- ❖ SRI cultivation has reduced the drudgery on women.

Constraints in adoption

- ❖ SRI has affected the employment opportunities for agricultural labour due to the use of the Rotary Weeder.
- ❖ The quality of the implements is such that they do not last for more than two seasons.

Lessons learnt

Contrary to the conventional belief that paddy is a water loving crop, Merugu Narayana is convinced that it grows better under semi-arid conditions with less water input.

Comparative study

Particulars	Cost of cultivation (1 acre)	
	Conventional method (Rs.)	SRI method (Rs.)
Operations		
Main field preparation	1,500	1,500
Seeds	390	26
Nursery management	250	100
Transplanting	600	440
Fertilizers	1,500	1,250
Weeding	600	480
Pesticides	360	200
Irrigation labour charges	750	250
Harvesting and Threshing	650	650
Winnowing	300	300
Transportation charges	800	800
Total	7,700	5,996
Yield and Income		
Grain yield (t/acre)	1.86	2.59
Price (Rs/q)	680	680
Straw yield (t/acre)	4	4
Price (Rs/q)	300	300
Gross Income	9,768	18,812
Net Income	6,148	12,816



Merugu Narayana with his SRI bounty

Anil Changmai

Changmai Gohain Gaon, Lahdoigarh
Chipahikhola Block
Jorhat, Assam

Contact: Dr. Pradip Kumar Bora,
Scientist (Engg), Department of
Agricultural Engineering,
Assam Agricultural University,
Jorhat-13, Assam,
Ph: 9435361070

Age: 42 years

Education: XII pass

Occupation(s): Agriculture

No. of years in farming: Since childhood

Paddy cultivation

Of his total land holding of 6 acres, his paddy land is 3.7 acres. He follows rain fed agriculture but has recently constructed a water harvesting structure for supplementary irrigation to *rabi* crops. His rice crop is still rain fed, but due to the suitable topography he can easily regulate the rain water during rainy season. He uses the following inputs: FYM, Urea, SSP, and MoP. The yields obtained are 6-9 q/acre (traditional variety) and 12-16 q/acre (HYV)

SRI adoption

Anil Changmai has been told about SRI and handed over a vernacular article on SRI written by Dr. Pradip Kr. Bora of the Assam Agricultural University. He also listened to a radio talk on SRI delivered by Dr. Mohan Sarma and Dr. Pradip Kr. Bora. He tried SRI in the autumn season on his own by taking the variety CV Lachit, but failed due to improper nursery management. After his failed experience, he was then given brief training by Dr. Bora. During *kharif* 2008, he tried the SRI method taking the variety CV Ranjit under rain fed condition, with proper water regulation in his field on medium-land where productivity does not go beyond 0.6 t/acre. When he transplanted the 10 day-old seedling singly at a spacing of 30 cm X 30 cm, he was ridiculed by all the villagers who passed comments that he had gone insane.

He adopted SRI for about 1.5 *bighas* (about 0.48 acres) of land. The crop is now at maturity stage and he found a number of effective tillers ranging from 32 to 55. He has also undertaken traditional cultivation of Ranjit variety near the SRI field, where the number of tillers have not gone beyond 20. He now proudly displays his SRI field to everybody. Recently, farmers from four villages visited his field during a

religious function. He has also found the SRI crop attaining maturity earlier than the traditional one (both sets of seeds were sown on the same day). He used no special tools or machinery in the SRI practice. He obtained a Japanese paddy weeder from the Department of Agriculture, Govt. of Assam which was used for weed control.

Innovations and modifications

He transplanted 12-day old seedlings in some SRI plots with the spacing ranging from 35 X 30 cm to 35 X 40 cm. But he could not get any benefit in terms of number of tillers, rather he found that these plots were heavily infested with weeds. Plots with a spacing of 25 cm X 25 cm are expected to give more yield because of a greater number of effective tillers per unit area.

Benefits

The villagers say that they have never seen such healthy crops on that particular field. Not only is the field on medium land, but due to the absence of flooding (conventional method), the crop was never good. The whole village is located on medium land and rice productivity has generally been very poor (6 – 8 q/acre). Now farmers are talking about SRI and plan to follow Anil Changmai in the coming year.

Constraints in adoption

Changmai has reported constraints in transplanting and weeding. His mother literally scolded Dr. Bora, when he visited Changmai's SRI field for teaching her son a method which causes the women to suffer, though she did express her satisfaction at such poor land giving good yield. Changmai used a Japanese paddy-weeder for weed control but reported that the weeder was ineffective in heavily infested plots. He left two plots without a third weeding.

Lessons learnt

Anil Changmai is upbeat. He is ready to expand the area under SRI. He is also going to motivate and demonstrate to other farmers. He reports that next year more than 20 farmers in his village plan to adopt SRI on their medium-land farms. His grandmother who is about 100 years old and still moves around the homestead, told him to make another granary for the coming year if his poor lands are going to yield such crops.

Comparative study

Operations	Conventional method	SRI method
Nursery	Less FYM was given, Seed-rate 120-150 g/m ²	More FYM was given, Seed-rate 20 g/m ² , other chemicals were not used
Seedling uprooting	Forced uprooting, washing of the roots, binding, carrying in bundles after 30-35 days	Uprooted with seed-bed soil and the seed at 10 and 12 days after sowing; carrying in baskets
Transplanting	Kept the bundles of seedlings overnight, transplanted 2-4 seedlings	Careful transplanting without damaging the main root, singly at the spacing of 25 cm X 25 cm within 30 minutes of uprooting of the seedlings
Water management	Flooding was allowed, irrigation was done to refill the land when water was depleted	No inundation was allowed throughout the season, field was not allowed to be dried
Weeding	No weeding was done	Three weedings at the interval of 10-15 days starting from 12 days of transplanting



Anil Changmai in his SRI field

Dinesh Chandra Ray

Tangabari,
Chirang
Assam

Contact: Mr. Aswini Bhattacharya,
PRADAN, Bongaigaon, Assam,
Ph: 9854030034

Age: 52 years
Education: VIII pass
Occupation(s): Agriculture
No. of years in farming: Since childhood

Paddy cultivation

His total agriculture land is 5 acres, of which paddy land is 1.75 acres. He uses a Dong or traditional water-channel for irrigation. The other inputs he uses are FYM, Urea, SSP and MoP. The yield obtained is 0.6 -1.0 t/acre for the traditional variety and 1.1-1.7 t/acre for the HYV.

SRI adoption

Dinesh Ray came to know about SRI from the staff of PRADAN, a local NGO, in the first week of June'08. Agricultural Development Officer of Govt. of Assam also told the farmers about the method. After long discussion he volunteered along with 11 others for SRI cultivation in the *kharif* season in an area of 2.5 acres each, albeit with skepticism. PRADAN staff provided training and technical guidance in the process of cultivation. Mr. Ray was given a complete package of practices for the method that he followed accordingly. However, due to initial skepticism he transplanted two seedlings instead of one in about 0.33 acres of land. He observed a marked difference in tillers development and over all crop health in that plot, where he followed SRI.

A Japanese paddy-weeder was supplied to him by PRADAN, which is also available in the local market.

Benefits

Dinesh Ray's SRI plot has 25-33 effective tillers which are much higher compared to 8-12 in the conventional method. He is expecting a yield of about 3 to 3.6 t/acre which is more than double the present practices. He has decided to practice SRI in his entire 12 *bigha* land (5 acres) next year.

Constraints in adoption

Difficulty in transplanting of 10-12 days old seedlings.

Lessons learnt

Now, whenever Ray meets farmers of other villages, he proudly shares his experience of SRI. Most farmers from nearby villages either have heard his story or visited his plot. He has become a self-styled trainer of SRI and helped farmers of nearby Hulmagaon and Enkorbari village to adopt, by personally visiting their SRI plots. The effect of his experience and motivation is such that more than 100 new farmers of the nearby villages of Subajihar, Silkhangguri, Neelibari, Padmapur, Bilaspur etc. are keen to adopt SRI in the next *kharif* season.

Comparative study

Operations	Conventional method	SRI method
Nursery	Seed-rate 120-150 g/m ² , FYM application is less	Seed-rate 20 g/m ² , FYM application is more
Seedling uprooting	Seedlings are uprooted forcibly, roots are washed, binding and carrying in bundles after 30-35 days	Uprooted with seed-bed soil and the seed 10 and 12 days after sowing; carried in baskets
Transplanting	Transplanting 2 to 4 seedlings in a bunch after keeping bundles overnight	Transplanting is done carefully without damaging the main root, singly at the spacing of 25 cm X 25 cm within 30 minutes of uprooting of the seedlings
Water management	Irrigation was done by flooding method	Water was not inundated throughout the season, field was kept in wet condition to avoid hard pans
Weeding	No weeding was done	Three weedings were done at the interval of 10-15 days starting from 12 days of transplanting



Dinesh Chandra Ray in his SRI field



Amar Singh Patel

Rathkhandi, Kota, Bilaspur
Chhattisgarh

Contact: Mr. Jacob Nellithanam,
Coordinator, Richaria Campaign, B-3,
Parijat Colony,
Nehru Nagar Bilaspur,
Chattisgarh-495001,
Ph: 9425560950

Age: 52 years

Education: Primary level

Occupation(s): Agriculture

No. of years in farming: 40

Paddy cultivation

He is mainly a rice farmer, but cultivates vegetables in winter and summer. He has got about 4 acres of paddy land of which about 1 acre is sandy loam soil close to riverside, which is irrigated by a shallow well. The rest of land is un-irrigated. By irrigated rice, he gets an average yield of 10-12 q/acre in a good year. Uses minimal application of fertilizers and regularly uses farm yard manure.

SRI adoption

He was introduced to SRI method by the Organic Farming program of Jan Swasthya Sahayog (JSS), Bilaspur, during village meetings in 2006. But, he avoided the trial after taking seeds from JSS. Seeing encouraging results of trials by 2 farmers in the village, he took his first trial in his own small field of 0.12 acre in 2007. He chose to experiment a fine variety called DRK. Trained and advised by JSS farming program, he was able to follow SRI practices thoroughly. Weeding was done twice by Rotary Weeder provided by JSS. Weeding was done a bit late and only 2 times using tool and one manually. The crop was uneven due to lack of complete leveling of plot. Even then, yield was very good measuring 5 bags that weighed 3.5 quintals. Labours cost for harvest is one sixth of the measure of paddy after thrashing. So, the estimated yield potential shown was 3.2-3.5 t/ac. The inputs were only farm yard manure and no pest control measures were taken.

In 2008 *kharif* season one acre was planted following SRI under different timings in different plots. First plot of 0.3 acre was planted in time and followed with timely weeding. Some plots which got delayed did not perform well. The standing crop showed a yield potential of 3.5-4 t/acre in the best plot of 0.3 acre. The rainfed plots, delayed in planting, had heavy pests due to low rainfall conditions. His average total yield of paddy under SRI is estimated to be 2.5 t/acre.

Benefits

- ❖ Benefits of SRI are many according to Amar Singh, beginning with very low seed requirement and planting with less number of man days, making it possible to do transplanting gradually with family labours alone.
- ❖ Due to Weeder, labour requirement is taken care only with family members. When each farmer learns to use weeders, labour sharing is possible to make weeding more efficient and timely.
- ❖ More paddy yield along with more than double straw yield compared to conventional method. Savings on chemical fertilizers and better quality rice for consumption. Variety being superfine, it will fetch very good market price.

Constraints in adoption

- ❖ The crop was uneven due to lack of complete leveling of plot.

Lessons learnt

- ❖ New method of transplanting and weeding is learnt.



Amar Singh in his SRI field planted with DRK variety.

A bumper crop of DRK variety with a potential of 3.5 to 4 t/acre



Girish Mansirav Chaudhary

Sarvar
Gujarat

Contact: Mr. Sachin Patwardhan, BAIF
Development Research Foundation,
Dhruva-BAIF, Lachhakadi, Gujarat.
Ph: 9890869647

Age: 28 years
Education: M. A.
Family size: 5
Occupation(s): Agriculture, Grocery shop
No. of years in farming: 10

Paddy cultivation

Girish possesses 7 acres of land, in which he cultivates paddy in 1 acre. In this rain fed land, he used hybrid and improved seeds following conventional method. He gets a yield of 15 q/acre.

SRI Adoption

He came to know about SRI from DHRUVA, an associate organization of BAIF Development Research Foundation, which provided him the training and field level guidance on SRI. It has been practiced by him for one season i.e. monsoon season of 2007. He used traditional implements like wooden plough for ploughing and puddling of the fields and weeding was done with the hands. The SRI practices followed by him are,

- ❖ Raised bed nurseries
- ❖ Early transplanting with 15 days old seedlings
- ❖ 25 X 25 cm² spacing
- ❖ Weeding twice, first 20 days after transplanting and second 40 days after transplanting
- ❖ Application of Vermicompost at the rate 2 t/acre.

He used Suruchi Hybrid. Some pests like Stem borers, Plant hoppers and diseases like Leaf blight were observed, but it was only an occurrence and not major attack. So, no plant protection chemicals were applied. There were natural occurrences of predators like Blister beetles and Lady bird beetles, which consume small sucking insects like hoppers and aphids.

Innovations and modifications

Girish had facility of pump, diesel engine and pipeline. During the critical water stress period, he gave a critical irrigation to SRI plot at the time of grain filling stage. It resulted in tremendous increase in the yield i.e. 38 q/acre. Such critical irrigation requirements, where SRI is being adopted in rain-fed upland areas where crop is likely to face water stress, should be fulfilled to get maximum benefits of SRI method.

Benefits

Increase in yield and reduction in seed requirement.

Constraints in adoption

- ❖ In the first year, when promotion of SRI was done along with Vermicompost application, farmers found it to be more time consuming. He also felt that it required skill at the level of every family members who are engaged in various stages of rice crop.
- ❖ There was more requirement for labour at the time of transplanting as the transplanting required more labour than the conventional method.
- ❖ As the farmers are habituated to do weeding in rice crop as per the conventional method, farmers found weeding practiced in SRI very tedious.

Lessons learnt

- ❖ Girish learnt some aspects of SRI i.e. more spacing and line transplanting.
- ❖ It is learnt from this experience that promotion of SRI requires continuous follow up and training for the farmers at least for 2-3 years, since it requires more knowledge building at the level of farmers than actual support to them.
- ❖ Knowledge building about SRI should be a continuous process rather than on time training and demonstration activity for the farmers.
- ❖ A participatory monitoring and evaluation of SRI would help to facilitate the process of knowledge building about SRI at the level of extension worker and farmers alike.
- ❖ There is also a need to work on detailed scheduling of activities in SRI since rain fed SRI depends on the monsoon.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Seedbed	A flat bed is prepared on the slightly sloping land where some dry biomass is burnt	Use of raised beds for raising rice seedlings.
Organic manures and fertilizers	Use of little or no organic manure as well as chemical fertilizers.	Use of Vermicompost at the time of puddling at the rate 2 t/ acre. Use of organic manure is also ensured.
Age of seedlings for transplanting	25-30 days	12-15 days
No of seedlings per hill	4-6	1
Spacing for seedlings	15 X 15 cm ²	25 X 25 cm ²
Other care while transplanting	Mud ball around the roots are washed out, deep transplanting	Mud ball around the roots are kept intact, shallow transplanting
Weeding	Little or no weeding practiced	Due to absence of rotary weeders, manual weeding were done twice (one in 15 days after transplanting and another in 40 days after transplanting)
Yield		
Plant height (cm)	84	90
Number of plants per m ²	32	16
Number of tillers per plant	12	17
Number of panicles per plant	08	13
Number of seeds per panicle	102	144
Grain production (q/acre)	11.8	21.5

Suggestions

- ❖ There is a need for continuous support to farmers for three to four years in the form of training, inputs like improved seeds, and production of organic manures etc.
- ❖ Farmers should select varieties with better tillering habit.



Girish with SRI crop at tillering stage

	<h2>Chamaru Ram</h2> <p>Loharkad Kangra Himachal Pradesh</p> <p>Contact: Mr. Debashish, Director (CPWD), People Science Institute, Deharadun, Uttarakhand. Ph: 9897080579</p>	<p>Age: 65 years Education: V pass Family size: Ten Occupation(s): Agriculture No. of years in farming: 40</p>
---	---	--

Paddy cultivation

His total agriculture land is 20 *karnal*, i.e. 2 acres (1 *karnal* = 400 sq m) of which paddy land is 8 *karnal*, i.e. 0.8 acres. He uses rainfall and Kuhl (irrigation channel) as twin water sources. The inputs used are organic compost (Panchgavya, Amritghol & Matka Khad), and chemical fertilizers. The yield obtained by the flooding method is 90 kg/*karnal* (9 q/acre).

SRI adoption

Chamaru Ram learnt about SRI from the Society for Environment & Rural Awakening (ERA) in Khundian, Himachal Pradesh. ERA is a partner organization of the Peoples' Science Institute (PSI), Dehradun. He adopted SRI in 2006 and was given training and guidance by PSI, and ERA.

Particulars	2006	2007	2008
Area under SRI	0.5 <i>karnal</i> (0.05 acre)	4.0 <i>karnal</i> (0.4 acre)	8 <i>karnal</i> (0.8 acre)
Seasons	<i>kharif</i>	<i>kharif</i>	<i>kharif</i>
Variety	Parmal	Parmal	Parmal
Inputs used	Panchgavya, Amaritjal, Matka Khad	Panchgavya, Amaritjal, Matka Khad	Panchgavya, Amaritjal, Matka Khad
Practices followed	Weeder used twice	Weeder used thrice	Weeder used thrice

Particulars	2006	2007	2008
Implements used - their availability and usage	Weeder and Marker, availed by PSI	Weeder and Marker, availed by ERA	Weeder and Marker, availed by ERA
Yield	110 kg/ <i>karnal</i> (11 q/acre)	160 kg/ <i>karnal</i> (16 q/acre)	180 kg/ <i>karnal</i> (18 q/acre)

Benefits

- ❖ Less seed required i.e. 250 g/*karnal*
- ❖ Less water, time and labour required.
- ❖ Achieved total production of 14.40 quintals in 8 *karnals* (about 18 q/acre)
- ❖ More green fodder
- ❖ Greater number of tillers, panicles, grains and a high yield due to adequate spacing
- ❖ Less damage by wind

Constraints in adoption

- ❖ Timely availability of Weeder and Marker.
- ❖ Less water availability

Lessons learnt

- ❖ Transplanting of seedlings needs to be done after 10-12 days.
- ❖ Due to organic practices, rice tastes better.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Nursery	At the field-level	Raised nursery
Preparation of field	Marker not used	Marker used
Transplantation	No fixed-spacing	10" x 10" (10 days old seedlings transplanted)
Weeding	Manual	Mandva weeder - thrice
Management of water	Rain fed	Application of 1" inch water, rest drained
Fertilizers/Manure	Urea & FYM	Panchgavya, Amaritjal, Matka Khad, Vermicompost

Particulars	Conventional method	SRI method
Yield and Income		
Total number of tillers/hill	6	17
Average plant height (cm)	75	120
Productive tillers/hill	4	15
Average panicle length (cm)	21	23
Average no. of grains/plant	1,000	2,400
Total grain output	90 kg/karnal (9 q/acre)	180 kg/karnal (18 q/acre)
Total straw output	175 kg/karnal (17.5 q/acre)	278 kg/karnal (27.8 q/acre)
Total cost of cultivation	Rs. 550/karnal (Rs. 5,500/acre)	Rs. 500/karnal (Rs. 5,000/acre)
Net income earned	Rs. 525/karnal (Rs. 5,250/acre)	Rs. 1200/karnal (Rs. 12,000/acre)

Suggestions

- ❖ Application of low-cost marking techniques.
- ❖ Increased number of weeding sessions can produce higher yields.
- ❖ Availability of tools (Markers and Weeders) should be in nearby areas and at a cheaper price.
- ❖ Timings of each cultural operation should be proper.



Chamaru Ram is practising weeding in his SRI field



Damyanti Devi

Bharmanu Ki Sher
Sirmour
Himachal Pradesh

Contact: Mr. Debashish,
Director, (CPWD), People
Science Institute,
Deharadun, Uttarakhand.
Ph: 9897080579

Age: 48 years
Education: IV pass
Family size: Four
Occupation(s): Agriculture
No. of years in farming: 30

Paddy cultivation

Of the total eight *bigha*, i.e. 1.6 acres (1 *bigha* = 800 sq.m) of agriculture land that she owns, the extent of paddy land is three *bigha*, i.e. 0.6 acre. She does rainfed agriculture using the plough, applying FYM and Urea. The yield obtained by the flooding method is 291 kg/*bigha* (14.5 q/acre).

SRI adoption

Damyanti Devi learnt about SRI through an NGO called Social Awareness Through Human Involvement (SATHI), at Thakurdwara in Himachal Pradesh. It is a partner organization of the Peoples' Science Institute, Dehradun. She adopted SRI in June 2007 and received training and guidance from PSI, Dehradun and SATHI, at Sirmour.

Particulars	2007	2008
Area under SRI	0.007 acre	0.020 acre
Seasons	<i>kharif</i>	<i>kharif</i>
Variety	Parmal	Parmal
Inputs used	Panchgavya, Amaritjal, Matka Khad, Cow dung	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Practices followed	Weeder used twice	Weeder used thrice
Implements used - their availability and usage	Weeder and Marker, availed by PSI	Weeder and Marker, availed by SATHI
Yield	19.2 q/acre	23.76 q/acre

Benefits

- ❖ Less seed requirement.
- ❖ Less water used.
- ❖ Less labour requirement.
- ❖ Only one woman can easily do transplantation work.
- ❖ Total production doubled in comparison to conventional method.
- ❖ 1.5 times more green fodder available.

Constraints in adoption

- ❖ In the event of heavy rainfall, the nursery gets damaged.
- ❖ Due to excessive water in the field, it is difficult to transplant properly.

Lessons learnt

She learnt from the SRI method how to get more production by applying less seed, water and labour.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Nursery	4 kg seed/ <i>bigha</i>	500 gm seed/ <i>bigha</i>
Preparation of Field	Marker not used	Marker used
Transplantation	No fixed spacing	10" x 10" (10 days old seedlings transplanted)
Weeding	Manual –one time	Mandva weeder -Thrice
Management of water	Rainfed	Application of 1" inch water, rest drained
Fertilizers/Manure	Urea and Cow dung	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Yield and Income		
Total number of tillers/hill	6	49
Average plant height (cm)	93	113
Productive tillers/hill	3	21
Average Panicle length (cm)	17.5	22.5
Average number of grains/ plant	840	3150

Particulars	Conventional method	SRI method
Total grain output	2.91 q/ <i>bigha</i> (14.5 q/acre)	4.75 q/ <i>bigha</i> (23.7 q/acre)
Total straw output	4.59 q/ <i>bigha</i> (22.9 q/acre)	8.31 q/ <i>bigha</i> (41.5 q/acre)
Total cost of cultivation	Rs. 1,364/ <i>bigha</i> (Rs. 6,820/acre)	Rs. 1,250/ <i>bigha</i> (Rs. 6,250/acre)
Net income earned	Rs. 2,000/ <i>bigha</i> (Rs. 10,000/acre)	Rs. 4,330/ <i>bigha</i> (Rs. 21,650/acre)

Suggestions

- ❖ Ensure adequate availability of quality tools and manure.
- ❖ Hybrid quality of seeds should be provided to the farmers.
- ❖ Weeder should be modified as per local conditions.



*Damyanti Devi
in her SRI field*





Saraswati Devi

Duhak Dharyniara
Kangra
Himachal Pradesh

Contact: Mr. Debashish,
Director (CPWD), People
Science Institute,
Deharadun, Uttarakhand,
Ph: 9897080579

Age: 73 years

Education: Illiterate

Family size: Five

Occupation (s): Agriculture

No. of years in farming: 40

Paddy cultivation

Of the total 4.5 *karnal*, i.e. 0.45 acre (1 *karnal* = 400 sq m) of agriculture land that she owns, the extent of paddy land is 2.5 *karnal*, i.e. 0.25 acre. She relies on rainfall and uses the plough and spade as implements, and applies Vermicompost and Urea in her field. The yield obtained by the flooding method is 130 kg/ *karnal* (13 q/ acre).

SRI adoption

Saraswati Devi learnt about SRI through the Peoples' Science Institute (PSI), Dehradun. She adopted SRI in 2007, and her son received guidance and training from PSI.

Particulars	2007	2008
Area under SRI	0.5 <i>karnal</i> (0.05 acre)	1.5 <i>karnal</i> (0.15 acre)
Seasons	<i>kharif</i>	<i>kharif</i>
Variety	Sarvati	Kastoori – Basmati
Inputs used	Cow dung, NPK (12:32:16)	Panchgavya, Vermicompost, Cow dung, Urea
Practices followed	All practices followed, except marking and weeding	All practices followed, except marking and weeding
Implements used: their availability and usage	Rope used for marking Manual weeding	Rope used for marking Manual weeding
Yield	Destroyed by cattle	245 kg/ <i>karnal</i> (24.5 q/acre)

Innovations and modifications

Use of rope in place of Marker, resulting in no cost in marking of fields.

Benefits

- ❖ Less usage of seeds.
- ❖ Less water required in this method for nursery.
- ❖ 50% time was saved in comparison to conventional method.
- ❖ Needs 50% less labour work.
- ❖ In comparison to the conventional method, total production was three times more.
- ❖ More green fodder available.

Constraints in adoption

- ❖ Weeds grow back each time after manual weeding.
- ❖ Due to delay in maturity of crops, additional efforts are required to protect the crop and this increased the cost of cultivation.
- ❖ The farmer was not confident about this method in the initial stage of SRI adoption. Others made fun of such activities in her field.

Lessons learnt

- ❖ People who earlier used to taunt were impressed by the SRI method.
- ❖ The crops under SRI do not lodge.



Saraswati Devi inspecting her SRI paddy crop.



Tilak Raj

Kardiana (Chakvan)
Kangra
Himachal Pradesh

Contact: Mr. Debashish,
Director (CPWD), People
Science Institute,
Dehradun, Uttarakhand,
Ph: 9897080579

Age: 35 years
Education: X pass
Family size: Four
Occupation(s): Agriculture
No. of years in farming:
Since childhood

Paddy cultivation

Tilak Raj's total agriculture land amounts to 7 *karnal* i.e. 0.7 acre (1 *karnal* = 400 sq m) and the extent of paddy land in this is 6 *karnal* i.e. 0.6 acre. His water source is the Kuhl (irrigation channel). The implements he used are the plough, spade, and he uses chemical fertilizers in his field. The yield obtained by the flooding method is 165 kg/ *karnal* (16.5 q/acre).

SRI adoption

He learnt about SRI from the Chinmaya Organisation for Rural Development (CORD), Sidhbari, Himachal Pradesh – a partner organization of Peoples' Science Institute (PSI), Dehradun. He adopted SRI in June 2006 and was given guidance and training by CORD, Sidhbari, Himachal Pradesh.

Particulars	2006	2007	2008
Area under SRI	1 <i>karnal</i> (0.1 acre)	2 <i>karnal</i> (0.2 acre)	4 <i>karnal</i> (0.4 acre)
Seasons	<i>kharif</i>	<i>kharif</i>	<i>kharif</i>
Variety	Parmal	Parmal	H.P. 6129
Inputs	Panchgavya, Amaritjal, Matka Khad, Vermicompost	Panchgavya, Amaritjal, Matka Khad, Vermicompost	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Practices	All practices followed, except usage of Weeder	Weeder used thrice	Weeder used thrice

	2006	2007	2008
Implements used: their availability and usage	-	Weeder and Marker, Weeder was provided by CORD	Weeder and Marker, Weeder was provided by CORD
Yield	220 kg/ <i>karnal</i> (22 q/acre)	240 kg/ <i>karnal</i> (24 q/ acre)	294 kg/ <i>karnal</i> (29.4 q/ acre)

Innovations and modifications

Self-designed wooden marker

Benefits

- ❖ Low seed requirement: 1 kg/ 4 *karnals*
- ❖ 50 % less water required in this method.
- ❖ 5 hours /*karnal* time saving
- ❖ Need less labour work
- ❖ 12 quintals of total production from 4 *karnals* (about 30 q/acre)
- ❖ 14 quintals of green fodder from 4 *karnals* (about 35 q/acre)

Constraints in adoption

- ❖ Due to excessive rainfall the nursery gets spoilt.
- ❖ Due to delay in growth, the crops were damaged by cattle.

Lessons learnt

- ❖ Filled seeds are obtained in the crop.
- ❖ There are fewer weeds in the crops.
- ❖ There is less fall (lodging) of the crops.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Nursery	50 sq.m.	24 sq.m.
Preparation of Field	Marker not used	Marker used
Transplantation	30 days old seedlings	12 days old seedlings

Particulars	Conventional method	SRI method
Weeding	Manual	Mandva Weeder -Thrice
Water management	6" water applied throughout	1" water applied at 10 days interval
Fertilizers/Manure	Chemical fertilizers	4 l Panchgavya, 4 l Amaritjal, 4 l Matka Khad, 30 kg Vermicompost
Yield and Income		
Total number of tillers/hill	8	18
Average plant height (cm)	98	124
Productive tillers/hill	6	16
Average panicle length (cm)	24	26
Average number of grains/ plant	600	2720
Total grain output	165 kg/ <i>karnal</i> (16.5 q/acre)	294 kg/ <i>karnal</i> (29.4 q/acre)
Total straw output	180 kg/ <i>karnal</i> (18 q/acre)	350 kg/ <i>karnal</i> (35 q/acre)
Total cost on cultivation	Rs. 550/ <i>karnal</i> (Rs. 5,500/acre)	Rs. 500/ <i>karnal</i> (Rs. 5,000/ acre)
Net income earned	(Rs. 12,800/acre)	(Rs. 27,900/acre)

Suggestions

- ❖ The availability of good seeds must be there for this method.
- ❖ The experts should be called upon on a regular and timely basis.
- ❖ The tools used for the SRI method should be available at reasonable prices.



Tilak Raj with his self-designed wooden marker.

	<p>Bharat Bhusan Gidar Gali (Sher Gharh) Miran Sahib R.S.Pura, Jammu.</p> <p><i>Contact:</i> Dr.Anuradha Saha, Asst.Prof/Jr.Scientist AICRIP, Rice, Div of PBG, Main Campus, SKUAST-J, Chatha, Jammu. Ph:9419235884</p> <p><i>Age:</i> 30 years <i>Education:</i> X passed <i>Family size:</i> Ten <i>Occupation(s):</i> Agriculture <i>No. of years in farming:</i> Since childhood</p>
---	---

Paddy cultivation

Farmer Bharat Bhusan has 0.62 acres of agriculture land and uses the entire area to grow paddy. He uses canal water for irrigation, seeds provided by the Department of Agriculture and fertilizers from private dealers. His yield used to be 18 q/acre (coarse variety), and 10 q/acre (Basmati).

SRI adoption

He learnt about SRI from SKUAST-J Project on SRI funded by WWF-ICRISAT-Hyderabad, and was given training and technical guidance by Ms. Anuradha Saha and Dr. Vijay Bharti. He took SRI on his entire 0.62 acres in *kharif* 2007 and the second in *kharif* 2008. He has grown the following varieties: Sharbati, PC-19, with the following inputs – seed (3.2 kg/acre), chemical fertilizers (Urea, DAP, MoP). There was no pest or disease attack and the yields were: 22 q/acre (Sharbati), 30 q/acre (PC-19).

He purchased a Conoweeder from ANGRAU, Hyderabad with the funding from WWF-ICRISAT. He used the following SRI practices.

- ❖ Raised nursery bed.
- ❖ Young seedlings (14-15 days old).
- ❖ Single seedling with 25x25 cm² spacing.
- ❖ Uprooting and transplanting of seedlings with soil.
- ❖ Weeding with Conoweeder thrice at 10 days intervals.
- ❖ Minimum irrigation.

Innovations and modifications

- ❖ Seed rate was standardized to 3.2 kg/acre.

Benefits

- ❖ Lower seed-rate (3.2 kg/acre) as compared to 12 kg/acre in the conventional method.
- ❖ Water savings and the crop can withstand even dry spells of monsoon.
- ❖ Simple and safe weeding as compared to the conventional method.
- ❖ Increased productivity: All the common cultivars i.e. PC-19, (coarse) and Sharbati (semi-fine), gave 40% higher yields.

Constraints in adoption

- ❖ Transplanting requires skill; therefore, availability of labour is a problem.
- ❖ Non availability of Conoweeders.

Lessons learnt

- ❖ Conoweeding as well as lesser use of water.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Nursery	Broadcasting	Raised bed
Management	Flood irrigation, weed, pest and disease control by chemicals	Minimum irrigation, no use of chemicals and use of weeders
Yield		
Number of Effective panicles		
Sharbati cultivar	7-8	15-20
PC-19 cultivar	10-12	20-25
Number of grains per panicle		
Sharbati cultivar	130	145
PC-19 cultivar	110	140
1000 grain weight (gm)		
Sharbati cultivar	18	20
PC-19 cultivar	21	22



Marking by locally made marker



Main Field of Bharat Bhusan



Janeshwar Singh

Hulsam, Tola – Manfarwa
Chhatarpur Block,
Distt. Palamau, Jharkhand

Contact: Mr. Manoj Kumar Singh,
Vikas Shayog Kendra,
Chhatarpur, Palamau
Jharkhand.
Ph: 9431715087

Age: 55 years
Education: IX passed
Family size: Eight
Occupation(s): Agriculture
No. of years in farming:
38 years

Paddy cultivation

Farmer Singh has a nine acres field, of which 2.5 acres is the extent of paddy land. He cultivates using the knowledge given by his father, Bishvambar Singh and gets a yield of about 10 q/acre. Palamau is a drought-prone region and he depends on the rains for irrigation.

SRI adoption

Keen to increase his yield, on 27 June 2006 he attended a training programme on SRI, conducted by the Vikas Sahyog Kendra, Chhatarpur, at Kokro village, where farmers from many other villages had come as well. He raised nursery using half a kilogram of seeds. Some seeds were eaten up by his hens, but he cautiously replanted the rest in 0.12 acre land and added one quintal of compost. Under the supervision of the Vikas Sahyog Kendra staff, he planted the seedlings by following marking system. Later he found that his yield had doubled, compared to the conventional method. Similarly his SRI paddy escaped a local disease called 'Bankee'.

Benefits

- ❖ By following SRI, he could save seeds (4.7 kg/acre).
- ❖ Transplantation time is saved by 5 hours.

Constraints in adoption

- ❖ Farmers needed to protect seedlings from hens and squirrels because they sow in a comparatively dry place.
- ❖ Weeding was done as a new system, which was found difficult
- ❖ Less availability of compost manure

Lessons learnt

- ❖ Learnt seed treatment.
- ❖ Learnt to make seedling bed.
- ❖ Learnt to cultivate under a new system.
- ❖ Learnt to plant in line.
- ❖ Learnt to weed the field.

Comparative Study

Particulars	Conventional method	SRI method
Seed-rate (2000 sqft)	2 kg	200 g
Size of Seedbed	10'x10'	3'x4'
Number of seedlings in 10' x 10' area	448	182
Number of tillers per seedling	6	25
Number of grains per panicle	184	296
Labours for transplantation (2000 sqft)	2 labours for 1 day	2 labours for 2 hours



Janeshwar Singh involving in various SRI operations in his field



A. Sasidharan Pillai

Nellanad
P.O, Vamanapuram,
Thiruvananthapuram.

Contact: Mr. John Jo Varghese,
Subject Matter Specialist (Agronomy),
Mitraniketan Krishi Vigyan Kendra,
Thiruvananthapuram.
Ph: 9447010474

Age: 53
Education: 10th class
Family size: Four
Occupation(s): Agriculture
No. of years in farming: 15

Paddy cultivation

He has an agriculture land of 6 acres in which paddy is cultivated in 3.5 acres. His is an irrigated land, where he applies inputs like green leaf manure, FYM, fertilizers, plant protection chemicals etc. He gets an yield of 3-3.5 t/acre in flooding method.

SRI adoption

He attended a training programme organized by Department of Agriculture at Kazhakkuttom Regional Agriculture Training Centre in 2003. The training programme was handled by Mr. John Jo Varghese, Subject Matter Specialist (Agronomy), Mitraniketan Krishi Vigyan Kendra (KVK), Thiruvananthapuram. After the lecture, he was much inspired by the new system of cultivation and tried SRI in one acre of his paddy field on a trial basis during *rabi*, 2003. He took up SRI in all the 6 acres and practiced for the past 9 seasons. He used varieties like Uma, Jaya, Harsha, Pavizhom, MTU-1, Aiswarya etc.

All the practices under SRI were followed, except strict water control during vegetative growth stage, as water in his plot cannot be easily controlled. He used implements like Rotary Marker and Rotary Weeder provided by Mitraniketan KVK.

With regard to pest incidence, it was relatively less in his SRI field. The spacing between plants provided enough space for monitoring, which helped in the management of Leaf folders. *Pseudomonas fluorescence*, an effective bio control agent, was used while seed treatment, nursery, and in the field also. Because of this, fungal and bacterial diseases were controlled. Application of *Pseudomonas fluorescence* was practically easier to adopt, as SRI required less seeds, less nursery area and enough spacing between plants for the spraying.

SRI fields gave yields of 6.5- 7.5 tonnes from 6 acres, which is almost double than the conventional system.

Innovations and modifications

Aluminium tray, which was used for rubber latex setting, was used to carry seedlings from the nursery to the main field. As rubber is grown in most of Kerala, the use of Aluminium trays is found ideal for transporting seedlings.

Benefits

Reduction in the required seeds to the tune of 1/10th of the quantity. Similarly, 1/10th of the area earlier required for nursery is only required. Planting of young seedlings in wider spacing did reduce the drudgery involved in uplifting the seedlings, transporting and planting. Weeding with the use of Rotary Weeder helped in turning up of the soil and reduced the time taken for weeding. There was reduction in pest and disease incidence in SRI field. With SRI, the yield was doubled in the same piece of his land by reducing the inputs used.

Constraints in adoption

The decision to shift to SRI cultivation created lot of uproar among other paddy farmers of his area (Nellanad Padasekhara samithy), as he was the president of that paddy growers association. After the planting, every one termed it as a foolish decision to do this suicidal act of planting young seedlings so early. Constant support and supervision from the staff of Mitraniketan KVK, helped him to overcome the criticisms faced in the beginning. After 1-2 months, the same people who had criticized started closely observing the growth of paddy in his field. On an average there were 40 tillers with more grains per panicle.

Lessons learnt

- ❖ Nursery of young seedlings in wider spacing reduces the drudgery involved in uplifting the seedlings, transporting and planting.
- ❖ Weeding with Rotary Weeder reduces the time taken for weeding.
- ❖ There was reduction in pest and disease incidence in SRI field.
- ❖ State Agriculture department authorities got convinced by his success and granted a project to expand the SRI method of cultivation to 25 acres of his Padasekhara samithy. Ministers, staff of agriculture university, students and

other farmers visited his paddy area. His success story was covered by various media.

Suggestions

- ❖ Kerala Agricultural University has not recommended SRI openly and there are few who oppose it publicly. This is creating confusion among farmers and reluctance for the Department of Agriculture to popularize the same. This issue should be addressed in order to scale up the SRI in Kerala.



Inauguration of 25 acres SRI demonstration by State Minister Paloly Muhammdkutty



Visit of Plannig Board Chief (Agriculture) at Sasidharan's Paddy field

	<p>C. Mohan Muthalamada Kerala</p> <p><i>Contact:</i> Mr. Shanmugasundram, Asst. Professor (Extn.), Regional Agr. Res. Station, Kerala Agricultural University, Pattambi, Palakkad, Kerala – 679 306, Ph: 9446239318</p> <p><i>Age:</i> 50 years <i>Education:</i> B.Sc. <i>Occupation(s):</i> Agriculture <i>No. of years in farming:</i> 15</p>
---	--

Paddy cultivation

Farmer C. Mohan has 18 acres of agriculture land, of which 4.8 acres is the extent of paddy land. Using canal water for irrigation and only organic inputs, he has obtained 2 t/acre, in conventional method.

SRI adoption

He learnt about SRI from another farmer and adopted SRI in 2007 on 0.5 acre of land, after undergoing training and guidance in Tamil Nadu. He has grown the IR-50 variety using organic fertilizers and by following the SRI practices. He has used a Marker with four wheels and a Rotary Weeder. He did not suffer much from pests because of the application of botanical extracts.

Innovations and modifications

He designed a marker for transplanting, in consultation with a farmer of Tamil Nadu state.

Benefits

- ❖ Simple technology.
- ❖ Less water requirement.
- ❖ Good aeration.
- ❖ Lesser labour cost by using Marker for planting.
- ❖ Low levels of fertilizer usage.

Constraints in adoption

- ❖ Damage to seeds by birds, crabs etc.
- ❖ Seedlings will get damaged, if there is a rain within 10 days of planting.

Lessons learnt

Line planting, single seedlings with good spacing will give more productive tillers.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Seed	20-24 kg/acre	2 kg/acre
Transplanting	30 days seedlings	12 days seedlings
Number of hills/m ²	30-40	20
Number of seedlings/hill	3-4	1
Fertilizer	Application of chemical fertilizers, pesticides, herbicides etc.	Preference given to organic solutions
Water management	Continuous flooding	Only moist conditions
Weed management	Weeds are manually removed from the field	Weeds are turned down into the field by Conoweeder.
Yield		
Grain yield	2 t/acre	3 t/acre
Cost benefit ratio	2.10	2.71

Suggestions

- ❖ To use organic fertilizers.
- ❖ To develop a eight-wheel marker.
- ❖ SRI is suitable for farmers of Kerala only in the second season.

Mohammed K.P.

Thriprangode
Kerala

Contact: Mr. Shanmugasundram,
Asst. Professor (Extension),
Regional Agr. Res. Station,
Kerala Agricultural University,
Pattambi, Palakkad,
Kerala – 679 306,
Ph: 9446239318

Age: 49 years
Education: SSLC
Occupation(s): Agriculture
No. of years in farming: 13

Paddy cultivation

Farmer Mohammed owns an area of 21 acres, in which paddy is covered under 10 acres. He depends on well for irrigation. He applies organic manures and NPK as per the package of practice.

SRI adoption

He came to know about the SRI through his area Agricultural Officer and adopted it in 2.5 acres in the year 2005. He followed it for one season with varieties like Navara and Basumati. He applied fertilizers, Neem cake and *Pseudomonas* etc. He practiced Conoweeder which is available in RAIDCO (Regional Agro Industries Cooperative Society), Kerala. With regard to plant protection measures, he applied Monocrotophos to control Leaf folder and Malathion to control Ear-head bug.

Benefits

- ❖ Less labour cost
- ❖ Less quantity of seeds for nursery preparation
- ❖ Non lodging
- ❖ Cono-weeding is more beneficial
- ❖ Input usage is less

Constraints in adoption

- ❖ Weeding by Conoweeder is difficult
- ❖ More pest population due to wide spacing
- ❖ Difficulty in planting and more labour is required

Lessons learnt

- ❖ Suitable for varieties like Basumathi and Navara where good yield obtained would fetch premium price in the market
- ❖ Single seedling planting requires to be carefully transplanted under supervision of the farmer himself.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Seed	28 kg/acre	2.4 kg/acre
Transplanting	30 days seedlings	15 days seedlings
Number of hills/ m ²	30-40	About 16
Number of seedlings/hill	3	1
Fertilizers	Application of chemical fertilizers, pesticides, herbicides etc.	Preference given to organic solutions
Water management	Continuous flooding	Only moist conditions
Weed management	Weed manually removed from the field	Weeds turn down into the field by Conoweeder.
Yield		
Grain yield	80 q/acre	1.2 t/acre
Cost benefit ratio	1.58	1.88

Suggestions

- ❖ Control of weeds by flooding water
- ❖ Motorized Conoweeder is necessary



*Mohammed
in his SRI field*



Ramprasad Kartikey
Dei
Madhya Pradesh
Contact: Mr. Sandeep Khanwalkar, MPRLP, Bhopal, M.P.
Ph: 9425303566.
Age: 42 years
Education: 11th passed
Occupation(s): Agriculture

Paddy cultivation

Shri Ramprasad is a traditional farmer. His entire family mainly depends on agriculture to meet their basic requirement. Total land holding is 4.5 acres only. Paddy is main crop in *kharif* season and he also takes wheat in winter season if everything is in favour. Out of total land, he cultivates paddy in 4 acres and in rest of the land he takes other crops like maize, minor millets, etc. His land is close to a canal, which is main source of irrigation.

Average production of paddy by conventional method is only 6 to 7 q/acre. Seed rate is also very high which results into 'high input-low return' in his field.

SRI adoption

When SRI is introduced by MPRLP team, farmers were little scary about this. Few training programmes were organized on the concept of SRI method, and it was requested to select a progressive farmer who could provide his field for demonstration. Shri Ramprasad Kartikey came forward. Regular training and hand holdings were provided to him with the help of Krishi Vigyan Kendra & Agriculture Department.

After initial orientation he agreed to provide about 0.50 acre land for SRI demonstration. It was also decided that around 0.35 acres of land will be kept under conventional method to compare the overall output from both the methods. The variety Ashoka-200 was selected. To make it a comparative study, detailed data were collected at various stages.

Date of Sowing	02.07.08
Date of Transplanting	13.07.08
Date of Harvesting	15.10.08
Area under SRI	0.50 acre
Area under conventional method	0.35 acre
Yield on SRI	7.20 q (from 0.50 acre)
Yield on conventional method	2.10 q (from 0.35 acre)

Innovations and modifications

- ❖ Use of self made wooden marker (Six rows)
- ❖ Use of short duration improved variety Ashoka-200 (90 days) to save late supplemental irrigation of paddy crop.

Benefits

- ❖ Saving of seed cost
- ❖ Saving labour cost at the time of transplanting.
- ❖ Crop productivity is more.

Constraints in adoption

- ❖ Time bound irrigation management.
- ❖ Weeding cost more due to more plant spacing.

Lessons learnt

- ❖ This is the best method of paddy cultivation to increase more productivity.

Comparative study

Particulars	Cost of cultivation (Rs./acre)	
	Conventional method	SRI method
Operations		
Field preparation	100	200
Seed	320	32
FYM	0	50
DAP	0	150
Urea	0	90

Particulars	Cost of cultivation (Rs./acre)	
	Conventional method	SRI method
PSB	0	20
Azotobactor	0	16
Fungicide	0	28
Nursery preparation & maintenance	30	100
Transplanting	200	150
Weeding	0	150
IPM (with Monocrotophas)	0	90
Harvesting	200	200
Thrashing	150	150
Total	1,000	1,426
Yield and Income		
Yield (q/acre)	6	14.4
Gross return (Rs.)	4,800	11,520
Cost of cultivation (Rs.)	1,000	1,426
Net Income (Rs.)	3,800	10,094

Suggestions

Irrigation facility should be ensured.



Ramprasad in his SRI field at different stages



Shivji Kushram

Moiyanala (Forest village)

Dhudhava

Madhya Pradesh

Contact: Mr. Sandeep Khanwalkar,
MPRLP, Bhopal, M.P.

Ph: 9425303566.

Age: 45 years

Education: Literate

Family size: Five

Occupation(s): Agriculture

No. of years in farming: 20

Paddy cultivation

Shivji possesses 10 acres of total agriculture land. He practices rain-fed agriculture in both seasons. Agriculture is mainly done to meet the food requirement of the family and livestock. If there is surplus production, he sells it in the market. To meet other requirements, his family depends on forest produces. Rice is the main food for his family. Therefore, paddy cultivation is done in a big plot. Due to limited availability of good quality land for paddy cultivation, he could take paddy only on 4 acres of land out of 10. Rain water is the major source of irrigation. He takes water from a stream using diesel pump on rent. Remoteness of his village does not provide opportunity to him to apply quality inputs in his field. Average yield in flooding method ranges between 5 to 7 q/acre.

SRI adoption

MPRLP team, a local NGO, is working in this village to address the issues of livelihoods through Panchayat Raj Institutions. As agriculture is the main source of livelihoods, it was decided to put extra energy to enhance agriculture production. Farming system approach was adopted to understand existing agriculture practices. After that MPRLP prepared plan of action. When the team discussed about overall production of paddy in his field, it came to know that it was very low. After that he was told about SRI method for paddy cultivation. He was told by Agriculture Department also about this method last year, but he could not adopt it because of the fear of failure. When the team enquired him about SRI, he could not explain it clearly. He knew this method as “*Madagascar method of rice cultivation*”. First time he was explained, oriented and trained on SRI by MPRLP team. A detailed discussion on the benefits of SRI was done with his family to bring them into confidence. This took two to three rounds of discussion with the entire family and they agreed to

adopt SRI in a small patch of land. He provided half an acre of his land for SRI demonstration.

He told MPRLP team that he would use his local seeds. Variety *Uraiboont*, which is commonly known in this region was used for this demonstration. Since he had so many doubts in his mind, he told that he would follow his own package of practices under SRI. Then it was negotiated and he was convinced to adopt only SRI method. But, no farm implement was used by him, only farm yard manure was applied.

Innovations and modifications

Earlier he used to sow his seeds by just broadcasting in the field. Therefore, overall germination was not good. This was the main reason for high seed rate. But in this plot he followed the SRI method of nursery preparation.

Benefits

- ❖ Less quantity of seeds is required.
- ❖ Because of transplanting, weeding is easy. Due to proper spacing during weeding, chances of plant damage is less.
- ❖ Plants look green
- ❖ More tillers. He experienced about 20 on average.
- ❖ Quality of grain is good. More grains in one panicle
- ❖ Production and productivity were enhanced
- ❖ Income was increased
- ❖ Water requirement got reduced

Constraints in adoption

During his SRI demonstration he experienced few constraints also which are as follows:

- ❖ Undulated plot leading to water logging in some parts of land
- ❖ Heavy rain fall delayed nursery raising
- ❖ Seeds were washed away
- ❖ Transplantation requires labour and availability of which is a big issue
- ❖ Availability of quality seeds is a big problem
- ❖ It requires more labour
- ❖ Lack of irrigation facility

- ❖ Due to small size of seedlings, transplanting is tough
- ❖ Lodging of standing crop

Lessons learnt

- ❖ Timely preparation of nursery is must
- ❖ Good quality of compost is must
- ❖ Transplanting of seedlings (along with seed) should be done.

Comparative study

- ❖ In conventional paddy cultivation, seeds are generally sown by broadcasting method. Even if nursery is prepared, it is not prepared properly. Thus germination of seeds is poor and quality of seedling is not good. Seed treatment is also not done. In spite of heavy investment, production is low (about 10 q/acre).
- ❖ In SRI method, nursery is prepared on good quality land. Seeds are sown in line, so the germination is good. Seed treatment is done before sowing. Transplanting of seedling is done with proper spacing. Weeding is done after 15-20 days. Because of wider space, weeding can be done using implements like hand weeder also. The productivity reaches up to 20 q/acre.

Suggestions

- ❖ Low cost agriculture implements are needed.
- ❖ Timely availability of seed, fertilizer, pesticide etc., is a must.
- ❖ Sustainable source of irrigation is required for timely irrigation.



Transplantation at the SRI field of Shivji Kushram.



Suresh Kushwaha

Kopra
Shahdol
Madhya Pradesh

Contact: Mr. Sandeep Khanwalkar,
MPRLP, Bhopal, M.P.
Ph: 9425303566.

Age: 32 years
Education: 8th passed
Family size: Five
Occupation(s): Agriculture
No. of years in farming: Five

Paddy cultivation

He is cultivating paddy in 4 acres of land. His main source of irrigation is rain water. He used to get an average yield of 6 q/acre

SRI adoption

SRI concept was new to the farmers of his village. Entire village traditionally cultivate paddy. Broadcasting method is a commonly adopted method by majority of the farmers. Few farmers do transplantation of seedling by adopting flooding method. Thus SRI was a new thing to all of them. He learnt it in the Farmers' Field School (FFS) run by MPRLP. FFS helped him understanding various new technologies and practices. In regular trainings organized before *khari* season, he was trained on SRI. Some of the farmers decided to adopt the method in a small piece of land this year. He was one of them. All plots, including his, started SRI with the guidance of Project Facilitation Team members. As it was first time, he did it in only in 1.5 acres out of total 4 acres. He has chosen most commonly used variety IR-64. Seed treatment was done using *Tricoderma* at the rate of 3g/kg. He also applied D.A.P., Urea, and Zink for better production in his plot.

First Step: Land was prepared to maintain the moisture in the field.

Second Step: Preparation of nursery bed was done. Size of each nursery bed was 15x1x0.15 m³. Total 5 kg of seeds were used for nursery raising.

Third Step: Transplantation of seedlings were done after 10 days. Each seedling was transplanted maintaining equal distance between row to row and plant to plant.

Fourth Step: Maintaining of moisture up to 21 days after transplantation.

Fifth Step: Weed management, pest and disease control was done. Gundhi bug attack was seen in the field. Quinalfas was applied to control this bug. Some plants were affected by *Khaira* disease which was controlled by applying Zink Sulfate at the rate of 8 kg/acre.

Traditional farm implements like plough, leveler and rope were used. Overall production was 13 q/acre.

Innovations and modifications

He was excited to adopt this method, because this was altogether a new experience to all of them. He used salt for seed treatment. This helped in removing poor quality seeds. Raising of nursery was first time done in his life. Drainage line was prepared around the nursery bed for proper drainage. Seed rate was very low compared to conventional method. Plant population was maintained well.

Benefits

- ❖ In conventional method, he used to use 30-35 kg of seeds. But in SRI, this quantity was reduced to 3-4 kg. This way he saved 30-32 kg of seeds per acre.
- ❖ In conventional method, plant to plant distance was very close thus number of tillers was less and weed was a major problem. But in SRI, he maintained distance of 25 cm by 25 cm, therefore he could save time, money and labour also. Weeds were less and weeding became easy.
- ❖ Overall, production from conventional method was only 6-7 q/ acre while in SRI it went up to 13-14 q/acre which was quite high in his area.

Constraints in adoption

Main constraint faced while adopting SRI was maintaining plant to plant and row to row distance. Farmers were not ready to adopt it completely. They managed distance according to their understanding.

Lessons learnt

- ❖ Preparing nursery was completely a new learning for him. Before that he had never done this way in his field.
- ❖ Seed treatment using *Trichoderma* was done first time in his life. To remove poor quality seeds, salt treatment was done which was also new to him.

- ❖ How to maintain plant to plant and row to row distance was biggest learning.
- ❖ How to control pest and diseases also learnt during this process.

Suggestions

- ❖ Use Marker to maintain spacing between plant to plant and row to row.
- ❖ For weeding Rotary Weeder is better to use.
- ❖ After transplantation of seedling, do not fill water in the plot up to 21 days.
- ❖ Seed treatment should be done using salt.
- ❖ Do not apply too much of Urea and DAP in the plot.



Transplanted seedlings at Suresh Kushwaha's SRI field.

	<h2 data-bbox="418 167 708 202">Debahari Gouda</h2> <p data-bbox="418 211 502 273">Jugudi Orissa</p> <p data-bbox="418 282 747 476"><i>Contact:</i> Dr. A. Ghosh, Sr. Scientist, Agronomy, Division of Crop Production, Central Rice Research Institute (CRRI), Cuttack, Orissa. Ph: 9437271328</p> <p data-bbox="805 299 1094 476"><i>Age:</i> 45 years <i>Education:</i> V pass <i>Family size:</i> Seven <i>Occupation(s):</i> Agriculture, and Milk-supply <i>No. of years in farming:</i> 20</p>
---	---

Paddy cultivation

His total agriculture land is four acres, of which paddy land is 3.5 acres. He uses both rainfall and a canal as his irrigation sources. The inputs used per acre are seed (60 kg), fertilizer [Basal dose: Gromor (a compound fertilizer containing 28% each of N and P) 50 kg, first top dressing: Urea 50 kg, MoP 50 kg, second top dressing: Urea 25 kg and MoP 25 kg, depending upon availability of water/rainfall]. The yield obtained by the flooding method is 2.1 t/acre.

SRI adoption

Debahari Gouda learnt about SRI from CRRI and BASIX, a local NGO. He adopted SRI in 2007 and was given training and guidance by CRRI and BASIX. The area under SRI was 0.1 acre in 2007 and 0.6 in 2008. He has grown two seasons of SRI crops using the JK RH 401 variety. He used the following inputs: seeds (3 kg) and fertilizers (Basal dose: Gromor 60 kg, MoP 35 kg, first topdressing: Urea 25 kg, MoP 15 kg). He followed the following SRI practices like transplanting single seedling of 15 days old, spacing of 25 X 25 cm², weeding at one month after transplanting, draining excess water up to one month of transplanting. He had no disease/pest attack in 2008, but in 2007 he had used a pheromone trap against Stem-borer. The yield was about 3.85 t/acre.

Benefits

- ❖ Less seed required.
- ❖ Less labour required.
- ❖ More yield.

Constraints in adoption

Greater weed incidence in SRI due to wider spacing.

Lessons learnt

With less cost of cultivation a higher yield can be achieved.

Comparative study

Variety : JK RH 401		
Particulars	Conventional method	SRI method
No of panicles/m ²	315	400
Panicle length in cm	30.8	31.8
No of grains per panicle	195	220
1000 grain wt in gm	25	33
Yield	2.43 t/acre	3.72 t/acre

	Debraj Das
	Chandanpur Orissa
	<i>Contact:</i> Dr. A. Ghosh, Sr. Scientist, Agronomy, Division of Crop Production, Central Rice Research Institute (CRRRI), Cuttack, Orissa. Ph: 9437271328
	<i>Age:</i> 45 years <i>Education:</i> IV pass <i>Family size:</i> Five <i>Occupation(s):</i> Agriculture and Wage work <i>No. of years in farming:</i> Eight

Paddy cultivation

His total agriculture land is two acres, of which paddy land is 1.4 acres. He uses rainfall as the main water source. The inputs used per acre are seed (35 kg) and fertilizers [(Basal: Gromor (a compound fertilizer containing 28% each of N and P) 25 kg; first top dressing: Urea 25 kg, MoP 15 kg, second top dressing: Urea 15 kg)]. The yield obtained by the flooding method is 1.4 t/acre.

SRI adoption

Debraj Das learnt about SRI from CRRRI and BASIX, a local NGO. He adopted SRI in 2005 and was given training and guidance by CRRRI and BASIX. The area under SRI is 0.6 acres. He has grown three seasons of SRI crop using the Sarala variety. He used the following inputs: seeds (2.5 kg) and fertilizers (Basal: Gromor 40 kg, MoP 15 kg, top dressing: Urea 40 kg). He followed the following SRI practices: transplanting 15 day old seedling, draining of water one month after transplanting, weeding after one month. He did the line-sowing using rope, and used the Rotary hoe weeder. He dealt with the pest attack by using botanical pesticides. The yield used to be about 2.8 t/acre.

Innovations and modifications

- ❖ Weeding was not possible 15 days after transplanting, so it was done after 25 days.

Benefits

- ❖ Fewer wage labourers are required: uprooting requires only two labourers as against 12 labourers in conventional planting. Transplanting requires 15 labourers, as against 35 per acre.

Constraints in adoption

- ❖ Seedling becomes older if there is lack of rainfall.
- ❖ Use of Rotary hoe-weeder is a problem in case of less water in the field.
- ❖ Labourers become reluctant to transplant single seedling as it is different from their traditional practice.
- ❖ There is greater weed-incidence in SRI and requires a greater number of labourers.

Lessons learnt

- ❖ Transplanting of single seedling in line, can give higher yield than conventional planting using more seedlings with close spacing.
- ❖ The cost of cultivation is less in SRI.

Comparative study

Variety: Sarala		
Particulars	Conventional method	SRI method
No of panicles/m ²	252	448
Panicle length in cm	29	30.4
No of grains per panicle	215	314
1000 grain wt in gm	28	29
Yield	2.0 t/acre	3.8 t/acre

Suggestions

- ❖ Modification in SRI is required to suit all types of land situations.



*Jubilant
Devraj Das
with his SRI
bounty*

Madhu Pradhan

Odagaon Block, Badagorada

Dist. Nayagarh

Orissa

Contact: Mr.Mitan Kumar Mohapatra,

BOJBP, Dist. Nayagarh, Orissa.

Ph: 9438296369

Age: 62 years

Education: Upper primary school

Family size: Seven

Occupation(s): Agriculture

No. of years in farming: 40

Paddy cultivation

Madhu Pradhan, a marginal farmer, has two acres of agricultural land and mainly cultivates paddy. His yield from the beginning was 6.75 q/acre. As soil fertility decreased, he began using chemical fertilizers to increase production. Over the last few years, his use of chemical fertilizers doubled every year, which in turn pushed him toward economic penury. To make things worse, he depends on the rain and in case the rains fail, it would be very difficult.

SRI adoption

Pradhan loves to tell the story behind his success in adopting SRI. A roadshow in 2005 by BOJBP (a peoples' organization) introduced him to SRI. Though initially unsure, he was convinced by Shri Laxmidhar Acharaya, a field motivator of BOJBP. He used to cultivate CR 1009 variety in his land. In 2006 he adopted SRI on an experimental basis in 10 cents (100 cents = 1 acre) of his land. During the *kharif* season he cultivated varieties Kalakoili and Swarna Masuri with inputs like Magic compost, Vermicompost, and Medicinal magic compost. To protect plants from pest attacks, he used leaves of different plants. He kept pests at bay by taking small natural precautions like seed purification using neem leaves on the seed bed etc. BOJBP organized training programmes to enhance the efficiency of many farmers on SRI. Madhu Pradhan has attended three training programmes on SRI and Sustainable Agriculture by BOJBP.

Innovations and modifications

The motivator told him about the Marker prepared by BOJBP, but he was not satisfied with it and used a Rope Marker for transplantation. He further found that the use of

compost increases the efficiency of the land. He has left 100 jungle goats into his land for compost.

Benefits

- ❖ SRI gave him food security in comparison to the conventional method of farming, where he used chemical fertilizers.
- ❖ He realized that by using less seed, less water and organic products, he can get good yield.
- ❖ Transplantation takes less time, in comparison to conventional method
- ❖ He got 5.5 bags (1 bag = 70 kg) from the 10 cents of SRI land whereas 4.5 bags from the rest 30 cents

According to him, SRI is like a lighthouse for small and marginal farmers guiding the way to a healthy income and healthy life. Madhu Pradhan is very much interested in sharing his experience with other farmers.

Constraints in adoption

He had to face taunts and teasing while adopting SRI.

Lessons learnt

As SRI is an organic method, Madhu Pradhan is now using its techniques to grow Sugarcane and Vegetables too. Fewer inputs are needed for SRI than the conventional method.

Comparative study

Particulars	Conventional method (50 Cents) Rs.	SRI method (50 Cents) Rs.
Seed	100 (10 kg)	5 (500 gram)
Labour	1,000	700
Fertilizer	500	100 (Compost)
Total	1,600	805
Money saved in SRI		795

	Surendra Masti
Mahadeiput, Koraput (D.t) Orissa	Age: 38
<i>Contact:</i> Mr. Prabhakar Adhikari, Pragati, Koraput, Orissa. Ph: 9437025045	<i>Education:</i> 10 th class <i>Family size:</i> Seven <i>Occupation(s):</i> Agriculture <i>No. of years in farming:</i> 20

Paddy cultivation

Surendra Masti owns 12 acres of land out of which 2 acres are low land, 1 acre medium land and the rest 9 acres are uplands. He depends on monsoon for agriculture activities as there is no other means of irrigation. If there is failure or irregularity of monsoon, it will be difficult period for the family. Out of his total landholding, he raises paddy in only 6 acres of land (2 acres low land, 1 acre medium land and 3 acres upland). Yield from up land is very low i.e. 4 to 5 q/acre and in the low lands it is 11 to 12 q/acre. But this yield feeds the family only for six months and for the other half of the year they have to purchase rice for consumption.

SRI adoption

He got an opportunity to attend trainings on SRI organized by Pragati, a local NGO, in 2006 but he was not at all convinced. Again before *kharif* 2007, he participated in a training on SRI & Sustainable Agriculture. In the mean time, he had seen another farmer of a nearby village adopting SRI and got impressed by the increased yield. He was tempted to try out for himself, though with a lot of doubt in heart. He decided to do SRI in only 40 cents (0.4 acre) of medium land in *kharif* 2007.

He stuck to the practices he had learnt during training. He had prepared the land with drainage channels, so that the field wouldn't be flooded with water, raised a nursery bed to prepare seedlings by applying cow dung compost and Vermicompost. He had prepared seedlings from 700 gm of Khandagiri variety of seeds. He prepared the seedbed, covered with the soil mixture and after broadcasting the seeds covered the bed with Vermicompost. Transplantation was made when the seedlings were 12 days old. He also maintained proper spacing of 25 cm² (line to line and plant to

plant). After ten days of transplantation, he first weeded the land by using a weeder and subsequently did it three times at an interval of 12 days each.

The inputs he used were green manuring (Sun hemp) and 50 kg of cow dung compost. He applied cow dung compost after each weeding. With regard to the use of implements, he developed the Marker locally. He could get the Weeder from Pragati. Surendra observed that there were no pest attack or plant diseases. He harvested three quintals of paddy from that patch of land.

He has adopted SRI in 1 acre in *kharif* 2008. He has used 2 kg of seeds treated in brine solution and raised a seed bed. As the monsoon was bit delayed this time all the agricultural activities were deferred. He transplanted 12 days old seedlings and did weeding 4 times. He had applied only organic manures. This time things were beyond his control, as monsoon rain was quite unpredictable and stopped suddenly when the plants were in fruiting stage. There was also no facility for irrigation to save the crops. He feels that this year he wouldn't be getting good harvest either in conventional or SRI method.

Innovations and modifications

- ❖ The wooden marker for proper spacing of plants was prepared locally by the farmer.

Benefits

Surendra is however convinced that SRI offers certain advantages over conventional method of paddy cultivation. He was previously using 24 kg of seeds in that patch of land in conventional method, whereas for SRI he had raised only seedlings from 700 gm of seeds out of which he used only 50% of seedlings. He also observed that there were no pests and diseases, but previously in conventional method there was at times plant disease like Leaf blight and pests like Stem borers. Though the weeds were more, due to weeding by weeders, the land could get green manure. There was less requirement of water in SRI as compared to conventional method. He could observe that there was less requirement of labour. The whole family was engaged in weeding in conventional method, whereas he could do it alone in 2 to 3 hours with the help of a Weeder in SRI method.

In SRI method, he could get on an average of 10 to 25 tillers per seedling, whereas in conventional method there were only 2 to 3 tillers. The panicles were also long and the number of chaffy grains was negligible. Above all, the most important difference

he could observe was increase in yield. He harvested 3 quintals of paddy from 40 cents of land whereas he used to harvest 1.5 to 1.75 quintals from the same patch in conventional method.

Constraints in adoption

The most important constraint for Surendra was that he couldn't convince himself of planting only one seedling and the discouragement by the fellow farmers of his village. As he adopted SRI for the first time in *kharif* 2007, he had to consult Pragati field staff more frequently. But in *kharif* 2008, he could manage himself. He now believes that once a farmer starts adopting the practices there would not be much problem for him. However the farmer has to stick to transplantation of seedlings 8-12 days old, water management and timely weeding.

Lessons learnt

After practicing SRI for two consecutive years Surendra has learnt that

- ❖ SRI can help increase productivity with less seeds, less water and organic practices.
- ❖ It requires less labour for weeding as compared to weeding in conventional method.
- ❖ Less vulnerability to pest attacks and diseases as the rice field is not flooded with water and the plants are healthy.
- ❖ Water management is an important factor in SRI. It can be the best method, if there is facility for controlled irrigation.
- ❖ A single seedling can bear so many tillers.

Comparative table

Particulars	Conventional method	SRI method
Operations		
Area	0.40 cent	0.40 cent
Land type	Medium land	Medium land
Water source	Rain water	Rain water
Seed variety	Khandagiri	Khandagiri
Seed used	24 kg	700 gm (before treatment with brine solution)

Particulars	Conventional Method	SRI Method
Preparation of nursery	Ploughed a patch of land, applied Cow dung manure and seeds were sown	Prepared raised seed bed (6ft X 2ft X 6 inches), applied Cow dung manure and Vermicompost
Land preparation	Ploughing	Ploughing, incorporation of green manure like <i>daincha</i> , prepared land with drainage channels
Manures	Cow dung compost	Cow dung compost
Transplantation	Put 3 to 5 seedlings at one place after seedlings are 45 days old	Planting 12 days old single seedlings
Spacing of plants	No proper spacing	25 cm ² (plant to plant and line to line)
Weeding	Twice manually	4 times by weeder
Pests and diseases	disease like Leaf blight and pests like Stem borer	Nil
Tillers per hill	2 to 3	10 to 25
Yield (q)	1.5 to 1.75	3 q (after excluding chaffy grains)

Suggestions

- ❖ Awareness among farmers on practices and techniques of SRI should be generated, as it involves change of practices, compared to conventional method.
- ❖ Government should support for irrigation facilities and provision of organic inputs at subsidized rates.



Surendra doing weeding in his field

	<p>Ramasamy #47, Middle Street Pillayarkuppam Thondamanatham (Po) Pondicherry– 605 502</p> <p>Contact: Ms.S. Puspalatha, Chairperson, Ekoventure, Pondicherry Ph: 0413-2275812</p>	<p>Age: 46 years Education: XII passed Occupation(s): Agriculture No. of years in farming: 25</p>
---	---	---

Paddy cultivation

Farmer Ramasamy has 5 acres of agriculture land, in that he cultivates paddy in 4 acres. He depends on his bore well. He applies FYM and chemical fertilizers and pesticides in his field. He gets a yield of 2.6 to 3 t/acre.

SRI adoption

He has come to know about the SRI through the local NGO Ekoventure. He adopted it in 10 cents (0.1 acre) during May 2002 and obtained a yield of 33 quintals. Having trained by Ms.Puspalatha of Ekoventure, he gradually increased his area to two acres now in 2008. He has practiced SRI during the past 12 seasons. He cultivates local ruling varieties like Chinna Ponni, White Ponni (*samba*), ADT-37, Annalakshmi. Apart from chemical fertilizers, he applies bio-fertilizers also. He follows all the SRI practices recommended by the Ekoventure. He uses rope with marking for transplanting. He has taken Marker from Ekoventure to use for the current *samba* season and experienced difficulty in pulling it because of the heavy clay soil. He is comfortable with rope. For weeding operations he uses a Conoweeder. He encountered pests like Leaf-folder, Stem-borer, and used Karate pesticide in one season. He obtained a yield of 3.5 to 3.8 t/acre.

Benefits

- ❖ Less seed, less water, family labour for removal of seedlings.
- ❖ More productive tillers, high grain & straw yield.
- ❖ Good quality grain, reduced fertilizers and pesticide usage.
- ❖ No lodging in I.W.Ponni variety during heavy rains.
- ❖ Less labour for transplanting (SRI 10 numbers & Conventional 16 numbers/acre) and, good quality straw for cattle consumption.

Constraints in adoption

Use of Marker was difficult due to heavy soil type. For few seasons he could not use the Conoweeder due to non availability and hand weeding was invariably resorted to.

Lessons learnt

With the use of family labours most of the skilled operations like raised bed nursery, transplantation and weeding by Conoweeder were done. Easy to save minimum of Rs. 2,000/- per acre in addition to higher yield.

Comparative study

Particulars	Conventional method (Rs/acre)	SRI method (Rs/acre)
Operations		
Seed	500	60
Nursery preparation	350	150
Main field preparation	1,500	1,750
Seedlings removal	1,000	120
Transplanting (Using rope)	1,200	800
Weeding	1,200	900
Fertilizer & Pesticides	1,000	600
Harvesting	1,500	1,500
Total	8,250	5,880

Suggestions

Support from the Government is very much essential to adopt SRI in larger area.



SRI practices are in progress in Ramasamy's field

	Selvanathan
	#12, Mariamman Koil St., Uruvaiyaru, Mangalam Po Pondicherry -605 110
	<i>Contact:</i>
	Ms.S. Puspalatha, Chairperson, Ekoventure, Pondicherry Ph: 0413-2275812
	<i>Age:</i> 57 years
	<i>Education:</i> X passed
	<i>Occupation(s):</i> Agriculture
	<i>No. of years in farming:</i> 38

Paddy cultivation

Farmer Selvanathan has 16 acres of agriculture land, in that paddy is cultivated in 8 acres. He has a bore well. He applies FYM chemical fertilizers and pesticides in his field. His yields are about 1.5 t/acre (White Ponni) and 2.5 t/acre (Other varieties).

SRI adoption

He came to know about SRI through TRPP (Tank Rehabilitation Project, Pondicherry) and trained by Ms. Pushpalatha, Ekovneture, a local NGO. He adopted SRI in the year 2003 *samba* and started with 5 acres of cultivation. He had an experience of 11 seasons in SRI, tried varieties like I.W.Ponni (*samba*), ASD 19, ADT43, ADT37, ADT46 etc. He applies FYM, chemical fertilizers and bio- fertilizers in his field. He follows all the practices recommended in SRI. He received 5 Conoweeder from TRPP and a Marker from Ekoventure. There was no pest problem in his field. To control Sheath rot, he used Bavistin. He got a yield of 2.2 t/acre (I.W.Ponni) and 3.4 t/acre (Other varieties)

Innovations and modifications

Has designed a small Conoweeder to use for 3rd and 4th weeding to avoid crop damage.

Benefits

Less seed, less water, less labour for removal of seedlings, but more grain and straw yield.

Constraints in adoption

- ❖ Conoweeder could be used in one direction only.
- ❖ Leveling the field is difficult.

Lessons learnt

- ❖ No lodging in the variety I.W. Ponni.
- ❖ When planted young seedlings it produces more productive tillers with long panicles.

Comparative study

Particulars	Conventional method (Rs/acre)	SRI method (Rs/acre)
Operations		
Seed	600	40
Nursery preparation (inputs including labour)	500	200
Main field preparation	1,650	1,900
Removal of seedlings	960	60
Transplanting	1,020	720
Weeding	2,000	1,000
Fertilizer & Pesticides	2,500	1,700
Harvesting	2,000	2,000
Total	11,230	7,620

Suggestions

In order to promote SRI, Government need not spend more on seed incentive, storage go downs etc. Instead, Government should take initiative to conduct awareness meetings, organize trainings and exposure trips for farmers and labourers.



Selvanathan along with his Weeders

Kapil Behal

Hayat Nagar
Punjab

Contact: Dr. Amrik Singh,
Dy Project Director ATMA cum
Agriculture Development Officer,
Gurdaspur, Punjab.
Ph: 9872211194

Age: 34 years
Education: BA
Family size: Four
Occupation(s): Agriculture
No. of years in farming: 12

Paddy cultivation

His total agriculture land is 17 acres, of which paddy land is 15 acres. He uses a tubewell for irrigation. The yield obtained is 18-20 q/acre.

SRI adoption

Kapil Behal learnt about SRI through Dr. Amrik Singh, Deputy Project Director, ATMA, in April 2006. He has taken SRI in four acres and completed three seasons. He cultivates the following varieties: Sharbati-pussa 1121, PAU 201, Rice 6129, PHB 71 and Super Basmati using FYM, 25 kg DAP and 50 kg Urea.

Innovations and modifications

- ❖ Bearings attached with ANGRAU Conoweeder were replaced by cycle axle. This led to improved performance

Benefits

- ❖ Improvement in soil fertility.
- ❖ Lesser seeds but more yield.
- ❖ Savings in water (45-50%).
- ❖ More bio-mass is added to soil after harvesting.
- ❖ Rice quality is better, and there is more rice recovery.

Constraints in adoption

Availability of labour, as the transplanting of paddy is being done by migrant labour from Bihar and UP. The migrant labourers do not show interest in SRI method, due to the delicacy involved in handling young seedlings.

Lessons learnt

- ❖ By applying SRI, farmers can save a lot of water, electricity as well as other natural resource while increasing production of rice.

Comparative study

Particulars	Conventional method	SRI method
Date of nursery sown	30/5/2008	30/5/2008
Date of transplantation	3/7/2008	11/6/2008
Date of harvest	25/10/2008	13/10/2008
Weed control	1200 ml Butachlor	3 times weeding with Conoweeder
FYM (t/acre)	Nil	4
Fertilizer (Urea in kg per acre)	110	25
No. of productive tillers/m ²	240 (mean of 10 observations)	376 (mean of 10 observations)
No. of grains/panicle	130	225
Wt of grain per panicle (gm)	3.65	7.35
Length of panicle (cm)	28.70	32.12
Chaffy grain (%)	26	21
No of plant / m ² (mean of 10 samples)	14	16
Grain yield (t/acre)	1.86	2.52
Crop duration (days)	139	136

Suggestions

- ❖ To make credit facility available to farmers.
- ❖ To make a motorized Conoweeder available.
- ❖ To standardize SRI practices according to Punjab situation.



Kapil Behal along with state officers during a field visit



	Jagathambal 1/15, ECR Mainroad Kizhpettai, Anumanthai & Po, Tindivanam Taluk, Villupuram Dist., Tamil Nadu - 604303	Age: 50 years Education: Illiterate Occupation(s): Agriculture No. of years in farming: 25
	<i>Contact:</i> Ms.S. Puspalatha, Chairperson, Ekoventure, Pondicherry. Ph: 0413-2275812	

Paddy cultivation

Farmer Jagathambal has 2.5 acres, of which 2.0 acres make up her paddy land. She has a bore well with an oil engine. Using this as her water source, as well as the inputs like FYM and chemical fertilizers, she has obtained 7.5-9.0 q/acre (10-12 bags) in flooding method.

SRI adoption

Jagathambal learnt about SRI from Ekoventure, an NGO under the Green Coast project and adopted it on 1.0 acre with the *samba* crop in 2006. The Ekoventure (NGO) team trained and provided her guidance. Over the last three seasons she has grown the following varieties: 99001, ADT-39, and improved White Ponni using the following inputs: FYM (five cartloads), EM (Effective Microorganisms), Amirthakaraisal, Vermicompost (own) 500 kg, as well as chemical fertilizers (Urea 25 kg, Phosphorous 25 kg, Potash 25 kg and bio-fertilizers and *Pseudomonas*). She found Leaf-folder, Stem-borer and Yellowing on her crop and used FPE (Fermented Plant Extracts), Neemazal and single spray of chemical pesticides (Monocrotophas, Karate).

She has followed all SRI practices and owns a Conoweeder received from the Green Coast project. She has obtained a yield of 1.1t/acre (five bags more than the conventional method).

Innovations and modifications

Hand-weeding using a hoe was taken up for two seasons, when they had a water problem to operate the Conoweeder.

Benefits

- ❖ Less seed, less water and less labour requirement.
- ❖ No lodging of seedlings

Constraints in adoption

- ❖ Women find it difficult to operate the Conoweeder.
- ❖ Water management is difficult due to low-lying area.
- ❖ Problem of timely labour-availability.

Lessons learnt

- ❖ Bore well related problems often result in drying up of the fields, developing cracks and withering of crops. However, development of crops just after irrigation gave confidence that a paddy field need not be stagnated with water all the time.
- ❖ Non-lodging of SRI crops is a desirable character that saves crops grown in low-lying areas subjected to rainwater inundation.

Comparative study

Particulars	Conventional method (Rs/acre)	SRI method (Rs/acre)
Operations		
Seed	600	50
Nursery preparation	350	150
Main field preparation	1,500	1,500
Seedlings removal	1,000	120
Fertilizer	1,500	800
Vermicompost (own)	-	800
Transplanting (Using Marker Rs. 800 & Rope Rs. 840)	1,200	800
Weeding (family labour)	1,200	1,000
Pesticides (including labour)	800	-
Organic pesticides	-	300
Harvesting	1,500	1,500
Total	9,650	7,020

Suggestions

- ❖ Location-specific trainings should be provided to farmers using the SRI method.
- ❖ The neighborhood approach (farmer-to-farmer) should be employed and trained farmers should help the new farmers.



Jagathambal practicing weeding in her field



SRI crop ready for harvest

K. Swaminathan

Agraharam Street, Kamakshipuram
Tanjavur
Tamil Nadu
Ph: 9444659142

Contact: Mr. Ramasubramanian,
Chief, Samanvaya
Mylapore, Chennai 600 004.
Ph: 9444957781

Age: 45 years
Education: B.Com, B.L
Family size: Seven
Occupation(s): Agriculture and Law
No. of years in farming: Four

Paddy cultivation

Swaminathan's total agriculture land is 35 acres, while the extent of paddy land is 22 acres. His water sources are bore well, and the Kaveri river. The soil in his land is a black clay soil, in which he uses organic farm yard manure and organic inputs.

SRI adoption

He learnt about SRI from media reports and the farming community and adopted it in the year 2006. Since he began on his own, he learnt it by trial and experimentation. Swaminathan is pursuing SRI despite resistance from his own family as well as labourers in his region, though his father had prior experience with row-planting and early transplantation. Even though he had received subsidy for 3 acres this year, he did not start SRI practice with the subsidy in mind, he said. Hence he would continue with SRI even if the subsidy is stopped. In his village, two of his cousins are also practicing SRI and in total there are about 50 acres under SRI.

Presently, Swaminathan has 22 acres under SRI. He cultivates varieties like Ponni, ADT 36 / 43 / 46, P.S. 44, CR 1009, and some hybrids. He uses organic farm yard manure, micronutrients and bio-fertilizers, cow-dung compost, Amirtha Karaisal etc., as inputs. He uses every possible tools and implements like Conoweeder, Rope Marker, Seed-drum, Harvester, and Leaf-colour cards.

He follows the SRI Practices as given below:

- ❖ Transplanting younger seedlings of 15 days old
- ❖ Square planting of 2 seedlings together
- ❖ Wide square pattern (distances varying 22.5 cm², 30 X 25 cm², & 30 cm²)
- ❖ Intermittent wetting and drying

- ❖ Frequent weeding
- ❖ Organic cultivation

His crop developed the white fungus during the vegetative stage. He managed this by spraying a solution prepared with cow's urine, bitter leaves, and water. There has been a decrease in its incidence since SRI is adopted.

Innovations and modifications

- ❖ Mulching with *Neyveli Kattamanakku* (Wild Castor)
- ❖ Growing green manure plants in the summer
- ❖ Designed a Weeder to remove *korai* grass (a local weed)

Benefits

Swaminathan is convinced about the success of SRI. His idea is that the benefits of SRI to the crops and soil will be reaped only in the long run. The benefits he has received are:

- ❖ increased soil and seed quality since beginning SRI practice. He knows this would aid in higher yields;
- ❖ lesser water and labour requirements;
- ❖ comparatively much lesser seed-rate in SRI practice resulting in decreased costs and higher profits; and
- ❖ increased soil fertility and earthworm count.

Constraints in adoption

- ❖ Labour-wages are an issue. Under conventional farming, 15 labourers were hired and paid a lumpsum to divide amongst themselves; under SRI the labour-demand has fallen to nine, but these nine still want to be paid the lumpsum settled for 15.
- ❖ Swaminathan feels that SRI and inorganic cultivation will not go together. According to him, to get the maximum benefits of SRI practice, organic cultivation will only help.
- ❖ Weeding and levelling need good implements. The Conoweeder is not the best and levelling manually is very difficult.

Lessons learnt

- ❖ Subsidies are not a good idea for long-term sustainability, since farmers re-plough and re-plant densely (conventionally) after getting the subsidy.
- ❖ Good seeds and fertile soil are important and these can only be possible with the combination of SRI and organic cultivation.
- ❖ Levelling the field is very important to sustain a crop without water-stagnation.
- ❖ Micro-nutrients inputs are very important for crop growth.

Comparative study

Particulars	Conventional method	SRI method	Notes
Seed-rate (kg/ acre)	16-20 kg	0.8-1.6 kg (single); 4.0-4.8 kg (double seedling)	
Grain yield/acre (1 bag = 60 kg)	36-40 bags	30 bags	SRI average increased from 18 bags to 30 over 5 seasons.
Straw yield/acre	–	4-5 t	This has been the constant yield since 2006.
Labourers/acre	Seed bed: 2 Plucking: 6 Transporting: 1 Planting: 15 (Ladies) Weeding: 8 Harvesting: 15 Total: 47	Seed bed: 1 Plucking: 3 Transporting: - Planting: 12 Weeding: 12 Harvesting: 9 Total: 37	
Total wage-cost per season (Rs.)	5,000	4,600	
No. of tillers per sq m	Less than 250	Above 250	
No. of panicles/ tiller	10 – 15	40 – 60	
No. of grains per panicle	100	200 – 300	
Germination % of seeds	80%	90%	Very good, no empty panicles in SRI.

Particulars	Conventional method	SRI method	Notes
Water Management			
No. of days crop irrigated	12 days	7-8 times in a crop cycle	Water saving under SRI is 40%.
Water flooding level	3-4 inches	2 inches	



15-days old seedlings ready for transplantation.



30-days old seedlings after transplantation.

V.K.V. Ravichandran

Poongulam
Tiruvarur
Tamil Nadu
Ph: 09443683724

Contact: Mr.Ramasubramaniyan,
Chief, Samanvaya
Mylapore, Chennai 600 004.
Ph: 9444957781

Age: 50 years
Education: B.Sc. (Mathematics)
Family size: Four
Occupation(s): Agriculture
No. of years in farming: 28

Paddy cultivation

Ravichandran's total agriculture land is 60 acres, but the extent of paddy cultivation differs every season (see table under SRI adoption). He uses bore well water, as well as water from the Kaveri river. The soil type is alluvial clay.

SRI adoption

Ravichandran was introduced to SRI by TNAU. He adopted SRI in 2003 and was given training and guidance by TNAU, SRI group. As seen in the table, he has taken SRI paddy in different seasons. He grows the following varieties of paddy: *Kuruvai* – TKM 9, CORH 1; *Samba* – CR1009; *Thaladi* – ADT 39, Ponni and uses the following inputs: Cattle farm yard manure, DAP, and Urea.

SRI practices followed by him are:

- ❖ transplanting younger seedlings of 14 to 18 days;
- ❖ careful planting of single seedlings;
- ❖ wide square pattern, 9 X 9 inch²
- ❖ intermittent wetting and drying; and
- ❖ frequent weeding.

He has used the following tools and implements: Conoweeder, Rope-Marker, Leaf-colour card, "*Pambu Palagai*" (a type of plank for levelling the field). When his crop

Year	Seasons	Area (acre)
2003	<i>Samba</i>	55.20
2004	<i>Samba</i>	55.50
2005	<i>Samba</i>	60.70
2006	<i>Samba</i>	60.70
2007	<i>Kuruvai</i>	10.00
2007	<i>Samba</i>	40.15
2007	<i>Thaladi</i>	10.00
2008	<i>Kuruvai</i>	12.00
2008	<i>Samba</i>	38.25
2008	<i>Thaladi</i>	12.00

suffered a Stem-borer attack, he managed the situation with Prepanophos. Pest attacks have decreased since SRI was adopted.

Innovations and modifications

Ravichandran modified the Weeder by providing ridges.

Benefits

According to Ravichandran, SRI would give a good yield provided the principles are followed as a package without deviation. SRI is a very good way for seed multiplication.

Constraints in adoption

- ❖ Fragmented holdings: this is a problem for intermittent wetting and drying, since irrigating and draining in one field will depend on the next field of another farmer.
- ❖ Single seedling transplantation cannot be practiced in low lying areas.
- ❖ If it rains within the first 15 days after transplantation, then there is not much hope for the seedling; hence selection of season becomes very important.
- ❖ Today, the government pressure, target-fixing and subsidy talk are very high and SRI cannot work on just incentives and reaching targets.

Lessons learnt

Though practicing SRI for the past five years, Ravichandran noted that some important features such as transplanting young seedlings, fewer seedlings per-hill, wider spacing, controlled irrigation, and application of Rotary Weeder had been sporadically practiced in his village by his uncle V.K. Janakiraman as early as in 1970. However, all the practices were not carried out in synergy and were eventually given up in spite of the benefits, as there were no scientific studies at that time. He considers it as a blessing for the farming fraternity that scientific interpretations are now done for each component of SRI.

Whenever his farmer colleagues ask him to explain SRI briefly, he tells them that it is like a two-wheeler motorcycle which gives more mileage under ideal conditions such as the fitness of the bike, ideal air-pressure of the tyres, condition of the road, wind direction, and so on. Thus, to attain success with SRI, farmers must provide ideal conditions and for this they must plan well in advance.

Still on the learning curve, he is optimistic that each time he commits a mistake, he can overcome it. He feels his fellow farmers might have experienced some difficulties in implementing SRI and is keen to know about these and also the corrective measures adopted by them.

Comparative study

Particulars	Conventional method	SRI method	Notes
Seed rate (kg/acre)	25	3 – 3.5	
Grain yield (t/acre)	3.2	4.4 (2007 <i>kuruvai</i>)	Both numbers are the best yields that he got under each method
Total cost of wages (Rs./acre)	4,000	2,500	Wages (men: Rs. 120/-, women: Rs.60/-)
Number of labourers	10 persons (plucking) 12 - 15 women (weeding)	1 woman (plucking) 7 men and 3 - 4 women (weeding)	For transplantation, the same number of 15 women for 1 acre is required. For harvesting, Combiner is used, so it cannot be said exactly. But it would be same for both conventional and SRI
Number of tillers	12 - 14 (10 productive)	40 - 45 (35 - 40 productive)	Under SRI number of tillers may even go up to 60 tillers
Water management			
Usage	3 motors are required to run for 12 hrs/day to maintain water level for 5 acres	2 motors are required to run for 12 hrs/day to maintain moisture in 10 acres	The numbers given here are for 155 days crop. Thumb rule is that for producing 1 kg of paddy, 2400 litres of water is needed under conventional while 1200 litres only under SRI

	Conventional	SRI	Notes
Water management Flooding level	3 inches and more for 135-140 days, after which it is left without irrigation, so that the harvester can be run after 155 days	More moisture is maintained until the earhead stage, after which water is gradually brought up to 3 inches	He has found that in overall water usage, there is a 60-70% decrease under SRI.

Suggestions

- ❖ Selection of field is important - with facilities to drain water. If water cannot be drained from a particular field, then SRI should not be practiced there.
- ❖ Preparation of field – “table-top” levelling of the field is important.
- ❖ Fertilizers – blanket recommendations of fertilizers must not be administered for SRI paddy since the nitrogen levels would be very high. The leaf colour card must be used for nitrogen management
- ❖ Staggered sowing of seeds, so that right age of seedlings can be maintained for transplantation.
- ❖ Dipping of roots in bio-fertilizers and spraying water soluble fertilizers is necessary.
- ❖ More research has to be done on making all tillers productive.



A labourer showing the rope used for marking in the field



V.K.V.Ravichandran in his just transplanted SRI field

Hriday Ranjan Debnath

Barjala
Tripura

Contact: Mr. Baharul. I. Mazumdar,
Senior Agronomist, Department of
Agriculture, Government of Tripura,
Agartala - 799 003, Tripura.
Ph: 9436123659.

Age: 63 years
Education: Madhyamik passed
Family size: 12
Occupation(s): Agriculture
No. of years in farming: 50

Paddy cultivation

Farmer Hriday Ranjan Debnath has 1.25 acre of agriculture land, all of which is paddy land. He uses a shallow tube-well and applies inputs like FYM (1 t), Urea (10 to 12 kg /*kani* (0.4 acre) and Rock phosphate chemicals. He used to get 1.4 to 1.7 t/acre yield in terms of paddy-dry weight.

SRI adoption

He learnt about SRI from a neighbouring farmer, and later from the local field staff of the Agriculture Department. He adopted SRI with the *Boro* crop in 2007-08 and received guidance from the Agriculture Sector Officer, and technical training from the Circle VLW and Technical Officers.

He planted 0.5 acres of SRI paddy and has grown the following varieties: MTU 7029, Uphar and Paijam in *Aman* and Short Paijam in *Boro*. Along with adopting all the SRI practices, he uses the following inputs: FYM -1.50 t/*kani*, Urea 15 kg, SSP 11 kg, MoP 4 kg and bio-fertilizer 700g. He also uses the Rotary-Weeder.

He noticed the Stem-borer, Leaf-folder, Sheath blight and Bacterial leaf blight on his crops. The chemicals Cartap Hydrochloride, Carbendazim and Bactinash were applied for that.

Year	Season	Yield (t/acre)
2007-08	<i>Boro</i>	7.5
2008-09	<i>Aman</i>	3 t/acre (Uphar and Hajari Paijam) and 2.5 t/acre (MTU 7029)

Innovations and modifications

Conducted a trial on direct seeded SRI by Hazari Paijam variety of paddy and found very good results. Growth of plants and tillers was best in direct-seeded SRI compared to transplanting, but the risk factor due to heavy showers remains.

Benefits

- ❖ Less seeds are required.
- ❖ Lesser man-days for nursery-raising, uprooting and transplanting compared to the conventional method.
- ❖ Man-days can be saved during transplanting, and by using Rotary Weeder per 'kani' (0.4 acre) as compared to the conventional method.
- ❖ Water requirement is less.
- ❖ Fewer man days are required during harvesting.
- ❖ 50% less pest infestation compared to the conventional method.
- ❖ Good crop appearance as compared to the conventional method.
- ❖ Overall cost of production is 25 to 30% less, as compared to the conventional method.

Constraints in adoption

- ❖ Timely availability of power tiller.
- ❖ Timely availability of chemical fertilizers as well as bio-fertilizer.
- ❖ Lack of availability of organic manure.
- ❖ Difficult to engage labourers for different cultural operations in time.
- ❖ Lack of agricultural implements, spare parts and mechanic for repairing.
- ❖ Lack of availability of water.
- ❖ Weeding thrice, at 10-day intervals within 30 days, is a problem.

Lessons learnt

- ❖ Seeds, fertilizers, water, labour, time requirement are all less in comparison with the conventional system.
- ❖ 30% or more increase in yield was recorded in SRI, compared to the conventional method.
- ❖ As spacing is more, weed infestation is high. However, two weedings at the proper time decrease weed-infestation significantly.
- ❖ More tillers, bigger panicle size, less chaffiness, bold grain, good lusture and more weight were observed.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Sowing in the nursery bed	Wet bed	Dry
Nursery management	Improper	Well-defined
Land leveling	Generally not followed	Has to be followed
Fertilizer application		
N:P:K	32: 16: 16 /acre	8.4: 2.8 : 9.6 /acre
FYM	2 - 2.5 t/acre	5 t/acre
Bio-fertilizer	Nil	1.4 kg/ acre
Age of seedling	25 -35 days	8-12 days
Transplanting		
Uprooting of the seedling	Roots get damaged	No damage to roots
Time interval between uprooting of seedling and transplanting in the main field	1 to 24 hours	With in 30 minutes
Depth of transplanting	More than 1 to 2 cm	Superficial
Colour of the plant 3-4 days after transplanting	Yellowish-green	Green
No of seedlings/hill	2-3 seedlings	Single
Spacing	10 to 15 cm	25 cm
Water management		
Inter and intra-plot irrigation/ drainage channel	No	Yes (50 cm width)
Distance between drainage channel	-	4 m
Weed management		
Chemical weeding	Yes	No
Mechanical weeding (using Weeder)	Not Done	Done
Seed rate /acre	12 kg /acre	2 kg /acre
Yield and Income		
Yield (t/acre)	1.5	2.5
Cost of cultivation (Rs/acre)	6,375	5,750
Gross Return (Rs/acre)	9,500	18,750
Net Return (Rs/acre)	3,124	13,000

Suggestions

- ❖ In case of a large holding, staggered sowing would prove useful for an easy and convenient transplantation-cum-cultural operation.
- ❖ Avoid use of polythene sheets in nursery, use more wood ash, rotten FYM and sow seeds with wider spacing.
- ❖ Seedling should be healthy, so as to sustain easily in the main field after transplanting.
- ❖ Timely cultural operation is very helpful to get a higher yield.



Debnath inspecting the seedlings in his field



Tapan Sen

Ramnagar, Hrishyamukh
Belonia, Tripura

Contact: Mr. Baharul. I. Mazumdar,
Senior Agronomist,
Department of Agriculture,
Government of Tripura,
Agartala - 799 003, Tripura.
Ph: 9436123659.

Age: 40 years
Education: 5th passed
Family size: Six
Occupation(s): Agriculture
No. of years in farming: 25

Paddy cultivation

Tapan Sen cultivates paddy in his total 0.64 acres of land with rainfall as his main source of water. He used to get an average yield of 6 q/acre.

SRI adoption

He learnt about SRI at a training programme conducted by the Sub-Divisional Agriculture Office of the Department of Agriculture, Govt. of Tripura in 2002 and adopted the process in 2003, sowing in 3.2 acres (*kharif*: 1.6 acre, *rabi*: 1.6 acre) under SRI. He was provided training and technical guidance by the Agriculture Sector Officer, Hrishyamukh, Dept. of Agriculture, Govt. of Tripura. He has done nine seasons of SRI farming so far. His yield pattern is tabulated below.

Year	Seasons	Area covered under SRI (acre)	Yield (t/acre)
2003	<i>rabi/boro</i>	0.4	3.8
2004	<i>kharif</i>	1.2	3.2
2005	<i>kharif</i>	1.6	3.0
	<i>rabi</i>	1.6	3.5
2006	<i>kharif</i>	1.2	3.1
	<i>rabi</i>	1.2	3.6
2007	1 st and 2 nd <i>kharif</i>	2.4 (1.2 + 1.2)	1 st kh - 0.9, 2 nd kh - 3.1
2008	1 st <i>kharif</i> (SD)	0.8	1.8
2008	2 nd <i>kharif</i> (MD)	1.2	Yet to harvest

SD: Short Duration variety
MD: Medium Duration variety

The inputs he used include seeds, chemical fertilizer, bio-fertilizer and Vermicompost. He followed all the laid down practices under SRI. He cultivates the following varieties: Pooja, MTU 7029, NDR-97, and BR-29. Among SRI-related implements, he used the Japanese paddy-weeder. At one point, his crop developed Stem-borer, which he controlled through the application of insecticides.

Benefits

- ❖ Less seed requirement
- ❖ Less time-consumption for raising seedlings
- ❖ Less fertilizer used
- ❖ Less water used
- ❖ Lesser disease incidence and insect infestation
- ❖ More yield
- ❖ More grain weight

Constraints in adoption

- ❖ More labour consuming than the conventional method.
- ❖ Lack of assured water source in his locality.
- ❖ 2-3 weeding became a problem due to more labour requirements.

Lessons learnt

- ❖ SRI created good soil health.
- ❖ It lowered the incidence of insects and disease.
- ❖ It resulted in more grain weight than conventional farming.

Comparative study

Particulars	Conventional method (per acre)	SRI method (per acre)
Nursery raising	10 Man days	3 man-days
Sowing in the nursery bed	2 Man days	1 man-day
Fertilizer application		
a) N:P:K (kg)	32:16:16	08:04:04
b) FYM	2.4 t	4 t
c) Biofertilizer	-	Azospirillum + Azotobacter + PSB @ 1.6 kg of each strain

Particulars	Conventional method (per acre)	SRI method (per acre)
d) Other organic manure	-	Compost 4q
Age of Seedling	21-30 days	8-12 days
Transplanting		
a) Uprooting of seedling	-	With shovel
b) Time-interval between uprooting seedling and transplanting in the main field	1-2 days	30 minutes
c) Depth of transplanting	5-7 cm	On the surface to 2-3 cm
d) Colour of the plant 3-4 days after transplanting	Yellowish	Greenish
No. of seedling/hill	3-5	1
Spacing	15x15 cm ² or random	25 x 25 cm ²
Water management		
a) Inter and intra plot irrigation through drainage channels	No	Yes
b) Distance between drainage channels	-	4 m
c) Width and depth	-	25 cm width and 25 cm depth
Weed Management		
a) Hand-weeding	2 times	1 time
b) Chemical weeding	-	-
c) Mechanical weeding (Weeder)	-	2 times
Seed rate	20 kg	2 kg
Variety	IR-64	IR-64
Yield	2.0 t	2.7 t

Suggestions

- ❖ Create a suitable paddy variety for all seasons.
- ❖ There must be suitable land selection for SRI.

Chain Singh

Masaon
Tehri Garhwal
Uttarakhand

Contact: Mr. Debashish, Director
(CPWD), People Science Institute,
Dehradun, Uttarakhand.
Ph: 9897080579

Age: 52 years
Education: V pass
Family size: Four
Occupation(s): Agriculture
No. of years in farming: 32

Paddy cultivation

Chain Singh's total agriculture land amounts to 30 *nali*, i.e. 1.5 acre (1 *nali* = 200 sq.m.) and the extent of paddy land in this is 8 *nali* i.e. 0.4 acre. His water source is the Guhl (irrigation channel). The inputs he used were the Cow dung and Urea. The yield obtained by the flooding method is 110 kg / *nali* (22 q/acre).

SRI adoption

He learnt about SRI through the Garhwal Vikas Kendra (GVK) at Nainbag in Uttarakhand. GVK is a partner organization of the Peoples' Science Institute, Dehradun. Chain Singh adopted SRI in 2007 and was given training and guidance by GVK.

Particulars	2007	2008
Area under SRI	1 <i>nali</i> (0.05 acre)	2.5 <i>nali</i> (0.13 acre)
Seasons	<i>kharif</i>	<i>kharif</i>
Variety	Local	Local
Inputs used	Panchgavya, Amaritjal, Matka Khad, Vermicompost	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Practices followed	All practices followed, Weeder used twice	All practices followed, Weeder used thrice
Implements availability and usage	Weeder and Marker given by GVK	Weeder and Marker given by GVK
Yield	180 kg/ <i>nali</i> (36 q/acre)	220 kg/ <i>nali</i> (44 q/acre)

Benefits

- ❖ Less usage of seeds.
- ❖ Less water required in this method for nursery.
- ❖ 50% time saved in comparison to conventional method.
- ❖ Needs 50% less labour.
- ❖ Double production than that of conventional method.
- ❖ Two-times more green fodder is available.

Constraints in adoption

- ❖ First time it was difficult to use Weeder and Marker
- ❖ At the time of harvesting, a sharp cutting instrument is required due to a larger number of tillers.

Lessons learnt

- ❖ Transplanting is easy in this method.

Comparative study

Particulars	Conventional method	S.R.I method
Operations		
Nursery	Dimensions are not fixed	Dimensions are fixed, 3 sq. m
Preparation of field	Marker not used	Marker used
Transplantation	30-day old seedlings transplanted	10-day old seedlings transplanted
Weeding	Manual	Weeder used thrice
Management of Water	2"-4" water applied throughout	1"-2" water applied after 10-days interval
Fertilizers/Manure	NPK, Urea	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Yield and Income		
Total number of tillers	10	40
Average plant height (cm)	62	97
Productive tillers	8	30
Average panicle length (cm)	16	29

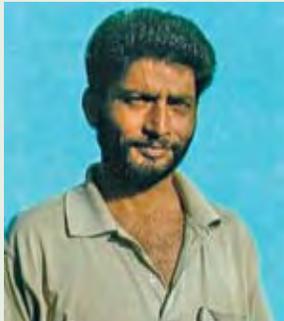
Particulars	Conventional method	S.R.I method
Average number of grains / panicle	80	190
Total grain output	110 kg / <i>nali</i> (2.2 t/acre)	180 kg/ <i>nali</i> (3.6 t/acre)
Total straw output	137 kg / <i>nali</i> (2.74 t/acre)	270 kg/ <i>nali</i> (5.4 t/acre)
Total cost on cultivation	Rs. 1,048/ <i>nali</i> (Rs.20,960/acre)	Rs. 731/ <i>nali</i> (Rs. 14,620/acre)
Net income earned	Rs. 3,780/acre	Rs.26,780/acre

Suggestions

- ❖ Good quality of seeds should be provided.
- ❖ Size/weight of the weeder should be reduced for easy carriage and transportation



Chain Singh in his SRI field

	<h2 style="color: green;">Rikeshwar Prasad</h2>	
	<p>Andarathi Tehri Garhwal Uttarakhand</p> <p>Contact: Mr. Debashish, Director, (CPWD), People Science Institute, Deharadun, Uttarakhand, Ph: 9897080579</p>	<p>Age: 42 years</p> <p>Education: BA</p> <p>Family size: Four</p> <p>Occupation(s): Agriculture and Animal Husbandry</p> <p>No. of years in farming: Since childhood</p>

Paddy cultivation

Of his total agriculture land of 8 *nali*, i.e. 0.4 acre (1 *nali* = 200 sq m) the extent of paddy land is 5 *nali*, i.e. 0.25 acre. Prasad sources water from the Gadehra stream and uses the plough, organic compost (Panchgavya, Amritghol and Matka Khad) and organic pesticides in his land. Yield obtained with the flooding method is 25 kg/*nali* (5 q/acre).

SRI adoption

He learnt about SRI from the Mount Valley Development Association (MVDA) at Doni in Uttarakhand. MVDA is a partner organization of the Peoples' Science Institute (PSI), Dehradun. Prasad adopted SRI in 2006, and was guided and trained by PSI Dehradun and MVDA.

Particulars	2006	2007	2008
Area under SRI	0.5 <i>nali</i> (0.025 acre)	2.0 <i>nali</i> (0.1 acre)	4 <i>nali</i> (0.2 acre)
Seasons	<i>kharif</i>	<i>kharif</i>	<i>kharif</i>
Variety	Pant- 11	China- 04	China- 04
Inputs used	Panchgavya, Amaritjal, Matka Khad	Panchgavya, Amaritjal, Matka Khad	Panchgavya, Amaritjal, Matka Khad
Practices followed	Weeder used twice	Weeder used thrice	Weeder used thrice
Implements used: their availability and usage	Weeder and Marker, provided by PSI	Weeder and Marker, provided by MVDA	Weeder and Marker, provided by MVDA
Yields	40 kg/ <i>nali</i> (8 q/acre)	53 kg/ <i>nali</i> (10.6 q/acre)	55 kg/ <i>nali</i> (11 q/acre)

Innovations and modifications

Wooden Marker is developed.

Benefits

- ❖ Less seed i.e. 250 gms/*nali*.
- ❖ Less water (0.5"-1") required in this method.
- ❖ Less time required.
- ❖ Need less labour work.
- ❖ 2- 2.5 times more green fodder.

Constraints in adoption

It was initially difficult to use the Marker and Weeder.

Lessons learnt

A small farmer can produce more crop.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Nursery	Seed- 2 kg/ <i>nali</i>	Seed- 250 gm/ <i>nali</i>
Preparation of field	Marker is not used	Marker used
Transplantation	No fixed spacing	10" x 10" (10 days' old seedlings are transplanted)
Weeding	Manual	Weeder used thrice
Water management	6" water applied throughout	Application of 1" inch water, rest drained
Fertilizers/Manure	Urea & farm-yard manure	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Yield and Income		
Total number of tillers	10	58
Average plant height	145 cm	174 cm
Productive tillers	6	41
Average panicle length	20 cm	24 cm

Particulars	Conventional Method	SRI Method
Average number of grains/panicle	130	254
Total grain output	25 kg/ <i>nali</i> (5 q/acre)	55 kg/ <i>nali</i> (11 q/acre)
Total straw output	37.5 kg/ <i>nali</i> (7.5 q/acre)	82.5 kg/ <i>nali</i> (16.5 q/acre)
Total cost of cultivation	Rs. 435/ <i>nali</i> (Rs. 8,700/acre)	Rs. 250/ <i>nali</i> (Rs. 5,000/acre)
Net income earned	- Rs. 2,950/acre (loss)	Rs. 7,650/acre



Sarla Devi

Doni Palli
Tehri Garhwal
Uttarakhand

Contact: Mr. Debashish,
Director (CPWD),
People Science Institute,
Deharadun, Uttarakhand,
Ph: 9897080579

Age: 40 years
Education: VIII pass
Family size: Five
Occupation(s): Agriculture and
Animal husbandry
No. of years in farming: Since
childhood

Paddy cultivation

Of the total 65 *nali* i.e. 3.25 acres (1 *nali* = 200 sq m) of agriculture land that she owns, the extent of paddy land is 30 *nali* i.e. 1.5 acres. She relies on a stream (Gadhera) for water and uses a plough and organic composts. The yield obtained by the flooding method is 35 kg/*nali* (7 q/acre).

SRI adoption

Sarla Devi learnt about SRI through an N.G.O called the Mount Valley Development Association (MVDA), Doni, Uttarakhand, which is a partner organization of the Peoples' Science Institute (PSI), Dehradun. She adopted SRI in 2007, receiving guidance and training from PSI and MVDA.

Particulars	2007	2008
Area under SRI	2 <i>nali</i> (0.1 acre)	5 <i>nali</i> (0.25 acre)
Seasons	<i>kharif</i>	<i>kharif</i>
Variety	Local	China-4
Inputs	Panchgavya, Amaritjal, Matka Khad, cow dung	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Practices	Weeder used twice	Weeder used thrice
Implements: availability and usage	Weeder and Marker, availed by PSI	Weeder and Marker, availed by MVDA
Yield	49 kg/ <i>nali</i> (9.8 q/acre)	57 kg/ <i>nali</i> (11.4 q/acre)

Innovations and modifications

She used a wooden Marker in the first year of SRI adoption.

Benefits

- ❖ Less seed (300 gm/*nali*) required in this method.
- ❖ Less water required in this method.
- ❖ Less time required.
- ❖ Need less labour work.
- ❖ Total production 1.5- 2 times in comparison to conventional method.
- ❖ The green fodder is 2- 2.5 times more.

Constraints in adoption

- ❖ First year use of Weeder and Marker was difficult.
- ❖ Due to late transplanting yield was less.

Lessons learnt

The SRI technique teaches how to get more production by applying less seed, water and labour.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Nursery	2 kg seed/ <i>nali</i>	300gm seed/ <i>nali</i>
Preparation of field	Marker is not used	Marker is used
Transplantation	No fixed spacing	10" x 10" (10 days' old seedlings transplanted)
Weeding	Manual – one time	Weeder is used thrice
Water management	5"- 6" water applied throughout	Application of 1" inch water after 10 days
Fertilizers/Manure	Urea and cow dung	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Yield and Income		
Total number of tillers	13	63
Average plant height (cm)	140	173

Particulars	Conventional Method	SRI Method
Productive tillers/hill	9	47
Average panicle length (cm)	18	22
Average number of grains/panicle	147	267
Total grain output	35 kg/ <i>nali</i> (7 q/acre)	57 Kg/ <i>nali</i> (11.4 q/acre)
Total straw output	55 kg/ <i>nali</i> (11 q/acre)	90 kg/ <i>nali</i> (18 q/acre)
Total cost of cultivation	Rs. 435/ <i>nali</i> (Rs. 8,700/acre)	Rs. 250/ <i>nali</i> (Rs. 5,000/acre)
Net income earned	- Rs. 600/acre (loss)	Rs. 8,200/acre

Suggestions

In our area more awareness is needed.

	<h2>Taro Devi</h2> <p>Sumankyari Tehri Garhwal Uttarakhand</p> <p>Contact: Mr. Debashish, Director (CPWD), People Science Institute, Deharadun, Uttarakhand. Ph: 9897080579</p>	<p>Age: 80 years Education: Illiterate Family size: Eight Occupation(s): Agriculture No. of years in farming: Since childhood</p>
---	---	---

Paddy cultivation

Of the total 40 *nali* i.e. 2 acres (1 *nali* = 200 sq m) of agriculture land that she owns, the extent of paddy land is 10 *nali*, i.e. 0.5 acre. She relies on the irrigation channel or *Guhl* and uses the implements like plough, spade, and applies cow-dung, Urea and DAP in her field. The yield obtained by the flooding method is 102 kg/ *nali* (20.4 q/acre).

SRI adoption

Sarla Devi learnt about SRI through an organization called the Garhwal Vikas Kendra (GVK), Nainbag, Uttarakhand, which is a partner organization of the Peoples' Science Institute (PSI), Dehradun. She adopted SRI in 2007, receiving guidance and training from GVK.

Particulars	2007	2008
Area under SRI	0.5 <i>nali</i> (0.025 acre)	1 <i>nali</i> (0.05 acre)
Seasons	<i>kharif</i>	<i>kharif</i>
Variety	Local	Local
Inputs	Panchgavya, Amaritjal, Matka Khad, Vermicompost	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Practices	All practices, weeder used thrice	All practices, weeder used thrice
Implements availability and usage	Weeder and Marker, availed by GVK	Weeder and Marker, availed by GVK
Yield	114 kg/ <i>nali</i> (22.8 q/acre)	144 kg/ <i>nali</i> (28.8 q/acre)

Benefits

- ❖ Less usage of seeds.
- ❖ Less water required in this method.
- ❖ Time saved.
- ❖ Needs 50% less labour work.
- ❖ In comparison to the conventional method, 1½- 2 times more total production.
- ❖ In comparison to the conventional method, the fodder production was more and nutritious.

Constraints in adoption

- ❖ Marking is a difficult process.

Lessons learnt

Transplanting is easy in this method.

Comparative study

Particulars	Conventional method	SRI method
Operations		
Nursery	Dimensions are not fixed	Dimensions are fixed, 3 sq. m
Preparation of field	Marker not used	Marker used
Transplantation	30 days old seedlings transplanted	10 days old seedlings transplanted
Weeding	Manual	Weeder used thrice
Management of water	2"-4" water applied all through out	1"-2" water applied after 10 days interval
Fertilizers/Manure	NPK, Urea	Panchgavya, Amaritjal, Matka Khad, Vermicompost
Yield and Income		
Total number of tillers	7	39
Average plant height (cm)	65	93
Productive tillers/hill	6	29
Average panicle length (cm)	17	27
Average number of grains/panicle	105	180

Particulars	Conventional method	SRI method
Total grain output	102 kg / <i>nali</i> (20.4 q/acre)	144 kg/ <i>nali</i> (28.8 q/acre)
Total straw output	143 kg / <i>nali</i> (28.6 q/acre)	216 kg/ <i>nali</i> (43.2 q/acre)
Total cost of cultivation	Rs. 1036/ <i>nali</i> (Rs. 20,720/acre)	Rs. 623/ <i>nali</i> (Rs. 12,460/acre)
Net income earned	Rs. 2,540/acre	Rs. 20,660/acre

Suggestions

- ❖ Local resources should be used for preparation of liquid manures.
- ❖ Weeder and Marker should be modified so that oxen can be used.

Resource materials on SRI

- ❖ Booklet on System of Rice Intensification (SRI) in Telugu Language by CROPS, Janagaon, 2008, WWF-ICRISAT Project, ICRISAT, Patancheru, Hyderabad
- ❖ Booklet on System of Rice Intensification (SRI) in Tamil Language, 2007, by C. Pushpalatha, Ekoventure, Puducherry.
- ❖ A Fact sheet on SRI – India and few states, 2008, WWF-ICRISAT Project, ICRISAT, Patancheru, Hyderabad
- ❖ Newsletter – Issues II & III, 2008, WWF-ICRISAT Project, ICRISAT, Patancheru, Hyderabad
- ❖ Realize full potential of Paddy Plant - SRI Method of Paddy Cultivation (English, Telugu, Hindi and Oriya versions), 2008, WASSAN-ICRISAT Dialogue Project, WASSAN, Taranaka, Secunderabad.
- ❖ Proceedings of Second National Symposium on System of Rice Intensification (SRI) in India – Progress and Prospects, 3-5 October 2007, SIPARD, Agartala – 799 003, Tripura, WWF-ICRISAT Project, ICRISAT, Patancheru, Hyderabad
- ❖ More Rice with Less Water - Small State, Big Results – Revised Edition 2008, Department of Agriculture, Tripura, WWF- ICRISAT Project, ICRISAT, Patancheru, Hyderabad
- ❖ Booklet on “System of Rice Intensification” (Telugu and English), 2004 by ANGRAU, Hyderabad.
- ❖ Manual on “SRI – A Revolutionary Method of Rice Cultivation” (English), 2004 by ANGRAU, Hyderabad.
- ❖ Booklet on “SRI Vs Conventional Rice Cultivation” (Telugu and English), 2006 by ANGRAU, Hyderabad.
- ❖ Manual on “SRI Paddathilo Vari Saagu – Karadeepika (Telugu), 2005 by ANGRAU, Hyderabad.
- ❖ Manual on “SRI Vari Saagu – Rythula Anubhavaalu” (Telugu), 2005 by ANGRAU, Hyderabad.
- ❖ Manual on “SRI Paddathilo Vari Sedyam – Var Mokka Digubadilo Purthi Samarthiam” (Telugu), 2005 and Revised 2006 by Centre for Sustainable Agriculture (CSA), WASSAN, WWF, et al, Secunderabad.
- ❖ Manual on “Chirantan Krishi Nimanthae SRI Ba Sadhan Dhanochsho Padhathi” (Oriya), 2005, Centre for Sustainable Agriculture (CSA), WASSAN, WWF, et al, Secunderabad.
- ❖ Farmers Experiences in SRI cultivation (English), 2007 by ANGRAU, Hyderabad.
- ❖ System of Rice Intensification in India – Innovation History and Institutional Challenges (English), 2006- by WWF, Hyderabad and X1M, Bhubaneswar.
- ❖ System of Rice Intensification; Weeders - A Reference Compendium (English), 2006 by WASSAN, Secunderabad.

- ❖ Taking Roots, Experiences with System of Rice Intensification in Andhra Pradesh (English), by Centre for Sustainable Agriculture (CSA) & WASSAN, Secunderabad.
- ❖ Proceedings of First National Symposium on System of Rice Intensification (SRI) – Present Status and Future Prospects (English), 17th –18th November 2006, Directorate of Rice Research (DRR), Rajendranagar, Hyderabad and WWF-ICRISAT Project, Patancheru.
- ❖ Abstracts of First National Symposium on System of Rice Intensification (SRI) – Present Status and Future Prospects, (English), 17th –18th November 2006, Directorate of Rice Research (DRR), Rajendranagar, Hyderabad.
- ❖ Papers and Extended Summaries of the Second National Symposium on System of Rice Intensification in India - Progress and Prospects (English), 3rd – 5th October 2007, WWF-ICRISAT Project, ICRISAT, Patancheru, Hyderabad.
- ❖ System of Rice Intensification (SRI) – A Water Saving and Productivity Enhancing Strategy in Irrigated Rice (English), DRR technical bulletin 2007, Directorate of Rice Research (DRR), Rajendranagar, Hyderabad.
- ❖ Towards A Learning Alliance, SRI in Orissa, (English), 2007, by WWF-ICRISAT Project, Hyderabad and X1M, Bhubaneswar.
- ❖ More Rice with Less Water, SRI – System of Rice Intensification (English), 2007, by WWF, Hyderabad.
- ❖ Sustainable Agriculture and the International Rice – Wheat System, 2004 by Rattan Lal et al, CRC press, USA (1ISBN 0824754913).
- ❖ Biological Approaches to Sustainable Soil Systems by Norman Thomas Uphoff, 2006, CRC press, USA (1ISBN 574445839).
- ❖ Participatory Research and Development for sustainable Agriculture and Natural Resource Management by Julian F. Gonsalves et al in 2005, 1DRC, Canada, (1ISBN 1552501833).
- ❖ CD – Film on SRI (Telugu), 2005 ANGRAU, Hyderabad.

Few websites on SRI

- ❖ www.sri-india.net
- ❖ www.wassan.org
- ❖ www.tropantag.de
- ❖ www.farmingsolutions.org
- ❖ www.ciifad.cornell.edu
- ❖ www.wikipedia.org
- ❖ www.ikisan.com
- ❖ www.cropscience.org
- ❖ www.echotech.org

