

INNOVATIVE UPSCALING FOR EQUITABLE PROMOTION OF SRI IN WESTERN ORISSA DURING 2009 KHARIF



- Final Report -



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INNOVATIVE UPSCALING FOR EQUITABLE PROMOTION OF SRI IN WESTERN ORISSA

Sahabhagi Vikash Abhiyan (SVA) and People's Science Institute (PSI) – Dehradun jointly planned and implemented a project to upscale the System of Rice Intensification (SRI) among 2600 (2000 new and 600 old) farmers in four districts, Nuapada, Kalahandi Bolangir and Bargarh, of western Orissa during the Kharif 2009.

The expected outcomes of the project are:

1. Adoption of the SRI method of paddy cultivation by at least 2000 new farmers.
2. Shift in emphasis towards small and marginal farmers and rainfed lands. To include at least 33% small and marginal farmers in the 2009 kharif season.
3. About 600 farmers from last year's participants to repeat or expand earlier effort.
4. Increased production of organic paddy with an average yield of about 5 T/ha on irrigated farms and 2.5-3 T/ha on rainfed lands.
5. Introduction of directly sown paddy along with the SRI method on an experimental basis and close monitoring of its performance.
6. Performance database of all the participating farmers.
7. Advocacy with agricultural extension officers and the state government to promote SRI in Orissa.
8. Creation of a talent pool of 40 master trainers and village level resource farmers who will be trained to better support SRI cultivation by small and marginal farmers under rainfed conditions.

In June about **52** master trainers were trained who in turn conducted **57** training workshops in July 2009 to train **1731** farmers in the SRI method.

Unfortunately, this year the region faced one of the worst erratic rainfalls. The monsoon which usually breaks in the second week of June got delayed by almost a month. The farmers could not raise seedlings. Even those farmers who raised seedlings 2 to 3 times, their saplings were damaged. In the third week of July heavy rains started and continued incessantly for more than seven days causing floods in several areas. The nurseries that were raised were washed away and no new nurseries could be raised. No agricultural operations could be undertaken due to heavy rains. The heavy rainfall was followed by a long dry spell and thus transplantation could not be undertaken. The uncertainty of rainfall discouraged farmers to try SRI. The farmers were unwilling to take the risk and started broadcasting instead of raising nurseries and then transplanting.

With drought situation in the region, a new strategy was adopted and line transplanting (LT) and direct seeding (DS) methods were promoted.

Finally in all, **238** villages in 14 blocks and four districts were selected and **1774** (1591 new and 183 old) farmers covering 978.45 acres (**391** ha) adopted any of the three (SRI/LT/DS) methods of paddy cultivation with the support of PSI and SVA. This year i.e. in 2009, SRI was expanded to one more district Bolangir in addition to the three districts – Kalahandi, Nuapada and Bargarh where SRI was started in 2008. A major shift this year was focus on small and marginal farmers (≤ 5 acres) and rainfed areas. More than 80 per cent farmers who adopted SRI were small and marginal and almost 60 per cent farmers practiced SRI in rainfed lands. The percent of rainfed area of total SRI area was also 60 percent. Out of the total 1774 farmers 46 percent adopted SRI while 28 and 26 percent adopted LT and DS method of paddy cultivation respectively

Productivity data for all the SRI practicing farmers was collected from both SRI and conventional fields. Analysis of the 1717 farmers shows an overall productivity increase of **72.5%** of SRI against the conventional method. The productivity in the SRI field was **4.48 T/ha** compared to 2.6 T/ha of conventional method. Kalahandi recorded the maximum productivity (5.19 T/ha) and district Bargarh recorded the lowest (3.77 T/ha).

Overall in both irrigated and rainfed the productivity increase is almost same in SRI method and conventional method (72.53 and 72.63 respectively). But when we see the performance district wise, 3 out of 4 districts show better performance in rainfed area.

Out of the three methods – SRI, Line Transplant (LT) and Direct Sowing (DS), SRI showed the best result with productivity increase of 89% followed by LT (76 %) and DS (10%). In two districts i.e Nuapada and Bolangir, the productivity was less in DS method compared to conventional method.

The research results of 60 randomly selected farmers showed an productivity increase of 62 percent. All the parameter showed better results in SRI method compared to conventional method. The seeds requirement was 95% less in SRI method. The average number of tillers was 400% more than the conventional method. Even the straw productivity was 68% higher than the conventional method. The average number of seeds/pinnacle and average weight of 1000 grain were higher by 37 and 25 percent than the conventional method respectively. This shows that the health of the plant in SRI method was better compared to the plant in conventional method.

Financial	Amount Released	Rs. 10,40,446
	Amount Spent	Rs .

INTRODUCTION

System of Rice Intensification or SRI as it is popularly called; is a fascinating case of rural innovation that has been developed outside the formal rice research establishments both in India and the rest of the world. It was developed in Madagascar by Fr. Henri De Laulanié, a French priest with a background in agriculture and passion for rural development. SRI method is emerging as a potential alternative to traditional way of flooded rice cultivation and is showing great promise to address the problems of water scarcity, high energy and chemical usage, thus offers a noble breakthrough in the way of growing more rice with fewer inputs. It requires less water and less expenditure yet gives more yields, so is highly beneficial for small and marginal farmers.

In Orissa over 3 million operational holdings are marginal or small holdings with average paddy yields of less than 1.5 T/ha.¹ There is a lot of variation in the rice yield from district to district and year to year. Analysis of five years productivity data from four districts, Bargarh, Bolangir, Kalahandi and Nuapada, of western Orissa shows that the highest average yield (1.93 tons/ha) is in Bargarh, while the lowest average yield (0.9 tons/ha) is in Nuapada.

As rice is the staple food in Orissa, productivity enhancement through adoption of the SRI method can significantly improve the food security of farming families. The stalk volume in the SRI method is much higher, providing more fodder for the cattle and more farmyard manure for fertilizing fields besides increasing milk yields. Thus SRI has a high potential to address the livelihood and food security needs of Orissa.

Sahabhagi Vikas Abhiyan (SVA) in partnership with P.S.I. - Dehradun proposed to propagate SRI with 2000 farmers in four districts – Nuapada, Kalahandi, Bolangir and Bargarh of western Orissa. The Azim Premji Foundation was requested to provide financial support of Rs. 2,098,621 (about 78% of the total costs) for this project.

The important expected outcomes of the project include:

1. Adoption of the SRI method of paddy cultivation by at least 2000 new farmers.
2. Shift in emphasis towards small and marginal farmers and rain fed lands. We will include at least 33% small and marginal farmers in the 2009 kharif season.
3. About 600 farmers from last year's participants to repeat or expand earlier effort.
4. Increased production of organic paddy with an average yield of about 5 T/ha on irrigated farms and 2.5-3 T/ha on rain fed lands.
5. Introduction of directly sown paddy along with the SRI method on an experimental basis and close monitoring of its performance.
6. Performance database of all the participating farmers.
7. Advocacy with agricultural extension officers and the state government to promote SRI in Orissa.
8. Creation of a talent pool of 40 master trainers and village level resource farmers who will be trained to better support SRI cultivation by small and marginal farmers under rainfed conditions.

¹ C. S. Prasad, K. Beumer and D. Mohanty: "Towards a Learning Alliance, SRI in Orissa", WWF International and Xavier Institute of Management, 2007.

ACTIVITIES

The major activities are summarized in the table below.

S.No.	Month	Proposed Activities	Activities Implemented
1	June (M1)	Selection of villages and master trainers Training of master trainers Selection and training of farmers	238 villages selected 52 Master trainers trained
2	July (M2)	Field support	57 Orientation Workshops for farmers to train 1731 farmers 253 Nurseries raised PRC meeting
3	August(M3) to October (M5)	Field support	Training on Direct Seeding Field Support
4	November (M6) to December(M7)	Farmer level data gathering Experience sharing workshops Information campaign	Exposure visits of 590 farmers from 46 villages Data collection
5	January(M8)	Data compilation and report writing	Exposure visits of 405 farmers from 24 villages Experience sharing workshops in 3 districts Data compilation
6	February(M9)	State Level Workshop Submission of Report	Experience sharing workshop in 1 district Report writing
7	March(M10)		State level workshop Submission of report

The above activities are described in detail below.

ACTIVITIES

I. Planning Meeting

A one day planning meeting was organized among SVA core staff and PSI to plan the project implementation. The entire project proposal was discussed. It was decided that the project would be implemented in four districts – Nuapada, Bargarh, Kalahandi and Bolangir. The group also resolved to focus on rain fed and small and marginal farmers. It was also decided that

Birendra Mahopatra (PSI) would coordinate two districts and another person (SVA) would coordinate the other two districts. Suklambar Nial, Hrishikesh Pradhan, Gaur Chandra Rajpalia and Raj Kisore Dhansena (all from SVA) would be in charge of Nuapada, Bargarh, Kalahandi and Bolangir districts respectively. Sitikanth Panda (SVA) was selected as Research Assitant to assist Field coordinators in collection and analysis of research data. It was decided that farmers would collect good quality seeds for practicing SRI farmer. SVA had also collected good quality seeds and if any farmer wishes to buy they can buy at Rs 10/kg. One of the criteria for selecting the SRI farmers was that they would do composting and apply only organic compost. Farmers willing to practice SRI would be registered for a fee of Rs 5. A weeder would be provided to a set of 10 farmers for which each farmer would pay Rs 20 towards its rental.

II. Training of Master Trainers

Old Masters Trainers (MTs) were contacted to promote SRI in their areas. The field staff also visited new villages, especially where there is no facility of irrigation and identified Master Trainers. Priority was given to persons who had experience of SRI and showed willingness to work as MT

A three day training workshop was organized from June 25 to 27 at SVA's training center for master trainers. Mr. S.P.Khadanga, a retired Agriculture Officer conducted the training. In all 52 master trainers from all the four districts participated in the workshop. The main topics covered during the workshop were:

Day 1: Concepts, principles and benefits of SRI, comparison with the conventional method of paddy cultivation, practical exercises on seed treatment, nursery bed preparation, seed sowing, mulching and watering.

Day 2: Practical exercises on marking, transplanting and weeding operations, organic farming practices and preparation of organic compost (*Matka khad* liquid manure – prepared by composting a mixture of dung, cow urine and jaggery), precautions in SRI.

Day 3: SRI on rainfed lands, SRI by direct sowing method, selection of villages and farmers, roles and responsibilities of MTs, support services to be provided during various stages, supervision and monitoring, data gathering and record keeping. A tentative list of villages and number of farmers where SRI could be promoted was also prepared.

The training was well received and the participants showed great enthusiasm.

A one day orientation workshop for old MTs was conducted on July 14, 2009 at SVA training center, Nuapada. The main objective was to refresh the concepts, principles and techniques. It also focused on selection of farmers especially small and marginal and on rainfed fields. The trainees were also oriented on line transplanting and direct seeding methods

Finally 50 Master Trainers were selected. (list enclosed in Annexure 1)

III. Selection of Villages and Farmers

Since this year the focus was on rainfed areas, apart from few old villages, new villages where there is no facility of irrigation were also selected. The FSOs along with MTs visited these villages and conducted village level meetings. Posters and booklets were used to explain the concept of SRI. List of farmers who showed interest was prepared. Priority was given to small and marginal farmers and rainfed fields.

IV. Orientation Workshops

After the training of master trainers in June, the MTs with the support of FSOs conducted 57 two-day orientation workshops for the selected farmers in the four districts. In all 1731 new farmers were trained. The presentations focused on (i) informing and educating farmers in the procedures of the SRI method, (ii) explaining them the strategies for effective use of the components of SRI and (iii) demonstrating the use of equipment to them.

District	Orientation W/S	Trainees
Kalahandi	11	258
Bolangir	16	675
Nuapada	19	472
Bargarh	11	326
Total	57	1731

District wise detail of orientation workshops is given in Annexure 2.

V. Field Support

In July 2009, an elaborate field support effort was launched by PSI and SVA for seed selection, seed treatment, nursery bed preparation and sowing operations. The field support staff comprising (FSO) and resource persons from PSI and SVA organized at least one field visit, on a weekly basis to each of the selected villages.

Unfortunately, this year the region faced one of the worst erratic rainfalls. The monsoon which usually breaks in the second week of June got delayed by almost a month. The farmers could not raise seedlings. Many farmers raised seedling 2 to 3 times but their saplings were damaged. In the third week of July heavy rains started and continued incessantly for more than seven days causing floods in several areas. Rainfall data of three districts – Kalahandi, Bolangir and Nuapada show that it received average 807.6 mm (234 % of normal) in just 15 days compared to normal 345.1 mm in 28 days (see rainfall data in Annexure 3). The nurseries that were raised were washed away and no new nurseries could be raised. No agricultural operations could be undertaken due to heavy rains. The nurseries needed to be raised again which delayed the transplantation. The heavy rainfall was followed by a long dry spell and thus transplantation could not be undertaken. In the next three months (August to September) the region received an average of 501 mm rainfall in 27 days compared to normal 628 mm in 46 days, a deficit of 20 percent compared to normal. More importantly there was a significant decrease (42%) in number of rainy days. The uncertain variability of rainfall discouraged farmers to try SRI. The farmers were unwilling to take the risk and started broadcasting instead of raising nurseries and then transplanting.

VI. PRC meetings

The first Programme Review Committee (PRC) meeting was held on July 21, 2009 at Billenjore, Nuapada to review the progress and discuss the new situation. The PRC

recommended some changes in the strategy (see minutes of PRC meeting in Annexure 4). It was decided that since farmers were not willing to adopt SRI this year, line transplant and direct line seeding method should be promoted, especially for the rainfed lands. Since it was already late, it was also decided to only promote short duration varieties like lalat, nabin and khandagiri. For direct seeding method traditional varieties like setka and saria should also be encouraged.

The second PRC meeting was held on March 21, 2010 at SVA office in Bhubaneswar. Productivity data and research outcomes were presented before the PRC. The results were discussed in detail. The members felt that the benefits of SRI method are quite visible with the productivity gains inspite of the drought conditions. It was also observed that the results of direct seeding method are not encouraging. The members suggested that now SRI should be expanded at much larger scale in western Orissa.

V. Training on Direct Line Seeding Method

On the recommendation of PRC's first meeting, a two days training on direct line seeding method was immediately organized for all the MTs on July 23-24, 2009. Mr. Khadanga conducted the training. First day was devoted on theory -- concept, principle and technique. On the second day all the trainees were provided practical training and they themselves experimented with the two methods in two fields.

VII. Information Dissemination

Efforts were simultaneously launched to enhance the SRI coverage area by information dissemination on SRI through "Gram Swaraj Abhiyan" newsletter published in Oriya. Information regarding the SRI technique was provided in the bi-monthly newsletters produced by SVA to reach out to the farming communities in the state

Copies of the manual on SRI (in Oriya) prepared by SVA were also distributed to the new SRI farmers. It explained the concepts, benefits, practice and methodology of SRI that leads to higher yields.

VIII. Exposure Visits.

Exposure visits for non SRI practicing farmers were organized to villages where farmers were practicing SRI. 995 farmers from 70 villages of all four districts were taken in small groups to villages within 2-3 km where farmers were practicing SRI. These exposure visits were timed during the harvesting period in the village. Crop cutting was done in front of the farmers so that they could themselves see the difference in crop harvest and compare it with conventional method. Officials from district agriculture office were also invited during these visits. They also interacted with the SRI farmers to know about the process and benefits. The farmers were quite convinced about SRI and showed interest in adopting this method this year.

IX. Experience-sharing Workshops:

Four one-day district-level experience-sharing workshops were organized in the months of January-February 2010, after the paddy crop was ready for harvesting, to popularize and extend the SRI method of paddy cultivation in the state. District-level government officials, agricultural extension officers, scientists and trainers from local KVKs, progressive farmers and

representatives of the print and electronic media were invited to participate. In Bargarh, Minister of Orissa Government was the chief guest while in Nuapada, the District Collector presided over the meeting. PSI/SVA, MTs and VLRLPs briefed the participants about the SRI method and participating local farmers shared their experiences. The farmers felt that inspite of the severe drought conditions, they were able to get better production in SRI fields. A field trip to nearby SRI fields was also organized in each workshop. Future strategies for effective extension of this method to other areas of western Orissa in 2010 and later were discussed at the end of each workshop.

X. State-level Workshop:

A state level workshop on SRI was organised in Bhubaneswar on March 20-21, 2010 by CWS. SVA/PSI collaborated in the workshop. About 400 farmers from 18 districts participated in the workshop. 20 farmers (5 each from 4 districts) from western Orissa also participated in the workshop. The State Agriculture Minister inaugurated the workshop. Policy makers, senior officials (agriculture and rural development) from the State, representatives from NGOs and other organizations and representatives of States where SRI is being promoted were invited. They deliberated on the issues like steps for expanding SRI in the state, technology improvements and mainstreaming SRI with government programmes. The farmers shared their experiences with the participants. They elaborated about the difficulties faced due to drought conditions. Many organizations that came to the workshop said that they could not meet their target due to drought. A memorandum was prepared which will be presented to the State Government. Progressive farmers were felicitated during the workshop. SVA/PSI had put up an exhibition stall, which received good response.

XI. Coverage

In all **238** villages in 14 blocks and four districts were selected and **1774** (1591 new and 183 old) farmers covering 978.45 acre (**391** ha) adopted SRI method of paddy cultivation with the support of SVA and PSI. This year i.e. in 2009, SRI was expanded to one more district Bolangir in addition to the three districts – Kalahandi, Nuapada and Bargarh where SRI was started in 2008. District wise details are given in the following tables

District wise details of number of SRI farmers and area

District	Villages	Old Farmers	New Farmers	Total Farmers	Area (acre)
Kalahandi	55	108	297	405	328.68
Bolangir	50	0	312	312	119.71
Nuapada	51	58	556	614	175.83
Bargarh	82	17	426	443	354.23
Total	238	183	1591	1774	978.45

A major shift this year was focus on small and marginal farmers (≤ 5 acres) and rainfed areas. More than 80 per cent farmers who adopted SRI were small and marginal and 60 per cent farmers practiced one of the methods in rainfed lands. The percent of rainfed area of total SRI area was almost 60 percent.

District wise details of small and marginal farmers

Small & Marginal				
District	Farmers	Area (acre)	% Farmer	% Area
Kalahandi	246	174.25	60.74	53.02
Bolangir	289	107.46	92.63	89.77
Nuapada	566	158.53	92.18	90.16
Bargarh	391	325.64	88.26	91.93
Total	1492	765.88	84.10	78.27

District wise details of farmers adopting SRI on rainfed areas

District	Rainfed				Total	
	Farmers	Area (acre)	% Farmers	% Area	Farmers	Area (acre)
Kalahandi	222	154.08	54.81	46.88	405	328.68
Bolangir	206	69.91	66.03	58.40	312	119.71
Nuapada	312	90.46	50.82	51.45	614	175.83
Bargarh	293	256.37	66.14	72.37	443	354.23
Total	1033	570.82	58.22	58.33	1774	978.45

Out of the total 1774 farmers 46.5 percent adopted SRI while 29.4 and 24.1 percent adopted LT and DS method of paddy cultivation respectively.

District wise details of different methods for paddy cultivation

District	SRI		LT		DS		Total	
	Farmers	Area (acre)	Farmers	Area (acre)	Farmers	Area (acre)	Farmers	Area (acre)
Kalahandi	193	174.35	203	151.23	9	3.1	405	328.68
Bolangir	260	103.2	2	0.2	50	16.31	312	119.71
Nuapada	325	130.74	185	30.29	104	14.8	614	175.83
Bargarh	47	34.65	131	152.21	265	167.37	443	354.23
Total	825	442.94	521	333.93	428	201.58	1774	978.45

Detailed farmers list is given in Annexure 5

XII. Productivity

Productivity data for all the SRI practicing farmers was collected from both SRI and conventional fields. Data of 36 farmers whose crop was totally lost due to drought and another 21 farmers whose data was not reliable were eliminated for analysis purpose. Analysis of the 1717 farmers show a overall productivity increase of 72.5% from SRI against the conventional method. The productivity in the SRI field was 4.48 T/ha compared to 2.6T/ha of conventional method.. Kalahandi recorded the maximum productivity (5.19 T/ha) and district Bargarh recorded the lowest (3.77 T/ha). District wise break is given in the table below

TOTAL

S.No.	District	No. of farmers	Productivity (T/ha)		Percent
			SRI	Conventional	Increase
1	Kalahandi	405	5.19	2.42	114.46
2	Bolangir	312	4.73	2.66	77.82
3	Nuapada	557	4.22	2.47	70.85
4	Bargarh	443	3.77	2.83	33.22
	TOTAL	1717	4.48	2.595	72.54

Overall in both irrigated and rainfed the productivity increase is almost same in SRI method and conventional method (72.53 and 72.63 percent respectively). But when we see the performance district wise, 3 out of 4 districts show slightly better performance in rainfed area.

IRRIGATED/RAINFED

S.No.	District	No. of farmers	Irrigated			Rainfed			
			SRI	Conventional	Percent Increase	SRI	Conventional	Percent Increase	
1	Kalahandi	183	5.52	2.59	113.13	222	4.93	2.28	116.23
2	Bolangir	106	5.73	3.45	66.09	206	4.2	2.25	86.67
3	Nuapada	286	5.47	3.23	69.35	271	2.89	1.67	73.05
4	Bargarh	150	4.45	3	48.33	293	3.43	2.75	24.73
	TOTAL	725	5.29	3.0675	72.53	992	3.86	2.24	72.63

Out of the three methods – SRI, Line Transplant (LT) and direct sowing (DS), SRI showed the best result with productivity increase of 89% followed by LT (76 %) and DS (10%). In two districts -- Nuapada and Bolangir, the productivity was less in DS method compared to conventional method.

DS/LT/SRI

S. No.	District	No. of farmers	DS			LT			SRI				
			Productivity (T/ha)	Conv.	%	Productivity (T/ha)	Conv.	%	Productivity (T/ha)	Conv.	%		
1	Kalahandi	9	3.39	2.27	49.34	203	4.95	2.43	103.70	193	5.54	2.41	129.88
2	Bolangir	52	1.84	1.92	-4.17	2	4.37	2.5	74.80	258	5.31	2.81	88.97
3	Nuapada	82	1.15	1.85	-37.84	172	5.29	2.71	95.20	303	4.44	2.50	77.60
4	Bargarh	265	3.1	2.56	21.09	131	4.97	3.48	42.82	47	4.2	2.57	63.42
	TOTAL	408	2.37	2.15	10.23	508	4.90	2.78	76.08	801	4.873	2.57	89.41

The region faced severe drought conditions this year. There was minimal rain during August –September which hampered the weeding operations. In the rain fed fields weeder could not be operated after two operations, which in turn affected the growth of plants. The absence of critical rain during the milking stage aggravated the problem. In spite of the drought conditions the SRI method gave higher productivity compared to conventional method in normal rainfall years.

XIII. Research Results

For detailed study of the performance of SRI, 60 farmers were randomly selected (20 irrigated and 40 rainfed). A research assistant monitored the performance on a regular basis. The results show the productivity of SRI is 5.89 Tons/ha compared to 3.63 Tons/ha by conventional method— a net increase of 62 percent. The productivity in irrigated area came to 7.02 T/ha against 4.23 T/ha in conventional while it was 4.77 Tons/ha compared to 3.63 Tons/ha in rainfed fields.

Results of various parameters from 60 selected plots

S.No.		SRI			CONVENTIONAL			Percent difference		
		Irrig.	Rainfed	Total	Irrig.	Rainfed	Total	Irrig.	Rainfed	Total
1	Area (ha)	3.52	5.94	9.46	7.1	10.7	17.8			
	No. of farmers	20	40	60	20	40	60			
2	Average Seed (kg/ha)	7.6	7.67	7.64	178.6	195.7	188.9	-95.74	-96.08	-95.96
3	Average no. of tillers	30	29	30	8	6	6	275.00	383.33	400.00
4	Average plant height(ft)	92.1	93.9	93.3	84	85.5	84.6	9.64	9.82	10.28
5	Average length of pinacle (cm)	16.23	15.47	15.56	12.35	12.32	12.33	31.42	25.57	26.20
6	Average no.of seeds/pinnacle	234	219	224	176	158	164	32.95	38.61	36.59
7	Average straw quantity (Q/ha)	108	137	126	69	80	75	56.52	71.25	68.00
8	Average wt of 1000 grains (gm.)	36.05	34.25	34.25	27.65	27.1	27.28	30.38	26.38	25.55
9	Productivity (Tons/ha)	7.02	4.77	5.895	4.23	3.04	3.635	65.96	56.91	62.17
10	Total Input cost (Rs/ha)	11096	10824	10926	14169	11560	12600	-21.69	-6.37	-13.29

All the parameter showed better results in SRI method compared to conventional method. The seeds requirement was 95% less in SRI method. The average number of tillers was 400% more than the conventional method. Even the straw productivity was 68% higher than the conventional method. The average number of seeds/pinnacle and average weight of 1000 grain were higher by 37 and 25 percent than the conventional method respectively. This shows that the health of the plant in SRI method is better compared to the plant in conventional method.

Problems Faced

Some problems were encountered during the implementation of the project

1. Rainfall Aberration: This year the region faced very erratic rainfall. The monsoon arrived late and then it rained heavy in the month of July. This was followed by a long dry spell. The variability of rainfall discouraged farmers from adopting SRI this year. In rainfed uplands there was total loss of crop due to rainfall failure
2. Variation in adaptability: Extensive variations in adoption of SRI by farmers, especially due to the prevailing drought conditions, in terms of age of saplings transplanted, spacing between plant to plant and row to row, use of weeder, application of manure, and water management was observed.
3. Use of Weeder: The weeder could not be operated after after two operations due to hard soil in absence of water.
4. Unavailability of labour: The labour does not like to do transplantation in SRI method

CONCLUSION

SRI method of rice cultivation was adopted by 1784 farmers in four districts of western Orissa. Three methods – SRI, Line Transplantation and Direct Seeding were adopted in irrigated and rainfed fields. The region faced erratic rainfall and witnessed drought conditions.

- Even in drought conditions the productivity in SRI method is significantly higher compared to the conventional method. The SRI productivity is even higher than productivity by conventional method in normal rainfall years.
- The results in rainfed fields is slightly better compared to the irrigated fields
- Productivity increase in SRI and Line Transplant method are almost similar
- Direct Seeding method is not successful in rainfed uplands. Though it may succeed in normal rainfall years
- The average health of the plant is better in SRI method, which is indicated by the number of tillers, height of plant, length of pinnacle, number of grains per pinnacles and average weight of 1000 grains.
- The average input costs are lower in SRI method
- The overall output in terms of both grain and straw is higher in SRI

Though the benefits of SRI method are quite evident, it will take some time for farmers to adopt this method on a large scale. It will require technological innovations, regular support and supportive policies.

List of Master Trainers

S.No.	Name of the MT	District	Operational area	Status
1	Mr.Umakant Nial	Kalahandi	Maningpadar,Karlapada,Haldi	New
2	Mr.Purnachandra Chinagung	Kalahandi	Balipati, Kulerguda	New
3	Mr.Kailash Naik	Kalahandi	Tepsa, Kandakhal, Palna	New
4	Mr.Keshab Ch.Shah	Kalahandi	Manoharpur,Sripur,Kanakpur,	New
5	Mr. Kuber Bachha	Kalahandi	Laxmipur, Medinipur	New
6	Mr.Ashok Kumar Majhi	Kalahandi	Bodapada, Rundimahur, Belpada, Nuapadar	New
7	Mr.Anadi Rana	Kalahandi	Sadingtara, Ratanpur, Jampadar	New
8	Mr.Narottam Deep	Kalahandi	Limursingha	New
9	Mr.Jadumani Bhoi	Kalahandi	Kurmel,Kupapadar,Bamak	Old
10	Mr.Thabira Bhoi	Kalahandi	Bhanpur,Bafla,Kenaga,Jampada	Old
11	Mr.Bhawani Shankar Senapati	Kalahandi	Boringpadar	New
12	Mr.Sabyasachi Padhan	Kalahandi	Karme, Surpadar, Nuapada,	New
13	Mr.Kailas Ch.Bhoi	Kalahandi	Khambapada	New
14	Mr.Narottam Deep	Bolangir	Limursingha	Old
15	Mr.Jadumani Bhoi	Bolangir	Kurmel,Kupapadar,Bamak	Old
16	Mr.Thabira Bhoi	Bolangir	Bhanpur,Bafla,Kenaga,Jampada	Old
17	Mr.Bhawani Shankar Senapati	Bolangir	Boringpadar	Old
18	Mr.Sabyasachi Padhan	Bolangir	Karme, Surpadar, Nuapada,	Old
19	Mr.Kailas Ch.Bhoi	Bolangir	Khambapada	Old
20		Bolangir		
21	Mr.Keshab Dharua	Bolangir	Kankadapadar,Peruamal,Karlapita	New
22	Mr.Gobinda Dharua	Bolangir	Dangarpada, Bandhbahal, Jubamal, Jamuna	New
23	Mr.Abhimanyu Majhi	Bolangir	Chalki,Jampadar	Old
24	Mr.Dutikrishna Ghibhela	Bolangir	Dumermunda,Kandakhal, Katadungri, Malpada	New
25	Mr.Bideshi Ghebhela	Bolangir	Sishakani	New
26	Mr.Nabin Ghebhela	Bolangir	Pipaldani	New
27	Mr.Durbadala Hati	Bolangir	Balpadar, Salebhata, Tupaudar	New
28	Mr.Karunakar Bagarty	Bolangir	Kumbhari, Kumbhekela	Old

29	Mr.Subash Gadtia	Bolangir	Badmunda,Kandhkel Gaon,Sinakhman, Sargigadi,Jalia,Brundamal,Dhunim ahul	New
30	Mr.Janakraj Mallik	Bolangir	Kherselbanji,Nuamunda,Keonmal, Jurabandh,	Old
31	Jitendra Majhi	Nuapada	Pendraban ,Bagabal	New
32	Keshab Nial	Nuapada	Bilenjore ,Koramahul ,Bahalmunda	Old
33	Umashankar Sabar	Nuapada	Rang ,Budhikomna	Old
34	Gojmohan Rout	Nuapada	Pandrapathar	Old
35	Jaydhar Hans	Nuapada	Sinamunda	Old
36	Biranchi Hans	Nuapada	Ganiary,Jadamunda	Old
37	Sunadhar Majhi	Nuapada	Kharvadi	New
38	Rupdhar Majhi	Nuapada	Jandramunda	New
39	Domru Baghel	Nuapada	Kumtimunda	New
40	Ranjeet Kumbhar	Nuapada	Kotribahal	New
41	Chintamani Sagaria	Nuapada	Kureswar ,Kendubhata	Old
42	Balaram Bag	Nuapada	Agren	Old
43	Tulsiram Bandhichhore	Nuapada	Belgan ,Krishna ,Rajana	Old
44	Hrusikesh Gohir	Nuapada	Anchalpur	New
45	Gaurishankar Nag	Nuapada	Kushmal	Old
46	Biswamber Nial	Nuapada	Dumerjore	New
47	Keshab Behera	Nuapada	Palsada	New
48	Khirmohan Majhi	Nuapada	Mahulpadar ,Temri ,Makarbirli	New
49	Ranjan Behera	Bargarh	Bijadihi ,Chhindikela,Gondpali	New
50	Tahsil Rana	Bargarh	Majhipali ,Makhnamunda,Malpada ,Salepali	Old
51	Pradeep Rana	Bargarh	Jhengnidihi ,	New
52	Ghanshyam Behera	Bargarh	Boitali ,Gothaguda ,Sankri ,Tuhungidadar	New
53	Jagdish Sahu	Bargarh	Borikel ,Betkarpur ,Bijadihi	Old
54	Alekh Bariha	Bargarh	Sompia ,Sargipali ,Sikhapali ,Siletpali	Old
55	Prashanta Pradhan	Bargarh	Adanpani ,Amthi	Old
56	Mohan Dalp[ati	Bargarh	Bijapali ,Jampali ,Batterma	Old
57	Harchand Pradhan	Bargarh	Kuamania	Old
58	Taranisen Patel	Bargarh	Ganiapali	Old
59	Prashanta Sahu	Bargarh	Gaurenmunda ,Meherpali	New

Details of Orientation Workshops

Sl. No	Date of Training	Place of training	Block	Master Trainer	Resource Person	Participants
District Kalahandi						
1	21.06.09	ManoharPur	Bhawanipatna	Keshba Sha	Mr.S.Gahir	32
2	01.07.09	ManoharPur	Bhawanipatna	Keshba Sha	Mr.S.Gahir	23
3	01.08.09	KanakPur	Bhawanipatna	Keshba Sha	Mr.S.Gahir	25
4	04.07.09	Limur Singha	Narla	Anadi Rana	Mr.G.Rajpalia	34
5	03.07.09	Sadingtara	Narla	Ashok Majhi	Mr.G.Rajpalia	16
6	06.07.09	Dharanmal	Narla	Ashok Majhi	Mr.G.Rajpalia	25
7	22.07.09	Artal	Bhawanipatna	Kailash Bhoi	Mr.G.Rajpalia	20
8	23.07.09	Balipati	Bhawanipatna	Purna Ch.Chinagun	Mr.G.Rajpalia	22
9	23.07.09	Kulerguda	Bhawanipatna	Purna Ch.Chinagun	Mr.G.Rajpalia	27
10	24.07.09	Kandakhal	Bhawanipatna	Kailash Naik	Mr.G.Rajpalia	17
11	25.07.09	Budhapada	Bhawanipatna	Kuber Bachha	Mr.G.Rajpalia	17
District Bolangir						
12	03.07.09	Thuapadar	Muribahal	Durbadal Hati	Mr.Rajkishore	35
13	04.07.09	Ganrai	Muribahal	Durbadal Hati	Mr.Rajkishore	20
14	08.07.09	Peruamal	Muribahal	Keshaba Dharua	Mr.Rajkishore	45
15	06.07.09	Dongerpada	Muribahal	Keshaba Dharua	Mr.Rajkishore	25
16	10.07.09	Suknipadar	Muribahal	Keshaba Dharua	Mr.Rajkishore	25
17	19.07.09	Chalki	Muribahal	Abhimanyu Majhi	Mr.Radhakant	50
18	17.08.09	Chalki	Muribahal	Abhimanyu Majhi	Mr.Rajkishore	50
19	07.07.09	Pipaldani	Titlagarh	Nabin Ghivela	Mr.Rajkishore	50
20	18.07.09	Pipaldani	Titlagarh	Nabin Ghivela	Mr.Radhakant	50
21	14.08.09	Sishakani	Titlagarh	Bideshi Ghivela	Mr.Rajkishore	50
22	16.09.09	Sishakani	Titlagarh	Bideshi Ghivela	Mr.Rajkishore	50
23	11.07.09	Kumbhekela	Saintala	Karunakar Bagarty	Mr.Sisir Parija	50
24	12.07.09	Khershelbanji	Saintala	Janakraj Mallik	Mr.Sisir Parija	50
25	05.07.09	Kadlimunda	Saintala	Janakraj Mallik	Mr.Rajkishore	40
26	01.07.09	Badmunda	Saintala	Subash Gadtia	Mr.Rajkishore	45
27	12.08.09	Badmunda	Saintala	Subash Gadtia	Mr.Rajkishore Dandsena	40
District Nuapada						
28	7.07.09	Naikpada	Komna	Jaydhar Hans	Birendra	40
29	7.07.09	Pandrapathar	Komna	Gojmohan Rout	Shuklamber Nial	34
30	8.07.09	Kumtimunda	Komna	Domuru Baghel	Shuklamber Nial	20
31	10.07.09	Rang	Komna	Umashankar Sabar	Shuklamber Nial	20

32	18.07.09	Kureswar	Komna	Chintamani Sagaria	Shuklamber Nial	32
33	18.07.09	Khairvadi	Komna	Sunadhar Majhi	Birendra Mohapatra	14
34	19.07.09	Jodramunda	Komna	Rupdhar Majhi	Shuklamber Nial	9
35	28.07.09	Kotribahal	Komna	Ranjit Kumbhar	Shuklamber Nial	37
36	17.07.09	Bilenjore	Komna	Keshab Nial	Birendra Mohapatra	22
37	17.07.09	Koramahul	Komna	Keshab Nial	Biren Dharua ,Chaitanya	19
38	18.07.09	Ganiary	Komna	Biranchi Hans	Biren Dharua ,Chaitanya	23
39	15.07.09	Dumerjore	Khariar	Biswamber Nial	Chaitanya Pradhan	24
40	7.07.09	Kushmal	Khariar	Gauri shankar Nag	Gaurishankar Nag	37
41	10.07.09	Kirkita	Khariar	Chaitanya Pradhan	Chaitanya Pradhan	17
42	6.07.09	Karandoba	Khariar	Chaitanya Pradhan	Chaitanya Pradhan	23
43	4.07.09	Mahulpadar	Boden	Khirmohan Majhi	Chaitanya Pradhan ,Biren	24
44	7.07.09	Palsada	Boden	Keshab Behera	Biren Dharua	37
45	7.07.09	Maharajajore	Boden	Khirmohan Majhi	Biren Dharua	17
46	8.07.09	Karanbahal	Sinapali	Biren Dharua staff	Biren Dharua	23
District Bargarh						
47	06.07.09	Chhindikela	Paikmal	Ranjan Behera	Hrishikesh Pradhan	38
48	10.07.09	Jhengnadihi	Paikmal	Pradeep Rana	Birendra Mohapatra	25
49	07.07.09	Boitali	Jharbandh	Ghanashyam Pradhan	Birendra Mohapatra	32
50	08.07.09	Gothaguda	Jharbandh	Ghanashyam Pradhan	Hrishikesh Pradhan	15
51	08.07.09	Gaufrenmunda	Gaiselet	Prashant Sahu	R.K.Purohit	33
52	09.07.09	Salepali	Sohela	Mohan Dalpati	Mohan Dalpati	25
53	10.07.09	Kuamania	Sohela	Mohan Dalpati	Mohan Dalpati	18
54	07.07.09	Ganiapali	Sohela	Taranisen Patel	R.K.Purohit	33
55	06.07.09	Borikel	Padampur	Jagadish Sahu	Hrishikesh Pradhan	32
56	09.07.09	Judhistirpur	Padampur	Jagadish Sahu	R.K.Purohit	40
57	11.08.09	Sounpia	Padampur	Alekh Bariha	Birendra Mohapatra	35

Minutes of Programme Review Committee meeting

Date: July 21,2009

Venue: SVA, Billenjore, Nuapada

A Programme Review Committee (PRC) meeting was held on July 21 at SVA campus, Billenjore on July 21, 2009.

The objective of the meeting was :

1. to appraise the members of the goals and objectives of the programme
2. to review the progress of the programme
3. to seek guidance for achieving the programme goals

The members who participated in the meeting were:

1. Dr. Ravi Chopra, Director, People's Science Institute, Dehra Doon
2. Mr.Jagadish Pradhan, President, Sahabhagi Vikas Abhiyan, Billenjore
3. Dr.Shambu Prasad, Professor, XIMB Bhubaneshwar
4. Ms. Ronali Pradhan, Programme Manager, CWS, Bhubaneshwar
5. Mr. Sabhyasachi Kar, PRADAN, Bhawanipatna
6. Mr. S. Khadanga,
7. Mr. S.K.Parija, Retd. District Agriculture Officer, Bhubaneshwar
8. Mr. Salil Das, Head Innovative projects, PSI

Apart from the above members following programme staff also attended the meeting

1. Mr. Birendra Mahopatra- Field Coordinaotor
2. Mr. Sitikanth Panda – Reseach Assistant
3. Mr. Suklambar Nial – Field Support Staff, Nuapada
4. Mr. Gaur Chand Rajpalia -- Field Support Staff, Kalahandi
5. Mr. RajKishore Dhansena -- Field Support Staff, Bolangir
6. Mr. Hrishikesh Pradhan -- Field Support Staff, Bargarh

The meeting started at 11.00 a.m. with a welcome note by Shri Jagadish Pradhan followed by self introduction of all the participants. Mr. Pradhan then presented a brief report on SRI results of Kharif 2008. He mainly highlighted that 1093 farmers practiced SRI in three districts (Nuapada, Bargarh and Kalahandi) during Kharif and the productivity in two districts – Nuapada and Bargarh was about 50 q /h. However, In Kalahandi it was about 30 q/ha. He also indicated at the various problems like rainfall aberration, variation in SRI practice, water management, inadequate number of master trainers and unavailability of good quality weeders. He then stressed on building cadre of master trainers, ensuring proper practices and regular training of master trainers and farmers as key to future expansion of SRI in west Orissa.

Mr. Salil Das then made a presentation of this year's (kharif 2009) proposal for innovative upscaling for equitable promotion of SRI in western Orissa. He first stated the goal and outcomes of the project and then briefly described the various components and proposed activities of the programme. He pointed out that this year there is a special focus on small and marginal farmers and rainfed fields. He also presented the progress made so far and then flagged some issues for discussion.

The major issues that were discussed are as follows

- Dr. Shambu Prasad pointed out that if small and marginal farmers are in the focus then why only 33% of them are covered. Ronali shared that in their area (Keonjore district) 98% of the total SRI farmers are small and marginal farmers. Salil clarified that since last year our focus was mainly on irrigated lands we were not able to cover large sections of small and marginal farmers, but this year since our focus has changed to rainfed fields we will cover at least 33%. Mr Pradhan added that this year in our area of operation most of the farmers are small and marginal farmers and therefore more than 60% of farmers will be from this category. The members agreed that at least more than 50% of the total SRI farmers must be small and marginal.
- The issue why only 60% of last year's SRI farmers will be repeated this year was raised. Ronali again shared that almost 100 per cent SRI farmers in their area are repeating. Ravi pointed out that there may be a strong correlation between the category of farmers and the viability of SRI. It may be possible that SRI is more viable for small and marginal farmers. He again stressed that there must be strong effort to involve small and marginal farmers.
- A copy of the format for collecting performance data from each farmer was shared with the members. All the members felt that the formats are too complicated to be filled by the farmers. Ravi said that only basic information of area and production from all the farmers should be collected for which a very simple format should be developed. For detailed study only a sample of between 50-80 farmers should be randomly selected. Dr. Shambhu agreed with Ravi and suggested that the detailed study must be designed very systematically. He also suggested to involve District Agriculture Office for crop cutting exercises because they have a very scientific way of doing the exercise. It was decided that only basic data of area and production will be collected from all the practicing farmers and a sample of about 60 farmers would be selected for detailed study. A dedicated researcher would be responsible for collecting, compiling and analyzing the data.
- Dr. Shambu also raised doubts on the expected outcome of increased production of organic paddy with an average yield of about 5 t/ha on irrigated farms and 2.5-3 t/ha on rainfed lands. He felt the expectations are too high. He suggested instead of stating the expectation so high, it will be more realistic to state that the production will be doubled.
- Mr. Sabhyasachi observed that Master Trainers play a very important role in the programme. He wanted to know the structure for capacity building of MTs. Salil informed that at the start of the programme there is a three day training programme and then at different stages resource persons interact with the MTs in the field. Mr Sabhyasachi felt that one-time training is not sufficient and there is a need to provide

training on regular intervals. Most of the members felt that a specific training structure should be prepared for capacity building of the MTs. For the time being it was decided that on the day of monthly review meeting, half day will be specifically kept for input session, where resource persons will provide inputs to the MTs.

- The issue of pest attack especially Bongi and absence of any reliable organic pesticide was raised. Mr. Parija informed that Neem oil and cake are very effective in controlling Bongi pest.
- Dr Shambu also suggested involving government officials in this programme and inviting some officials to the PRC. Mr Pradhan informed that Director, Agriculture and Deputy Director were invited but due to some important meeting they could not attend. Dr Shambh also requested to send material relating to SRI to SRI Orissa network.
- The members were appraised about the present status of rains and agriculture. The monsoon got delayed by almost a month. The farmers could not raise seedlings. Many farmers raised seedling 2-3 times but they got damaged. In the third week heavy rains started and continued incessantly for more than seven days. The nurseries that were put up got washed, no new nurseries could be put and where seedlings were ready transplanting could not be done. No agricultural operations could be undertaken. The members also reviewed the progress of the project. They felt that if the situation continues it would be difficult to meet the present target. They advised to prepare a new strategy so that the targets could be achieved.
- Mr Khadenga suggested that where farmers are not ready for transplanting they may be advised to do direct line sowing instead of broadcasting. He felt that since sowing has been delayed by more than a month, it is not advisable to go for conventional long duration varieties. He suggested that only short duration (90-100days) varieties like latat, naveen and khandagiri should be sowed.
- Mr. Khadenga and Mr Parija also advised that no new nurseries should be raised after July 31 and transplantation could be taken latest upto August 15. Direct line seeding method should not be taken later than July 31.
- It was decided to immediately organize a training for Master Trainers on direct line seeding practices and provide inputs in view of the present situation.
- Dr. Shambhu enquired about the project period and funds availability. He was informed that the present proposal is for 9 months. He suggested to seek funds for long term to build sustainability to the programme.

The meeting ended at 5:30 p.m. with vote of thanks from Mr. Pradhan.