

REPORT ON VISIT TO INDONESIA, JULY 8-13, 2011, TO LEARN ABOUT S.R.I. PROGRESS

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Having spent a very full week in Malaysia, attending the 1st National SRI Conference in that country, I arrived in **Bandung** at 11 o'clock on a Friday from Kuala Lumpur. My traveling companions were **Ahmad Jatika**, director of the **Nusantara Organic SRI Center** (NOSC), who had organized my five-day visit to Indonesia, and his son **Eriko**. We were met at the Bandung airport by **Prof. Hersanti**, a plant pathologist on the Faculty of Agriculture at the **Universitas Padjadjaran** (UNPAD) and by several of Pak Jatika's colleagues from the NOSC center in Bandung as well as one of Prof. Hersanti's PhD students. This made quite a large group. The day's main activity was to be a seminar on SRI at UNPAD that afternoon, starting at 2 o'clock.

Background on NOSC: During the drive from the airport, and later that day and the next, I learned more about **NOSC** operations from Jatika. This NGO, which is registered as a foundation (*yayasan*), started as a single SRI training center at **Nagrak**. This is a sub-district (*kecamatan*) near the city of Sukabumi in West Java, a 2-hour drive south from Jakarta. But it is now more than a training center. At first, the organization was called the **Nagrak Organic SRI Center**; but as it has expanded, the first word in the name was changed to **Nusantara**, which means 'archipelago' and which also represents 'national.'

NOSC operates within Indonesia in a role similar to that which our small **SRI-Rice** secretariat at Cornell University plays for SRI internationally. Our secretariat provides information and supports training and research, but it does not operate or fund programs in the various countries with which it maintains communication and collaborative relationships.

There are already seven branch NOSC training centers, each functioning independently; and three more are being set up. None is financed by NOSC, as this organization has no funds for such support. The different centers work more as *affiliates* of NOSC than as *branches*. All have been established and then managed, respectively, by like-minded NGOs, companies, farmers, or altruistic businessmen.¹

Each affiliate has its own program for training and extension, sometimes with support from local governments or charitable institutions. Each does as much as it can, as well as it can. The core staff based at Nagrak assist with materials, visits, contacts, etc. In addition to this network, NOSC has made formal agreements to provide training on contract to other SRI programs, such as the corporate social responsibility program of **PT HM Sampoerna**, a major tobacco products company in East Java recently acquired by Philip Morris, and the **Federal Land Consolidation and Rehabilitation Authority** (FELCRA) in Malaysia. NOSC has facilitated SRI training also in Timor Leste (East Timor) and the Solomon Islands.

Jatika described how NOSC is starting to get land donated, transferred or leased to it by individuals who are interested more in promoting organic production than in making money, although they do get some

¹ The **Nagrak** center is managed by **Jatika**, who was formerly engaged in a number of businesses but is now mostly dedicated to SRI promotion. The Czech branch of the international Catholic NGO **CARITAS** operates an NOSC center in **Aceh**, North Sumatra, while farmers operate the centers in **Ngawi**, East Java (**Miyatty Jannah**) and in **Tasik Malaya**, West Java (**Hendra Kribo**). Several businessmen are supporting and maintaining NOSC centers on their own in **West Sumatra** (**Sofwandi**), **Bandung** (**Agung**), **West Kalimantan** (**Heri**); and **Yogyakarta** (**Dibyoy**). Three more are now being established; one in **Maluku** (by **Sutarmin Kasnawi**, a retired government official whom we were about to meet in Bandung); another in **Malang** (by a manufacturer with broad-ranging interests whom we planned to meet the next day, **Pierre Dermawan**); and a third in **Lombok** (by a businessman with the name of **Elvis**). NOSC also has a small office in Jakarta to support activities in the capital city. But mostly it is decentralized.

financial return on their resources. NOSC already has 7 hectares under an innovative set of arrangements, and it expects soon to be managing 50 hectares. This area could expand much further given the flexibility of these arrangements and the win-win-win structure of incentives they offer.

The land donated or leased to NOSC is operated by paddy farmers whom it has trained in SRI methods and who receive a good basic wage, better than most farmers with little land can earn. They have an incentive to use the new methods well because they receive also one-third of the value of any production over 7 tons/hectare (t/ha) as a bonus. Because the rice produced is organic and high quality, it gets a better market price than ordinary paddy, and this makes the operation is more profitable.

Meeting the production target of 7 t/ha, about 75% higher than the average paddy yield in Indonesia, can cover all of the costs of production. These include farmers' earnings, whatever payment has been agreed upon for the land, and also NOSC's management costs. If the yield exceeds the target, the landowner who has leased land to NOSC also gets a third of the extra production as a bonus, and NOSC gets the final third as its return for doing successful management. If the land has been donated to NOSC as a kind of endowment, NOSC receives the share of the payments due to land to add to its revenue.

This business model is good for all parties. (a) Farmers are assured of an income greater than usual from paddy farming with conventional methods. (b) Landowners get a good income from their land and are freed from the headaches of managing their land; they also get the satisfaction of nudging paddy production in Indonesia toward more environmentally-friendly practices. (c) NOSC generates a stream of income to support and expand its training and other activities.

NOSC is also supporting **research** on SRI, especially but not exclusively on organic SRI. It has a number of trials ongoing at the center in Nagrak, and NOSC been given 2.4 hectares of paddy land in Bogor, which is available for researchers, and especially students, to carry out trials there. The country's leading agricultural university (IPB) is close by, so this is a good location, but others can also use the research plots. The National Nuclear Energy Agency (BATAN) is currently carrying out some experiments there aimed at shortening the crop cycle of a popular traditional rice variety using SRI methods.

Day 1 -- Friday: After lunch at a Sundanese restaurant in Bandung, on our way to the university we stopped at a training center in **Caringin** about 5 minutes from the campus. There we met with a group of about 80 farmers from six districts around Bandung. They had been participating in a training session led by **Sutarmin Kasnawi**, an SRI proponent and early NOSC member. I first met Pak Sutarmin in 2005, when I visited the farmer training center in Bandung run by PU, the national department of irrigation, for which he was the director. He was already giving farmers training in SRI and had launched a local rice marketing scheme that paid farmers a higher price for their SRI paddy, which was processed and packaged as 'organic SRI rice,' getting a premium price (60% more) in the market. When I first met Pak Sutarmin, he was wearing a T-shirt proclaiming '*SRI Organik*.' The nutritional and chemical analyses he had gotten done on the rice documented its advantages for consumers' health. He was one of the first members of NOSC, and since he retired from PU he has been able to spend more time promoting SRI.

The training program in Caringin had finished that morning; but when the farmers learned that I was visiting Bandung that day, they requested a visit before the university lecture, which Jatika was glad to arrange. Fortunately they had not had to wait too long. Almost all of the farmers at the meeting had practiced SRI when I asked for a show of hands. We did not have much time for discussion since this was being fitted into a tight schedule already set. But it was good to see the understanding and dedication of

these farmers to alternative agricultural methods. They had developed their own 'salute' for SRI, similar to the 'Jai SRI' salute that farmers in the Indian state of Orissa have begun using to express support.

We arrived at **Universitas Padjadjaran** just on time. The presentation titled '*SRI and Other Agroecological Opportunities for Indonesia*' was co-sponsored by the UNPAD Faculty of Agriculture and **MAPORINA**, an acronym for the **Organic Farming Society of Indonesia**, an NGO. Its founder and director, **Zainal Soedjais**, was there to meet us, along with **Dr. Entun Santosa**, an active supporter of SRI on the UNPAD faculty, as well as the Faculty of Agriculture's dean, **Dr. Benny Joy**. Pak Soedjais showed me a copy of the letter that he had recently written to the Vice President of Indonesia about SRI detailing its potential benefits for the country. We know that the President of Indonesia, Dr. S.B. Yudhyono, already knows about SRI because he attended an Organic SRI Harvest Festival in 2007 and strongly endorsed SRI (see video on <http://www.srividio.zoomshare.com/>).

As the university's summer holiday had already begun, there were not many students attending. But in all, there were about 30 persons present for the talk, mostly faculty and some students, but also a few others, including an agronomist from **Dinas Pertanian**, the provincial department of agriculture. The dean after introducing me invited Pak Soedjais to make some preliminary comments. Soedjais is a strong proponent of organic agriculture after spending most of his life producing and promoting inorganic fertilizers. When we first met in 2008, he said he had formerly been a CEO for several large fertilizer companies in Indonesia, but in retirement he had decided to redirect his energies. In referring to the letter that he had recently written to the Vice President, he added that we should not be dependent on the government for SRI's spread, as this can be done by anybody.

The session went until 4:30, with many questions following my powerpoint-assisted presentation. The official from Dinas Pertanian said that he had seen some data showing that SRI raises the costs of production, so I discussed studies from a number of countries which showed usually about a 10-20% reduction. At first, when SRI plants are not handled as quickly and deftly as they can be because people are not used to the methods, there can be more labor required. But once skill and confidence are gained, even labor inputs can be reduced. In India and China, already first-year farmers have reported that they invest less labor time when using SRI. In 2004, studies of SRI in India by the International Water Management Institute (IWMI) and the Tamil Nadu Agriculture University (TNAU) both calculated an 8% reduction in labor per hectare. A study in Nusa Tenggara, Indonesia, in 2006 found no increase in labor inputs per hectare (Sato and Uphoff, 2007, published in *CABI Reviews* – see abstract on-line: <http://www.cabi.org/cabreviews/?loadmodule=review&page=4051&reviewid=33802&site=167>).

The Dinas Pertanian official suggested that the biggest obstacle to SRI adoption is changing farmers' minds, a common conclusion. My response was that most people, ourselves included, are resistant to having our minds 'changed' by someone else. The best way to get farmers to take up SRI methods is to engage them as partners in a process of evaluating SRI under their own field conditions, so they can see the results themselves, rather than be regarded as 'adopters' of a set technology. He agreed and suggested that with the wide range of crops now having their production improved with SRI ideas and methods, it might be better to change the name to something like System for Crop Innovation. I noted that some colleagues are already using SRI to refer to 'System of Root Innovation.' He also commented that for many farmers, it was difficult to get enough organic matter to make sufficient compost, so their results will not be as good as when they supply their crop with enough organic manure.

We discussed how in a tropical country like Indonesia, **biomass** is a relatively abundant and readily renewable resource. Ways and means should be found to collect, process and apply more organic

matter to all cultivated fields, not just to rice paddies, for greater productivity and for sustainability of agricultural production. Where soils are presently very low in organic matter (Soedjais said this was true of as much as 73% of the soils in Indonesia), it may be necessary to apply some inorganic nutrients for best SRI results, until their organic content has been built up. In any case, applying more organic matter will be beneficial, whether following a fully organic fertilization regime or a mixed organic-inorganic one.

Pak Soedjais asked about SRI and GMOs (genetically-modified organisms): what was my opinion? I responded that I do not reject GM technology in principle; but it should be put through rigorous testing for any hazards; and 'the precautionary principle' should be taken seriously: anything that could have irreversible effects bears a greater burden of proof. Some GM innovations could be safe and also beneficial. SRI methods should enhance the productivity of GM crops much as they do other crops. The increased productivity that SRI practices can elicit from available varieties and cultivars, however, may make the expense and risks of developing and using GM crops relatively less attractive and justifiable.

Pak Soedjais commented that many people think that SRI is 'too labor-intensive,' and that one has to 'take care of the plants like a baby.' This can certainly be a psychological factor that inhibits SRI uptake. But farmers will learn that as they gain experience and skill, that the opposite is true. And new weeding implements are becoming available, even motorized ones, as are being developed in Sri Lanka and Malaysia. These will make considerable labor-saving possible. Malaysian engineers are developing a new power weeder for SRI that can weed 7 rows at once, and they are working on a larger implement that can be mounted on a mechanical transplanter which can cultivate 11 rows at one time.

Dr. Hersanti asked about data on pests and diseases with SRI cultivation, so I showed the group some tables from TNAU which documented large reductions in the prevalence of pests and associated diseases in both nurseries and in the main field. She wanted to know what happens if an SRI field which is resistant to pests is surrounded by other farmers' fields that harbor a lot of pests because they are conventionally cultivated. 'The abundant SRI field will surely attract them.' It was unfortunate that I did not yet have in hand some pictures that I would be given the following day by a farmer/SRI trainer who lives in Ngawi district, East Java. Many Ngawi farmers have had their paddy crops devastated by brown planthoppers (BPH) the last two seasons. Yet SRI farmers in the area have been able to harvest a crop at least 80% of normal since their SRI rice plants did not succumb to the pest attack. (These pictures are shown below.)

Someone asked about barriers to adoption and disadvantages with SRI? I had covered most of these in the presentation. For best results, I said, one should have reasonably good **water control**, to be able to apply smaller amounts of water reliably. As water becomes scarcer and the value of water increases, it will become more and more profitable to invest in the hardware and software for irrigation management. There can be **inadequate biomass** for organic fertilization, but this is a constraint that can be mitigated by working seriously to enhance biomass supply. Sometimes **pests and diseases** can be a problem, but usually these are less rather than more serious. Rats can be a problem with any rice cultivation, but one farmer with whom I spoke on this visit observed that rat damage is also less in SRI fields. The most pervasive barriers are **mental**, a matter of mindset, for both farmers and officials. Farmers who understand the principles and use the recommended practices well are the best advertisement for SRI adoption. In almost every farming community there are some farmers who are curious, experimental, and willing to innovate. They become the starting point for SRI extension.

After the session adjourned, **Merry Melawati Kho**, who works with the NGO called **BERAS Organik 88**, an NGO dedicated to 'functional food, enriching your life,' discussed the work that she is doing with

organic rice which has a *low glycemic index*. This is beneficial for diabetics, but it can be good for others also. She is also trying to promote the consumption of brown rice, which is high in B₁, B₆, B₁₂ and various minerals, as well as with the flavonoid *anthocyanin* which has a number of reported health benefits (<http://en.wikipedia.org/wiki/Anthocyanin>). Merry is very interested in SRI and was correct in suggesting that in my presentation I should have said more about health issues in relation to SRI. Unfortunately, we do not have as much evidence on these as we would like, so I focus more on those things for which we have good data. However, more work should be done on this subject since rice production is not an end in itself; its goal is to have *healthy people*. I will try to discuss these issues more in future presentations.

The drive to the hotel where I stayed that night was long and slow because this was a Friday evening with holiday travel making traffic even more congested than usual. That evening, Pak Jatika, Dr. Hersanti and others hosted me for dinner at a restaurant in Bandung with a great variety of Sundanese foods. I happened to sit across the table from **Utju Suiatna**, a graduate of ITB, the technical university in Bandung, who went into farming after graduation because he was not attracted to the high-tech industrial jobs that most ITB graduates take. He has become an SRI activist, forming an NGO **Ganesha Organic SRI**, with the motto "GO SRI." The logo on his business card shows beautiful rice plants with the words "health 'n wealth." The website for GO SRI is www.health-rice.com Utju has produced a fine 15-minute video on SRI posted now on YouTube: <http://www.youtube.com/watch?v=ACQ8B4ZmmNU>

GO SRI operates from a Bandung base in association with a number of business enterprises that include a restaurant and café, an art gallery, travel services, and the Ganesha Entrepreneur Institute. These various enterprises provide resources for the *pro bono* work of GO SRI and other philanthropic endeavors. Utju has previously written a book on SRI in Bahasa Indonesia which found its way to Cornell, so I was very pleased to meet him. He said that the first 1,500 copies printed have already sold out, and he has recently released another book, *Bertani dengan Akal and Nurani*, which he gave me a copy of. The title means 'Farming with Mind and Soul.' "This is the first SRI 'novel,'" he said proudly, adding that it has been selling faster than his first SRI book.

With Utju at the dinner was a GO-SRI colleague, **Amar Rasyad**, who heads the Ganesha umbrella organization in Bandung. He is in the hospitality industry, working with various hotels, restaurants and conventions, but is also very interested in organic food production and in SRI. His business card featured a restaurant *JoPakar* ('healthy resto') located at a business center **Wisma Joglo**, which houses many Ganesha enterprises. It was not clear to me how all the various activities relate to the Ganesha Entrepreneurship Club mentioned on Utju's card. But from the internet, I could see subsequently that there is quite a complex of businesses operating in Bandung and Yogyakarta which have social objectives as well as economic functions. These are in turn associated with a huge international network of loosely-linked businesses of many kinds operating under a broad 'Ganesha' rubric.

This appears to be the kind of 'social entrepreneurship' which has been publicized and encouraged in a recent book *Building Social Business* (2010) by Nobel laureate Mohammad Yunus, founder of Grameen Bank in Bangladesh. NOSC is one of these emerging 'hybrid' organizational forms which blur the line between 'for-profit' business and 'non-for-profit' NGO activity. This is giving needed energy and resources to the earlier construct of 'civil society' that was essentially NGO-based and kept its distance from both the government and from the private sector.

Day 2 – Saturday: Pak Jatika and Eriko picked me up at the hotel at 7 in the morning to go to the Bandung airport to fly to **Surabaya**. As the traffic was unusually light, we got there in 15 minutes, checked in quickly, and had almost two hours for discussion over a leisurely breakfast. I learned more

about NOSC, and we discussed how my involvement with the SRI phenomenon had been shaped by my previous involvement with colleagues in Sri Lanka in introducing participatory irrigation management there. One of the prime things I learned was the potent force of ideas, ideals and friendship in bringing about social and technical change, as written about in my book *Learning from Gal Oya: Possibilities for Participatory Development and Post-Newtonian Social Science* (1992) The conclusions that we had come to from that Sri Lankan work corresponded with Pak Jatika's experience with SRI in Indonesia, he said.

In Surabaya, we were met at the airport by **Prof. Iswandi Anas**, who had flown in earlier that morning from Jakarta, having spent the previous week with Jatika and me in Malaysia. Pak Iswandi, a soil biologist, is director of the Soil Biotechnology Laboratory at the *Institut Pertanian Bogor* (IPB). He also serves as chairman of the *Indonesian Association for SRI* (Ina-SRI) and as an advisor to NOSC. The research questions that are posed by SRI are redirecting and expanding his laboratory's research program, including the measurement of greenhouse gas emissions from paddy fields under alternative modes of management.

The drive from Surabaya to **Malang** was more than two hours, with a long detour necessitated by the eruption with resulting lava-like flow of mud and sludge from a disastrous oil-well drilling accident that has led to the displacement of 200,000 persons. Arriving in Singosari which adjoins the city of Malang, we went to the home, factory and display room of **Pierre Dermawan**, a successful businessman who I learned was one of the first persons in Indonesia to try out SRI methods, as early as 2002. He now devotes much of his time and resources to organic agriculture, to environmental conservation, and to improving human health. He is himself a practitioner of alternative medicine known as *reflexology*, a massage technique that is credited with healing many ailments. This service he provides free to those whose needs are not being met by conventional medicine. As a consequence he has gotten to know many people in high positions of the Indonesian government and society who have gotten relief from his ministrations. This plus his business success puts him in a position to engage in many altruistic efforts.

We were first taken around the showroom for the outdoor furniture of many kinds that he and his partner build in their factory -- and export to the U.S., to Sam's Club, Costco and other large merchandising chains. We then had a wonderful Javanese lunch and conversation. Pierre told me about his early positive experiences with SRI, showing me pictures of his crop, and discussing the lack of interest expressed by the IPB rice scientist to whom he showed his field. Pierre's involvement with SRI began when he learned about it from a famous pop singer, **Maya Rumantir**, whom he knew. She had apparently learned about SRI from a Catholic group that knew about SRI from Madagascar. However, the source of SRI knowledge grow srather indistinct when traced back more than ten years.

Maya had sponsored the production of a training video (DVD) on SRI methods, for which Victor Lee did the videography. This was subsequently distributed by ADRA, the Adventist Development and Relief Association in 2004. It is available on-line in 3 parts: <http://www.youtube.com/watch?v=huifOQX6BkU>; <http://www.youtube.com/watch?v=JqcgmjYtcDA>; <http://www.youtube.com/watch?v=p1T2d4a9bdY>. This part of SRI's history in Indonesia was interesting to learn, sitting at lunch next to a furniture showroom in East Java. Such serendipity has been frequent in the SRI story, which has many elements that few novelists could imagine if they were writing fiction.

After lunch, Pierre showed us around the factory grounds, where we saw various fields of organic vegetable production and the small cattle herd that he now maintains mostly for their manure to have material for the biofertilizer that he needs for his vegetable and herb production. Pierre and Jatika are

discussing setting up an NOSC organic SRI training center in Malang for farmers in the surrounding area. Pierre would support this himself, being fully convinced of the merits and benefits of this methodology.

After informal discussions and some demonstrations of reflexology in Pierre's home, he drove us to the Taman Dayu Hotel and Golf Course, owned and operated by **PT HM Sampoerna**, now a subsidiary of Philip Morris, where we were stayed the next two nights. As noted above, Sampoerna has been supporting SRI evaluation and dissemination since 2008 under its corporate social responsibility (CSR) program. Our visit to Malang was planned around the Sampoerna program's 'launching' of a book on SRI scheduled for Monday morning at its Entrepreneurship Training Center.

That evening we had supper at a popular local fried-chicken restaurant that outdid KFC, which is also a popular food chain in Indonesia. **Miyatty Jannah**, a SRI farmer/trainer/activist, joined us with her brother, **Wahyu**, who works in Sampoerna's CSR SRI program. Miyatty was one of the first SRI farmers in East Java, and she had introduced innovations such as using 5-day-old seedlings and mechanical shredding of organic matter to accelerate the making of compost. Miyatty briefed me on her impressions of the **Solomon Islands**, where she has gone as an SRI trainer at government invitation in September-October 2010. The government of the Solomon Islands wants to support SRI methods in its small rice production sector, and its Cabinet endorsed SRI in a white paper approved in January 2011. It wants Miyatty to come back to the Solomon Islands for a six-month training assignment, covering a whole season and working with rice farmers on four islands.

Most interesting was Miyatty's report on how her organic SRI crop this past season had withstood the double disaster of **brown planthopper (BPH) attack** and **typhoon storm damage**, mentioned above. She showed me pictures of her field, standing upright and green, next to her neighbor's field that was badly lodged (blown down) and brown in color. She harvested 800 kg of paddy from her 1,000 m² field, which amounts to a yield of 8 tons/hectare, from a local aromatic variety (Sintanur), while her neighbor got practically nothing from a 'modern' variety (Ciherang) using fertilizer and agrochemical protection.

This is one of the strongest pieces of evidence yet for promoting (organic) SRI methods. Protecting farmers and the country against **crop failures**, whether from biotic or abiotic stresses, should be an even higher priority than further increase in yields. BPH infestation has been growing in several parts of Indonesia, probably spurred by the continuing high applications of chemical fertilizer and pesticides. Resistance to pesticides has emerged, and climate change is likely to increase the frequency of typhoons hitting Indonesian communities and wrecking their crops.

Day 3 – Sunday: The next morning, our group was driven, half an hour, to the village of **Sri Gunting**, which is not far from PT HM Sampoerna's Entrepreneurship Training Center and near the Sampoerna factory. There we met with some 50 farmers from six villages, plus some Sampoerna CSR staff, who were gathered under a large bamboo-mat shaded venue for a discussion of their SRI experience and ideas. We were told that this season, SRI training was provided to 403 farmers from 9 villages between end of April and early July. The methods learned are being applied on 182.75 hectares. A total of eight Farmer Field School (FFS) training programs on SRI have been conducted. Local farmers contributed land areas ranging from 300 to 2,000 m² for providing other farmers with the hands-on, in-the-field learning experience that a FFS provides.

A Sampoerna CSR program staff member, **Widowati** (Wido for short), whom I had met on a previous visit, told me that the typical yields with SRI methods in the area is now 7 tons per hectare, well above the previous level of 4 tons. (The document that she gave me on the program, *Progress Report, June*

2011, like many reports, was focused more on the *process* than on the *results* of the program.) SRI rice plants often have 70-80 tillers, she said, which impresses farmers greatly. Also, now that SRI methods are being used, water scarcity and pests and disease are not such serious problems. The Sampoerna CSR program provides farmers with organic fertilizer, seeds, and implements, worth about \$300 per hectare. This is usually divided (and the implements shared) among 3 or 4 farmers since paddy holdings in this area are quite small.

I asked the farmers: 'Why are you gathered?' The response was: 'To learn about SRI.' 'What did they know about SRI already?' 'One plant per hill will give more harvest than many plants per hill,' said a woman farmer. Why? I queried. She replied: 'To save seed, and to get more tillers.' To this, I responded that this answer was correct but not basic enough. 'Why plant just one seedling per hill?' I asked. 'To promote greater root growth,' I said, answering my own question. When rice plants have larger, longer-lived roots, they can produce more tillers and grains, and farmers can save seed.

A elderly farmer sitting in the front row wearing a fedora hat, who was later identified as the village headman (*lurah*) named **Ngasimun**, said that his SRI-grown plants have longer tillers and panicles. He told us proudly that he was the first farmer in this village to try SRI. When he started, "People said that I was crazy." Now in the three villages under his jurisdiction, there are 135 farmers using SRI methods on 51.6 hectares. He added that "nobody is forced; all this is voluntary." This is an important consideration because in some previous government rice programs, there has been coercion. Everyone here knows that simply reporting the number of 'adopters' can be spurious.

The *lurah* commented that they have had some problems with stem borer. This pest, I acknowledged, can be a problem, suggesting that farmers experiment with different means of control. I introduced Miyatty to the group, as she was attending the meeting, and asked her to describe her experience and that of her neighbors in Ngawi province with the control of brown planthoppers, another dreaded pest, through organic soil management. Everyone listened attentively (see pictures on next page).

A fairly broad-ranging discussion followed, covering the roles of microorganisms in plant protection as well as nutrition, the importance of micronutrients for plant health, and the greater resilience of plants nourished organically rather than chemically. The Farmer Field Schools conducted here have trained farmers in the production and use of 'local microorganisms' (MOL) which are applied in a solution or spray. MOL technology is gaining popularity as farmers can fairly easily collect the most common endemic microorganisms and then culture (multiply) them to apply to their soil and plants. One woman farmer said she had gone to her cousin Manu, known locally as Dr. Padi, to purchase MOL from him. Another farmer recommended making a decoction from local hot peppers to spray on rice plants to control pests.

Different 'recipes' for pest control were proposed and discussed, such as combining Tithonia leaves with those from other bitter-tasting plants, then adding sugar, coconut water, and rice bran to make a home-made extraction for crop protection. Feeding leaves to goats was suggested as a test of whether a plant will have protective properties against pests; if a goat will not eat the leaves, these will probably repel insects. In one recipe, the leaves of certain weeds are collected and used with other biomass in a mixture that farmers said reduces pressures from weeds and other pests and also enhances crop growth and productivity. The use of MOL -- indigenous microorganisms (IMOs) -- may not be as effective as applying some commercially-available mixtures, such as 'Effective Microorganisms' (EM). However, once farmers are trained, they can produce MOL solutions at low cost. Farmers also said they like the seed-saving possible with SRI as it requires only 5 kg/hectare -- 10 times less than in conventional practice.



Neighboring field by Miyatty Jannah's affected by typhoon that hit Crawuk village, Ngawi district



Combined effects of brown planthopper (BPH) and typhoon damage to 'regular' rice field on left; no evident effect on Miyatty Jannah's organic SRI field on left; harvested yield of 8 tons/hectare.

I asked the group about **labor requirements**, thinking back to the discussion that we had at Padjadjaran University. A young farmer who is cultivating 6,000 m² with SRI methods (and getting three times more yield than previously, he said) reported that his SRI operations require less labor. Before, it took 6 persons to pull up rice seedlings from the nursery and transport them to the field; now this is unnecessary as SRI farmers grow their seedlings in plastic trays and simply carry them to the field. The number of seedlings is only about 10% of what were used before, so the number of persons needed for transplanting has been reduced from 6 to just 2.

Weeding labor requirements are similarly reduced as the number of laborers can be cut from 7 to 3. Why? I asked. Because the wider spacing between plants makes access easier, and there are many fewer plants involved. Harvesting does take more labor, because yield has gone from 1 ton to 3 tons.² But nobody objects to bringing in more paddy. The farmer said that he has not gone fully organic, but he has cut his chemical fertilizer use in half, from 400 kg to 200 kg. The results are already very good. “Come and see for yourself,” he told everyone in concluding his remarks.

When we discussed the use of local varieties, some of the farmers appearing surprised that these would be considered seriously. ‘Modern’ varieties have been widely promoted throughout Indonesia, widely displacing traditional ones. One farmer said that he had planted a local variety on 4,000 m² and got a yield of 3.5 t/ha instead of the usual 1.8 t/ha. There was agreement that everyone prefers the taste and other qualities of local varieties compared to ‘improved’ varieties, which have been improved only in terms of production, not palatability. The market price for local varieties is generally higher than for new varieties because of consumer preferences, so SRI methods can make their production profitable.

There was a lot of interest expressed in trying out different local varieties with SRI methods, feeling encouraged that farmers in Sri Lanka, India and elsewhere had gotten substantial yield improvements with SRI. The head of a women’s group that was formed after FFS training, **Karyani**, said that she will certainly try out traditional varieties with SRI methods. She said that she has gotten SRI yields as high as 13 tons/hectare, so she should be skilled enough to make appropriate adaptations. I encouraged her and other farmers to try out SRI ideas and methods also with **other crops**, as farmers are doing in India, Ethiopia and elsewhere.

One farmer stated: ‘Our soil is sick,’ and asked: ‘What can we do about this?’ My response was to try to return as much organic matter as possible to the soil, quoting the advice: *Feed the soil, and the soil will feed the plant*. Iswandi supported this with a ten-minute impromptu lecture on soil biology and soil health in Bahasa Indonesia, communicating on this subject directly as I cannot, and adding some humor.

Having had almost two hours in Sri Gunting and needing to visit the Sampoerna center before lunch, we took our leave, after the obligatory taking of dozens of pictures. Dozens of digital cameras materialized out of pockets once the first picture was taken. I was asked for some parting words, and I encouraged them all to “*work together and learn together.*” Rather simple thoughts, but the most appropriate words that I could think of in this Farmer Field School setting.

² I commented that in Aceh, smallholder farmers to whom SRI was introduced by the NGO CARITAS have boosted their yields four-fold with SRI methods, from 2 t/ha to 8.5 t/ha. Such large increases are thus not unprecedented (<http://www.caritas-europa.org/module/FileLib/RiceaplentyinAceh.pdf>). This kind of increase has been seen also among very poor farmers in Cambodia (<http://sri.ciifad.cornell.edu/countries/cambodia/camldsrrpt07.pdf>).

En route to the Sampoerna training center several miles away, we stopped along a village road by a signboard that announced this was an SRI area where 15 farmers were cultivating 4.5 hectares of SRI rice. The field was a little weedy, with what I knew as *tunessa* in Sri Lanka, but the crop growth was good. The training center's facilities were quite ample, new and impressive, in the middle of a traditional rural Javanese area. One large shed/shelter was devoted entirely to SRI displays and demonstrations, along with compost making.

Other innovations explained/demonstrated were for integrated cattle-crop systems where manure was processed for biofertilizer, urine was collected for field improvement, and biogas was generated for cooking and lighting from an underground digester. also producing slurry as a by-product for soil enrichment. There were nicely laid-out trials to evaluate optimum SRI spacing, and the manager of the trials promised to send his results to Cornell when the plots are harvested. We saw also the open-air assembly hall where the book launching would occur on Monday.

From the training center we drove to Malang, where we met Pierre Dermawan again at the home of his partner for a 'really proper' Javanese meal, with black bean soup called *rawon*, a soyabean food very popular with Indonesians known as *tempe*, salty boiled duck eggs, red chili sauce, and so forth. Miyatty and her brother joined us for lunch as well, and I was shown dozens of pictures from her rice farm in Crawuk village and downloaded some on my laptop.

That evening, we had dinner with the new head of the **Directorate for Land and Water Management** in Indonesia's Department of Agriculture, referred to as **Deptan**, along with several other government officials. Ir. (Engineer) **Tunggul Iman Panudju** has taken as strong an interest in SRI as did his predecessor, Ir. **Suhartanto**, now retired from Deptan. Pak Suhartanto supported the spread of organic SRI in many parts of Indonesia, contracting with NOSC in 2006 to provide organic SRI training to improve the country's land and water resources. Already by 2008, the program was working with over 150 farmer groups which were practicing SRI methods in 55 districts (*kabupatens*) across 16 provinces.

Pak Tunggul discussed with us various ways in which the SRI 'message' could be better and more broadly communicated to farmers, the general public, and government officials. Miyatty's pictures of organic SRI plants resisting BPH and typhoon damage (see page 9) would certainly have a positive effect. He suggested that I write a short article on this, with pictures, which could be translated into Bahasa for the popular press. He understands the benefits that SRI management of crops, soil, water and nutrients can confer on farmers and on the country. Although some rice scientists and administrators in Indonesia are still dragging their feet on accepting SRI, it was good to have this directorate within Deptan on board. I commented to Pak Tunggul that, ironically, in a number of countries we had found the specialists in irrigation and land management to be more receptive to SRI opportunities than are their counterparts in the agricultural ministries or departments. This is a sad commentary on resistance to new ideas.³

³ On the day that I left Indonesia, July 13, an article was published in a Nepal newspaper *The Himalayan* titled: 'Government ignores high rice production method' (<http://www.thehimalayantimes.com/fullNews.php?headline=Govt+ignores+high+rice+production+method+&NewsID=295318>). The reporter criticized rice researchers in Nepal for blocking official acceptance of SRI. The narrowness of the opposition to SRI was evident from an article three weeks earlier in *The Nepali Times*, June 24 (<http://www.nepalitimes.com/issue/2011/06/24/Nation/18312>). In that article, the Agriculture Department's Director-General was quoted as saying: "It is surprising why the government is not supporting SRI. ... But we [in the Department of Agriculture] are not waiting for NARC [the National Agricultural Research Council] and are holding SRI demonstrations in all rice-growing districts so that farmers can adopt the technique themselves."

July 11 – Monday: We reached the **Sampoerna Entrepreneurship Training Center** by 8:30 to get ready for the book-launching scheduled to begin at 9. There were opening remarks from head of PT HM Sampoerna's Regional Relations Department, Ms. **Henny Susanto**, based in Jakarta who had come to Pandaan for this event. She told me beforehand that the change in ownership to Philip Morris was not affecting the CSR program. She was followed by Jatika speaking on behalf of NOSC. The Dean of Agriculture at Brawijaya University, **Dr. Sameru Ashari**, also spoke, having written a foreword for the book being launched: *Pertanian Berkelanjutan Berbasis Padi Melalui Jembastan SRI (The System of Rice Intensification)*. Then **Pak Tunggal** from Deptan was called on to speak, and he gave a very strong endorsement of SRI for the sake of improving Indonesia's land and water resources.

At this point there was a half hour devoted to journalists asking questions of the opening speakers and of me, which was a fairly disorganized event since the questions were quite scattershot. My presentation on SRI from a global perspective followed, and then Pa Iswandi's presentation that combined both agricultural and soil biological findings.

Unfortunately, we had a tight schedule constraint, to leave by noon so that we could catch the planned flight to Jakarta. Thus we could not hear all of the farmer contributions to the program. One was a chorus of women farmers, led by Ibu Karyani, singing a song they had composed about SRI. While I could not understand the Javanese words, 'SRI' came through again and again as they sang vigorously. This was followed by a solo, sung by a male farmer, a kind of ballad to SRI. I recalled my visit in 2005 to Tasik Malaya, one of the first strongpoints for SRI acceptance, now exporting organic SRI rice to the U.S. Then, 40 farmers stood up in unison to sing for me a song that they had composed about SRI. While such events do not satisfy economists or agronomists who want quantified evaluations of SRI, to a social scientist these farmer creations and performances qualify as salient evidence of farmer satisfaction.

Fortunately, the drive back to Surabaya airport with Jatika and Iswandi was much less slowed by the kind of heavy traffic we encountered on the drive from the airport on Saturday. The return trip was thus almost leisurely. Our flight arrived in **Jakarta** about 5 pm, and we were met by a NOSC driver. The trip to the hotel where I was staying, given the evening traffic, took an hour and a half, longer than the flight time from Surabaya to Jakarta.

That evening, **Emily Sutanto** and **Iwan Kurniawan** came to the hotel to take me to dinner at a nearby Japanese restaurant. Emily has established a social enterprise **Bloom Agro** (www.bloomagro.com) which is exporting organic SRI rice to the U.S. and Europe, a tasty combination of traditional varieties dubbed 'Volcano Rice.' This rice, grown by a farmers' cooperative in Tasik Malaya with 2,300 members, is distributed by a San Francisco-based company **Lotus Foods**, along with other traditional varieties from Madagascar and Cambodia sold as organic SRI rice, available now even in Ithaca, NY. Iwan was part of an interdisciplinary team of Cornell graduate students who helped Bloom Agro for several weeks during January, researching domestic market opportunities for sale of organic SRI rice. He was back in his home country Indonesia having been offered an attractive internship for the fall, and therefore he was delaying completion of his MBA degree from Cornell. The evening's discussion updated me on the progress of Bloom Agro.

July 12 – Tuesday: The day started at 8:30 when Jatika picked me up to go to the **Department of Agriculture** in South Jakarta, an hour's drive at that time of the morning. We met persons from several different directorates of Deptan in Pak Tunggal's office when we arrived, and at 10, a group meeting began, chaired by Tunggal, who characterized this as informal. He had brought together colleagues from

the Food Crops Division, which has responsibility for rice production in Indonesia, and from the research wing of Deptan, known as Litbang. Having two hours, I could make a fairly thorough presentation on SRI, elaborating on points that had been gone over quickly in previous sessions during this visit to Indonesia. Pak Iswandi made a presentation as well going into issues of organic cultivation practices.

Pak Tunggal prefaced the discussion to noting the multiple objectives of rice policy in Indonesia: ensuring food security, coping with climate change which increases risks of drought and storm damage, as well as maintaining the sufficiency and quality of both land and water (the latter are his division's responsibility). One interesting question raised was: What is the difference between SRI and BIMAS? The latter was a massive campaign in the 1970s to raise rice production with 'Green Revolution' technology, new seeds and heavy promotion of chemical fertilizer and agrochemical protection. It was successful, but with heavy economic and environmental costs, and also with some coercion. The differences between the two approaches were easy to enumerate. The informal discussion went until almost 1 pm as packed box lunches were brought in for everyone.

Back at the hotel at 2 pm, Iswandi, Jatika and I met with **Chris Bennett**, a faculty associate at the University of British Columbia, Canada, and a consultant for the U.S. government's **Millennium Challenge Corporation** (MCC) on ecologically sound business development. His long experience in developing countries, including Indonesia, has focused on the forestry sector, but he met previously with Jatika and Iswandi (and with our SRI colleague Glenn Lines, formerly CIIFAD's team leader in Madagascar, 1996-2004, now on MCC's staff), so he is now very interested in SRI. We had a good discussion, and possibly MCC will include some SRI support in the design of a new development initiative that will focus on Sumatra and other islands off Java.

At 3:30, **Prof. Budi Setiawan**, currently on leave from IPB, came by the hotel. Pak Budi, who has been serving as the unpaid vice-chairman of the **Indonesian Association for SRI (Ina-SRI)**, has been selected for a select leadership training program of the Government of Indonesia. This is usually a 'fast lane' for political careers and advancement, although Budi is not keen on such a career, preferring his teaching and research at IPB. His professional field is irrigation and water management, which has led to his interest in SRI. Jatika and Iswandi were with me for the initial discussions, but had to leave before long. Budi assured me that he wants to continue working on knowledge generation and network development for SRI in Indonesia, complementing Pak Iswandi's skills and work on the agronomic side.

That evening, Emily and Iwan picked me up at the hotel to go to the home of **Dr. Iwan Jaya Azis**, a colleague in regional science on the Cornell faculty who has taken a leave for two years to head the Office of Regional Economic Integration of the **Asian Development Bank** in Manila. He and his wife Erina and daughter Mireko just happened to be in Jakarta this week at their permanent home in the center of the city, and they wanted me, along with friends, to join them for dinner before I left Indonesia. So quite a large group of Cornell and SRI colleagues gathered for a meal in the Azis home in Menteng.

Iwan Azis has been hearing from me about SRI for quite some time, and he has been interested in its economic as well as its environmental implications. He said that he is helping to plan the next congress of the **International Regional Science Association**, which would be held in Padang. July 20-21. This meeting will include planners and policy-makers from various countries, so we discussed what kind of presentation could be made on SRI by Jatika and Iswandi. This was an unexpected opportunity for giving SRI more visibility internationally, coming fortuitously out of this visit to Indonesia. The *World Economic and Social Survey 2011*

published recently by the UN's Economic and Social Commission for Asia and the Pacific (ESCAP) -- with a focus on *The Great Green Technological Transformation* -- has a favorable 'box' on SRI (http://www.un.org/en/development/desa/policy/wess/wess_current/2011wess.pdf), page 84. SRI is becoming less controversial in international circles, so there should be more receptivity to learning about SRI experience in Indonesia and elsewhere.

Wednesday – July 13: The next morning at 6:30, Jatika picked me up at the hotel to go to the airport, for a 9:40 flight to Kuala Lumpur and then back to the U.S. He had previously scheduled a meeting with officials of **Garuda Airlines** at their headquarters for 10 o'clock, so he could make use of this trip to the airport. Garuda is also obliged to devote 2.5% of its profits to CSR activities, and its leadership has taken an interest in SRI. It has expressed interest in buying into the sponsorship of SRI production with NOSC-trained farmers, as described above, and is also sending some its staff nearing retirement age to be trained in organic SRI methods at the Nagrak center, so they can practice -- and even train others in -- these methods.

Although this was only a five-day visit, it covered literally a lot of ground, as seen in this report, and had the advantage of spending most of the time outside of Jakarta. Indonesia is a huge and quite diverse country. There are many provinces where SRI work is going on, and accelerating, which I would like to know more about. Jatika, Iswandi and I discussed the possibility of a national SRI conference within the coming year, similar to the one put on by Malaysian colleagues July 5-6 in Putra Jaya near Kuala Lumpur.

Indonesia has a diverse coalition of SRI-engaged actors in the government, NGO, university and private sectors, and a growing number of farmers like Miyatty Jannah who are taking leadership roles in the documentation and spread of SRI. **Ina-SRI**, thanks to the efforts of Iswandi, Budi and many others, provides an electronic platform for the exchange of ideas and experience, and **NOSC** is providing a training and technical support capability that is spreading across Indonesia.

There is still some resistance to the acceptance of SRI within government circles, especially among researchers and policy-makers who have strong ties to the International Rice Research Institute, which has been skeptical and even dismissive of SRI contributions. However, results such as those that Miyatty achieved this past season should make SRI management increasingly attractive, to farmers if not as quickly to some scientists and officials.

The brown planthopper pest has not been well-controlled by agrochemical means, some resistance having developed; and extreme weather events are likely to increase in the years ahead. Building into rice plants more resilience to biotic and abiotic stresses will become more and more urgent. The increased yields and reduced costs of production will also be strong incentives as Indonesian rice farmers contend with a price/yield/cost squeeze.

On each visit to Indonesia, I meet more persons, very capable and motivated, who are willing to join in the effort to reorient rice production, and the agricultural sector in general, toward more environmentally-friendly practices that are also more beneficial for farmer incomes and human health. This should be a successful combination, but much work, learning and adaptation remain to be done.