

HIGHLIGHTS OF TRIP REPORT OF VISIT TO SRI LANKA, DECEMBER, 2003 REVIEWING PROGRESS WITH THE SYSTEM OF RICE INTENSIFICATION (SRI)

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Thanks to an opportunity provided by the Asian Productivity Organization to spend 9 days in Sri Lanka, serving as a resource person for an APO regional seminar on community-level infrastructure, I was able to get updated on progress with SRI in this country, where the first evaluations began in 2000, and as many as 8-10,000 farmers may be using SRI methods by now.

Support for this spread has been given by Dr. Gamini Batuwitige, presently the director of a World Bank-funded project for poverty reduction and formerly an Additional Secretary of Agriculture, with assistance from many colleagues, some through the Mihidiya Foundation. Community Aid Abroad (CAA), the Oxfam affiliate in Australia, has an active program in Sri Lanka which has taken up SRI as one of its main program initiatives. ADRA, World Vision, CARE and other NGOs are also getting involved, as seen from the reports below.

On December 22, a national seminar on SRI was held in Colombo, with about 100 participants. A summary report on that event is provided below, as well as on a field trip December 14 to meet with farmers using SRI, some for 3-4 years and some just beginning. Some of the points of main interest, elaborated in the reports below include:

1. A new method for crop establishment that **may greatly reduce the labor requirements for SRI** was reported by a farmer in Mahaweli System H, very similar to a method described to me by a Tamil Nadu farmer in September.
 - Instead of transplanting young seedlings in a square pattern, this method **broadcasts germinated seed**, with a seeding rate of 25 kg/ha, and then digs up most of the plants during a first weeding at 15-20 days, to create a square pattern of plants 'retrospectively.' Seeds are broadcast just densely enough to have one or at most two plants at the intersection of rows spaced 25-30 cm and running perpendicularly.
 - The Tamil Nadu farmer broadcast young seedlings rather than pregerminated seeds, but reduced the crop population by the first weeding which left just a few plants standing in the desired square pattern. This practice 'costs' 4-5 times more seed, but it saves the labor of making a nursery and of transplanting. This may be one way to get the benefits of SRI principles and practices in large-scale production.
2. Farmers are making numerous innovations in the **design of weeders**. We need to collect pictures and technical drawings to share through the SRI home page. The farmer who is making the above innovation in crop establishment has already built a **motorized weeder** that helps him speed up weeding operations, and make them less onerous, on a 5-acre field. (see picture and description at <http://ciifad.cornell.edu/sri/ariyatneweeder.html>)
3. The observation made in other countries, that SRI trials tend to give **lower yields of research stations than on farmers' fields**, was supported by a report that yield on replicated SRI plots at Batalagoda research station averaged 3.8 t/ha, while farmers in the same district were

getting 8 t/ha on their fields. This disparity deserves systematic investigation; the hypothesis is that SRI practices create significant differences in soil flora and fauna.

4. Now that there is a cease-fire in the conflict between the Sri Lankan government and the separatist LTTE forces, CAA is **taking SRI to Tamil farmers** who have been cut off from the rest of the country by years of ethnically-defined conflict. For many reasons, we hope that the methods will be very successful for them.
5. With local leadership and good results, SRI can be expanded to **cover whole irrigation tracts**, as seen Thulhiriya. Also, with capable use and good results, SRI can help farmers get out from under **debt bondage** due to the higher yields. This was seen from the field visit.
6. A young farmer group using SRI in part to **conserve rice biodiversity**, because they can get very good yields, 5-7 t/ha using these methods with traditional landraces, reported that it has now exported 17 tons of 'wild eco-rice' to Italy. The farmers get about twice as much income per kg for this rice which qualified as organic and has desirable taste, aromatic and other qualities.
7. One of the main rice pests in Sri Lanka is the **paddy bug**. It has been found that if the flowering of the rice crop coincides with the moon's dark phase, the bugs are less active at that time and do not infest the crop very much. There is even less infestation if the climate is cool and windy during flowering. For the main (maha) crop in Sri Lanka, this means that farmers should plan to have their rice flower during the dark moon phase in January. Depending on the maturation required for the variety they are planting, they can 'count backwards' from that date and determine the best date to sow their nursery to minimize paddy bug damage. This is a very straightforward and understandable 'IPM' practice to support SRI.
8. Since it was introduced in 2000, there has been resistance to and vocal criticism of SRI from some of the leading government rice researchers. This seems to be subsiding, however, as both the Minister of Agriculture and the Secretary are more openly supporting the trying out of SRI methods. Also, the new Director-General of the Department of Agriculture, who happens to be a Cornell alumnus, says that he wants to see a more open-minded view of SRI, seeking to determine what benefits if any it can bring to Sri Lankan farmers. Since we have often found SRI yields to be about double former yields, this should prove very beneficial, especially since water shortages are getting more severe in Sri Lanka, and farmers are finding that SRI methods can 'drought-proof' their rice crop.

REPORT ON 2003 SRI LANKAN NATIONAL SEMINAR ON SRI

A national seminar on the System of Rice Intensification was held December 22, 2003 in the auditorium of the Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) in Colombo. It was organized by Dr. Gamini Batuwitige, who has been spearheading the spread of SRI knowledge and practice in Sri Lanka. HARTI made all of the logistical arrangements. About 100 participants came from all over the island, about half farmers using or interested in SRI, and the rest NGO staff, researchers, university faculty, government personnel, and interested individuals. The Minister of Agriculture, the Hon. S. B. Dissanayake, had planned to come to inaugurate the meeting, but a meeting with the president that morning preempted his time. The Secretary of the Ministry, *Dhanasena Hettiarachchi*, came for most of the meeting.

During registration time, I met several staff of the NGO Community Aid Abroad (CAA), the Australian affiliate of OXFAM, who are now promoting SRI in Sri Lanka, including in certain Tamil areas in the east that are still under LTTE control. SRI is one activity that 'the Tigers' permit behind the current cease-fire lines. I talked with a university student whom CAA is supporting to carry out an island-wide *survey of SRI users*. When I expressed concern about the length of the questionnaire that she showed me, she said she has been getting good cooperation from most farmers in completing it. Her data should be analyzed and available by the end of January.

Prof. Punchihewa from Ruhunu University at Matale in the south of the country had come with half a dozen of his students. One of them is studying the effects on *soil fauna*, particularly collembola (better known as springtails), as an important part of the soil food web enriched by SRI practices. The professor was carrying a *lightweight weeder* that he has designed and built with wire 'fingers' mounted on a hollow metal drum which turn up and aerate the soil. He said this weeder is easier to handle than most now in use, though it is not so suitable for heavy soils. It was put on display along with other weeder models that Gamini had brought.

Ariyaratna Subesinghe, a farmer from Hingurakgoda in the north, showed me a picture of a *motor-powered weeder* that he has designed and built himself for use with SRI. It is driven by a small motor that he can get from China for about 35,000 rupees (\$350). The whole machine can be built and sold for \$750. Since he cultivates 5 acres of SRI, he feels that a need for some mechanization. He gave me a picture of the weeder to put up on the SRI internet home page.

A young farmer whom I had met in January 2002 came up to tell me how his ecological-agriculture group has expanded its *exports to Italy* of what they call 'wild eco-rice' to 17 tons. The traditional landraces they are growing with SRI methods are certifiable as 'organic' so they earn 65 rupees/kg, compared with the more regular price of 30 rupees/kg. The group says it practices SRI for more than profit as it is seeking to preserve traditional rice varieties, which have superior taste, texture, keeping and other qualities, and hereby to maintain rice biodiversity. The higher yields that SRI makes possible make these varieties more profitable than growing high-yielding varieties. (W. M. Premaratna, the Sri Lankan farmer who first began using SRI methods after reading about them in the ILEIA newsletter in 1999, now plants only traditional varieties in his fields, averaging 12 t/ha with them, about 3 times the national average.)

Just before 10, a number of us, starting with the Secretary, were brought to the front of the auditorium to light the wicks, in turn, on a huge ceremonial brass oil lamp that is illuminated for festive occasions. The Secretary from the Ministry of Agriculture in his opening remarks observed that a lot of farmers have taken an interest in SRI. He himself, while the Government Agent (senior administrator) in Nuwara Eliya District sent some farmers to Kurunegala district to learn about SRI first hand. He also gave them weeders. He acknowledged that there are "different opinions" on SRI, alluding to the continuing resistance to SRI from certain government rice scientists who insist that the SRI results reported are either not true or not generalizable. Dhanasena said that his Ministry's policy is that if farmers like SRI, they should use it as long as they get benefits from it, adding that it would be good to continue SRI research.

The *Ministry of Agriculture* is encouraging the expansion of organic agriculture, according to Dhanasena, including for export; and SRI he said is consistent with this initiative. He expressed appreciation for Gamini's efforts to spread knowledge about SRI in Sri Lanka, and he thanked me for my support of these efforts. In closing, the Secretary said, "If farmers like SRI, they can do it." While this did not sound like a very strong endorsement, given the often vociferous objections to SRI from government rice experts, it was a significant and encouraging statement.¹

Gamini then provided some background on SRI, its introduction to Sri Lanka, and how it has been spreading based on good results. Yields are often doubled while the environment benefits from reduced water demand and less use of chemical fertilizer and agrochemicals. In the spread and improvement of SRI, he noted that 'farmers are researchers,' an idea that may be upsetting to some government scientists. Gamini showed some video clips from Madagascar of SRI practices, stressing that these are starting points; with SRI there is always 'a duty to experiment.'

The credibility of his comments was enhanced by his discussing his own experience using SRI methods on his own paddy field, which he has done for three years now. This past season, he grew basmati rice, which it has been said could not be grown in the wet zone, organically without any pesticides. He has shown this to be wrong, as he got a good yield in a water-stressed year when neighbor's crops failed. To support his report, Gamini showed a picture of both his field and a neighboring field. Given his lower costs of production and a much higher price for his yield, this was quite a profitable operation.

Gamini's powerpoint presentation gave various data sets on SRI yield. The training institute at Ambepussa got 116.5 bushels/acre, compared to its usual yield of 30-40 bushels and a previous maximum of 80 bushels. A group of farmers in the Mahaweli system got 135 bushels/acre with SRI compared to their usual yield of 70 bushels. The Statistical Office of the Department of Agriculture certified an average SRI yield of 11.5 t/ha for ten farmers, doing crop cuttings done the same way that official yield statistics are calculated. Another data set for 17 farmers in 5 districts showed SRI average yields of 3.1-7.6 t/ha compared with the national average of 3.8 t/ha. (The high yields with SRI ranged from 4.1-11.5 t/ha; low yields were 0.9-4.1 t/ha). Three other data sets showed a SRI average of 8.6 t/ha vs. 4.1 t/ha otherwise.

¹ Three days earlier, I met with Dr. Sarath Weerasena, new Director-General of the Department of Agriculture, the technical arm of the Ministry, and he assured me after our discussion that he would expect the Department to take a serious interest in evaluating SRI and, where the results warranted, in supporting its dissemination to farmers.

In conclusion, Gamini noted a number of concerns and opportunities: increasing labor efficiency and reducing labor requirements, e.g., for weeding; improving collective water management; promotion of organic rice farming, particularly using traditional varieties for export; and the production and distribution of seed paddy.

After some questions and discussion, I was invited to talk about the spread of SRI in other countries and the most likely explanations for SRI methods working so well. When I finished, the first question was somewhat rhetorical (I had said in the presentation that direct seeding is being experimented with in several countries), but extremely interesting. Ariyaratna Subesinghe asked: is transplanting necessary with SRI? He quickly described a new method for SRI crop establishment that he thinks can facilitate the expansion of scale of production for SRI. As I listened, I saw that this was similar to a method that Ramasamy Selvam, an organic farmer in Tamil Nadu, had told me about in September, only Selvam broadcasts young seedlings, not seed.

Rather than transplant young seedlings, this farmer *broadcasts germinated seed* onto a muddied field, with a seeding rate of 25 kg/ha. While this is more than the 5-7 kg/ha used with SRI transplanting, it is much less than normally used in Sri Lanka when establishing rice by the broadcasting of seed. Then, when the young plants are 15-20 days old, he weeds as normally done with SRI, churning up the soil with a series of parallel and then perpendicular passes. These leave just one rice plant, or at most two, at the intersections of a 'grid,' which has the same effect as transplanting with wide spacing. But the time spent constructing and operating a nursery and then transplanting is avoided. The weeding is the same as would have been done with regular SRI methods, so labor costs are much reduced.

Since Ariyaratna has not yet harvested this season's crop, he could not report any yield figures, but he said that his crop is looking very good. He may not attain a yield as high as is possible with the most careful use of SRI methods; but with 5 acres of paddy land to cultivate, this new means of crop establishment can give him a higher net income. Farmers with small holdings will probably still do better using the usual, more intensive methods, to get the highest returns from their scarce land. But this alternative method opens up possibilities for larger-scale, less intensive production that capitalizes on the principles of SRI. Selvam in Tamil Nadu was also enthused about this variation, saying that even his children could do such broadcasting.

I was asked why I think that there has not been more scientific interest in SRI. I responded that the resistance we have encountered in Sri Lanka is quite unique; in most countries, rice scientists have taken a more positive attitude toward SRI. Government researchers in China and Indonesia have taken the lead in SRI evaluation and promotion. I suggested that it is fortunate that we did not limit the evaluation and introduction of SRI to research institutions because most of the time on-station trials have given lower SRI yields than seen from evaluations on-farm. This is the reverse of the usual situation, where farmers cannot replicate researchers' results on their fields, getting lower yields on their farms than are reported from research station plots.

My comment was supported by L. W. A. M. H. Saman Kumara, a young CAA staff member who the previous year did his thesis research at the government's main rice research station, comparing SRI results in replicated trials with those from standard methods. His SRI yields at Batalagoda averaged just 3.8 t/ha, while at the same time, he said, farmers elsewhere in the

district were getting 8 t/ha yields with SRI. I suggested this difference may be due to differences in soil microbiology, which can be affected by years of heavy applications of fertilizer, insecticides, fungicides, etc. on-station. This young fellow previously expressed to me his pleasure at being able to promote SRI now under NGO auspices, being persuaded of SRI merits based on his work with the methodology.

After a rice-and-curry lunch in the ARTI canteen, served to all hundred participants very efficiently, Gamini showed them a SRI training video produced in Madagascar. The *CAA/OXFAM* presentation was made by Sarath Wijesiri, with whom I worked 20 years earlier in a program to introduce participatory irrigation management in the Gal Oya scheme when he was a young institutional organizer. *CAA/OXFAM* is working in six districts, including in some LTTE-controlled areas. Premaratna, the most expert SRI farmer in Sri Lanka, has been hired as a consultant to provide training and also do monitoring and trouble-shooting.

Pictures were shown of huge rice plants grown with SRI methods. I thought that these pictures might make rice scientists uncomfortable because they have come to regard semi-dwarf varieties, responsive to high doses of chemical fertilizer without lodging, as the ideal. The prolific SRI plants look excessive, extravagant, exuberant. However, with SRI methods the Harvest Index (the proportion of total plant biomass that goes into the grain) does not change; the plants have larger canopies and root systems, and more and larger grains. The root systems in particular help to improve soil aeration and organic matter as well as increase soil biota. *CAA* is helping farmers to form organizations that can improve their milling and marketing, so they can sell cleaner, more nutritious, chemical-free rice for a higher price.

The next report was from Dr. Parakrama Weligamage, a researcher with the *International Water Management Institute* (IWMI). It has done did an evaluation of SRI based on a comparison of 60 randomly selected SRI farmers and 60 non-SRI farmers in two districts. 87% of the non-SRI farmers had heard about SRI, mostly from other farmers; 75% said they planned to use it in the future; 69% said that there was a favorable opinion of SRI in their villages.

Among SRI farmers, 100% said there is saving of seeds; 98% said more tillers; 92% used less herbicide; 91% had less lodging; 91% higher seed quality; 90% saving of water; 88% fewer pests and diseases; 86% less inorganic fertilizer; 85% lower input costs; 83% more yield; 80% less labor for harvesting (despite higher yields); 77% more milling output (fewer unfilled grains). On the negative side: 77% said more work was involved in making and applying compost; 75% said more effort overall; 69% need for well-drained soil; 65% more work days; 60% need more weed control; 58% organic matter not readily available; 50% more labor; 37% transplanting is more difficult; 32% need more skilled management.

Adoption was greater with larger families which have more family labor supply. Contrary to some published research from Madagascar, there was no significant difference in adoption by richer vs. poorer families, and once they started, poor families were more likely to continue than richer ones. Yield with SRI increased on average by 50%, while water productivity (yield/m³ of water) went up by 90%. Estimated net profits doubled with SRI, and fewer SRI farmers reported a net loss from their paddy production, making SRI risk-reducing. In conclusion, Parakrama said

that the problems that need to be addressed for SRI to spread are: weed control, the availability of organic matter, and higher labor demand (labor saving methods).

Dr. Punchihewa from *Ruhunu University* reported briefly on his and his students' research on soil biology and health. He talked about 9 soil-dwelling animals, focusing on oribatid mites and springtails (collembola) which play key roles in the decomposition of organic matter. Before the meeting, he told me that he had a Cornell connection, having been a student of Dr. A. T. Mosher, former Cornell faculty member who taught at the University of Peradeniya in the 1970s. He said that he had practiced 'modern' agriculture on his own rice paddies for a number of years, using fertilizers and agro-chemicals, but the soils became less and less fertile. This turned his attention to less chemical-dependent forms of agriculture.

He had come to same conclusion that agriculture should try to approximate forest soil conditions and management as the high productivity of natural forests must high fertility, even though forest soils are regarded as 'poor' in terms of soil chemistry -- a conclusion reached by a number French researchers with CIRAD. These 'poor' soils compensate with their great biological resources and diversity -- an argument made also by the eminent Brazilian soil scientist, Dr. Ana Primavesi.

In January 2002, Punchihewa was asked to preside at a seminar on SRI for the Sri Lankan Association for the Advancement of Science. He took an interest in trying it out for himself and consulted with Premaratna on the techniques and principles. His SRI plants were clearly more vigorous and productive, so he started studying the differences in soil biology. He suggested focusing on mites and collembola as they are easy to count and are indicator species for overall healthy soil. "These creatures are our friends," he said, so we should try to encourage and preserve them. He described how the new weeder he has designed aerates the soil to create a more favorable growing environment for soil microflora and fauna. In conclusion, he said that he had gotten into trouble pursuing high-input farming methods. He was ashamed by how he kept subsidizing a weakening system with more and more chemical inputs until he realized how important is the biological life of the soil.

The next presentation was by Premaratna, the most active and prominent SRI farmer in Sri Lanka. This rounded out presentations from a government official, an NGO leader, an international center researcher, a university professor, and a farmer. Prema started by stressing the use of organic matter in compost and as mulch. He particularly recommended using branches of the fast-growing leguminous tree *gliricidia* for mulch as it decomposes well. Cow manure he said is good particularly for attracting earthworms, which naturally aerate the soil; in good soil, there will be hundreds of thousands of them. Whatever increases earthworm populations is beneficial for the crop. He suggested sometimes adding a little urea, about 10-15 kg/ha in the dry zone, not taking a purely 'organic' position. He advised against deep tillage, saying this is not necessary for deep rooting. "Soil organisms will loosen the soil better than ploughing it can."

One of his pictures showed six different designs of weeders, for different kinds of soils. The cost has come down from 1800 rupees (about \$20) to 950 (1050 with shipping), a little over \$10.

Premaratna spoke about biodiversity within the rice canopy, focusing on spiders, which control insect pests. He said that in his SRI fields, he has about 15 spider species per m², whereas in

conventional fields, the number is more likely to be about 3. He showed pictures of vigorous rice plants with huge root systems and 45-50 tillers/plant. He gave data for a farmer in Ampere District who had previously gotten 26 bushels of rice from an acre (1.3 t/ha); with SRI he got 22 bushels from 1/4 acre (4.4 t/ha). Such improvements, he said, are common with SRI methods.

An interesting question came up: how to time the planting of the crop to minimize pest damage? Prema said that paddy bugs, the main rice crop pest in Sri Lanka, are particularly numerous during the full moon phase, so farmers should plant their rice so that it flowers during the dark phase of the moon. The best month for pest-free flowering in the main (maha) season is January, which is cool and windy, not good conditions for paddy bugs. Farmers should count backwards from the date of January moon's dark phase: 60 days for short-maturing varieties, 80 days for medium-term varieties, and 90 days for long-maturing varieties, and then they should add 10 more days for seedling growth in the nursery before transplanting, and 5 days for soaking the seeds before planting. Good timing, he said, can greatly reduce crop losses to insect pests. He also suggested not taking all weeds off the paddy bunds because these provide good habitat for small frogs that eat insects, and also for birds.

Someone asked why Sri Lankan farmers should be growing chemical-free rice for export or 'for overfed people in Colombo' rather than for average Sri Lankans -- "Why not have a program to feed ourselves with this better quality rice?" This drew a round of applause. He went on to ask that Premaratna give more such training to young farmers. Prema responded that he is already spending as much time as he can in training, being home only 2 days in the past three months. Farmers need to become independent and not depend on trainers, he asserted. He is working with CAA and other institutions to train more farmers as trainers. "Your salvation is in your hands" is what I understood him to tell the audience. Everyone agrees on the need for more training and for this work to be spread more widely.

The seminar had been scheduled to conclude at 4 o'clock, but with the presentations, questions and discussion, it got to be 4:30 before the schedule was finished. Concluding comments, vote of thanks, etc. went on to almost 5, with very few participants leaving before then. My suggestion was for the participating organizations and active individuals to form a network which could coordinate efforts and facilitate the sharing of information and innovations. Dr. Jayasena, associate director of HARTI, suggested that his institute could provide the operational support for such a network. Then the seminar adjourned for tea and snacks, with lively discussions continuing outside the auditorium.

There is evidently increasing momentum for SRI in Sri Lanka. Premaratna thinks that the number of farmers using SRI methods is now 8,000-10,000, but because there has been no national institutional support, it has not been possible to acquire systematic data. The CAA/OXFAM-sponsored student thesis will give the most thorough assessment so far, complementing the evaluation done by IWMI. A week earlier, I was able to make a one-day field visit, which is written up in a separate report. Each country has had a different experience and trajectory with SRI, but Sri Lanka has made a lot of progress within just four years, starting from Joeli Barison's visit in January 2000, bringing experience and ideas from Madagascar.

REPORT ON FIELD TRIP, DECEMBER 14, 2004

Gamini Batuwitage had arranged for me to see some of the work going on to evaluate and promote SRI in this country. I had one day unscheduled after arriving in Sri Lanka before the start of a workshop organized by the Asian Productivity Organization (APO) for which I had come. The Australian affiliate of OXFAM, Community Aid Abroad (CAA), kindly provided a vehicle and driver to take me to System H of the Mahaweli irrigation scheme, four hours north of Colombo. *Kavita Kasynathan* (CAA) went along as an interpreter and we left the hotel at 7:45. This report is written to give some flavor of the spread of SRI in Sri Lanka as well as what facts and details I was able to pick up along the way. Kavita, I was pleased to learn, is the daughter of Mrs. Nalini Kasynathan, a university lecturer with whom I had worked 20 years earlier when we were introducing farmer organizations for improved water management in the Gal Oya system in southeastern Sri Lanka.

An hour northeast of Colombo, at Thulhiriya junction, we met *W. M. Premaratna*, Prema for short, waiting on his motorcycle. He led us to the nearby home of Mr. *Ariyaya*, one of the early adopters of SRI who is now in his seventh season using these methods. Last season his yield with SRI was about 100 bags per hectare (5 t/ha), more than double the 45-bag yield he had gotten before. He was the first farmer in his area to try SRI; now all 30 farmers in his tract are using it.

As we walked to his fields, I could see from a red film on the water standing on the edges of the plots, indicating high Fe content in the soil, perhaps why previous yields were low. SRI methods are particularly well suited for such a situation, as alternately flooding and drying rice fields reduces iron toxicity. We met and talked also with three other farmers who are practicing SRI. All said they are very satisfied with the methods. Although SRI requires more labor, the returns are worth it, one said. Now that they are acquainted with the techniques, they find practicing SRI to be *leesi* (easy). Indeed, transplanting now takes less time than before, and since farm laborers now like the SRI methods, it is not difficult to find workers to help with the planting.

Weeding is the only real challenge. But the cost of weeders is now down to 950 rupees (about \$10). As many as 10 farmers can share a weeder, so there is little capital cost involved. They do just two weedings, enough to control weeds. I suggested that they experiment with doing a third weeding on a part of their fields, and even a fourth weeding on part of that small area, to see whether additional soil aeration will add enough yield to be worth an extra expenditure of labor.

As we drove on after the visit, Prema told me more about Ariyaya, who is a long-time activist in the area and who has served as chairman of the sub-district council. He has been an outspoken critic of successive governments, even gaining notoreity by staging a hunger strike at the Ministry of Agriculture against certain policies a few years ago. Prema said that Ariyaya was a leader in the JVP, a leftist organization/political party that twice tried to overthrow the government, first in 1971 and again 1987-89. Ariyaya led an attack on a police station in 1971, burning it to the ground and then serving many years in prison after the insurrection collapsed.

Since his 'rehabilitation,' Ariyaya has turned his efforts to improving agriculture and the environment, both reasons for an interest in SRI. He looked rather slight and even wizened to me, but obviously looks can be deceiving. He still has considerable influence in the area, as

indicated by his election as chairman of the Pradesiya Sabhawe, the local government council. He was introduced to me as *Nilame*, meaning official. He is thus not really not a 'typical farmer,' but he is far from being a rich one, doing his own cultivation and owning less than a hectare.

In Kurunegala, the district capital, we picked up *Sarath Wijesiri*, whom I first met more than 20 years ago, when he joined the Gal Oya irrigation management improvement program as an Institutional Organizer (IO). He was one of the most effective IOs in our cadre, and it is good to find him now working with CAA as a rural development staff member. Having been Agricultural Development Authority manager in Ampare district for over 10 years, he brings a lot of experience as well as talent to the effort.

When we got to System H, we drove to the home of *Lanarolle Premasena*, one of the first SRI adopters in that area. He read a Ministry of Agriculture bulletin on SRI that Gamini published in 2000, and he tried the methods first on a small plot (with 1,077 plants, he recalled). The results were good, so he expanded gradually over the next six seasons to this season planting 2 acres with SRI methods. He and his family and a dozen women laborers were in the midst of a major transplanting effort when we arrived.

From the appearance of the homestead and his children, it is clear that Lanarolle's household is still in the 'poor' category. But after we left him, Prema and Sarath told me a sad yet encouraging story. Some years ago, he decided that his isolated homestead was not a good or a safe place for his young daughter to grow up, so he mortgaged his 5 acres of land to build a house for the family along the main road. He has been in debt ever since, for many years not able to make any repayment of the principle, having to make substantial interest payments to the moneylender.

With the increases in his production with SRI (his last season, he averaged 10.5 t/ha), he has been able to redeem 2.5 acres, so he can keep the full production from them for his family. He figures that in another two years, he can redeem the other 2.5 acres that he mortgaged and will become again a self-standing farmer. With 5 acres and yields of 10 t/ha, he should be able to do quite well economically in the future. He and his wife *Srimati* spoke very animatedly about how much SRI is improving their situation. I complemented them on being farmers who both read and think, since only some of the 30,000 bulletins that the Ministry distributed in 2000 'lit a spark' and led to the new practices being evaluated. His willingness to 'take a chance' is paying off, and he deserves the improvements now coming his way.

Prema told me that Lanarolle is not just benefiting himself. He has been very generous with his time to show his SRI fields and methods to others. By now many hundreds have come to see his farm, and field days have been held at his homestead. He proudly showed me the SRI manual that CAA has prepared in Sinhala language, with space for record-keeping on inputs and costs and on production and profits. He asked me to write an inscription in it for him. Prema said that some researchers have come from the government's rice research station at Batalagoda to evaluate his field and have been very impressed. Except for his brother, who is well educated and a researcher at Batalagoda. That institution has remained steadfastly critical of and opposed to SRI, and despite several invitations, the brother has not come to see Lanarolle's crop.

Not only has Lanarolle's harvest greatly increased. His costs of production have come down. Whereas he used to sow 5 bushels (110 kg) of seed for his land area, he now plants the entire area with just 6 kg of seed. And the quality of his rice is such that he was able to sell it last season for 25 rupees/kg, compared to the more usual price of 12 rupees/kg. This helps explain how he is able to free himself from his indebtedness.

We next drove to a homestead where behind, a group of women associated with CAA's livelihood program were working on their SRI demonstration plots. This land had been mortgaged so that most of the benefits of production went to a moneylender. CAA has redeemed the land and made it available to the group with the provision that its members should try SRI for four seasons. If after that time they are not satisfied with the methods, they can use it however they like, but it will continue to be group property to benefit members' households.

The women lined up on a bund for us to ask questions of them. This was their first season using SRI methods, so they didn't have much experience to report. Prema had trained them and two other women's groups in the immediate vicinity before the season started. They were at first rather dismayed by how barren their newly-transplanted SRI plots looked, and neighbors who came by teased them a lot. But now the plants are 20 days old and looking very good. The plots were starting to dry (they started cultivation with rainfall), but the first irrigation water issue was scheduled to come the next day. So the crop should get well established within the next few weeks and be able to withstand any future water shortages better than other rice fields in the area.

We asked if there were any questions for us. One woman asked me: where does SRI come from, and how was it developed? She had heard it came from Madagascar, but wanted to know more. I suggested that I could discuss this with all three groups when we met together after lunch. After taking leave, we drove to the home of the head of the second group, a very tall and handsome woman. The members of her group had each cooked different dishes for us, so we had a splendid rice and curry meal, bringing back many fond memories of previous 'feasts' in farmers' homes.

After lunch we visited the fields of the third group, which also looked well planted. The adjacent fields planted with conventional methods will provide a very good comparison for SRI methods. If the women get the results we expect based on experience elsewhere, the differences will be very clear to all farmers in the area, and this should spur SRI adoption.

At the home of a member of the third group, we found 25 bright blue plastic chairs arranged in a circle under some trees. As members of the other two groups began to arrive, it became clear that we would need more seating, so word was sent to get more chairs. Soon we saw a 'caravan' of upside-down blue chairs headed our way, one borne by a 4- or 5-year-old not much bigger than the chair. While waiting for everyone to assemble, we were shown a fuel-saving boiler made out of clay that the women use to heat water and parboil their rice, so that they can sell it for a higher price than just as unprocessed rice.

The meeting was a memorable experience, with about 30 members paying close attention to all that was asked and said. I discussed the origins of SRI, stressing that it is a system still evolving, still changing. I suggested that in 5-10 years, most SRI rice may not be transplanted but rather direct-seeded, to save labor, as farmers in several countries are starting to experiment with such

methods. Nothing in the SRI concept requires transplanting, only that if there is transplanting, the seedlings should be young (less than 15 days old) and handled very carefully.

We discussed the different SRI practices and how they can vary, the principles underlying them, why we think they are important, and finally the reasons why these methods work: because they promote vigorous root growth and also support more soil biological activity, which contributes to higher yields. Discussing soil microbiology in simple terms is always a challenge, but possible. There was a lot of interest among the women as we discussed why 'germs,' i.e., bacteria and fungi, are not all 'bad' -- the common conception -- and indeed, why most of them are essential to life on earth -- because they create life in the earth.

This area was opened up by the government as a resettlement scheme in the 1980s, with the provision of irrigation facilities expected to encourage people to relocate here. The roads are poorer than in the Gal Oya irrigation system where I worked 20 years ago in Ampare district on improvement of irrigation management. The only advantage here in System H is that the government built better houses for the settlers than many families had in Gal Oya. Even so, the place felt to me like lonelier and a more artificial place than I am accustomed to visiting.

The women's groups, however, showed a strong sense of solidarity ('social capital' is the common social science term used nowadays), and evident intelligence and motivation. They want very much to improve their lives and those of their families, and CAA is helping in a way that should foster self-reliance rather than perpetuate dependency. If the groups' members can get the kinds of results with SRI methods that Ariyaya and Lanarolle have been able to get, this should add quite measurably to their well-being and prospects for the future.

Prema and Sarath are working with farmers in other parts of Sri Lanka as well to introduce SRI. Their boldest move is to train Tamil farmers in the east of the country, in territory still under the military control of the LTTE separatists demanding an autonomous Tamil state. The LTTE has not let CAA work on human rights or gender issues, but SRI seems to be acceptable so far. Prema had arranged for someone else to handle a training program previously scheduled for this day (Sunday) in Moneragala District so that he could accompany me on this field trip.

Prema estimates that as many as 10,000 farmers throughout the island are now using SRI methods, though it has not been possible to compile any comprehensive data because there is no official support for SRI. Some government personnel, even ministers, have been cooperating with SRI, some very enthusiastically, but others are aloof or even antagonistic. A national workshop on SRI had already been planned for December 22 at the government's Agrarian Research and Training Institute to assemble farmers, officials, researchers, journalists and others to assess the SRI experience in Sri Lanka to date. A report from that workshop gives more of an overview of SRI progress and problems in the country. This field visit, however, gave a more immediate and tangible sense of what SRI methods can do to affect people's lives.