

## **SRI On-Farm Trials in Eastern Visayas – Progress Report Leyte State University, Cornell University (funded by ALO)**

### **Introduction**

The increasing trend in food demand is a stark reality in developing countries. As reported by the International Food Policy Research Institute, the developing countries will account for about 85 percent of the increase in global demand for cereals and meat between 1995 and 2020. To meet this demand, the world's farmers will have to produce 40 percent more grain in 2020 most of which will have to come from yield increases. Expanding the cultivated land for rice will have minimal impact owing to the conversion of prime rice lands into subdivisions and for other establishments.

A closer look at the foregoing situation and the status of the rice economy in the country would certainly provide insights to policymakers and other stakeholders. To increase the yield of our staple food is a priority, more than ever. Another equally important concern is on food safety and quality. Platt (1989) reported that basic food needs must be satisfied, but increasing prosperity brings with it the demand for a wider range of quality food products year-round, and foods which are fresh or subjected only to minimal methods of preservation.

A new rice culture that appears inconceivable to most Filipino farmers is the **System of Rice Intensification (SRI)** method. It was developed by chance by the late Father Henri de Laulanie, S.J. in Madagascar. It was reported that an increase in the average yield of 2.2 tons/ha to 8.8 tons was noted following the SRI practice (IIRR and ILEIA 2000). The average yield of lowland rice irrigated in Region 8 following the conventional culture ranges from 2.5 to 4.5 tons/ha. Increasing this yield average to 6.0 tons/ha or higher would significantly reduce the rice importation scheme of the Philippine government to meet the rice needs of the nation. Uphoff (2004) indicated that there are confirming results from 18 additional countries ranging from China to Peru, with average yields from SRI in the 7-8 t/ha range, and with yields over 15 t/ha reported from at least four countries.

As reported in CIIFAD Annual Report 2000-2001, the rapid spread of interest in SRI is due mostly to the dramatic rice yield increase without requiring the purchase of new seeds, chemical fertilizers and other inputs; and also partly to the speed and cheapness of modern electronic communication. Additionally, the reports elaborated that the new technology has just opened up a light of hope to the disadvantaged farmers. Increased rice production would result to self reliance and a better life for the farm-dependent Filipino family. Therefore, adopting the SRI methodology or practices in the Philippine could have a tremendous impact of increasing rice yield to meet the demand for food at present and in the future.

The government's thrust of food security and rural development is for the well-being of the Filipino farmer. It is a fact that rice is the staple food of Filipinos and its increasing demand now is felt, more than ever. This is due to the population growth even as prime land available for rice cultivation diminished due to urbanization. The final hope of the world's farmers to meet global demand for food and meat products would be through application of modern farming technology. A technology that would increase farm productivity without jeopardizing the capacity of the environment to meet the needs of the incoming generations is imperative.

The **System of Rice Intensification (SRI)** is a breakthrough methodology or practice that appears hopeful for attaining rice sufficiency. According to reports in Madagascar, an effective SRI has been developed. It was first developed with the use of chemical fertilizers in the 1980s. But after fertilizer prices skyrocketed toward the end of the decade, Father de Laulanie began experimenting with compost. He used cattle manure where available, but mostly just decomposed biomass of any kind, including rice straw. He found that using organic sources of nutrients, even obtained from plants grown on nutrient-deficient soils, increases production to levels otherwise impossible with synthetic fertilizers. Hundreds of farmers around Ranomafana working on very poor soils have increased their rice yields from an average of 2.2 tons per hectare to 8.8 tons per hectare. This yield increase these group of farmers got was consistently similar for the past 10 years.

The conventional cultural management of lowland irrigated rice of most Filipino farmers is almost exactly the opposite of SRI methodology/practices. It is the opposite because Filipino lowland rice management is almost always associated with constant irrigation from date of planting to harvesting. In contrast, SRI methodology employs controlled irrigation, wider spacing, planting one seedling per hill and wider planting distance, to cite a few. Rabenandrasana (2000) reported that the success of SRI is based on the synergetic development of both the tiller and root system - where there is vigorous root growth, the plant grows fuller and taller and will have more access to nutrients and water for the growth of tillers and seeds.

In the Philippines, the average rice yield a typical farmer usually gets for lowland irrigated rice ranges from 2.5 to 4.5 tons per hectare. This is far below what SRI practitioners in Madagascar obtained which ranged from 6.2 to 10.2 tons/ha or even higher. In some parts of southern Mindanao SRI has been tried with good successes. The urgent need for rice sufficiency and the significance of SRI rice management in increasing rice yield to ensure food security is undeniable

## **Goal and objectives of the Project**

Primarily, the goal of the Regional On-farm trials on SRI is to enhance the productivity and sustainability of the Philippine rice economy. More specifically, the following are the objectives: a) to conduct SRI orientations to interested provinces/municipalities/groups; b) to test and demonstrate the applicability of SRI practice in Region 8; c) to evaluate the yield increment between the SRI practice and the farmer's conventional rice cultivation; d) to determine its economic advantage over the conventional rice culture; and e) to document farmer-cooperators' feedback on SRI principles and practices.

## **Approaches prior to the implementation of SRI**

The Leyte State University (LSU) and Cornell University (CU) has an on-going research partnership on Community-based Watershed Management Project in support to community led-efforts in protecting the critical watershed in the Central Philippines. As part of the Association Liaison Office for University Cooperation and Development (ALO) Project, Dr. Norman Uphoff, Director of Cornell International Institute for Food Agriculture and Development (CIIFAD) of Cornell University, Ithaca, U.S.A. through Dr. Terry Tucker, ALO Project Director, was invited by the LSU administration to conduct a seminar on SRI to LSU staff, DA-LGUs, NGOs, and farmer-leaders representing the region at FARMI audio visual hall last March 25, 2004. The seminar was primarily done to address one of the themes of the project on enhancing productivity and sustainability on critical watershed in Central Philippines.

As an offshoot of the seminar held on March 25, 2004 at LSU, a working group on SRI was formed during the workshop. Some enthusiastic and curious members in attendance have signified their commitment to collaborate in implementing on-farm trials on SRI practice in their respective areas.

There were 14 test sites originally identified as rice growing areas strategically located in Region 8. These sites represent the attendees who were invited to the seminar and who were called to attend the second SRI organizational meeting on April 15, 2004 at FARMI.

As an offshoot of the seminar, a proposal was prepared to include, among others, list of protocol and guidelines in selecting the site and the methodology in implementing the on-farm trials. An agreement was reached during the second meeting for the SRI core team together with some selected farmers to convene again at FARMI on the 29<sup>th</sup> of April 2004 to discuss the final implementation guidelines in testing SRI in their respective farms.

## **The Collaborating Partners and Agencies**

The following are the collaborating agencies namely: the Leyte State University, (LSU), Cornell University (CU), the Department of Agriculture (DA)– Region 8, the LGUs – OMA & cooperating farmers of the Rural Development Institute (RDI)- (NGO-Ormoc & Biliran based), the City Agriculture Services Office of Ormoc, Maasin and Calbayog and Borongan, Eastern Samar. A growing interest on SRI was observed after the first group of cooperators on SRI have successfully realized higher yields than their conventional culture.

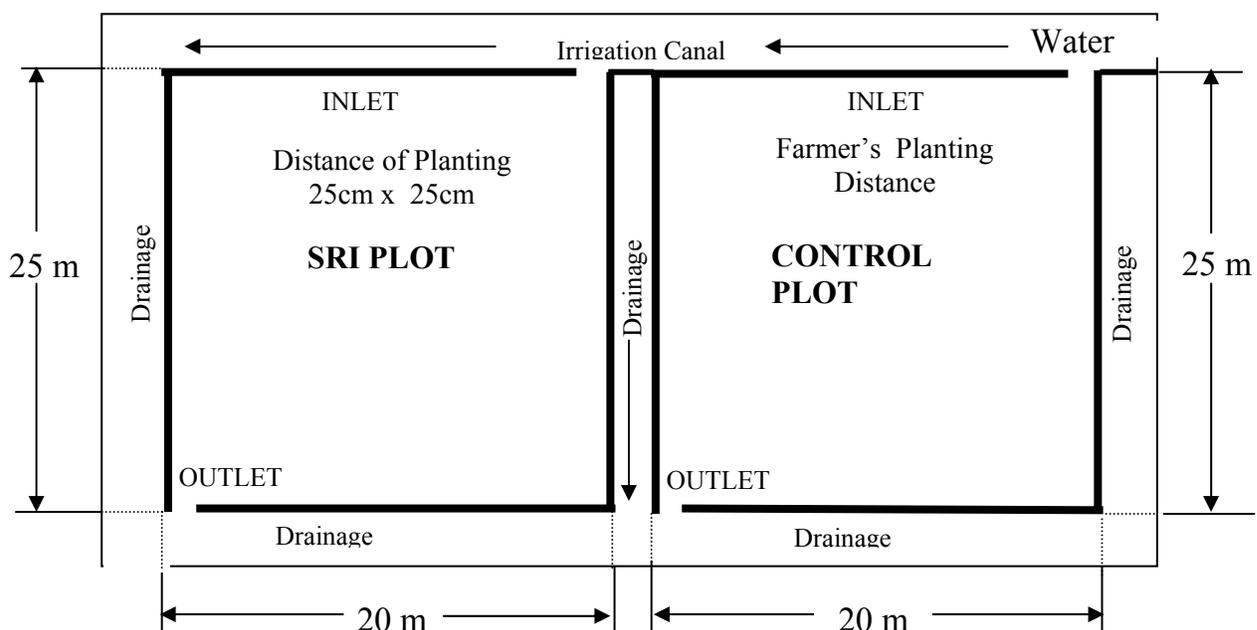
With meager financial support from the ALO/CIIFAD and from the Office of the Research and Extension (ORE) of LSU, the project attained very encouraging results during the first cropping season. Likewise, invaluable manpower support was given by the local government units and other collaborating partners.

## **Methodology/Procedure and Strategies Employed**

1. Dr. Norman Uphoff of CIIFAD conducted SRI seminar in March 20,2004 at LSU attended by researchers, Municipal Agriculture Officers (MAO), selected DA technicians and non-government staff (RDI) from Region 8.
2. Interested individuals who have attended the seminar met again at LSU in April 2004 to further discuss SRI protocols together with selected farmers from rice growing areas in the region. A thorough discussion on the protocol was done especially with farmers and technicians.
3. There were 14 strategic locations identified in the Region with 28 farmers who signified to participate.
4. These on- farm trials provided other farmers within the cluster areas/adjacent barangays an opportunity for a face-to-face interaction with the first SRI cooperators. Also, agricultural technicians assigned in the area were encouraged to see, monitor and validate the trial during the reproductive stage.
5. Conducted 4 Farmers' SRI Field-Days in 4 different locations on a cost-sharing basis to defray activity expenses. As a result, around 200 persons composed of farmers, NGOs, POs, LGUs attended the forum and were able to interact with the cooperators and evaluate and compare the performance between SRI and the conventional rice culture. A number of attendees signified interest to try the new rice management for the next cropping season.

6. The following suggested SRI procedures were adopted by farmer-cooperators:
- At least a 500 sq m of well-paddled/prepared /leveled irrigated lowland rice field was used per location with a planting distance of ( 25 cm x 25 cm ).
  - The plot was demarcated by a buffer and irrigation/drainage channels on all sides to arrest inter-plot/paddy seepage and hydraulic conductivity.
  - Some farmers applied compost/manure available in the area. One cooperater incorporated 15 sacks (12 kg/sack) of chicken dung the first harrowing. While others who have no access to organic manure/fertilizers still used inorganic fertilizers.
  - Pre-germinated seeds good for the SRI area plot (500 sq. m.) was used.
  - Farmers transplanted the seedlings ranging from 8 to 15 days old at a distance of 25 cm x 25 cm.
  - Majority of the farmers used rotary weeder and kept the paddy moist but not flooded during the vegetative stages of the rice plant. However many of them did not allow the soil to exhibit a sign of cracking.
  - Generally, two weeding using rotary weeders were employed by farmers. The first was 8-10 days after planting. The next was done approximately 3 weeks after followed by hand weeding during the growing/tillering phase depending on the weed population.
  - Maintained 1 cm to 5 cm of standing water in the rice field- during the reproductive phase (initiation, booting, flowering, grain filling).
  - Drained the rice field 10-15 days before harvesting.
  - Took 3 crop cuts (2 m x 5m) both from SRI & Non –SRI & the whole area

### Plot Size and Lay-out (suggested)



## Activities Conducted

### 1. SRI Orientations

Name of Municipality and Province	Number of Participants (DA technicians & farmers)	Date Conducted
1. Almeria, Biliran	35	Sept. 24, 2004
2. Jabonga, Agusan del Norte	27	Oct. 21, 2004
3. Sogod, So.Leyte	60	Nov. 5, 2004
4. Maasin City So. Leyte	44	Nov. 15, 2004
5. Almeria, Biliran	39	Nov. 22, 2004
6. Matag-ob, Leyte	23	Dec. 17, 2004
7. Naval, Biliran	15	Jan. 10, 2005
8. Baybay, Leyte	67	Jan. 14, 2005
9. SWC, Network, Bohol	27	Jan. 7, 2005
10. Borogan, Eastern Samar	36	Feb. 16, 2005
11. City Agricu.Office, Calbayog, Western Samar	28	Feb. 25, 2005
12. Leyte	48	March 11, 2005
<b>Total</b>	<b>449</b>	

The SRI orientation conducted in the different provinces and municipalities were centered specifically on the principles and practices behind SRI to support the growth of the rice plant and to increase its yield. Emphasis was also given on how to improve the soil through the use of organic matter, such as compost, animal manure and other crop residues.

Discussion on the initial result of the first SRI on- Farm Trials conducted by the first batch of farmer- cooperators during the wet cropping season (July – October 2004) was also emphasized.

**2. On- Farm Trials Conducted – June – October, 2004 Cropping season.**

<b>Place/ Area/Province</b>	<b>Number of Trials</b>	<b>Area (in ha.)</b>
1. Baybay	3	0.1500
2. Ormoc, City	2	1.1000
3. Labrador-RDI assisted	2	0.0900
4. Almeria-Biliran Province –RDI assisted	3	0.7000
5. Maasin City –assisted by CASO Maasin, So. Leyte	1	0.0500
6. Jaro, Leyte	1	0.0500
7. Brgy. Roxas II, Calbayog, Western, Samar	2	0.1000
8. Babatngon Seed Farm	1	0.2000

**3. On-going on-farm trials for the dry cropping season ( Dec. – April, 2005).**

<b>Place/ Area/Province</b>	<b>Number of Trials</b>	<b>Area (in ha.)</b>
1. Baybay	15	5.50
2. Ormoc, City	2	1.25
3. Labrador-RDI assisted	3	1.00
4. Almeria-Biliran Province –RDI assisted	7	2.50
5. Maasin City –assisted by CASO Maasin, So. Leyte	3	1.25
6. Jaro, Leyte	1	0.25
7. Brgy. Roxas II, Calbayog, Western, Samar	2	0.05
8. Babatngon & San Jorge Seed Farms , Leyte and Samar	2	0.25
9. Biliran Agricultural College(BAC) Biliran Province	1	3.00

As shown in the above tables, an increasing number of farmers and area devoted to SRI practice this cropping season compared with the previous season is observable. It is expected that the number of SRI practitioners for the succeeding planting seasons would increase as evidenced by the number of requests from LGUs for SRI orientation.

#### 4. Farmers' Field Days

<b>Cluster Area/Place</b>	<b>No. Participants Attended</b>	<b>Date Conducted</b>
1. Sitio Landing Daan, brgy. Lilo-an, Ormoc City	57	Sept. 23, 2004
2. Brgy. Maganhan, Baybay, Leyte	55	Oct. 5, 2004
3. Brgy. Olotan, Jaro, Leyte	48	Oct. 6, 2004
4. Brgy. Labrador, Ormoc City	65	March 8, 2005

During the field days, the SRI cooperators and the supervising agriculture technicians gave testimonies on their experiences in the conduct of the SRI trials. Each cooperator substantially answered questions and queries from their co-farmers and provided them with their new learnings and insights following the SRI practice. Those who attended and saw the stand of the rice crop in the fields were amazed of the results.

#### 5. Farmers' Forum

A farmers' forum was conducted in December 1, 2004 at FARMI Audio visual room. It aimed to share experiences among the first group of cooperators in the conduct of SRI on-farm trials in their respective farms. Secondly, it was also designed to document their feedback, problems and new ideas. Finally it was geared to help participants evolve their own plans for the next cropping season.

The forum was attended by DA technicians, MAO's and other farmer cooperators. All cooperator gave encouraging testimonies of their experiences, insights and learning. Generally adoptors of SRI rice culture method reported an increase in their production yield. They further decided to employ the SRI method in their farms for the succeeding cropping season. Result of this venture definitely showed increased yields.

#### 6. 1<sup>st</sup> National SRI Symposium

The 1<sup>st</sup> National SRI Symposium at Los Baños last October 28 to 30, 2004 provided a forum in sharing results and experiences of the SRI Regional On-Farm Trials in Eastern Visayas with other SRI practitioners. Through this forum, the program leader was able to establish linkages and gained insights and learnings from SRI practitioners of other regions in the country.

## 7. Distributed SRI reading materials (both in English and Cebuano/waray)

More than 250 copies of the SRI “cebuano” guide were distributed to farmers, MAO and other interested individuals. Likewise, a number of SRI reading materials downloaded from the internet and a seminar briefing notes of Dr. Norman Uphoff were also distributed to DA technicians and Provincial Agriculturists (PA) throughout the region.

### Results of SRI on- Farm Trials

The table below shows the yield performance of the rice using the SRI method compared with the conventional rice culture.

Table 1. Computed average yields (t/ha) of SRI and conventional rice culture during the wet cropping season July – October 2004 under different locations in Eastern Visayas.

<b>Name of Farmer-Cooperator &amp; Location</b>	<b>Variety</b>	<b>SRI (t/ha)</b>	<b>Conventional (t/ha)</b>	<b>Yield difference (t/ha)</b>
Marcelino Quartero (Jaro, Leyte)	Mestizo NSIC 116	6.85	4.00	2.85
Benecia Okan (Lilo-an, Ormoc City)	Mestizo NSIC 116	6.25	7.60	(1.35)
Edilberto Magalyano (Manhilo, Maasin, So. Leyte)	Bigante	13.58	11.08	2.5
Angelina Cano (Maganhan, Baybay, Leyte)	PSBRC – 18	10.70	7.70	3.0
Juanito Poliquit (Patag, Baybay, Leyte)	RC – 98	6.25	4.75	1.5
Panfilo Ochea (Look, Almeria, Biliran)	Hybrid NSIC 110	14.00	10.50	3.50
Guadalupe Mesario (Biasong, Baybay, Leyte)	Mestizo NSIC 116	8.30	7.60	0.70
<b>AVERAGE YIELD</b>		<b>9.42</b>	<b>7.61</b>	<b>1.81</b>

Results showed that in all SRI plots, productive tillers count ranged from 25 – 35 per hill despite that only 1 seedling planted per hill. On the other hand, in the conventional rice culture, it ranged from 9 – 18 tillers per hill despite that 3 to 6 seedlings in clump were planted per hill. The average number of tillers in plots is still way below compared to other SRI trials from many Asian countries. It is surmised that the ideal growing conditions needed in the SRI method was not correctly followed by the first group of cooperators. This is expected due to the new shift or modality in managing rice plants - the SRI way.

Table 2 below shows the yield (t/ha) and the gross margin (Ph/ha) between the SRI practice and the conventional rice culture of the first batch of cooperators during the first wet cropping season (July – October 2004).

Name of Farmer Cooperator & Site of the Trial	Yield (t/ha)		Gross Margin (P/ha)	
	SRI	Conventional	SRI	Conventional
1. Benecia Okan Liloan, Ormoc City	6.25	7.60	26,4491	31,307
2. Juanito Poliquit Gabas, Baybay, Leyte	6.25	4.75	800	(8,300)
3. Gaudioso Potot, Labrador, Ormoc City	8.32	7.80	29,200	27,000
4. Marcelino Quartero Jaro, Leyte	6.85	4.00	10,951	(5,453)
5. Dario Pilapil Labrador, Ormoc City	6.37	5.66	37,856	24,631
6. Guadalupe Mesario Biasong, Baybay, Leyte	8.30	7.60	32,428	30,918

### **Lessons Learned in the conduct of SRI on-Farm Trials (Farmers' Feedback)**

#### *a. During the pre-implementation stage*

- “kuti” – it means tedious in transplanting young and small seedlings
- young seedlings (8-12 days old) planted can be eaten easily by snail or kohol
- uncertain if planting 1 seedling per hill is better than planting in clump
- no ready available sources of organic fertilizer/compost and manure

## *b. During the implementation stage*

### a.1 negative feedback/comments

- more intensive labor required in planting & weeding
- negative criticism from neighboring farmers- (why only one seedling)
- almost daily collection of “kohol” is needed until seedlings produce more suckers
- newly planted seedlings near the dikes are attacked by mole crickets
- replanting is needed
- still green straw after harvest which is hard to plow and it takes time to rot

### a.2 positive feedback

- lesser kilo of seeds in needed per ha
- plants are more robust & with bigger leaves after two to three weeks
- less number of kilos of seeds needed per ha
- lesser irrigation water is required during vegetative stage
- rate of compost and inorganic fertilizers application varies
- more suckers are developed/produced compared to non-SRI plot
- longer panicles with bigger & more grains than non-SRI
- bigger plants with stronger stems & lodging resistant
- observed to be more resistant to sheath blight
- higher grain yield than non-SRI plot
- cooked rice from SRI tastes better than from non-SRI
- environment friendly than the conventional rice culture
- almost all farmers who attended the Farmers’ Field Days signified to try SRI next cropping season
- first batch of SRI cooperators will expand the SRI area next cropping season

## **Conclusion and Recommendation**

The first batch of farmers (9) who conducted SRI on-farm trials in the different rice growing areas in the region during the June – October 2004 wet planting season claimed to have increased their yield by as much as 2 tons per hectare. It was noted during the 4 SRI Farmers’ Field Days conducted in 4 different locations that farmers in attendance and other researchers were amazed of the new rice culture yield results. Hence, the number of farmers who are now testing SRI has increased more than twice the original number of cooperators for this cropping season (Dec.2004 - March 2005). Other reasons considered as plus factor of the SRI method is the steady rise in the price of chemicals and its concomitant environmental and health effects.

The SRI as a methodology to increase rice production puts premium on the use of organic fertilizers, such as animal manure and compost. In addition, the intensive use of highly toxic chemical sprays is discouraged for obvious reasons. It is therefore recommended that concerned government and non-government agencies extend appropriate assistance to further motivate farmers to produce safe rice for the Filipino families through the SRI way.

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