REPORT ON VISIT TO VIETNAM TO REVIEW SRI PROGRESS – January 3-12, 2006

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SYNOPSIS

These are the main observations from a visit to Vietnam to get acquainted with what is going on in various institutions and in the field with SRI. Details expanding on these observations follow:

- Although SRI got a **later start** in Vietnam than in most other countries of Asia, starting in only in 2004, some very good people and institutions have gotten engaged with SRI, and some good results are already being achieved. So it appears that Vietnamese farmers could fairly quickly **catch up** with farmers in other countries in utilizing SRI opportunities.
- While SRI results so far have been positive, the **yield increases in Vietnam have not been as great** as in some other countries. There may be some soil biological factors accounting for this that would be worth studying.
- The **seed-saving** and **water-saving** associated with SRI are attractive to Vietnamese farmers as well as to researchers and policy-makers. **Cost reduction** can also be substantial. Farmers in Dông Trú village which I was able to visit, where they have used SRI for two years now, had gotten a 21% increase in yield with a 24% reduction in cost. The resulting **65% increase in net income per hectare** is very attractive.
- Farmers who have gone through the Farmer Field Schools of the **National IPM Program** are particularly well-prepared for SRI. FFS alumni whom I met in Dông Trú were very enthused about, as well as successful with, SRI. The FFS approach is ideal for dissemination of SRI, and Vietnam has many well-educated, motivated farmers who are impressive and capable. They could quickly take over SRI and make it their own.
- The largest university, **Thai Nguyen University**, which has a 'land-grant' kind of mission for rural development in the mountainous northern region of the country, has done some systematic evaluation of SRI methods, documenting SRI yields up to 8.8 t/ha. It would like to expand its research and extension work on SRI and offers a good academic base for this.
- While the NGO sector is not large in Vietnam, as it is in the Philippines, this has some real strength. One of the most experienced NGOs, **CIDSE/LÚA**, which has worked with the IPM program, is prepared to get involved with SRI. Its new name, *lúa*, means *rice* in Vietnamese.
- While there is a lot of 'verticality' among institutions in Vietnam, i.e., horizontal connections for **communication and cooperation** are not as strong as in many other countries, the persons and institutions involved with SRI express strong disposition for collaborative work.
- The **Ministry of Agriculture**, which has been promoting the 'modernization' of agriculture with an emphasis on chemical inputs and genetic improvement, appears interested in SRI. It appreciates the need to raise productivity and incomes for large numbers of small and poor rice farmers, the opportunity to use less water in rice production, and the value of reducing Vietnam's use of and reliance on agrochemicals. If it provides policy and financial support, the institutional capabilities to capitalize on SRI's opportunities are already in place.
- Strong interest in SRI and a willingness to cooperate with other Vietnamese institutions on its evaluation was expressed in the Ministry's **National Institute of Soils and Fertilizers** after a seminar on SRI and ensuing discussion there. NISF could be an important partner for SRI.

INTRODUCTION

My initial reason for traveling to Hanoi was to participate in the 2nd International Conference on Environmental, Cultural, Economic and Social Sustainability, January 9-12, to make make a presentation on SRI. This event was organized by the Australian publishing company Common Ground together with the Australian National University. It was supported by the Pacific Asia Observatory for Cultural Diversity in Human Development; the Hanoi University of Culture; the Dept. of National Cultural Heritage of the Vietnamese Ministry of Culture and Information; the Quang Ninh Provincial Government; the Ha Long Bay World Heritage Area; the Hanoi Office of UNESCO; and the Globalism Institute of the RMIT University (formerly Royal Melbourne Inst. of Technology). A previous conference was held in 2005 at the University of Hawaii at Manoa.

By coming January 3, several days ahead of time, I was able to have a more diversified visit, getting together with government, university and NGO staff who are working on, or interested in, SRI. These are persons whom I knew (or knew about) only through email communication. This visit gave us an opportunity for face-to-face meetings and for also a field visit the first day to meet some Vietnamese farmers who have begun using SRI methods.

IPM FARMER FIELD SCHOOL PROGRAM

On Wednesday, January 4, I was picked up at my hotel at 8:30 by Ngo Tien **Dung**, coordinator for the **National IPM Program**, and several of his staff. This program, which is based in the **Plant Protection Department** (PPD) of the Ministry of Agriculture and Rural Development (MARD), was established in 1992 with FAO support. It has a solid record of success in changing pest and disease control practices by using farmer field school (FFS) methodologies.

Three impact evaluations have documented yield increases of 13-21% for farmers who use IPM methods with rice; these are accompanied by 63-69% reductions in the use of insecticides, and 22-47% decreases in pesticide use. Dung gave me a **2006 IPM Calendar** which reported that through the end of 2005, the IPM Program had conducted 29,097 Farmer Field Schools for rice, with 872,910 farmers participating. The Program's focus is now shifting to cover other crops, and an additional 66,000 farmers have been trained already on IPM methods for vegetables, cotton, or tea. DANIDA is one of the main donors supporting the program.

Dung told me that the IPM program began introducing SRI in 2003, and by 2005 it had done training on SRI in 12 provinces. Its FFS approach is very appropriate for SRI, and FFS farmer alumni have begun carrying out experiments with the new methods on their own fields and deciding how best to utilize them under their own conditions. Farmers have seen that with SRI they can grow healthier rice while reducing seed requirements by 50 to 80%. Water management is still the most difficult aspect of SRI, especially in the raining season, although farmers have found some solutions to deal with this problem that they will to try out in the next season

Dung organized a field visit in the morning to visit **Dông Trù village** in Hanoi Province. It lies east-northeast of the city across the Red River. Women's farming groups there have used SRI methods for two years now and are very enthusiastic about their results. Elske van de Fliert, who works with the vegetable IPM program as an FAO advisor, had told me about these women after her visit to the village previously. Elske sent pictures of the women and their rice fields to a mutual friend in Australia, Max Whitten, who in turn sent the pictures on to me at Cornell.

One of the pictures, shown below, was of adjoining rice fields after they were hit by a typhoon. 'Regular' rice is on the right, while in the center there is a strip of SRI rice with closer spacing, and a field of SRI rice with wider spacing on the left. The ability of the SRI rice to withstand such stress is surely one reason why these farmers are interested in the new methods.

As it was wintertime, there were no rice crops to see in the field. So instead of going to the field we met in a local assembly hall. The four women in another picture that Elske had sent (below)

were there to greet us. It was a special pleasure to meet them, after having admired them and their SRI work for some months from Ithaca, New York. Elske reported that they had become self-appointed promoters of SRI among neighboring farmers.

A hamlet official welcomed us and said that they were pleased to have us visit, to see their progress with the new system. (The Vietnamese words being used for SRI, *canh tać*, mean 'improved farming'; 'intensification' connotes use of external inputs.) Then, the women made a fairly elaborate presentation, unrolling large sheets of paper and presenting their data systematically, as learned in Farmer Field School. The merits of such training were very evident as I watched and listened. They had not just learned how to use new techniques and methods. They were actively analyzing and innovating in response to the new opportunity.

Their report from the past season was in several parts, each presented on large sheets. On the next page are the numbers that they gave to me, with translation of the words provided by IPM Program colleagues. On the first sheet, they reviewed how they practiced SRI differently from their conventional practice. The **percentage of reduction in plant population** I calculated from their figures and have added to the table (line 4). Then they presented a second table with data on **differences between SRI plants and conventional plants**. To their two columns of data I have added a third column, which reports the differences in percentages, to make the contrast clearer.

CULTIVATION METHODS	**Conventional**	**SRI**
Seedling age (leaf stage)	**4 – 4.5**	**2 – 2.5**
Seedlings per hill	**3 – 5**	**1**
Spacing (in cm)	**13x17 – 14x17**	**25x25 – 30x30**
Plant population (per m^2	**120-225**	**12-16 (-90%)**
Water regime	**Continuous flooding**	**Periodic drying**
Fertilization	**Chemical fertilizer + manure**	**Compost + some fertilizer**

CROP DATA	**Conventional**	**SRI**	***% Difference***
Effective tillers/hill	**7**	**11.6-15.6**	***+95%***
Plant height (cm)	**103-105**	**134-138**	***+30%***
Panicles per m^2	**280-345**	**180-187**	***-70%***
Grains per panicle	**120**	**221-237**	***+90%***
Health of plants	**Normal**	**Good**	
Projected yield (t/ha)*	**5.3-5.5**	**6.1-6.4**	***+16%***
Actual yield (t/ha)*	**4.1**	**4.9-5.0**	***+21%***

On the first sheet, they reported the '**projected yield**' based on plant crop characteristics. This was supplemented by figures on '**actual yield**' on another sheet. I include the latter figures as a last row in the table above for easier comparison. The farmers explained that there had been a **typhoon** which reduced the yields of all their rice -- but with less reduction for their SRI plots.

Their information on **crop protection expenditures** and **associated pest problems** was interesting. With conventional cultivation, they spent 64% more money on pesticides; and yet

their pest problems were more severe on that rice. Rust was more of a problem with their SRI rice, but sheath blight was much more serious on 'regular' rice, as were brown plant hoppers.

	Conventional	SRI
Expenditure on pesticides	**637,000,000 VND**	**388,000,000 VND**
Pest Problems		
Sheath blight	+++	+
Rust	+	++
Brown plant hopper	++	+

Next, a woman farmer presented detailed comparisons of the **differences in cost per hectare** when using SRI vs. conventional methods. I have added two columns, for 'difference' and '% difference,' to make the comparisons easier to appreciate. All the figures for conventional and SRI costs of production, and the difference, are in thousands of Vietnamese dong per hectare (000 VND/ha). The exchange rate is 15,000 VND = $1.00.

	Conventional	SRI	Difference	% Difference
SEEDS	**436**	**63**	**-373**	**-85%**
FERTILIZATION	**2,636**	**468**	**-2,168**	**-82%**
Manure*	*1,036*	*250*	*-786*	*-76%*
Chem. Fertilizer	*1,600*	*218*	*-1,382*	*-86%*
LABOR	**3,878**	**3,938**	**+60**	**+1.5%**
Land prep.	*1,939*	*1,999*	*+60*	*+3%*
Transplanting	*1,385*	*831*	*-554*	*-40%*
Weeding	*554*	*1,108*	*+554*	*+100%*
AGROCHEMICALS	**775**	**388**	**-387**	**-50%**
Herbicides	*138*	*0*	*-138*	∞
Pesticides	*637*	*388*	*-249*	*-39%*
TOTAL COSTS	**6,267**	**4,797**	**-1,470**	**-24%**

The 'total costs' listed above are those provided on the women's first sheet of data. These were quite close to the total of the amounts itemized for SRI but the figure given for total conventional production costs was higher, indicating that some other costs were also figured into their total.

When I wrote down these detailed cost data in the village, I did not notice that the amounts in the third row reported for expenditure on manure, upon later reflection, appeared reversed. Usually, farmers spend **more** on manure with SRI rather than less. Back at the hotel afterwards, when drafting this report, I noticed this discrepancy and reversed the numbers in my table and analysis to avoid any exaggeration of SRI's cost-saving advantages. This made SRI's cost-reduction only 5%, rather than the much figure I came up with at first. However, when combined with a 21% increase in gross income, this cost saving of 5% meant a 44% increase in farmers' net income from SRI (9,140,000 VND/ha vs. 6,360,000 VND/ha).

I checked this calculation with Dung by email, just to be sure of it. He checked with the villagers and sent me an email back explaining that the women's figures were indeed correct. Their manure costs with SRI were so low because they made their compost from groundnut plants,

abundant free biomass left after that crop's harvest. They bought and added some pig manure to enhance and balance the compost's nutrient supply. On the other hand, for conventionally-grown rice, to get a better yield they purchase and apply more expensive chicken manure (30 dong/kg) along with their chemical fertilizer. Thus, these farmers get a very significant reduction (82%) in their overall costs of fertilization while also getting a higher yield.

Further, they are cutting their agrochemical costs by half. Eventually they expect to reduce these by still more. Their labor costs remained about the same, as the extra time required for weeding (they doubled their time devoted to this operation) is compensated for by an equal reduction in the time needed for transplanting (since their plant population is cut by 85-90%). They expect land preparation to become quicker and easier in the future, so that disadvantage with SRI should disappear. They may be able to save labor also in other SRI operations as they become more skilled with the techniques, so it should be possible for SRI to become **labor-saving** over time.

When the accuracy of the cost data had been confirmed, the comparison of average **revenue**, **cost**, and **net income per hectare** worked out as follows. It is no wonder that the women are enthusiastic about SRI and have been taking their own time to try to persuade fellow farmers to switch to the new methods.

Economic evaluation	Conventional	SRI	% Difference
Gross income/ha	**12,300**	**14,850**	**+21%**
Costs of production/ha	**6,267**	**4,797**	**- 24%**
Net income/ha	**6,033**	**10,053**	**+65%**

I asked the women whether they found any difference in **grain quality** with SRI. They said that the taste of SRI rice is better when cooked. They also noted that the **outturn of milled rice** from a bushel of SRI paddy is higher, although they did not have any numbers on this. Farmers and/or millers in China, Cuba, India and Sri Lanka have reported about a 15% increase in the rate of milled rice with SRI because its paddy when milled has fewer unfilled grains (less chaff) and fewer broken grains (less shattering). Thus we have seen this benefit elsewhere.

When I asked why they put organic matter into the soil, they said that it improves soil structure (water-holding capacity) and also supports more soil organisms. They have gotten this concept correct from their Farmer Field School education. I told that in the US and UK, the motto of organic farmers is: *don't feed the plant; feed the soil and the soil will feed the plant*. They estimated that with SRI methods, their **water saving** is about 60%.

Thirty women, organized in 6 groups constitute the core of the SRI interest in Dông Trù. Each group is trying to bring 10-15 others into the SRI network. "Most farmers are at first skeptical, except the ones near the study fields," someone said Water management is the most difficult part of SRI at first. This will only become easier when all of the farmers in the tract cooperate to reduce water levels. They said that they are lobbying local officials, especially those responsible for water distribution, for an expansion of SRI practices in the village and township.

A picture similar to the one below was used on the first page of the **2006 IPM Calendar** that is being distributed by the National IPM Program. I am sorry that I did not write down the names

of the women in Dông Trù, particularly the one displaying an SRI plant and a 'normal' one in front of their respective SRI and conventional plots post-typhoon. It is easy to imagine how persuasive such farmers can be on behalf of SRI.

I have no way of knowing how typical Dông Trù is of other rice-growing villages in Vietnam. The advantages that are most apparent with SRI here are **not super-high yields**, but rather **less seed**, **less water**, **less transplanting time** (women's work), reduction in use of **agrochemicals** and in the **cost of production**, increased **profitability**, and **more resistance to pests, diseases and typhoons**. As more Vietnamese farmers learn about the SRI experience in Dông Trù and other places, there could be very rapid uptake since the National IPM program has trained, and gained the confidence of, so many rice farmers across the country.

Wednesday afternoon, there was a seminar on SRI at the Plant Protection Department offices in Hanoi, to which about 30 staff in the IPM program and some others came for my powerpoint presentation. This provided more of the theory of SRI to buttress their understanding of the empirical results being achieved. Given its Farmer Field School methodology and philosophy, the National IPM program should provide a good base within the Ministry of Agriculture for SRI evaluation and spread.

THAI NGUYEN UNIVERSITY

The next morning, a staff member of Thai Nguyen University, Duong Dang Khoi, picked me up at the hotel at 8:30 for the two-hour drive north of Hanoi to TNU. He works with Dr. Hoang Van **Phu**, an agronomist who is involved in the university's program of outreach in the surrounding mountainous areas and who was recently appointed director of its International Relations Office. Phu has been doing evaluations of SRI for the past two years and wanted to discuss with me his results. When I arrived in his office and sat down for some welcoming tea, my first question was: how did you learn about SRI and first become interested in it?

His answer was simple and fully explanatory. While doing his master's degree in agronomy at Chiangmai University in Thailand, Phu had become friends with Klaus Prinz at the McKean Rehabilitation Center in Chiangmai. Klaus has been the most active catalyst for SRI efforts in Thailand, encouraging everyone whom he can to try out SRI methods. Phu further explained that he had when he had done a PhD in farming systems at the University of the Philippines at Los Baños, his advisor and teacher was Dr. Pamela Fernandez. She has been one of the most visible academics in the Philippines working with and supporting SRI. While Phu was at UPLB, she was not yet involved with SRI. However, anyone getting higher education with her would surely be favorably disposed to what SRI has to offer.

Although TNU is a relatively new university, having been established only in 1994, it is already the largest university in Vietnam in terms of student enrollment. It is really more than 10 years old because it was constituted from a merger of colleges of agriculture and forestry (established in 1970), engineering (1965), education (1966), and medicine (1968). After they were combined into TNU, a college of economics and business management was created in 2004 and a junior college of economics and technology in 2005. New faculties of information technology and of natural sciences were added in 2001 and 2002, respectively.

Thai Nguyen was the center of nationalist resistance to the French, and then it was for a while the base of operations for Ho Chi Minh when leading the struggle against U.S. forces. So it is seen as more than just a provincial center, Phu explained. More important at present, TNU has been given a mandate to work for the uplift of 16 provinces in northern Vietnam that are largely mountainous and have the most extensive poverty in the country. TNU has what we would call in the U.S. a 'land-grant' mission to train students who can benefit their society, not just themselves, and to generate and apply useful new knowledge for the improvement of society.

It was a surprise to learn that TNU is the beneficiary of grants from a major U.S. foundation that until recently gave only anonymous gifts, the Atlantic Philanthropies. Charles Feeney, a Cornell alumnus who acquired great wealth by conceiving and operating duty-free stores around the world, wanted to give back generously to society, but preferred to remain out of the spotlight. In the late 1980s, he offered Cornell University (through intermediaries pledged not to reveal the source of the funding) a gift of $15 million. This gift was intended to enable Cornell faculty and students to work more actively and creatively on problems of sustainable agricultural and rural development with colleagues in countries where poverty, hunger and environmental degradation were growing worse. It provided the financial support for establishing the Cornell International Institute for Food, Agriculture and Development.

For most of the 15 years that I served as director of CIIFAD it was possible, thanks to 'the anonymous donor,' to take novel initiatives for sustainable development – quickly, flexibly, boldly, not having to spend time coaxing money from donors. In fact, my getting involved with SRI and then being able to work on evaluating and extending this novel system was made possible by the exemplary altruism of Mr. Feeney. Now I learned that his generosity extended to Vietnam and is supporting TNU and the other three regional universities in Vietnam, at Hue, Danang and Can Tho. With Atlantic Philanthropies' grant of $7.25 million to TNU, it is building a Learning Resources Center for the use of modern technologies for better outreach into the mountainous areas, and a dormitory for 1600 students that will enable ethnic minorities from the more remote parts of the north to attend the university.

After discussing how our international SRI network based at Cornell could be supportive of Phu's work on SRI, and how Cornell University could become involved with TNU's program of outreach, we had lunch at Phu's favorite restaurant in the town with several other colleagues. At 2 o'clock, there was a seminar on SRI at the College of Agriculture and Forestry with about 30 lecturers and fourth-year students, most of whom work on rice. I wished that somebody could have taken a picture of me and my laptop with a large white plaster bust of Ho Chi Minh looking over my shoulder. He would have approved of our making SRI available to Vietnamese farmers.

When my presentation was finished and we had had some discussion, Phu presented some of the data that he has from his evaluations of SRI methods. He began on the TNU campus and then moved to a field location once he was satisfied that the methods are beneficial. Not all of the yields were as impressive as we have seen in other countries, but they were seen to be consistent and significant, and when accompanied by a reduction in the costs of production and by water saving, they produce substantial net gains for farmers as well as environmental benefit.

The first season, Phu tested components of SRI methodology in factorial trials on campus, focusing on seedling age, spacing, and water management. He tested 24 combinations, with three replications each, on 2x4m plots, having an experimental area of 576 m^2. All trials were conducted with 2 seedlings/hill and got 3 weedings by hand, so these SRI practices were not really tested. The fertilization was at a rate of 10 tons of manure/ha, plus 100 kg N, 150 kg P_2O_5 and 100 kg K_2O. Here are some of the specific results that Phu reported.

Location: Thai Nguyen University – Variety: Khang dan 18 -- Spring Season 2004

Seedling age	Hills/m^2	Water mgmt.	Yield (t/ha)	Percent change
24			**6.61**	**--**
16			**7.16**	**+8.3%**
8			**7.87**	**+19.1%**
	39		**6.70**	**--**
	16		**7.00**	**+4.1%**
	9		**7.60**	**+13.4%**
		Normal	**6.82**	**--**
		SRI	**7.60**	**+11.4%**

The next year, Phu evaluated the effect of different spacings, confirming that 'wider spacing' means not maximization but optimization, needing to find the best distance for the particular soil and other growing conditions. 'Best' spacing is always site- and soil-specific, and it can change over time if the soil's fertility improves as a result of SRI practices.

Location: Thai Nguyen University – Variety: Khang dan 18 -- Spring Season 2005

Seedling age	Hills/m^2	Water mgmt.	Yield (t/ha)	Percent change
24	**42**	**Normal**	**6.07**	**--**
14	**25**	**SRI**	**7.37**	**+21.4%**
14	**17**	**SRI**	**7.40**	**+21.9%**
14	**13**	**SRI**	**7.37**	**+21.4%**
14	**11**	**SRI**	**7.47**	**+23.0%**
14	**8**	**SRI**	**6.56**	**+8.0%**

In spring 2005, Phu also started evaluating two different varieties, one a hybrid, in an upland location. In Vietnam, 'upland' refers to production in mountainous areas in contrast to 'lowland' areas, e.g., deltas. 'Upland rice' in Vietnam is not a rainfed crop. However, because water is limited in upland areas, water-saving is important. Phu's trials showed (again) that some varieties respond better than others to SRI methods. Also, he found the best spacing to be 30x25 cm. The trials were conducted on three farms under farmers' conditions on an area of 900 m^2.

Location: Bac Giang – Spring 2005

Variety	Seedling age	Hills/m^2	Water mgmt.	Yield (t/ha)	Percent change
Khang dan 18	**25**	**42**	**Normal**	**6.56**	**--**
	14	***17***	***SRI***	***7.74***	***+17.9%***
	14	***11***	***SRI***	***7.39***	***+12.9%***
Nhi Uu 838	**25**	**42**	**Normal**	**6.93**	**--**
(hybrid)	***14***	***17***	***SRI***	***8.53***	***+23.2%***
	14	***11***	***SRI***	***8.03***	***+15.9%***

In the summer season of 2005, Phu repeated these trials in Bac Giang and saw the same patterns. However, probably because the soil is more saturated and there was less sunlight in that season, the average yields were lower for both conventional and SRI methods.

Variety	Seedling age	Hills/m^2	Water mgmt.	Yield (t/ha)	Percent change
Khang dan 18	**25**	**42**	**Normal**	**4.03**	**--**
	14	***17***	***SRI***	***4.71***	***+16.9%***
	14	***11***	***SRI***	***4.22***	***+4.6%***
Nhi Uu 838	**25**	**42**	**Normal**	**3.88**	**--**
(hybrid)	***14***	***17***	***SRI***	***4.46***	***+14.8%***
	14	***11***	***SRI***	***3.94***	***+1.4%***

Phu did not report the full extent of his trial data for lack of time. Afterwards he sent me by email a huge table, with 15 measurements made for 24 different treatments (combinations of practices), with three replications. In spring 2004, Phu evaluated through factorial trials the interactions among three variables:

- water management (conventional or SRI),
- age of seedling (24, 16 or 8 days), and
- spacing (13x20, 25x25, 33x33 or 40x40).

When SRI water management practices were used with the youngest seedlings (8 days old) and optimizing spacing of 33x33 cm, the yield was **8.8 t/ha.** This was 31% higher than the 6.7 t/ha benchmark yield from conventional water management, 24-day seedlings, and 13x20 cm spacing. Slightly wider spacing of 40x40 cm -- with SRI water management and 8-day seedlings -- gave a yield of **8.74 t/ha**. These results are more in the usual range of SRI results than I have previously seen from other SRI evaluations in Vietnam.

On the basis of his research and observations, Phu listed the following '**advantages**' of SRI:

1. Reduction in the cost of seeds, by 56-76%
2. Saving of water, by 62%
3. Reduction in the labor needed for transplanting
4. Increased yield and increased income, reducing poverty
5. Increased efficiency in the use of land, labor and capital investment
6. Increased yield without an increase in chemical inputs, so SRI protects the environment.

Note that these conclusions match quite well those reported by the farmers in Dông Trú village, except they have cut their seed rate by even more, i.e., by 85%.

Phu listed a number of reasons why he thought SRI is particularly relevant and applicable for the northern upland areas of Vietnam:

1. 'Non-package technology' approach is more suitable for upland/fragile conditions.
2. The areas have small farms and small plot size, so more suitable for intensive utilization.
3. Farmers in these areas are hard-working.
4. There is a need there to produce rice with less water.
5. Seedlings in early spring can be made safer with nylon covers to protect them from cold.
6. SRI's reduced cost of seed is attractive for poor farmers, who have limited capital.
7. An extension network is developing that can support this effort.

As **difficulties** facing SRI, Phu listed the following points:

1. Optimum SRI practices for different kinds of soils still need to be determined.
2. In the spring season there is high risk for young seedlings due to cold temperatures.
3. With scarcity of water, farmers are afraid to drain their fields.
4. Soils in the northern mountainous areas are degraded and poor.
5. Weed problems are significant, due to poor soil and lack of water.
6. Golden snails can be a problem for young seedlings.
7. Waterlogged fields are difficult to drain.
8. Farmers' beliefs and habits on preferred transplanting density (they favor high density).
9. Integration of SRI into Department of Agricultural and Rural Development's guidelines.
10. Lack of funds to support SRI research and extension.

Phu had prepared a **matrix** of problems, possible solutions, and research needs/opportunities.

Problems	Possible solutions	Research
Optimum SRI practices with various varieties, soils, and crop seasons	Farmer participatory research (FPR)	SRI photosensitive varieties SRI on irrigated, fertile soil vs. poor, sandy soil SRI in spring, summer seasons
Death of young seedlings due to cold	Timing of transplanting Water control	Role of phosphorus in protecting seedlings from cold
Farmers afraid to drain because of lack of water		Testing of SRI on rainfed land
Golden snail	Pick up after harrowing	Use traps to catch snails
Waterlogged fields are difficult to drain	Dig canals	Testing of SRI on waterlogged lands
Disadoption because of farmer belief and habits on density for transplanting	Demonstrations Training and TOT Farmer clubs, FFS	Survey on farmers' opinions and evaluation
Integration of SRI into DARD rice-growing guidelines	Workshop on SRI for DARD, academics, NGOs, farmers	
Lack of funds to support SRI research and extension	TNU research program FAO, DANIDA, Cornell U?	

He also listed some '**basic research**' questions: long-term effect of SRI on yield stability, soil nutrient status, and other characteristics; no-till cultivation options; control of pests and diseases; and adaptation of SRI for other crops and farming systems. He had a number of suggestions for collaboration between TNU and Cornell on upland research, training, and regional or international workshops.

The increases in production that Phu documented are very respectable. Most rice researchers would be very pleased with 15-20% increases, especially if they are achieved with reductions in cost. Unfortunately, SRI has 'spoiled' me with expectations of even greater yield enhancement. As noted above, SRI results in Laos and Thailand and now Vietnam, while positive, have not been as impressive as in neighboring Cambodia and Myanmar, where doubling and even tripling of yields has been possible. (This is, admittedly, easier to achieve when starting from a lower level of production.) We know from Cornell thesis research carried out in Chiangmai, Thailand, that there can be nematode problems with SRI that reduce yield when paddies are not kept flooded (flooding can suppress plant-parasitic nematodes by suffocation). Maybe nematodes could be controlled by modifying the SRI water management, with more flooding than now recommended but less than with farmers' current practice. Possibly this could inhibit these pests and yet obtain the desired yield improvements by having aerobic soil much if not all of the time.

Given the needs and situations of Vietnamese farmers, both Dung and Phu thought that SRI methods offer substantial advantages, and the women at Dông Trú certainly achieved significant economic gains. I was pleased to learn that Dung and Phu know each other, and both expressed willingness to cooperate. Dung suggested that the IPM program could try to organize a national

seminar on SRI later in the spring, perhaps May, which could bring together those who know something about SRI in Vietnam and those who are interested to learn about it. Below is a picture with Phu (center) and TNU colleagues.

Livelihoods and Upland Agriculture

Friday morning, Vu Thi Bich **Hop**, head of the LÚA team, came to meet me in my hotel together with Nguyen Van **Phuc**, one of this NGO's agriculturalists. LÚA was quite literally 'in transition' as it was moving its office and taking on a new status, as an indigenous NGO. The name for the new NGO had been chosen because *lúa* means 'rice' in Vietnamese. This Friday was moving day, so Hop and Phuc could only spend the morning getting acquainted.

LÚA is descended from an NGO known as **CIDSE-Vietnam** (Coopération Internationale pour le Développement et la Solidarité). It has been working in Vietnam for the past 27 years with support from a consortium of European church-affiliated organizations. I learned that CIDSE-LÚA has been working on integrated pest management for about a dozen years and thus has good contact with the National IPM Program. My contact with LÚA was facilitated by Elise Pinners, who formerly worked with the Belgian-supported NGO VECO which is doing good SRI work in Eastern Indonesia. Elise is now serving on LÚA's advisory/governance board.

Although LÚA has not been working with SRI, Hop and Phuc both knew about it from various contacts, and expressed strong interest in getting involved with its evaluation and dissemination. Given LÚA's mandate to work in the poorest areas of Vietnam, where food security is still an issue, and given its commitment to environmentally-benign development, SRI fits well with its program directions. After lunch at the hotel, Hop and Phuc had to return to their office for the less exciting work of moving desks, files, records, etc. They said they would be glad to work with Dung and Phu and others to see how much benefit for Vietnamese households can be gotten from the insights and methods of SRI. They were particularly interested in how these might be adapted to improve production of other crops as well as rice.

Ministry of Agriculture

That afternoon at 4, I had an appointment with Dr. Bui Ba **Bong,** Vice-Minister of Agriculture, whom I had met in China at an international conference on hybrid rice in September 2004. We had previously corresponded by email about SRI, thanks to the intermediation of Howdie Bouis of IFPRI, and it was fortunate to have a chance to get personally acquainted at that meeting. From our discussion, Dr. Bong had taken an interest in SRI. Since he serves as chairman of the board for the National IPM Program, he has a connection with SRI in that way.

Dung had given me a copy of the 2006 IPM calendar to give to Dr. Bong, 'hot off the press.' I showed him the picture on the first page (almost the same as on page 7 above) of the Dông Trú farmer holding up a large SRI plant in one hand and a 'normal' plant in the other, with the typhoon-affected fields behind her. I also gave him a copy of the data provided by the Dông Trú women farmers, and Dr. Phu's data plus several papers that he has written on SRI in Vietnamese.

Dr. Bong did not have much time to talk about SRI, because his already busy schedule has been further complicated by additional responsibilities for trying to prevent any spread of the avian flu in Vietnam. He asked whether I could give a seminar on SRI for the ministry, and we fixed a time for the following Wednesday. He said that a car would come to the hotel to pick me up. This would give me a chance to make a systematic presentation on SRI to persons with professional background and knowledge on rice. As it turned out, the venue set for this was the National Institute of Soils and Fertilizers (NISF), which has a multi-disciplinary staff, including soil biologists who should be very interested in what SRI is showing.

This left the weekend unscheduled, but there were drafts of materials sent by SRI colleagues in Nepal and Philippines that needed to be worked on. So the time went fast. Sunday noon I was invited by **Elske van de Fliert** to have lunch at her home. This gave us a chance to catch up on each other's work, having met first in Chiangmai in January 2002 and then again in Beijing in September 2003. Although her responsibilities for FAO have been as vegetable IPM advisor, she has given encouragement to the IPM program's SRI initiatives on rice. As elsewhere, personal connections and initiatives have been helpful for SRI's forward movement. When results are so 'incredible,' there often needs to be some amount of trust mobilized on a personal basis to get the methods considered seriously.

2nd Intl. Conference on Environmental, Cultural, Economic and Social Sustainability
On Monday morning, this conference opened at a nice hotel in downtown Hanoi, actually just two blocks from the better-known 'Hanoi Hilton,' which housed American prisoners of war during the war in Vietnam. There were about 300 persons attending, most from Asia and North America, but all continents except Antarctica were represented. One paper in the morning -- "Just Aromas? Issues of Governance in the Indian Rice Commodity Chain' -- looked relevant for our efforts to promote the production and trade of indigenous, local varieties with SRI methods. The presenter, Jagjit Plahe from the Faculty of Business & Economics, Monash University, Australia, had taken a 'global commodity chain' approach (Hopkins and Wallerstein, 1986) in her research, looking at relationships reaching from the farmer to the exporter within India. She was particularly concerned with how state policies and interventions affect practices, linkages and remuneration within the rice sector.

I learned that there are more than 4,000 rice varieties in India, although only a few of these enter into the world market. India has moved up from 6th largest exporter of rice in the 1980s to 2nd in 1994/95. The commodity chain at local levels is greatly influenced by 'commission agents' who provide inputs and credit and then purchase the rice once produced. The government buys rice at a fixed price and then sells in turn to exporters, 156 at present. Ten of these now have their own brands.

The most important conclusion I could take from the presentation for our purposes is that **'branding'** is the most lucrative value-added activity within the rice commodity chain. When setting up channels to enable small producers to get more value from their SRI production, we should do what is necessary to 'brand' SRI rice. Our SEED Initiative network, with the leadership of Olivia Vent and Christina Gradl, has already started addressing various issues and procedures for 'branding' SRI rice as organic and/or fair-traded, or just as 'SRI,' maybe with certified better taste or higher nutritional value. Other papers unfortunately had little apparent connection to SRI concerns.

Tuesday morning I had half an hour for a presentation on SRI. The turnout was fair, about 25, but most were there out of curiosity, not having any responsibilities or institutional links that could help get SRI tested or evaluated. One participant from India said that she would try to establish some links with farmers in the Punjab; and two professors (development geographers) from New Zealand expressed personal and professional interest. We talked more about SRI that evening over dinner at the cultural event, which included a water-puppet theatre performance.

My view of the world has been skewed by my SRI experience and involvement, so I happen to think SRI offers one of the best opportunities available in the world for contributing to global sustainability. There are, however, a only minority of persons who think this way, not just among professional agriculturalists (most of whom still resist the idea that SRI has something significant to offer), but also among persons self-selected on the basis of their concern for sustainability in all its dimensions. What I saw and heard in Vietnam supported, however, my conclusion that SRI will be able to make some major contributions economically, socially and environmentally.

NATIONAL INSTITUTE OF SOILS AND FERTILIZERS

The Vice Minister, Dr. Bong, had arranged to convene my seminar on SRI at this institute, located about 12 km from the hotel, where about 40 research staff assembled at 10 o'clock. It was established in 1969 and has recently increased the number of soil biologists on its staff from 7 to 22 by absorbing a small institute on microbiology that was rather isolated.

When I arrived at the Institute, I was met by Dr. Tan Truc Son, vice-director of the institute, and Dr. Phạm Quang Hà, head of the Soil Environment Research Department, who did his PhD in soil biology at Louvain University in Belgium, as well as several other senior staff. As Dr. Hà had the best command of English, he was assigned to translate my presentation as it went along.

My first powerpoint slide introducing SRI included these points: SRI methods are raising outputs usually by 50% or more, with 80-90% less seed and 25-50% less water; with no need to change varieties and little or no need for agrochemicals; and with a reduction in costs by about 20%. A comment at the bottom stated the caveat that in Vietnam so far, SRI yields have been increased by less than elsewhere.

After translating this first slide, Hà commented to me that he didn't think this was possible. I responded that I could understand such skepticism since I had myself been skeptical of SRI for the first three years. But seeing farmers in Madagascar go from an average yield of 2 t/ha to 8 t/ha on soils that were, in standard chemical terms, some of the poorest for agriculture, I had changed my mind. By the middle of the presentation, once I got into the soil biology aspects of SRI as possible explanations for the effects and results that I had been presenting with pictures and data, Hà was commenting, on slide after slide, that he fully agreed with what I was saying.

At the end of the presentation (which with translation and questions took two hours), staff came up with memory sticks to get copies of the powerpoint presentation. I told them at the end of my talk about the forthcoming book on 'Biological Approaches to Sustainable Soil Systems" that I was main editor for, with 50 chapters by 104 contributors from 28 countries, passing around a table of contents. There was strong interest elicited in the book.

Over lunch with Hà, Son and others, they expressed strong willingness to take up SRI research and evaluation and to cooperate with the National IPM Program, Thai Nguyen University and others. I included in my presentation the pictures and tables included above, so they could see that SRI is something already taking root in Vietnam, with very respectable results. So the timing of my visit was good. Such a persuasive case for SRI could not have been made a year ago.

Indeed, the whole visit seemed well-timed. Thanks to some advance assistance on scheduling from Elske van de Fliert and Elise Pinners, and a welcoming email from Dr. Bong, everything fell into place for a very productive visit, though a week before, the schedule was still quite open. I had an opportunity on Thursday to have lunch with Elise at a wonderful Vietnamese restaurant near the hotel which made me realize what I had been missing by eating most meals in the hotel. As I said in my opening observation, Vietnamese professionals and farmers are starting on SRI a few years behind their counterparts in many other countries. But this country has a dynamism and degree of organization that could make for very rapid uptake of SRI concepts and practices if farmers and researcher continue to get the kind of results that initial efforts have produced.