

**REPORT ON A VISIT TO WEST BENGAL FOR AN UPDATING ON PROGRESS AND PROBLEMS
WITH SRI/SWI/SCI, FEBRUARY 24-27, 2011**

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This visit to West Bengal was part of our longer visit to India that included also the states of Bihar, Orissa and Tamil Nadu and two days in the capital of this vast country. The trip to India was constructed around our participation in an international symposium on ‘intensification,’ held at BCKV, the agricultural university of the West Bengal state. This event brought us together with SRI colleagues from Bangladesh and Indonesia as well as many from different parts of India.

Given that interest in the System of Rice Intensification (SRI) is growing and accelerating across the country, expanding now to include the application SRI concepts and methods to other crops, what started out as a visit to West Bengal for the symposium grew into a packed and informative schedule for Erika from February 20 to March 14. Norman had limited time that he could be away from Cornell, so his time in India, with his wife Marguerite accompanying him, was only from February 24 to March 4. For both the activities ranged from meetings in very urban settings (Kolkata, Patna, Delhi) to field visits in rural, sometimes remote locations. Indian colleagues proposed some visits to other states (Manipur, Karnataka, Rajasthan), but unfortunately this much travel could not be worked in. An overview of the whole trip is given at the end of this report (page 18).

For readers not acquainted with the expanding nomenclature of SRI, **SWI** refers to the **System of Wheat Intensification**, which adapts SRI concepts and methods to wheat production. SWI is now being included by some persons within the broader category of **SCI** is the **System of Crop Intensification**. This covers a great variety of crops – cereals, legumes, oilseeds, even some vegetables – which are now being produced more abundantly by drawing on SRI ideas and insights. We are working on other reports for the other state visits. A report of the **Roundtable Discussion on Status of SRI in India: Up-Scaling Strategy and Global Experience-Sharing**, organized by the National Consortium on SRI and hosted by the Indian Agricultural Research Institute in New Delhi, March 3, is posted on the SRI-India website: http://www.sri-india.net/html/SRI_Roundtable_Discussion.html

International Symposium on ‘Systems Intensification,’ Kalyani, West Bengal (February 24-25)

Ever since the 2008 National SRI Symposium held in Coimbatore, Tamil Nadu, Dr. Ratikanta Ghosh at West Bengal’s agricultural university, **Bidhan Chandra Krishi Viswavidyalaya** (BCKV), has wanted to have the annual meeting of India’s **Crop and Weed Science Society (CWSS)**, which is regularly hosted by BCKV, focus on SRI and on related agricultural innovations. Happily, the **National Bank for Agriculture and Rural Development** (NABARD) through its **Natural Resource Management Center** agreed to support such a program. The theme for this year’s CWSS meeting was ‘Systems Intensification towards Food and Environmental Security,’ to which Norman was invited as Chief Guest to give a keynote.

At first, it seemed disappointing not to have SRI as the explicit focus of the colloquium. But since the application of SRI concepts and methods to other crops like wheat (SWI) is accelerating, it turned out to be helpful for us and others to focus attention more broadly. Norman’s keynote [URL for paper] traced the origins of what is being called the **System of Crop Intensification (SCI)** and reviewed results from a range of crops, even considering pulses and vegetables produced with SCI practices in the states of Himachal Pradesh and Uttarakhand. This latter work has been done by the Dehradun-based NGO **People’s Science Institute** (PSI) and by farmers working with PSI staff. Innovative SCI work is also being

done in Ethiopia by the NGO *Institute for Sustainable Development* (ISD) which cooperates with farmers in the poor, very dry province of Tigray, applying SRI ideas to many crops – wheat, barley, sorghum, millet, teff, etc. Norman’s keynote presentation on Friday morning [URL for powerpoint] aimed to knit together some of the various topics addressed by diverse conference papers under the theme of ‘intensification.’

On Friday afternoon, several presentations provides some international perspectives on SRI and SWI as Dr. Muazzam Husein reported on SRI in **Bangladesh**, and Erika summarized experience with SRI and SWI in **Mali** [URL for powerpoint]. On Thursday afternoon, there was also a paper from **Indonesia** on SRI evaluation there. We missed its presentation, however, because that was when we were taken to see some SRI demonstration plots about 20 minutes’ drive from the BCKV conference center. These trials were assessing, with farmer participation, different methods of weed control with SRI management. Fortunately for us, the authors of the Indonesian paper provided us with a copy of their presentation (see below).

The trials seen on Thursday were part of a program of SRI demonstration and extension undertaken by a local NGO, the **Chandamari Sannidya Rural Welfare Society**, run mostly by BCKV students. A report on their work and results was the last paper presented on Friday (late) afternoon. Talking with them about their activities during the tea break afterwards was one of the highlights of the symposium for us. It was gratifying to see the next generation of Bengali agricultural leaders taking a personal interest in SRI evaluation and spread, beyond their academic responsibilities. The day’s program ended more than two hours behind schedule, so we got a late start back into Kolkata Friday evening to be ready for the next day’s event.

Bangladesh: One of the benefits of attending the symposium was the opportunity for discussions with participants from Bangladesh and Indonesia, learning about their work with SRI. **Dr. Muazzam Husain** has served since 2002 as a voluntary coordinator for SRI activities in Bangladesh since presiding over a meeting in January that year which established a Bangladesh national SRI steering committee. This body included representatives from the NGO sector, from the government (the Dept. of Agricultural Extension, and the Bangladesh Rice Research Institute -- although BIRRI cooperation has been limited), from the national agricultural university at Mymensingh, and from the private sector (Syngenta Bangladesh Co. Ltd. – which liked SRI for its prolific seed-multiplication).

A consortium of these organizations got funding from IRRI’s program in Bangladesh to do on-farm evaluations over two years, 2002-04. However, despite positive results from on-farm comparison trials (N=1,071) that were reported to IRRI (and were summarized in Husain’s symposium paper), there has been continuing resistance to SRI from rice scientists in Bangladesh. Most progress with SRI in this country has come mostly from NGO initiatives, although many technical personnel in the government’s extension service, seeing good farmer results, have been favorable to SRI.

Scientific resistance to SRI in Bangladesh may soon be persuasively countered. Attending the BCKV conference with Muazzam were also **Abu Bakar Siddique Sarkar**, a BIRRI researcher who is completing his research on SRI for a PhD thesis in plant science from the national university, and his thesis supervisor, **Dr. Najrul Islam**. Abu Bakar has been persuaded of SRI’s merits since 2001, despite opposition from BIRRI colleagues. He is still analyzing the data from his trials, but his results, he said, are consistent with the positive results reported repeatedly from other evaluations and other countries. Dr. Islam suggested that Abu Bakar’s thesis, when completed and defended, should help to satisfy

agricultural faculty members at Mymensingh on the merits of SRI management, and it should also have some impact on BRRRI attitudes since the research has been done 'by one of their own.'

Indonesia: Two persons had come to the BCKV symposium from Indonesia: **Dr. Ir. Minar Ferichani**, a lecturer in the Agribusiness Program of the Agriculture Faculty at **Sebalas Maret University** in Central Java and also a Member of Parliament, and **Dani A. Prasetya**, a trainer for the **Joglo Tani Association**, a farmers' association based in Yogyakarta. Their co-authored paper was based on analysis of SRI performance on six farmers' fields, but there were not many details on the farmers or on how they were selected. The paper's most interesting data were on *variable costs* from the 2010 season. These were calculated in rupiahs per 1,000 m² (small rice paddies are the norm in Central Java). SRI costs added up to 382,111 rupiahs (\$43.60) vs. 555,417 rupiahs (\$63.70) for conventional practice, a reduction of 32% (or \$20). The cost components were not broken down, however. Most of the reduction came from using compost instead of chemical fertilizer.

More interesting than their paper was the enterprise that they are involved with: processing and selling various organic agricultural products, including SRI rice. Their illustrated catalog was very impressive. Dani presented us with a vacuum-packed package of mixed red and white SRI-grown organic rice which is being sold at a premium price in Yogyakarta. We had no knowledge that such a sophisticated marketing operation was going on with SRI in Central Java, having connections with organic SRI production and marketing only in West Java so far. Minar and Dani did not know about the organic SRI operation and sales in Bandung that Norman learned about in 2005, or about BloomAgro's collaboration with a farmer cooperative growing organic SRI rice in Tasikmalaya for export (see pages 4-6 of the trip report on this activity: <http://sri.ciifad.cornell.edu/countries/indonesia/indotrep905.pdf>). So this meeting was an opportunity to provide linkages among SRI activities well beyond India.

State-Wide Meeting of Banglar-SRI, Kolkata (February 26)

Saikat Pal, formerly with the NGO PRADAN and now heading the Kolkata-based NGO known as PRASARI, was our host for the next two days. Saikat has been serving as the volunteer coordinator for **Banglar-SRI**, a state-wide consortium of NGO and other organizations working with SRI. It was established in April 2010, with 11 members. By October, it had 21 members, and as of February 2011, Banglar-SRI's membership was up to 31 within one year. Saikat described it as a 'pragmatic, not formal' organization. Its members have designated a committee of 5 representatives to negotiate with the Ministry of Agriculture on their behalf. Members tallied 10,089 farmers using SRI methods in the state, but this number is surely over 15,000 by now.

The meeting, held at a function centre in central Kolkata, began at 10:30, with Saikat welcoming everyone. Bouquets were presented to all of the guests, including representatives of the **National Bank for Agriculture and Rural Development** (NABARD) and the **Sir Dorabji Tata Trust** (SDTT), which have emerged as the major funding sources for SRI extension in West Bengal and elsewhere. It was noted that **Dr. Muazzam Husein**, coordinator of the National SRI Committee for Bangladesh, who was with us, was himself born in Kolkata and lived there (here) until he was 6, until the partition of colonial India at time of Independence in 1947. We wanted to build up solidarity and exchange between West Bengal and the former East Bengal, now Bangladesh.

The self-introductions of meeting participants scheduled for 25 minutes took almost two hours. But they were very informative for us, and probably for many members attending because the group is growing

so fast. Erika made quick notes on the introductions that give a kaleidoscopic view of SRI in West Bengal. The identifications and comments are cursory but informative, jotted down during rapid-fire translation.

1. **Saikat Pal** started off, representing **PRASARI**: His introduction in Bengali was punctuated with a statement in English, "SRI is my passion." He commented on the many and good working relationships that PRASARI has developed with a number of smaller NGOs in the state.
2. **Aritra Ghosh, a representative of the Chandamari Sannidya Rural Welfare Society**, spoke next. CSRWS is a student-led NGO in Nadia, some of whose demonstration plots near BCKV campus we had visited the previous Thursday. After two years of on-station trials, in 2008 it started field work with 2 farmers doing SRI. Now 200 farmers are cooperating with CSRWS to spread SRI practices.
3. **Altab Mollah, a farmer from the Sundarbans**, the low-lying coastal area on the Bay of Bengal that we were planning to visit on Sunday: Altab said that he had practiced SRI for three years now, having been the first in his village to try the methods. Now he has six seasons of experience.
4. **Sanjib Bhattacharya, Secretary, BSWI**: This NGO started working with SRI methods in 2008 with 35 farmers. Now they are up to 600 farmers in Maldah district.
5. **A farmer from Sankrail**, the operational area for the Ambuja Cement Foundation, as that SRI work in his area started with 135 farmers in 2008. Now they are up to 300 farmers using SRI. They have had some problems with water scarcity, and farmers are figuring out how to combine SRI with fish culture in their paddy fields. Their yields have been raised from 13-14 maunds per bigha, to 18-19 maunds.
6. **Tarun Shukla, representing Trickle Up**: This is a New York City-based international NGO which works with people having daily incomes less than \$1.25, concentrating on food security. Its activity focuses on four states – West Bengal, Jharkhand, Bihar and Orissa. SRI is enabling households to move up from 3 months of food security per year, to 7 months per year. This we heard from many different farmers during our visits in West Bengal and Bihar.
7. **Ratikanta Gayen, a representative of Jeevika**. This is the state government's livelihoods program which is dedicated to improving poor families' livelihoods. It has been functioning for three years and is integrating SRI into its strategy.
8. **Amitesh Chandra, representing the Ambuja Cement Foundation**: This major cement producer has factories (19) all over India. It began introducing SRI in 2008 to 10 farmers, under its Corporate Social Responsibility program. Now it is working with 1,250 farmers practicing SRI on 350 acres (these are all very small farmers). In another district, the Foundation is working with another 1,500 farmers, having NABARD assistance in addition to using its own funds. (NABARD is the National Bank for Agriculture and Rural Development.)
9. **Purima, a woman farmer**, reported that she has been using SRI methods for two years under the Jeevika livelihood program. Before she got 13 bags of paddy from her rice field of 1.5 bighas (about 1 hectare). Now with SRI methods, she gets 16-17 bags.
10. **Malavika, staff member of the Jeevika Development Society**: Her work focuses on women's involvement and on agriculture in general, promoting organic farming and now SRI. She has done SRI training for NABARD.
11. **Ashok Ghoshal, NGO worker with the Environmental and Economic Sustaining Agriculture Association**: He commented that he has had fellowship support from the USA, and that his organization works on SRI in tribal areas.
12. **Pratap Chandra Maiti, representing a farmer's cooperative**: Standing very short and with a sparkle in his eyes, Pratap recounted how, when he and four other farmers started to use SRI, neighbors called them "mad." But when they got outstanding results, the attitude changed. Now 200 farmers are using the new methods. Before their paddy harvest was 30 maunds, but now it is 35-40, with less expense. (One maund usually equals about 37 kg.)

13. **Pradeep, representative of Access Development Services:** This NGO is working with 600 farmers in 7 blocks. Yields which were formerly about 13 quintals per acre (3.25 t/ha) are 22 quintals per acre (5.5 t/ha) with SRI methods. The area is Marxist-controlled, so the NGO has had a tough time. Meetings there are banned by the government, but still, ADS is making progress in SRI spread.
14. **Chandrashekhar Jana, representative of the Tagore Society for Rural Development:** This NGO has 12 branches working in the states of West Bengal, Orissa and Jharkhand. SRI has become part of their income-generation program, starting in 2008 with 35.7 acres. Now there is a much larger area, 55.92 acres. Farmers have been made well aware of the benefits of SRI.
15. **Sumanta Kumar, World Vision-India:** WV-I started working with SRI in 2008, with PRASARI assistance, introducing SRI onto farmers' fields in its operational area at Malada district. This is an area where 68% of the population lack food security. Some SRI farmers are very successful, and they are knowing the benefits of the new methods.
16. **Shibion Murmu, a farmer belonging to the tribal community.** In his village (Pandua, Gazole block, Maldah district), just 3 farmers started with SRI in 2008. Before they usually got 6-7 maunds, but with SRI methods they are getting 13 maunds. This has built up local interest. After the first year, he increased the spacing between his plants, and he got 70-90 tillers per hill, with 50-60 effective tillers. He had a pest attack in his field, but still got a yield of 17.5 maunds. Then he got a 15 maund yield in a drought season. In the second season, 13 farmers used SRI, and in the third season, this number went up to 25 farmers, out of 50 in the village. These farmers are assisted by the NGO World Vision.
17. **Ms. Jui Gupta, from Trickle-Up:** She said that she worked formerly with PRADAN. This is the 8th year that Trickle Up has been working in India, Its program has been re-focused from business development to livelihood promotion, and SRI fits into this emerging focus very well.
18. **Jana, PRASARI project coordinator in the Sundarbans:** His program started work with SRI in this area in 2008 with one landless farmer. In 2009, the number increased to 152 farmers. Now in 2 blocks, there are 1,500 farmers using SRI. This work is supported by the Sir Dorabji Tata Trust. In another area, with NABARD support, PRASARI started working on SRI last year with 49 farmers; this year, there are 221 farmers. Jana commented that scientists for the Indian Council for Agricultural Research (ICAR) have said that it was impossible to get such good yields on this saline soil as are being reported with SRI management. But these results are correct, he averred.
19. **Accountant for PRASARI:** We didn't catch his name. He said that he has little field experience with SRI to report, but added that he helped arrange this forum for Banglar-SRI.
20. **Singoor, a male farmer** from Hoogly district: There are 650-700 farmers practicing SRI in the two blocks where he comes from, he said, noting that 'the SRI infection' is spreading. (In his opening comments, Norman had made a reference to SRI spreading 'like a beneficial infection' –Singoor apparently liked this metaphor.) Seven farmers have gotten outstanding results, he added.
21. **Chandan Rai, representative from Satmile Satish Club-o-Pathagar,:** This is an NGO working in the north of West Bengal. It initiated SRI work in 2009, getting support from NABARD and from IDE-I. The NGO's club and library are very popular, he said. The NGO is planning to develop 13 model villages for SRI production with NABARD funding.
22. **A representative from Jamgoria Sevabrata, an NGO in Purulia district:** SRI started here in 2006 with support from Trickle Up, involving just 2-3 farmers the first year. Then next year, the number went up to 50 farmers; then it reached 2,000 farmers in three year's time. This year they had expected to have still more farmers in six districts; but there was severe drought, so many farmers were afraid to try something new. The NGO was able to work with only 520 farmers this past year, but with good results. Also there are 300 wheat farmers used SWI methods for the first time. SRI and SWI are being integrated into all of the NGO's livelihood work.
23. **Dhananjay Roy from CDHI:** This NGO has been working in a northern hill region on health, education, and livelihoods since 1996, In highland areas, tea gardens compete for labor, which is a

constraint. In one area, SRI has gotten a good reception, but in another area there was some negative feedback because of labor constraints. 513 farmers are working with SRI already and getting good feedback. Rainfall is very heavy in this region, >3000 mm, so soils can become too saturated for good SRI results. Some rainfed, unirrigated rice is being produced in the area, so SRI methods are being adapted to this farming system.

- 24-25. **Girija Nandan Upadhaya and Mr. Somnath Nag, representatives of International Development Enterprises India:** IDE-I started with 500 farmers in five districts; now have about 6,000 farmers using SRI methods on 2,500 acres of land. SRI is especially successful in boro season. IDE-I is promoting the use of treadle pumps, which are usually appropriate with SRI.
26. **Sumarttya Ghosh, Manager, NABARD/Kolkata:** He introduced himself briefly, saying that he would report on NABARD's work when his turn came on the program.
27. **Banarjee, PRASARI:** Banerjee commented that when he first saw pictures of SRI rice, he thought to himself: 'Why can't we do this here?' PRASARI's SRI effort started with a single farmer; now it is working with 3,500 farmers in two regions, also working with improving mustard and wheat crops. PRASARI is working with Panchayati Raj institutions and has met with the Minister of Agriculture to get his support. But there are "still many miles to go," Banarjee concluded.
28. **Anibrata, representing the SRI-Secretariat that is supported and promoted by SDT in Mumbai:** This foundation has been funding SRI extension since 2007, starting with a grant of \$2.8 million for three-years. This supported NGO activities that made SRI available to farmers in targeted poor districts. The grant was renewed and doubled in 2010. **Banglar-SRI** is one of the organizations enabled in its SRI work by a grant from SDTT. It has now 163 NGO partners promoting SRI in the east and north of India across 11 states.
28. **Ms. Nandini Basu, Secretary and Director for Rural Development Associates:** This NGO is working with SRI methods in rice and mustard for sustainable food security and environmental management in two districts. "At first it was a struggle to introduce SRI," she said. But now 740 farmers are using the methods, and 414 are making vermi-compost. "We are very much satisfied with the methods."
29. **Dr. Amalesh Misra from PUPA:** This NGO works in the Sundarbans, where cyclones and flooding are a problem. Misra endorsed the self-help concept for SRI development, saying that the use of cash incentives has become a problem in India. This NGO works with farmers' knowledge to deal with salinity and water stagnation, which are major problems in its area. To deal with salinity, they keep water level at 3 inches and do not let the soil dry out. A training centre has been established.
30. **Dr. Thakur, Vivekananda College:** Thakur is an economist working with SDC, an agency in West Bengal doing action research. At first he couldn't believe it possible to get more production with less cost. This is hard for economists to believe. He commented that Green Revolution technologies are too costly for small farmers and are not applicable to their conditions. His group started working with just one farmer planting one line of young seedlings; once started, he continued to the entire field. Thakur underscored that this is a problem of 'paradigm shift,' having heard Norman speak on this previously. Since 2008, he has been working with ICAR in Bihar, having an interest in zero-tillage methods for using SWI. It has been difficult to get ICAR scientists interested in this innovation, even though farmers can get 15 maunds instead of their usual 10 maunds.

SDTT: After these introductions, there were reports from the main financial supporters of SRI expansion in West Bengal. The **Sir Dorabji Tata Trust** supports an SRI Secretariat for the eastern part of India based in Bhubaneswar, Anibrata said. SDTT's support for SRI expansion started in 2006 with just 2 agencies, one of them being PRADAN. In 2008, the Trust allocated 10.94 crore rupees (US\$ 2.45 million) to spread SRI work, based on initial good results. Then in 2010, another 23.91 crores (US\$ 5.35 million) was added.

All of the funding is directed to assist small and marginal farmers, through demonstrations, cadre development, policy advocacy, support of interaction among stakeholders, and promotion of further innovations, e.g., for implements. The number of farmers using SRI (and NGO partners) under SDTT grant support has grown significantly: from 11,000 farmers (2 NGO partners) in 2006, to 14,000 farmers (assisted by 5 partner NGOs) in 2007, and then 31,000 farmers (127 partners) in 2008. Further growth was to 65,000 farmers (101 partners) in 2009, and 59,300 farmers (143 partners) in 2010. The latter was a drought year which slowed the growth of SRI acceptance.

The severe drought conditions in 2010 slowed the program's growth because so many farmers were afraid to try new methods with such water limitations and uncertainty. However, those who did use SRI methods were rewarded. There are now over 160 NGO partners receiving SDTT assistance to support SRI work at the grassroots, in 109 districts across 11 states: Assam, Bihar, Chattisgarh, Jharkhand, Madhya Pradesh, Meghalaya, Manipur, Orissa, Uttarakhand, Uttar Pradesh, and West Bengal.

SDTT supports an **e-group** with 400 members: the **SRI India Google Group**. The Trust has also been developing a management information system (MIS) that can gather and pool reliable data, and it has supported multi-institutional alliances working with state governments in Orissa and Uttarakhand. Helping to develop and make accessible low-cost weeders and other implements has been a priority, and now efforts are expanding to wheat, finger millet (ragi) and other crops.

SDTT did an evaluation of participating households across seven states, considering the food security for households with 6 members and 0.33 acres of paddy land, needing 2.4 kg/day of rice for home consumption. Comparisons were made for 482 farms in the 2009 kharif season, where average yield has been 2.5 t/ha on these soils. Yield improvements achieved with SRI methods have added, on average, 89 days of food security per annum. SDTT is now cooperating with NABARD in SRI expansion.

NABARD: This report by Sumarttya Ghosh started by noting that NABARD, the **National Bank for Agriculture and Rural Development**, was created by the Reserve Bank of India in 1982. Its program has been evolving ever since. In 2008, a **Farmers' Technology Transfer Fund** was established, and it has been assisting farmers to take up SRI because of the increase that can be made in productivity with reduced groundwater depletion and lower costs of cultivation. NABARD seeks to create awareness of SRI, doing capacity building and providing demonstrations at field level, all the time encouraging stakeholder participation, involving Farmers' Clubs, NGOs, Panchayat institutions, and banks.

In West Bengal, there were last year 115 units receiving NABARD assistance, involving 5,630 farmers. Farmers have reported a great increase in their plants' tillering, 42-75 tillers per plant, with 25-52 effective tillers. As important, they have experienced a 10-20% reduction in their input costs. However, it has been learned that one season of guidance is not enough for most farmers. Accordingly, NABARD aims to provide multi-year support. It is NABARD's experience that one season of guidance is not enough for SRI to get established in a community, so it is prepared to support 2-3 years of NGO or other guidance for farmer groups.

The Bank is currently working with 767 groups in West Bengal, having 30,910 farmer members, spread across 17 districts. The number of agencies that it works with, or through, has expanded from 37 to 69, while the number of farmers has grown in one year from 5,360 to almost 32,000. A major problem in West Bengal is the prevalence of tenancy, and this legacy has created less trust of 'outsiders. On the technical side, getting farmers to accept SRI's spacing theory (very wide spacing between plants) is 'formidable.'

Expansion of SRI in the State: After the meeting, Norman made a chart based on the various reports on SRI uptake and expansion, added at the end of the report. PRADAN did not report at the meeting, so its results are not included. It first introduced SRI in Purulia district on the western edge of West Bengal, with 4 farmers in 2003. Based on good results, the number grew to 150 farmers the next year, and then to 2,000 farmers in the 3rd year. The number reached 7,000 in 2006 (see reports on this expansion posted on the SRI website: <http://ciifad.cornell.edu/sri/countries/india/inpradan406.pdf> and <http://ciifad.cornell.edu/sri/countries/india/inpuruliakh0607.pdf>). Since 2006, PRADAN's SRI work has spread into other states beyond West Bengal, especially into Bihar (Gaya district).

Considering just the reports of those who attended this Banglar-SRI meeting, it appears that apart from farmers in Purulia, SRI methods were not used much in West Bengal before 2008. IDE's report of 500 farmers using SRI methods in 2006 apparently referred to many other states. In 2008, however, there were **at least 1,200 farmers** using SRI methods in West Bengal, in addition to those in Purulia district, thanks to the efforts of many NGOs. This number was tripled in 2009, to **at least 3,700**. Then in 2010, this number tripled again, as the groups present at the meeting reported **over 14,000 farmers** using SRI methods. These were not all of the groups promoting SRI in West Bengal.

This expansion -- by more than an order of magnitude in two years' time -- was achieved with limited financial support and without government assistance, although the latter is now beginning. The spread has been spurred by support from SDTT, which has helped mobilize NGO activity in many areas of the state, and from NABARD, which is now expanding its financial commitment for SRI activity. So, there should be more rapid spread from now on.

Farmer Reports: Optimism based on such numbers was reinforced by the more 'qualitative' reports from farmers who attended the meeting. After the donor agencies' reports, they were invited to make more extended reports to the group on their respective SRI experiences.

1. **Male farmer (50+ years):** When he started with SRI, people said he was 'mad.' But after 10-12 days, people started to change their attitude and began accepting SRI once they saw the young plants growing so well. His plants reached 45 tillers, with 32 fertile tillers. Now he is practicing SRI on 1 hectare. Finding skilled labor for using the new methods is difficult, but now the laborers are adapting and learning.
2. **Male farmer (40s):** When he first tried out SRI, his wife was upset, and neighbors asked him what he had done to 'spoil his field.' But after 15 days, they started to see vigorous tiller growth, reaching 40-50 tillers per plant, and even up to 90 tillers. The first year he got a yield of 13 maunds. When people saw his threshing results, they started to acknowledge his success. His wife was also happy, as their own production went from having only enough food grain for four months to double this. . The next season, he took it as a challenge to do better, and he produced 17 maunds. Before he could produce enough food for his family for only 3-4 months a year; now they have food security for 7-8 months. The third year, he got 15 maunds. Now in his village, 25 of the 50 families have adopted SRI. When he had a pest attack, he used 'effective microorganisms' and bokashi (organic soil amendment) which seemed to give the protection needed.
3. **Male farmer (about 35):** He learned about SRI from a meeting, at which he and two other farmers decided to try SRI, even though it was late in the season. People laughed and said: 'You'll get only straw,' i.e., no grains. But he kept on, and even though he started late, his plants started to mature

more quickly than usual. When the temperature declined, SRI panicles developed even so, whereas with traditional practices, no panicles would form at this stage with such low temperatures.

[Norman commented that in Nepal in 2006, it was calculated, from results of over 400 farmers, that SRI rice crops matured 16 days earlier on average; that same year, some researchers at ANGRAU, the state agricultural university in Andhra Pradesh, found when there was an unexpected cold spell-- with air temperature dropping below 10°C for straight five days-- SRI yield was unaffected; it gave a yield of 4.2 t/ha, whereas the control plot with conventional practice yielded only 0.2 t/ha.]

4. **Women farmer (40):** She cultivates rice on leased land, not having any of her own. She learned SRI from the Jeevika program. The first year she encountered a lot of social problems, with some pressure from home and from neighbors not to do this. Some people told the landowner that she was 'spoiling' his land, but fortunately he did not evict her. The climate was not good that season, including hailstorm, but she was able to harvest 2.5 bags of paddy when ordinarily she wouldn't have gotten anything. The next year, she leased 1.5 bighas of land. When she and other SHG members were criticized, they took this as a challenge to succeed. Instead of a typical yield of 20-22 bags, she got 27-28 bags at harvest time. She said, 'my husband was not with me at first, telling me that he would move out if there was not gain.' However, there is now agreement on SRI. She said she is able to transplant properly just by sight, not needing a marker to achieve regular spacing.
5. **Male farmer (30-35):** When he was first asked to use SRI, he could not use the inputs recommended (neem cake, etc.), so he tried the methods without these inputs but he did the recommended weeding. He used the new methods on 2 katthas of land (20 katthas = 1 bigha) and had plants with 65-70 tillers, with a quintal of yield. Next season he used SRI methods on all 5 katthas of his land, where he used to get 11-12 bags, he got 15 bags. At first, the new methods took considerably more time; but now transplanting takes less time than traditional methods. For his area, he recommended keeping the soil with a thin layer of water on it for the first 15 days, up to the first weeding. After that, the soil can be dried intermittently. (This would be sensible if his soil has high clay content.)
6. **Male farmer (40):** When he first heard about SRI, he liked the idea and thought it could be done. He learned about SRI from a demonstration field. Initially 100 farmers were ready to try out SRI, but there were some drop-outs. Farmers said: let's do it, but then certain problems with water or with transplanting discouraged some. A few farmers have become experts in transplanting, and their group does the transplanting for all of the fields. Where yields used to be 13-14 maunds, with SRI management the yield is 18-19 maunds. They are also making some innovations to combine SRI with prawn culture in the paddies to earn supplemental income.

Next, **Erika Styger** and **Muazzam Husain** gave short presentations on SRI experience and expansion in the very arid country of Mali in West Africa and neighboring Bangladesh, respectively, sharing some of the insights gained in those countries. These countries represent very different, almost opposite, kinds of agroecological environment, showing how versatile SRI methods are for different agricultural settings.

Then **Marguerite Uphoff** was invited by Saikal to add her own observations, having been described by Norman in an email as 'the first person to concur in my belief in SRI.' She expressed her appreciation for all of the efforts being made to bring knowledge about the opportunities of SRI to a growing number of farm households in West Bengal. Adequate food and nutrition is the basis for life, from our birth throughout our lives. It was impressive to see such a variety of organizations involved in this effort, and to hear from farmers about their experiences and how their lives could be improved by this innovation.

Challenges: Norman's assignment on the program was to respond to what he had heard from others and to comment on challenges for the **Banglar-SRI** partners. He commented on how impressed he was with the recent outpouring of activity and initiative in West Bengal. It was one of the first states in India to use SRI, through PRADAN's initiation in Purulia district. But overall, West Bengal is starting later with SRI than some other states. However, organizations and farmers in West Bengal are now making up for lost time.

Support from SDTT and NABARD is creating a very different and more favorable situation for SRI expansion than in the neighboring country of Bangladesh, where SRI efforts have been resource-constrained. Also, there has been resistance from some rice scientists in the Bangladesh Rice Research Institute. Even with funding support available, impact and success will depend on having a network of informed and energetic partners such as are coming together in an active, inclusive **Banglar-SRI** to make the most of SRI opportunities (and those of SWI, SCI, etc.). SRI is a very human enterprise, with people's ideas, ideals and friendship contributing to success, so it is not just a technical/agronomic intervention.

Norman addressed some of the things that have been reported by farmers, NGOs and others as 'bottlenecks' for SRI expansion in West Bengal and offered some suggestions, in no prioritized order:

- **Skilled labor**, knowledgeable and careful in using SRI techniques, is often not available. Some of the reluctance of agricultural laborers to follow SRI practices, at least for the prevailing wage, appear to resent that landowners should get all of the productivity gains of the new methods, and laborers get nothing more. NGOs and government agencies could provide SRI skill training for agricultural laborers, and could give those who have mastered the techniques a certificate entitling them to a higher daily wage (perhaps 25% more), in recognition of their greater skill which would surely add to the landowners' net income.
- **Price for quality rice:** Since the quality of SRI paddy rice is higher – outturn of polished rice, after milling, is 10-20% higher from a given amount/volume of SRI paddy, and SRI rice is generally reported to have better eating qualities – millers should be paying at least a **10% premium per bushel or per kilo** of SRI paddy. Farmers who produce this higher-quality rice should get much or most of the value they are adding. A premium price can be justified, but it would need government or other measures to institute it. This would be a tremendous incentive for getting farmers to adopt SRI methods, if they receive a higher price per unit of output as well as having more output.
- **Weeders:** Having access to good-quality, well-made, well-designed **weeders** is a major bottleneck. The extra mechanical weedings recommended or required for SRI production are 'self-financing' in that they add much more to the yield, and resulting income, than the cost of procuring the weeder. NGOs or government should have competitions to elicit and then evaluate the best designs for weeders – and not just a single design, but several that are best suited to different soil conditions, to women vs. men, etc. – so that farmers have good choices. If weeders are made privately, there can be competition to give farmers better design, more durability, greater quality, etc. If farmers do not have the ready cash to buy weeders outright at the start of the season, they should be able to enter into a hire-purchase agreement with a dealer, paying 20% down – to get temporary ownership and use of the weeder – with the balance due after harvest, when the farmer has ample cash on hand. The weeder more than pays for itself within one season. So NGOs and governments should work out arrangements with banks or other financial sources to ensure that farmers have access to good weeders.
- **Extension approach:** This should enable farmers to feel and to take '**ownership**' of SRI, making their own adjustments and fine-tuning. As much as possible, extension staff should recruit and utilize the most talented and motivated SRI farmers to communicate its methods and advantages, as well as its

possible pitfalls and ways to solve problems, to fellow farmers. The extension personnel, whether government or NGO, should see themselves as working with or for farmers, not as transferring technology to farmers whose choice is to adopt the new technology or not.

- **Guarantees:** Because it is possible that farmers in their first year may not use the methods successfully, and because at first farmers may be put off by the apparent fragility or vulnerability of young seedlings, it may be advisable to have some kind of **crop insurance scheme**, guaranteeing to farmers who use SRI methods as recommended will get at least the same, if not higher, yield. This way the family's food security is not jeopardized. When such guarantees have been made, there is virtually no need to pay anyone because SRI so reliably raises yields. But as with any biological innovation, it may not follow exactly the anticipated plan. Sponsoring agencies can give a big boost to SRI acceptance by reducing the risk which is necessarily preoccupying farmers' concerns.
- **Organic matter:** One of the constraints for SRI utilization is the **availability of biomass**. Even though there is high population density in West Bengal, as in Bangladesh, and there is little unutilized arable land, farmers should be innovative in growing and/or acquiring biomass from non-arable areas. Better tools, implements, carts, etc. should be developed for collecting, transporting, processing and applying compost and mulch to paddy fields.
- **Raised beds:** Where flooding is a problem, particularly in kharif seasons, farmers should be encouraged to experiment with these, to create better-aerated soil for plant root zones when soil is generally saturated and even flooded. Norman described a **mechanized no-tillage version of SRI** with mechanically-made raised beds and also powered implements for facilitating transplanting, applying organic fertilizer, weeding, etc. The methods, described on the SRI website: <http://sri.ciifad.cornell.edu/countries/pakistan/index.html#MSRI> reduce water requirements by 70% and labor also by 70%.
- The higher productivity with SRI intensification is being used in Cambodia for **diversification** of farming systems in Cambodia: <http://sri.ciifad.cornell.edu/countries/cambodia/cambSidMPREng.pdf> One of the themes of SRI is to 're-biologize' agriculture, capitalizing on agroecological dynamics.

Group Building: There was less time remaining for small-group discussions at the end of the day than had been planned. But some time was devoted to such interaction, with reports back to the plenary. There was agreement that the kind of **broad coalition** of partners which Banglar-SRI brings together should be strengthened and should have more formal organization. A steering committee of half a dozen representatives of some of the most active members has been guiding Banglar-SRI, setting up meeting with officials, organizing get-togethers, etc. There was no agreement on what and how formalization should occur, but the steering committee of stakeholders will meet to propose concrete measures for this, and agreement should be reached on assignment of responsibilities.

There is need for **financial support** of this enterprise, not in competition with members but to give more support to members' efforts, by sharing experience and knowledge, by engaging in collective problem-solving, and by interacting with policy-makers and administrators, journalists, and others to gain broader understanding and appreciation of the opportunities which SRI is opening up for West Bengal, particularly its small farmers. It was agreed there should be discussions with SDTT and NABARD as well as the Department of Agriculture about putting some financial base under Banglar-SRI as a platform for expanding grassroots work and policy dialogue on SRI.

There is need to gather **more extensive and more comparable data**, to add weight to the presentations made to government and private agencies, and to the public in general, and the media in particular. Also, farmers are asking for access to more and more appropriate **implements** for SRI. Agencies like SDTT and NABARD could help with holding competitions for best designs, with farmers making thorough

practical evaluations, and possibly with schemes for subsidization or hire-purchase acquisition. This is a subject area where IDE-I has some experience and comparative advantage. Farmers need implements, especially weeders, that are well-designed, well-built and affordable if SRI is to be more widely utilized.

The meeting ended several hours after scheduled to conclude because there had been so much to discuss and so much discussion. Votes of thanks were given, and participants dispersed to their homes, many far from Kolkata. That evening we had dinner with **Dr. Raji Gain**, head of NABARD's Natural Resource Management Centre based in Kolkata. She has been following SRI developments very closely on behalf of the Bank and has already supported a number of SRI initiatives. She also came to Delhi to participate in the national roundtable on March 3.

Field Trip to the Sundarbans (February 27)

On Sunday morning, Saikat Pal picked up, Erika, Norman, Marguerite, and Muazzam Husein to drive to the Sundarban area, south of Kolkata, the huge delta area for the Ganges river where it fans out to enter the Bay of Bengal. This area is known for its natural disasters and poverty. Flooding is an annual occurrence, varying only in severity, matched at other times of the year by cyclonic damage from wind, rains and, again, flooding, since the area is very low-lying. Because of the high salinity of the soil, crops are low, contributing to the poverty.

We drove two and a half hours, to the coastal town of Gosaba, stopping to enjoy a packed breakfast snack along the way. From here we took a ferry boat across several hundred meters of water to get to an island, which is often flooded seriously by seasonal events. We were met at the landing pier for the village of **Shambhunagar** by a large delegation of farmers, some blowing conch shells to make the mood festive, and proceeded to a small office at which PRASARI's operations in the area are based (Picture 1). After a half hour of greetings and some Q&A, we climbed onto a motorcycle-drawn wagon that chugged along a raised road for 20 minutes, until we came to a hamlet within the village.

Previously, we had received at Cornell from PRASARI a charming story of the experience of the first farmer in his area to practice SRI -- **Paresh Das**. The account of his experience is included at the end of this report, pages 19-21. Saikat had not told us that we were going to visit Paresh Das and to meet his wife, who had initially opposed his trying out SRI, as explained in the report, so this was a nice surprise.

Paresh and his wife Kalpana operate a tea stall (snack bar) across from the village school, and because it does not generate enough income for them and their four daughters, Paresh rents land in the main season each year to support the family. It was a great pleasure and great privilege to have lunch with them in this tea stall which we had read about, enjoying freshly-made *parathas* (a puffed-up bread, round like the flat naans which are fried rather than cooked on boiling vegetable oil), accompanied by potato (*aloo*) curry (Picture 2).

One sad thing that we had not known before was that Paresh – because he is a landless renter -- was having to change his SRI field every year. Landowners, when seeing his great productivity with SRI methods, took the land back for their own use the next season. So he was having to start over each season to build up the soil's fertility with organic matter and aerobic irrigation management. He was thus not getting the full benefit of his land stewardship because when SRI is practiced for a number of years, the build-up in soil fertility raises yields further.

The first year, he told us, neighbors who were skeptical about SRI methods went to the landlord and told him that Paresh was 'spoiling his land.' Paresh said it took some persuasion to get the landowner to let him continue. Since there was a sharecropping arrangement, of course, the landowner also benefited from the increase in production. Now nobody is questioning that new methods raise productivity, but that only means that other landowners are willing to rent to Paresh, expecting their soil fertility to also be improved.

After lunch, we went to see Paresh's current rice field, his sixth in as many seasons (Picture 3). He said that five-sixths of the farmers in his village are now using SRI methods, and there is no doubt about the merits of SRI. They know, however, that SRI does require more precise management and regular attention to the needs of the crop, at least if one wants to get the most benefit. Not all farmers are able to make this investment, even if it would pay off. Many have to take employment outside the village to keep income coming in for their household. If they could avail themselves of loans for consumption purposes at a reasonable rate of interest (usurious rates are the current norm), they could begin to get themselves out of debt bondage.

Then we reboarded the motorcycle rickshaw (conveying 10 persons) and drove almost half an hour to visit an elderly farmer who has been the innovator with SRI methods for mustardseed (also known as rape or canola). His magnificent full beard was overshadowed only by the huge mustard plants he was growing (Picture 4). This was his first year with the new methods, but he was very optimistic of getting at least doubled yield. The following day, in Bihar state, we visited a farmer who showed us even larger plants and reported SCI mustardseed yield of 3.3 t/ha, compared to the usual yield of 1 t/ha (Picture 5).

[Six weeks later, we received an email from Anil Verma, the PRADAN team leader in Gaya district of Bihar, which said: "Dear Norman, A government delegation consisting of government officers and a specialist measured the yield of rapeseed [on a farmer's plot grown with SCI principles and practices]. The yield came out to be 4.8 t/hect. The existing yield is only 1 t/hect. The government is quite excited about this. The Agriculture Production Commissioner has visited rapeseed and wheat done under SCI/SRI. A large number of officials are now visiting wheat and rapeseed plots. Regards, Anil."]

This elderly farmer's field was deep into Sundarban area, near the Bay of Bengal, so it was a long way back to the Kolkata airport to board a flight to Patna in Bihar state late in the afternoon. During our return trip, Saikat reported that Indian Council for Agricultural Research (ICAR) rice experts had said that it not possible to get such high paddy yields as PRAGATI was reporting from the Sundarbans on these saline soils. Yet the yields are being measured and calculated with standard methods, and the yields measured from neighboring conventionally-grown fields for comparison are consistent with official measurements. That the use of SRI has grown from 1 farmer in 2008 (Paresh Das) to 1,500 farmers this year lends credibility to the results being reported.

We felt badly not to have more time in West Bengal, as there is a lot of initiative and enthusiasm based on impressive results in the field. Institutional support is coalescing to take advantage of these opportunities. From Kolkata, we went to Bihar state for three days where the government sponsored at National Colloquium on SCI, to consolidate experience and advance shared learning. After the day trip to the Sundarbans, that evening we traveled from Patna to Gaya, where the next morning we had a special guided tour of the Mahabodhi temple complex at Bodh Gaya, a World Heritage site to start the day, experience the place where the Lord Buddha attained his Enlightenment some 2.5 millennia ago.

The next two days of field visits in Gaya and Muzzafarpur districts showed how SRI, SWI and SCI are rapidly expanding in Bihar, the number of SWI users going from 400 in 2008 to almost 50,000 in 2010, an unprecedented expansion. The state government has set a target for SRI expansion in 2010 of 350,000 hectares. West Bengal is not yet on this fast-track, but Bihar is only about two years ahead of West Bengal in terms of SRI introduction (2006), so we will see in the next few years how rapidly these two states, and others in India, can capitalize upon the opportunities created by SRI knowledge and practice.



1: Village meeting in Shambhunagar; Erika is not seen in these pictures since she was taking them.



2: Paresh Das and Kalpana Das in the middle of their tea stall, with Saikat Pal in back, while Norman and Marguerite partake of Kalpana's puris and aloo curry.



3: Paresh Das's SRI current field on right, standing in center with Saikat on left and Norman on right.



4: Elderly farmer in Sundarbans holding mustard plant grown with SCI methods from single seed.



5: Dr. O.P. Rupela, retired senior scientist with ICRIASAT, standing in front of SMI mustard field in Bihar.

Rough estimate of expansion of SRI use in West Bengal, from reports at *Banglar-SRI* meeting, 2/26/2011, not considering PRADAN expansion of SRI in Purulia district

Farmer/Organization	2008	2009	2010
2: Nadia Welfare Society	2	NA	200
4: Madaripur Welfare Society	35	NA	600
5: Farmer from Urupunia	135	NA	300
8: Ambuja Cement Foundation	10	NA	1,250
12: Farmer's cooperative	4	NA	200
13: Access Development Services			600
16: Farmer from Bandua	3	13	25
17: PRASARI – Sundarbans	1	152	1,500
17: PRASARI – Northern WB		49	221
20: Farmer	1?	NA	600-700
22: Trickle-Up – Purulia	50	1,000	2,500
24: Intl. Dev. Enterprise-India	1,000+	2,500+	6,000
Sum of the above reports (not complete)	1,240+	3,714+	14,096+

OVERVIEW OF SCHEDULE IN INDIA FOR ERIKA STYGER AND NORMAN UPHOFF:

February 20-23: Field visits in Bihar state by Erika Styger, hosted by the NGO *ASA*; these focused on the **System of Wheat Intensification (SWI)**, which is gaining recognition and achieving remarkable impacts.

February 24-25: International Symposium on ‘Systems Intensification towards Food and Environmental Security,’ held at BCKV in Kalyani, 2 hours north of Kolkata in West Bengal state, attended by Erika and Norman, who made a keynote presentation on the 25th, following a field visit to nearby SRI trials on the 24th. This BCKV event was attended also by Marguerite Uphoff and many SRI colleagues.

February 26: State-wide meeting of Banglar-SRI, the network of SRI partners in West Bengal, held in Kolkata; attended by Erika, Norman, Marguerite, and also Muazzam Husain, chair of the **Bangladesh SRI National Network**, and by representatives of Banglar-SRI’s 31 organizational members.

February 27: Field trip to the Sundarbans in West Bengal’s delta area adjoining the Bay of Bengal, to meet with farmers practicing SRI and SCI methods applied for mustard (rapeseed), to see their crops and to learn from their experience; trip was organized by the NGO *PRASARI*.

February 28: Field trip to Gaya district in Bihar state, one of the poorest parts of India, to meet with SRI and SWI farmers, mostly women, and to learn about their experiences, also with other crops (SCI); Erika, Norman and Marguerite were joined in this trip by Sue Edwards, director of the **Institute for Sustainable Development** in Ethiopia, which is working with African farmers on various applications of SCI; trip was organized by the NGO *PRADAN*.

March 1: Field trip to Muzzafarpur district in Bihar state, which has more favorable ecological conditions (less drought), but as much or more even poverty because of landlessness and flooding, to meet with farmers engaged with SWI and SCI. Because this was still in the winter season, there was no SRI rice crop to be seen; trip was organized by the **Bihar Rural Livelihoods Promotion Society (BRLPS)**.

March 2: National Colloquium on System of Crop Intensification (SCI) held in Patna, and organized by the *BRLPS*, which was our host for the visit to Bihar on behalf of the State government.

March 3: Meeting of the National SRI Consortium in New Delhi; this was hosted by *IARI*, the **Indian Agricultural Research Institute**; discussion focused on how to get support for SRI, SWI and other extension included within the **12th Five-Year Plan** currently being prepared by the Government of India’s Planning Commission.

March 4: Afternoon meeting with the leadership and some staff of the NGO *PRADAN*, which has pioneered SRI in West Bengal, Bihar and half a dozen other states of India. That evening, Norman, Marguerite and Sue returned, respectively, to the US and Ethiopia, while Erika continued her visit.

March 5-9: From Delhi, Erika went to **Orissa state** to visit a number of SRI partners there, participating in a meeting of that state’s **SRI Learning Alliance** on March 7th at Xavier Institute of Management in Bhubaneswar (XIMB).

March 10-14: Erika then visited SRI partners in **Tamil Nadu state**, hosted by the IAMWARM project unit of **Tamil Nadu Agricultural University**.

**A Case Study from the Sundarban Delta, West Bengal: Paresh Das's Field –
From System of Rice Intensification (SRI): Status Report, to November 2009, prepared by
PRASARI, Kolkata, 2010, for *Banglar-SRI*, Platform for Promoting SRI in West Bengal, India**

Paresh Das lives with his wife and four daughters in Shambhunagar village of Gosaba Block in the Sundarban delta, in South 24 Parganas district of West Bengal. He runs a tea shop which hardly secures 6 months of food for him and his family. Taking land on lease for rice cultivation is thus a necessary practice to enable the family to manage food for their remaining six months. His wife, Kalpana, is a member of a women's self-help group (SHG) promoted by a local voluntary agency, Shambhunagar Sarbik Manunnayan Samity (SSMS). Kalpana and Paresh began practicing SRI together for the second season in 2008-09 after they had experimented with the new methods in the summer season 2008. Here is Paresh's story about SRI:

When I started with the new methods, people started calling me Paresh pagal (Mad Paresh), but I have proven these people wrong. My name is Paresh Das, and I am owner of a small tea shop in front of the Shambhunagar High School. My parents left me when I was eight, and I owe my entire presence to the late Mr. Nandalal Banerjee, our neighbor under whom I was brought up and from whom I learned about agriculture. I constructed my home with the help from the Banerjee family, and gradually I started the tea shop at my home. Income from the tea shop does not suffice to meet the basic requirements of my family, however. Hence I have always to take agricultural land on lease from big farmers. Not only the land must be rented, but fresh tank water for cultivation in the summer season has to be purchased in advance too. This is how I have to run my family affairs.

Goutam, who figures prominently in Paresh Das's story, is a local boy who has been voluntarily working for SSMS for the last ten years. He and his SSMS colleagues have made a huge contribution to local welfare by promoting and nurturing 87 women's SHGs in the adjacent villages. Goutam attended an SRI training programme at Kultali in South 24 Parganas district. The training programme was organized and facilitated by the NGO PRASARI for representatives from eight NGOs operating in three districts of West Bengal. What Goutam learned in that training programme created a lot of impetus in his mind. He was quite convinced that the technique has the potential to give at least doubled return of rice in the Sundarban area.

Bubbling with his new learning, Goutam floated the concept in Paresh's tea shop one evening. People were literally laughing at him. But he did not give up hope and finally was able to convince Paresh a bit. The next morning, Goutam again met Paresh, who strongly refused the proposition of adopting SRI on his field. Goutam was willing to shoulder the risk himself and told Paresh: *"If you get a lesser harvest through SRI, I will pay you the amount equivalent to the yield that you used to get in other years. Also, I will arrange another Rs. 1000 to pay for the cost of the lease."* This was persuasive enough that Paresh was ready to test the new techniques on 10 decimals of land, planting the first SRI seedlings in the soil of Sundarban.

Paresh says: *Last summer I started a mysterious rice cultivation practice on my land. Initially this prompted my neighbors to call me mad. Admittedly, when I first heard of the details of the SRI*

technology, I was pretty skeptical. However, my own analysis suggested that it may be practically possible. So I decided to put SRI in place on 10 decimals of land.

However, when I discussed the matter with my wife, she refused and reacted very strongly. She said that planting a single seedling with such wide spacing can never produce any yield, and she objected that gambling with staple food supply is not acceptable for poor families like us. I was literally cornered within my own family and at odds with the village itself. The challenges and comments from the people around me made me angry and eager to jump into the practice.

Paresh had to encounter a lot of objection from his family and the neighbors when he planted a nursery using only 400 grams of saltwater-tested seeds [this method of seed selection ensures that only dense, well-developed seeds are used]. The nursery bed was 20ft x 4 ft. With the nursery growing nice and green, however, comments from other people were still tolerable. But the peer environment became worse when he transplanted single seedlings at intervals of 1 ft (30 cm). The women engaged for the transplanting were very skeptical. They were not prepared to transplant single seedlings of such a young age. It took a lot of convincing and supervision to get this done, according to Paresh.

In Paresh's own words: Those 12 days after I had I transplanted the single seedlings were the worst part of my life. In the initial couple of weeks, at least 10 times I thought of replanting the field with the conventional method. My wife who has shared with me all the pains of poverty all throughout our lives even stopped talking to me. For the first time in my life, I was afraid of a drop-off in the customers to my tea shop.

My wife never visited the plot until 15 days after the SRI transplantation (15 DAT). However, during these 15 days I used to visit my plot every night when nobody could see me nurturing the plants. To my great surprise, after 15 days the plants started behaving differently. Distinctly I could observe that the vigor of the SRI plot was better than with the conventional practice beside it. I saw this and started thanking God for the blessings. But I did not dare to share this feeling with my wife. Still, I started believing that this rice crop can really grow.

One day -- I think it was 20 DAT -- I requested my wife to provide the irrigation to the SRI plot. I told her, 'I am not well today. Can you do me this favour?' She responded there was no point in putting further money and labour into that plot. But finally she agreed and left for the SRI field. Almost immediately, at most after some 15-20 minutes, she came back very excited and shouting in joy. 'Have you seen the field? It has got miraculous growth. It is astonishing. How can there be more than 10 tillers from a single seedling?' I could not control my tears at that point of time.

The game started since then. Every day I paid a visit to my field and could see more and more tillers. Gradually I discovered people were commenting favorably on the SRI plot, and were paying more visits to my plot than me. As the crop was growing, many a times I felt like applying urea and NPK to enhance its growth, but there was very strong recommendation from Goutam not to apply anything apart from 20 kgs of mustard oil cake and 6 bags of cow dung.

At the end of the season, the plot ended up having on average 40 tillers per plant, as compared to the 10 tillers with conventional practice. It became a topic of discussion in the village. What is miraculous in the new technique? What produced the 240 kgs of rice instead of 115 kgs that people are used to getting through the conventional system? How could Paresh get doubled yield using such a minimum of nutrients, instead of the conventional 20 kg of NPK (10:26:26) and an added dose of 10 kg of urea which generally farmers use for this same size of plot?

I feel proud whenever unknown faces come up to me and ask: 'Paresh, how could you do this?' I never thought Paresh would become a known name in the area, even as a farmer, Paresh said. This kharif season (2009), there are 152 farmers practicing SRI across the Shambhunagar Gram Panchayat with field support from PRASARI and financial support from the Sir Dorabji TataTrust.

Paresh concludes his story: *In this kharif, I have done SRI on 2.5 bighas (83 decimals) of land and am expecting a return almost equal to that I could previously get from 5 bighas of land that I take on lease. From this time onwards, I don't need to approach multiple farmers to take a larger area on lease. I have booked the freshwater for next summer to practice SRI again. Smiling, Paresh confides: The best part is that my wife is with me from day one in this kharif season.*