

Report on a National SRI Farmer Workshop, Phnom Penh, January 19, 2006
**Annex to “Report on Visit to Cambodia to Review SRI Progress,
January 13-20, 2006” by Norman Uphoff, CIIFAD**

At 8 a.m., a **national SRI key-farmer workshop** convened at the office of CEDAC, the Center for Studies and Development of Agriculture in Cambodia, in Phnom Penh. About 60 farmers were present, including 10 women farmers, having come from all over the country. **Dr. Yang Saing Koma**, director of CEDAC, opened the workshop by welcoming all farmer-participants plus staff from CEDAC, the government, and several donor agencies. At the head table with Koma and me were two farmers who have been providing excellent leadership on SRI:

- **Mey Som** from Kandal province, whom I had met on several previous visits, and
- **Prak Chres**, whom Koma and I had visited in Takeo province two days previously (see trip report). They opened the workshop with some of their own thoughts and reflections.

Opening Remarks: Mey Som was invited to speak first, being the first Cambodian farmer to try out SRI methods in 2000, and then becoming known affectionately as ‘the professor’ for his earnest efforts to inform other farmers about SRI. He started by recalling how a farmer association was formed in his province in 1997 with CEDAC help, to begin improving smallholder farming systems. This was three years before SRI came on the scene. Here are comments noted down from the translation that I was given as Mey Som spoke:

We were in a difficult situation. CEDAC staff came to help and discussed agricultural improvement with us. They were easy to understand, but not many farmers were interested at that time. We were able to produce some concrete results and tried to promote alternative methods of production among farmers. But it was not easy to get farmers to work in a group.

Tree-growing was encouraged, but multi-purpose trees, not fruit trees. At first few understood their value, but now they understand and a lot of people are planting them. For some homesteads, you can’t see the houses any more. Slowly people started to understand. Our idea was to do whatever we could do with our own resources. We started to dig ponds, for storing water and for fish, for example. When we hit sand, some were discouraged and quit. But others kept on digging, and now the ponds are okay. (This is a wonderful metaphor for much of our work on rural development.)

SRI was introduced to us for the first time in 2000. We were not sure about it. For myself, it was not so much the possible loss of food that held me back so much as the laughter of friends and neighbors. But I discussed this with my wife, and we tried SRI on 10 ares. The results showed that these methods were better. I didn’t believe that rice could do this well without chemical fertilizer.

At first CEDAC subsidized our experimentation with compost as an alternative. I observed that fertilizer encourages the quick growth of plants, but this is not sustained. The growth with compost is slower but sustained. When drought comes, the fertilized plants lodge. We saw how one farmer in our neighborhood who used a lot of fertilizer suffered serious losses because of this. I also tested the number of seedlings: 1 vs. 2. vs. 3. vs. 4 vs. 5. Single seedling was definitely the best.

We also have to think about the maturity of the varieties. For short-term varieties, 8-15 day seedlings are best; for medium-term varieties, 10-15 day seedlings; and for long-term varieties, 15-20 day seedlings.... Working with CEDAC is good because there is systematic follow-up, with monitoring and evaluation. Even if you fail in something, you should not hide it but rather share the learning.

He added that previously, he was not very generous in sharing things, ideas, seeds, money. “But now people share with one another.” (I had heard this from another farmer, that Mey Som had become a more generous person in the course of his SRI work.) Before working with CEDAC, farmers did not have enough rice to eat, and every few vegetables, Mey Som said. “This does not mean that we were lazy, but that we didn’t have many good ideas to work with.”

“Now we are not poor, though we are not rich either. We are self-sufficient and produce a surplus. We can sell the surplus, or can process it for later use, for example, lemons. We are also able to give some away. We can participate in (religious) ceremonies and make donations.” (This is something very important in Buddhist communities, I have been told.)

Mey Som reminisced how for a while he had worked part-time as a goldsmith. When he bought meat and vegetables for his family in the market, others laughed at him. “You are a farmer. So why are you buying things instead of producing them yourself?” This got him thinking: why not produce as many things as possible on land not otherwise used, and with time that can be spared?

He commented that he is now getting old and a little deaf. But he always wanted to play music. He has joined a traditional music group and travels to other villages to give concerts. However, he has difficulty playing the music “because people keep coming to me to ask about SRI.” (He has become nationally known through the media for his SRI promotion.) He closed by saying that his daughter has now become an SRI promoter, and he is very proud of her.

Prak Chres was asked by Koma to speak “on behalf of the national farmer-nature network.” He started by saying that SRI is not only about techniques and technology but about approaches to agriculture, and having good, strong farmer associations is the key to success. “To have a successful village association, you need participation from the members, to have enough funds to support activity, to be clear about your goals, to define and plan your activities well, and to have an identity that is attractive and respected. You have to make sure that people trust the organization. We should not have just associations at the village level but also a network to represent us.”

Chres spoke approvingly of the emerging national network, suggesting that it is “like an eye and a nose for us,” giving vision and direction, or “like the right hand of the associations,” giving strength. “The people who work for the network are all farmers, like us, only they have been given more responsibility for protecting the interests of farmers.”

“An association without activities is useless, but activities have to be ones that serve the interests of the farmers. If we have a surplus of rice, how can we sell it advantageously? We need to sell our produce as a group, to get better prices. We need more ideas and technical information,

things we can get through the network. For representing farmers and protecting our interests, we need the network.” He went then into more detail on the network’s formation and operation.

Next Chres addressed a topic of importance for our SEED Initiative. “We need to have an identity for our product with marketers.” He suggested that they need to have their own brand for SRI rice. “We work like a cooperative, that is, marketing outputs and providing inputs,” he said, “even though we call ourselves an association. We do not use the word ‘cooperative’ because farmers have had some bad experience with cooperatives in the past. The term ‘association’ is a popular term,” he said, “something neutral.” If farmers want to get ahead, they need the support of something like a cooperative, he reiterated.

“To get registered as a cooperative, an association has to have at least 30 members. Also, if we want to export our rice products, we need quality control, and that requires some internal system. Without a brand name and a control system, how can we assure the quality of our product? How can we compete? If we have an organic product, we need to prove this.

In his conclusion, Prak Chres thanked CEDAC for helping in all this. He reiterated the growing importance of marketing for farming, and also the value of alternative agriculture. “We need to allow natural processes to work, or we will not get and sustain good results.” A very modern message in several ways, I thought. I could see why Koma and farmers had such high regard for him. Like Mey Som, he was very short of stature, and had no sophisticated demeanor. But he has given a lot of thought to the way the world works and how farmers can best participate on the contemporary scene.

My invited remarks focused on how our thinking about SRI has been evolving ‘beyond rice’ and ‘beyond intensification.’ Rather than focus so much on yield, we should pay more attention to costs of production and net income with SRI since farmers are more concerned with *profitability*. With this, there should also be more thought given to documenting and increasing *productivity* – of land, labor, water and capital. Productivity is what makes individuals and countries more prosperous and secure.

Gains in productivity will free up some share of farmers’ land, labor, water and capital now used in rice production so that they can utilize these resources in other productive activities. This will enhance both farmers’ income and people’s nutrition. The emerging strategy is to utilize intensification to achieve diversification. And all of this can be accomplished more quickly and better with organization -- a very condensed message. Most farmers made notes carefully on these various terms, replicating the arrows that I drew connecting the terms on the whiteboard.

National Overview: **Chey Tech** started the proceedings with a ‘progress report’ in powerpoint on behalf of the National SRI Secretariat. His data showed SRI use by the end of 2005 to include 40,000 families in 2500 villages in 19 provinces. Here are the data he presented on the uptake of SRI in Cambodia since 2000:

	2000	2001	2002	2003	2004	2005
Farmers	28	400	3,000	10,000	17,092	40,000
Villages	18	122	350	815	1,397	2,500
Provinces	4	7	14	14	17	19
Yield	5.0	3.2	3.5	3.87	3.66	4.12
Area (ha)	1.6	28.7	900	4,700	4,788*	11,200

*2004 was a year with serious drought so harvested area was considerably less than planted area.

Tech also reported on the number of institutions cooperating on SRI promotion, starting with 27 local or Khmer national organizations, mostly NGOs, starting with CEDAC, included 53 in all. The international organizations included the Australian affiliate of Oxfam (OCA), GTZ, ADRA, CARE International, Australian CARE, CARITAS, and Catholic Relief Services. Fourteen Provincial Departments of Agriculture were included in the total of 53.

Kompong Thom Province: Next there was a report by Lim Sokundarun from CEDAC evaluating SRI in this major rice-growing province. The report included results from the Strung Chinit irrigation scheme, where CEDAC has been introducing SRI under a joint project with the French NGO GRET, supported by the French Development Agency (AFD). Here are the data that Lim presented:

	2002	2003	2004	2005
Kompong Thom province:				
Farmers (no.)	32	189	536	548
Area (ha)	16	54	200	239
SRI yield (t/ha)	2.0	2.4	3.3	N.A.
Conv. yield (t/ha)	1.7	1.9	1.8	N.A.
Stung Chinit irrigated area:				
SRI yield (t/ha)	--	2.2	2.7	2.6
Conv. yield (t/ha)	1.6	1.3	1.4	2.1

CEDAC staff did detailed evaluations of SRI vs. conventional methods (a) within the Stung Chinit irrigation scheme, (b) in the 500 m peripheral area around the scheme, and (c) in two other Kompong Thom districts for comparison. In total, SRI led to a 57% increase in output.

	SRI methods		Conventional methods	
	No. of samples	Yield (kg/ha)	No. of samples	Yield (kg/ha)
SC scheme	25	2631	25	2117
Peripheral area	25	417	22	212
Santak district	33	2025	30	1072
Baray district	20	4205	25	2388
Total	103	2278	102	1447

Next, four farmers from Kompong Thom province, all wearing flip-flops indicative of their status as regular farmers, reported on their own experiments. **Ear Phorn** from Santouk district told about how, after visiting Mey Som's SRI field, he began using the methods on his own farm in 2003. He did not use them in 2004 because of the severe drought, but in 2005, he resumed

them. Last year he did two experiments: planting in rows and not, and using raised beds and not. He figured that SRI methods have raised his yield on 16 areas to 14 tang (2,016 kg/ha) compared to 6 tang (864 kg/ha) with his former methods. Koma asked what he had concluded from his experiments? Phorn said that next year he will expand his SRI to cover his whole area. Water is his main constraint for using SRI.

Pen Theun also from Santouk district started to cooperate with CEDAC in 2002 and is a key farmer in his village. He cultivated with only himself and his wife. He monitored six plots with different methods varying the number of seedlings per hill. Of the six, his best yield was from transplanting single seedlings in rows. He did not see much difference between one and two seedlings per hill. When his neighbors saw that his SRI field was good, they asked to have some of the same variety. He had to explain to them that the performance difference was not in the seeds but in the techniques.

Ke Kaov from Baray district explained the results of his 6-plot trials with a broad grin. He focused on shallow vs. deep transplanting. He definitely saw a difference in the plants' tillering. He had not been able to use young seedlings, transplanting at 45 days because of the delayed rainfall. He said that neighboring farmers at first were critical ('blamed' him) for his new practices, but when they saw the results, they asked him for his seeds. His land is not level, with sandy soil, so his yields are not that good, he said. To raise them he intends to use more compost and to level the plots for smoother flow of water.

Norn from Santouk district, who obviously had a serious accident that deprived him of one eye, discussed his raised-bed experiments. The beds were formed "like one would prepare for growing cabbage," he said. He transplanted 15-day seedlings, having put 15 oxcarts of compost onto 30 ares. During the drought, the compost applied as mulch conserved soil moisture. This helped to minimize the effects of drought, but he reported no specific figures. He said he will try beds again next year. What lessons had he learned? To make more compost for the rice fields from whatever biomass can be gathered. Also, he will keep lobbying local officials to improve irrigation access. Currently only one farmer in his village has access. He wants to get everyone in the area served by the present system. Someone asked him about the labor involved. He said it took more labor to construct raised beds, but once they are built, one can conserve on compost by applying it in rows for the transplants. Also, the work next year should be less.

Koma underscored the importance of shallow transplanting, just 1-2 cm. Don't worry if the small plants don't stand upright at first. They will recover if the roots have been gently and well placed in the soil. I told the farmers about experience of Madagascar farmers whose newly transplanted SRI crops had been entirely eaten down to the ground by locusts; yet the crops recovered to give a normal yield just from root regeneration. Koma said: "Where there are roots, there is hope."

Chhor Ving Kong from the Provincial Department of Agriculture (PDA) for Kompong Thom then introduced himself and three farmers who work with the PDA. Kong said that from his observations, he can say that under all conditions SRI gives more yield. Farmer exchange visits are very important for getting SRI adopted, expressing appreciation for the visits organized in his area by the Minister of Agriculture, The Hon. Chan Saeun.

Kong said that the reason he disseminates SRI is that farmers are very appreciative of it. He said he had conducted 15 experiments, but described just two of them. He was puzzled why his 'single seedlings' trials gave rice plants with 25 tillers, while plants grown on raised beds gave 15 tillers on average – but the latter gave higher yield. When a chance came for questions, I explained that higher yields with SRI depend very much upon the number, diversity and activity of soil organisms. The changed soil-water-nutrient dynamics of raised beds could enhance all of these.

Morn Saneth from Santouk district said that he has sandy soil but can get 25 tillers per plant with SRI methods. When first invited by the PDA office for training and saw its SRI plot. "I couldn't believe it. Even when transplanting my own seedlings, I still didn't really believe. Some farmers blamed me when I started using SRI. I was disappointed, even depressed. But then the plants got very lively. They thought it was because of more fertilizer giving more yield. But I explained that it was the methods used. I like to say thank you to CEDAC for disseminating this technique." Saneth said that his yield was more than expected because he had tried SRI on a field that had not been used for rice before and the soil was very hard, difficult to plow. He tried to level the land but was only 90% successful. For the next season, he will do experiments to evaluate different varieties with these methods.

Mrs. Sun Ya also from Santouk district said that her land is very low-lying and uneven. She did experiments with raised beds and saw a little difference, but not yet very much: 40 grams per m² from the conventional plot and 45 grams per m² from the raised bed. She observed that the panicles from the latter were longer, but she did not have enough improvement that she planned to try raised beds again next year. She also said that she plans to reduce spacing distance. I commented that when the soil is 'poor,' this often means that the soil is not well endowed in terms of soil organisms, and that it can take several years of SRI practice, adding compost and getting larger plant root systems which put more exudation into the soil, before good fertility is established. I said that the decision is hers, but she should know that experience shows that more intense soil management, including raised beds, can take a while to build up.

Eur Suphorn from Stung San district, a relatively young who spoke very confidently, talked about his experience with raised beds. He said, reinforcing my point, that they are very good for soil fertility. He advised positioning beds parallel to the sun's path, so that plants get maximum sunlight. He changed his spacing from the recommended square pattern to a rectangle, 20x50cm, with narrower rows but more distance between plants to capture more energy as the sun moves overhead. He makes his raised beds by hand, using local tools, with two rows per bed.

Suphorn said that giving up some area to construct water channels within the field, thereby getting better water control, does not reduce yield but rather raises it. If designed in conjunction with a pond, fish are raised for additional income. Fish enhance his rice yield as well. From his experiment on 20 ares, he had gotten 30 tang (a yield of 3.6 t/ha). When asked what kind of fish he raises, he said he stocks his field-pond with fingerlings. From one hectare, he can get 4-5 tons of fish together with 4-5 tons of rice. He also grows vegetables on his small farm so by combining rice, fish and vegetables, he can do quite well. The pond water makes his crops more secure, he added. With SRI methods, 10 ares of rice land (just 1/10 of a hectare) are "enough."

Kompong Chom Province: The CEDAC project officer in this province, **Chea Chhourn**, reported that there are 1,600 farmers in 45 villages within the Bathay and Chheung Prey districts now using SRI, including one farmer who is applying the methods on 3 hectares. The water table is high here, so it is a deepwater rice area. He turned the reporting over to three farmers, one with leather shoes, one with leather sandals, and one barefoot (it surprised me that he had the largest landholding).

Sok Chak Rya from Bathay started SRI in 2004 on 21 ares. This past year his SRI area was up to 1.18 ha. He also experimented on 6 plots, testing the effects of seedling number, raised beds, and shallow transplanting. Like Suphorn has undertaken diversification and plants in rows that follow the sun's path. He has dug channels and a pond to support more diversified production. Before he got 50 tang (1,200 kg) when putting on 100 kg of fertilizer; now he gets higher yield using neither fertilizer nor pesticides; otherwise he would stop SRI, he added. Many farmers ask to purchase his rice for seed. He is selling 1 tau (12 kg) for 10,000 riels (\$2.50), a very good price. He also explained how he has started decorticating his rice seed before planting, and is getting very good results. He said that in one crop-cut, one square meter had given 2 kg harvest, which is a yield level of 20 t/ha, although his average for the whole field was less than this. He did not say how much his yield was.

Teng Cham from Chheung Prey, the farmer who last season planted SRI on more than 3 ha, said that he did this all with family labor. Before he applied 10 bags (500 kg) of fertilizer, and now just 5 bags. Before even with his large holding, planting 5-6 seedlings per hill, he did not produce enough rice for his family. Now in his third year with SRI, he is no longer using string for spacing, just putting in the seedlings by eye. This is not as precise as it should be, he said. (That afternoon, I showed a picture of a simple 'roller-marker' such as developed by an Indian farmer that should serve his purposes well.) He said that he uses as much compost as possible in his seedbed, but doesn't have enough compost for his whole farm, larger than that of most Cambodian farmers, which is why he is still using chemical fertilizer. His seedbed is only 5 m² for the 3 hectares. Last year his yield was 300 tang (7.2 tons, or 2.4 t/ha). This year he has not yet so he could not say what his yield was, but he expect it to be better.

Ry Vuthy from Srey Santhar district was the only farmer doing a systematic experiment in his district, with 3-are plots. He found little difference between single 15-day seedlings and 5-6 per hill, older 45-day seedlings, however, his total yield from all his 36 ares of SRI rice was 1.8 tons, which is a yield of 5.2 t/ha, very respectable. When Vuthy finished, there was considerable discussion of the technique of decorticating of seed before transplanting. This is very labor-intensive, requiring each seed to be husked. However, the increase in yield, at least for small farmers appears to be quite cost-effective. [Later in the day, a Cambodian NGO known as NAS reported that it was working with 116 families which are using SRI methods in Kompong Chom province, and they were getting 3 to 6 t/ha.]

Kompong Chhnang Province: The PDA representative from this province, **Prak Kimsong**, described how SRI was started there under the EU-supported PRASAC project in 2001, with CEDAC guidance, and CEDAC continues to work with Kampong Chhnang farmers. 1,160 SRI farmers in 8 districts are assisted by the PDA and/or CEDAC. In 2004 there was a severe drought in the province, but this presented little or no problem for the SRI fields. Those who planted

short-term varieties were able to get a good harvest. They have conducted experiments with 10 farmers and found that using SRI methods with 12-day seedlings, the yield was 4.5 t/ha; SRI methods with older, 30-day seedlings gave 3.75 t/ha; and conventional methods gave 3.47 t/ha (this is a better area for rice than is typical; typical yields in Cambodia are around 2 t/ha).

Lay Reth from CEDAC's program in Kampong Chhnang said that it was working now with 216 SRI farmers in 20 villages. The average household SRI area is 16 ares. The crop cuts at harvest time this year had given 2.1 t/ha for conventional methods and 4.935 t/ha from SRI.

Mrs. Keo Khan from Pong Vo district in that province said she very much appreciates SRI, having started using it in 2001 after getting training from CEDAC. Her husband at first rejected her proposal to try the new methods, but she got him to agree to try it on just 2 ares. She harvested 85 kg from this small area (4.25 t/ha), so that persuaded him to expand the area. In 2005, she did experiments on 3 plots of 5 ares each. The yield results were again the same, with conventional yield only 2.5 t/ha (less than the 3.47 t/ha that the PDA reported for the province). Mrs. Khan said that that here children like the SRI field very much and come to help weed and to care for the field, seeing that it is very nice, laid out in rows. Before when she asked them to help with the weeding, "they couldn't go." For the next season, she said she will expand her SRI more and will help disseminate SRI "to every village."

Kim Loan from Rolea district said that he started in 2004. He had been getting 2.4 t/ha, using 5 bags of fertilizer (200 kg). After cooperating with CEDAC, he became aware of the impact that fertilizer has on the soil and stopped using it. Now all of his rice area is under SRI, transplanted in a square pattern so that "air can reach all plants on all sides." His yield is 3.13 t/ha without use of chemicals. Fertilizer costs 50,000 riel a bag, so he is saving 250,000 riel (about \$60) this way.

Loan explained how he does careful seed selection, soaking the grains in a salt solution that he can test for its concentration by seeing whether a fresh egg will float in the water. All of the seeds that float also he throws away, only planting those dense enough to sink to the bottom. He also collects all of the green leaves, manure, etc. around his house and compound to make compost. He sprays water periodically on the compost to keep enough moisture in the pile, and covers it with a plastic sheet, thinking this will keep volatilized nitrogen from escaping.

Pen Chan Thon also from Rolea said that he had just started SRI this last year, on 14 ares. He used just 1 kg of seed and got 350 kg back from his harvest. This sounded like good seed multiplication, but I have talked with one Sri Lankan SRI farmer who said that from half a kg of seed he harvested 1600 kg, an even greater amplification.

Prak Chres questioned whether covering a compost pile could really stop N loss. Koma agreed that the covering served some useful purpose, but it would not contain gaseous nitrogen. He discussed the process of decomposition, explained the role of oxygen and the need to keep the material aerated as well as optimally moist. In concluding the morning session, Koma underscored that our objective is not to obtain the highest possible yield but to produce rice efficiently, profitably and in harmony with the environment. At this point, after four hours of presentations and discussion, there was a two-hour lunch break.

Siem Riep Province: After lunch, the sharing of experience and ideas continued with two women farmers reporting. **Mrs. Chorm Sy** from Kralanh district in Siem Riep said that she started SRI in 2004, when only four farmers in her village would try the new methods. Last year there were eleven. She used 11-day seedlings and encountered first drought and then too much rain. Most farmers used only chemical fertilizer, not compost as she did, even though the fertilizer did not increase yield.

Before Mrs. Sy harvested 13-15 bags of paddy from her field; with SRI she got 25 bags. Another farmer tried SRI on 17 areas and got 800 kg harvest (4.8 t/ha), which was really impressive. Rice is often established by broadcasting in her village. Direct-seeding on 2 hectares gave only 600 kg; SRI can give the same yield on 0.5 ha, and SRI requires only 10 kg of seed for that much area, compared with 200 kg for 2 ha when using usual methods. Her saving of 190 kg adds to the profitability of SRI.

Mrs. Nai Sareth from Pauk district said that in her villages, there were only 8 SRI farmers in 2004. Last season there were 16. In 2004, most villagers had a shortage of rice, of at least 2 months' supply. In 2005, all SRI farmers had a surplus. With traditional methods, they use 12 kg of seed to get 80 kg of harvest (a ratio of 1 to 6.66; while with SRI, 1.5 kg of seed gives 200 kg yield (a ratio of 1 to 133.33). This is a 20-fold increase in profitability. Chorm Sy said that they can improve the system further, particularly by making more and better compost and applying it to the soil. Nai Sareth said that in 2004, she got only 40 tang; this last year she got 80 tang, as her soil is improving. Both spoke very calmly and confidently about their experience and will surely be able to help CEDAC and the PDA disseminate SRI in their area.

Takeo and Kompong Speu Provinces: This report was led off by **Bao Vuty** from CEDAC: 78 villages are involved in Takeo province and 110 villages in Kompong Speu province. Here are the data that he provided to the workshop, noting that 2004 was a year of severe drought:

	2003	2004	2005
Farmers	578	2,233	9,435
Villages	83	127	108
Yield (t/ha)	3.7	2.15	3.8
Area (ha)	13.2	119	2,648

Vuty's conclusions, accompanied by some impressive powerpoint pictures, were:

- (1) SRI methods can double yield.
- (2) Farmers can get even greater increase in income because expenditures are decreased.
- (3) Soil is improved with more addition of organic matter and reduced fertilizer use.
- (4) With SRI, there is more harmony within rural households.
- (5) More employment and income opportunities come with diversification.

The PDA representative from Takeo, **Sao Somol**, talked about its 'Promoting Local Innovation' project which includes SRI. It involves a group of 17 farmers, who are working with the 'Twelve Practices' being recommended as the PDA presentation of SRI. Not all of these practices are always applied, he noted; but still they get good results. Their average number of tillers per plant is 46, compared with 28 on control plots, managed by the same farmers; the maximum number

of tillers was 63 and the minimum 30 (note that the minimum is greater than the average for the control plots). The number of panicles per hill were 40 vs. 25; and the SRI yield was 4.3 t/ha vs. 2.6 t/ha with conventional methods. “The farmers’ perception is that SRI is very beneficial. All will extend it to other farmers.” One practice being introduced and evaluated is crop rotation to improve the soil. Farmers within the group invite others in the village to visit their plots.

Mok Chenda on the CEDAC staff in Tramkok district of Taken province reported these data:

	2001	2002	2003	2004	2005
Farmers	69	230	980	2,181	5,300
Area (ha)	13	NA	150	304.8*	1678.7
Yield (t/ha)	4.8	4.5	4.2	4.5	NA

* 2004 was a drought year, so not all area was harvested and recorded.

Chenda also reported experimental results where they have used SRI methods with raised beds, green manures and cover crops:

	Green Manure	Raised Beds	PDA’s12 Practices’	Cover Crop
Replications	9	8	6	7
Experimental area (ha)	0.74	0.66	0.73	0.24
Control area (ha)	0.70	0.37	0.93	0.25
Experimental yield (t/ha)	2.85	3.30	2.40	2.80
Control yield (t/ha)	2.45	2.10	1.54	2.23

Chenda also reported their experiments with decorticating seeds before sowing gave very good results. He said that in Tramkok district, not there are only about 20% of farmers who don’t yet know about SRI. It could become the first ‘all-SRI’ district in Cambodia.

Next, two NGOs working in different areas of Takeo province where CEDAC is not active reported on their SRI experience. The first, known as CCK, is working in two districts with 95 households who use SRI methods. In 2005, due to a drought at the beginning of the planting season (delayed onset of the rains), they could not use young seedlings. The NGO emphasizes shallow planting of young seedlings and the use of compost. He said their trials show smaller rice panicles when 5-6 seedlings are transplanted together and deep.

The other NGO, Rachna, said that it worked with 17 farmers who started by cultivating 1.5 ha of SRI in 2004. In 2005, after providing training and farmer-to-farmer visits, there were 208 farmers in 8 villages using SRI methods on 81.7 ha. The SRI yield was 3.5 t/ha in a village where there was enough water; and 3.0 t/ha in another villages where water supply was more limited, according to an evaluation made with 20 crop-cuts.

One woman farmer cooperating with the first NGO said that in 2004 she used SRI on a small area and got 18 tau where before she got 12 tau, with as many as 41 tillers per plant. In 2005, she cultivated 24 ares with SRI and got 75 tau where she got 50 tau before. This is a yield of 3.6 t/ha if a tau in her area = 12 kg. Another CEDAC staff member working in Takeo province, **Sa Mei**

Ka, reported that the farmers with whom he works also faced drought at the start of the past season. He did not have yield figures yet, but 1,087 farmers in his area cultivated 235.8 ha of SRI in 2005. As was evident from my attendance of award ceremonies and village visits in Takeo province on Sunday and Tuesday-Wednesday, this is an area where SRI is pace-setting.

Prey Veng Province: Results from Preah Sdech district in 2005 were reported by **Bon Phak** from CEDAC. He said 372 households in 40 villages used SRI methods on 170.85 ha, with an average yield of 3.37 t/ha. However, at most, farmers used just 10 of the 12 ‘principles’ (I think his reference to principles referred to practices); the minimum use was 3. Thus, there is still room for further and better use of the methods. Usually about 1 t/ha of compost was applied. More farmers would have used the methods last season if the rains had come on time. Before the season started the program had expected to have 1,000 households participating, Phak said. Also, he noted that most applied SRI methods on fields fairly far from the village, where they could not give their SRI crop as much attention as is recommended, so the yields were lower than they could have been. Actually, 3.37 t/ha in a year of bad weather is very respectable rice yield in Cambodia.

Hach Phom from CEDAC reported from his area of responsibility in Prey Veng, where 168 villages have farmers working on SRI. The time-line he gave was as follows:

- 2000: 10 households,
- 2001: 50 households;
- 2002: 500 households (50 villages);
- 2003: 1,000 households;
- 2004: 1316 households; and
- 2005: 2050 households (750 hectares).

The farmer impressions from their experience and experiments he summarized as: yield increases; expenditures decrease; and resource inputs are saved (presumably seeds, water, fertilizer). He commented that farmers are now growing multi-purpose trees in conjunction with their rice farming, and there is an increase in cultivated area.

Battambang Province: A young woman representing a Cambodian NGO, Aphiwat Strey, working in this province in the northwest of the country gave a brief report on uptake of SRI:

- 2000: 1 farmer
- 2001: 9 farmers
- 2002: 13 farmers
- 2003: 64 farmers
- 2004: 195 farmers
- 2005: 233 farmers.

She noted that much rice production in the province has not been very intensive of high-yielding. With traditional broadcasting of seed, rather than transplanting of seedlings from a nursery, yields are around 240 kg/ha in both 2004 and 2005. Yield with this ‘extensive’ adaptation of SRI practices have ranged from 1.5 to 3.7 t/ha.

Kompong Speu: The Cambodian NGO by name of NAPA reported that it started SRI work in 2004 with 30 households, and in 2005, there were 77 households in its program, plus another 52 households that were participating indirectly, having learned from program participants. Yields,

averaged 3.5 t/ha, with a range of 1.57 to 6.0 t/ha. **So Teth**, a farmer leader in Kampong Speu reported that in his area, they have about 300 households in 75 villages now using SRI. He referred to one farmer who has only 0.4 ha and could not grow enough rice previously to feed his family; now with SRI methods, he has a surplus.

Kandal Province: Mey Som was invited to give the report from this province. He noted that they had expected to spread SRI to 29 villages in the previous season, but due to the unfavorable rainfall patterns, only 19 villages were involved. “SRI is easy to extend because it gives good results with reduced expenditure,” he said. He said that experience in Kandal was similar to that in other provinces, so he would not give a lot of statistics. Instead he asked permission to present a poem that he had composed about SRI. Unfolding a sheet of paper that he had extracted from a shirt pocket, he read the poem in a kind of chant that elicited much approval from the group, but also much amusement.

During the tea-break that followed, I asked Koma and Chey Tech for a translation that I could include in this report. Both said that it would be very difficult to translate the poem because there were many puns and double-meanings in Khmer, explaining the smiles and chuckles that the poem had elicited from farmer-participants. The theme of the poem, a mini-epic, was Mey Som’s life before and after he learned about SRI from CEDAC. It reminded me of a song about SRI that some 40 Indonesian farmer-field-school alumni now practicing SRI sang for me at a meeting in Ciamis the previous September, and of a musical skit that Bangladeshi SRI farmers composed and then performed at a national SRI workshop at Mymensingh in September 2002. Such enthusiasm and creativity does not often accompany agricultural innovations.

Reasons for Non-Acceptance of SRI: After the break, Koma asked for farmer thoughts on why not all farmers take up SRI? This question elicited a series of responses:

- Some people just don’t know, they are ignorant about SRI; or they don’t care that much about increasing income, or don’t have the resources needed, or rely on others.
- Some farmers are lazy, and don’t take up any improvement. SRI admittedly is more difficult to practice, it takes more labor, at least when beginning.
- It is difficult to deal with the weeds that are more numerous with SRI practice.
- It is difficult to handle the young seedlings when transplanting.
- Some cannot find enough organic matter to make compost.
- Some farmers are involved in other businesses and don’t have enough time to devote to serious rice-growing. Or maybe they don’t like to go to meetings. Also, many farmers don’t think ahead. They are the kind of person who builds a house but doesn’t finish his roof before the rains come. (Mey Som)
- We need to invite other farmers to join us in our activities, such as marketing and lobbying. If we bring them into our circle, they will see that our results and our progress are very fantastic. (Prak Chres)
- Cambodia is a young country for SRI, as it started only 5 years ago. Remember that the use of chemical fertilizer and pesticides has been promoted for over 30 years. When CEDAC gives different advice than the chemical companies have been giving, some farmers get confused.

- Some farmers practice SRI without proper training. It is good to have indirect spread, but there is a danger that if they do not do SRI well, and their crop fails, others will say that SRI is not a good.
- Small farmers say that they need “SRI seed,” not understanding that the SRI is a matter of methods. Some have seen good SRI results for two years and still don’t believe it. Also, some persons criticize us, saying “You are Pol Pot” because the Khmer Rouge also promoted use of organic fertilization rather than depend on chemical fertilizers (a woman farmer).
- When some farmers demonstrate SRI, some neighbors don’t follow their example, but instead just complain. Small farmers often say that proper water control is not possible. His PDA has disseminated SRI since 2005. It is not so appropriate for rich farmers who are usually doing a lot of other jobs besides rice farming. They want to rely on machines, so they don’t adopt. Also, it is difficult for the poorest people (PDA Kompong Thom).¹
- Dissemination is more difficult when the promoters don’t understand SRI very well themselves and are not clear in explaining it to others. If the farmer-promoters are clear in their own minds, spread should be better. Also, if some farmers have constraints, we can help them come up with solutions.

Koma reinforced the last comment, that we should take a problem-solving approach to SRI, rather than promote it as a ‘package’ with all practices fixed. He cited an example from Siem Riep where a farmer had been getting less than 1000 kg from his 1-hectare rice farm, but now with SRI methods he is getting that same yield from just half a hectare and with the same labor. He also showed how one farmer with 1 hectare of land has divided it into four sections, growing rice on only three of the sections in any one season; on the other quarter, he sows a green manure crop. His rice yield is enough improved that he gets more yield from a reduced area, and it does not require more labor. Farmers are showing real interest in such innovation.

Farmer Panel: A woman farmer began by telling how she learned the technique of removing the husk on rice seeds to get better yields from farmers in Thailand. She said that when seeds are used, instead of transplanting, it is necessary to build a fence around the field to keep chickens out. The time spent on decorticating the seeds is saved by not having to construct a nursery and do transplanting, and there is higher harvest. One thing she has learned is the importance of soaking the seeds before sowing, to get higher germination. Also, she puts gasoline (or some hydrocarbon) around the seedbed to keep insects out.

Chres spoke again, saying that he has had similar experience with removing seed husks. It requires more care. One wants grains that are clear, not discolored or dark, for best results. IN a handful of seed, he finds that about half should be discarded upon closer inspection. He also puts the seeds into water to check on their density, throwing away those that float. Seedbed

¹ This has been argued by Moser and Barrett (2003), that SRI is less suitable/acceptable for the richer and the poorer farmers. But the IWMI evaluation done in Sri Lanka (Namara et al., 2004) and the CAU evaluation in Sichuan, China (Li et al., 2005) found no such disparity in uptake. The China study found poorer and richer farmers slightly more represented among SRI farmers than in the general population. I told the workshop that one rich farmer in India has cultivated 40 ha of SRI contiguously, with a harvested average yield of 11.15 t/ha according to the Andhra Pradesh extension service measurements. SRI is thus scale-neutral, though it is relatively more attractive to smaller farmers.

preparation is the same as for regular cultivation practice, except it is important to put on as much compost as possible, working it into the soil. He has also done transplanting under rainfed conditions, on beds similar to those he uses for cabbage, planting three rows of rice. He then mulches the beds with green manure to keep down weeds. Tillering is very similar, 40-45 tillers per plant, with panicles about 30 cm long (8 inches). Grains per panicle are 350-400, and the yield is 0.8 kg/m², which comes to 8 t/ha.

A third farmer talked about his experimentation testing different densities: 1 hill, 4 hills, 9 hills and 16 hills per square meter (100x100 cm, 50x50 cm, 33x33 cm, and 25x25 cm). His yield was 1.1 kg/m² (11 t/ha) at 33x33 cm spacing, and 0.8 kg/m² (8 t/ha) at 25x25 cm. At the wider spacings of 50x50 and 100x100 cm, plant population was too sparse for better yields than this, although the average yield across all four trials was 0.77 kg/m² (7.7 t/ha). Before he produced rice on 15 ares. When making channels for water control and a fishpond, he reduced his arable area to 10 ares. But he grows rice on only half of this (5 ares) and gets as much yield as before from three times this area.

A fourth farmer said that his rice land is rather unfertile. But since diversifying his production, using SRI methods and digging canals in his field for water control, his rice crop is quite satisfactory. He puts as much green manure as possible on his paddy soil to improve it. Koma commended him on his transformation of his small farm and suggested that others try the same kind of experimentation to intensify and diversify their production.

Farmer Innovation: Then I was asked to make a presentation, and using powerpoint, I focused on the kinds of innovations that farmers in many countries around the world – Madagascar, China, Cuba, India, Sri Lanka, Cambodia, and elsewhere – are making and evaluating. I hope that this gave farmers in attendance some ideas and encouragement for doing their own invention of ways to establish rice crops more quickly and reliably, to handle weeds better, to save labor and water, etc.

Closing Session: This began with comments from **Ms. Sim Chanthou** from Takeo province. She said that from the workshop, she had learned many things. In particular, she was more persuaded than before of the value of young seedlings and use of compost. “These things are very necessary,” she said. She said that from now on, she would commit herself and her whole life to implementing SRI, and also converting to diversification. Her rice field is only 30 ares, but it should be sufficient to support her family. She thanked everyone for what she had learned and wished everyone a good trip home.

Another woman, from Prey Veng province, said that this was her first time at a national workshop. She had learned more than she expected. She commented that she had not known that there was such wide application of SRI in Cambodia, let alone all around the world. Next season she will do more, she said.

Koma then called on Mey Som for some closing remarks, asking: “Before you did SRI all alone; now there are many thousands. How are you feeling?” Mey Som said that he was very surprised with the progress of SRI. He never expected anything like this, and he is very happy with the

spread. “I hope it will spread more, to the whole country. If farmers will try all of the innovations being offered by CEDAC, they will be very tired, but their results will make them very happy.”

“All of the people here are leaders of SRI dissemination,” he said. (All invited are key-farmers working with CEDAC programs in different provinces.) “So when participants go back home, they will disseminate SRI even more. Some farmers say that NGOs disseminate things only for earning their staff salaries. But now you can see that this is done for the benefit of farmers.” Before he didn’t share much with others, he said. “I thought that other farmers would compete with me. But now that I have seen the new possibilities with SRI, I want to share.”

Koma also made some concluding comments, noting that diversification is an important step beyond intensification. Farmers can produce more rice by using less of their land for rice, and less water. The main focus of the new practices is on the **root system**. Plants’ health depends on their roots. “Roots are life.” Also, farmers should focus on **seed quality**. By selecting good seed, they can make their other resources more productive. A third focus is on **compost**, getting more organic matter into the soil, both to provide nutrients to the plant but also to support larger populations of soil organisms. Making compost from any and all biomass available will have the added advantage of keeping homesteads cleaner and neater. Keeping rice stubble in the field is also important for supporting soil organisms. Don’t burn your stubble, and tell other farmers not to burn, he said. And keep animals in the fields, to add their manure to the soil. All this adds to soil biodiversity.

By now it was almost 6 o’clock, and it was still possible for some of the farmers to get home that evening, although those who lived farther away would have to spend the night in Phnom Penh. This was not the first such workshop, and it would not be the last, so the closing was more of an adjournment, for discussions to be resumed in the future, than a final conclusion.