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Centre for System of Rice Intensification Initiative (CSRII)

PROGRESS REPORT

The U. S. Ambassador's Special Self-Help (SSH) Program:
Scaling up SRI farming practice of paddy rice growing for better productivity and increased income to sustain the livelihoods of 300 farmers in the Zambezi District of the Northwestern Province of Zambia

System of Rice Intensification (SRI)

For
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Ambassador
U. S. Ambassador's Special Self-Help Program
Embassy of the United States of America
LUSAKA - ZAMBIA

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Abbreviations

CIIFAD	Cornell International Institute for Food, Agriculture and Development
CSRII	Centre for System of Rice Intensification Initiative
FFS	Farmer-Field School
HA	Hectare
HYVs	High-yielding varieties
SRI-Rice	SRI International Network and Resources Center
SRI	System of Rice Intensification
ToT	Training-of-Transformation
USA	United States of America
WFP	World Food Program

Acknowledgements

I wish to thank the Government of Zambia under the Ministry of Agriculture and Zambezi District Council for providing recommendation letters to the American Embassy in support of CSRII and SRI activities in Zambezi district.

I would like also to give great thanks to Professor Norman Uphoff and the SRI International Network and Resources Center (SRI-Rice) in the USA for their devotion in seeing that the SRI activities spread in Southern Africa, Zambia in particular, and for recommending the SRI Project in Zambezi district to the Embassy.

I wish to extend my gratitude to Oxfam America, WWF and Africare for their informative press release on SRI that provided profound justification to the US Embassy in Zambia.

Special credit goes to the US Embassy in Zambia, not only for providing financial support, but for leading the way to other international donors and Governments in accepting and supporting SRI.

In conclusion, the positive response emanating from the entire rice farming community in Zambezi west-bank was motivating and inspiring because the main purpose of the project was to see farmers benefiting from *better productivity and gains from their rice yields.*

Merry Christmas and Happy New Year!

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Background

The Centre for System of Rice Intensification Initiative (CSRII), which was founded in 2010 in Zambia, was awarded funds on 9th February 2011 from the United States Embassy in Zambia to hold workshops to teach the internationally-recognized System of Rice Intensification farming practices to rice growers in rural Zambezi district, North-Western Province.

Zambia is ranked as the 28th country to join the international SRI network in 2006. This is served by the SRI International Network and Resources Center (SRI-Rice) that is based at Cornell University in the USA under the auspices of the Cornell International Institute for Food, Agriculture and Development (CIIFAD). SRI-Rice provides information on SRI background, technical matters, and updates on progress with people around the world from over 40 countries where SRI is practiced and beyond. For more information, download the SRI-Rice brochure and its 2010-2011 annual report.

The first SRI trial in Zambia, and possibly the first in Southern Africa, was initiated in late 2005 by Henry Ngimbu, the CSRII founder member and initiator, at Solwezi in North-Western Province. Since then several efforts have been demonstrated across Zambia to showcase the importance of practicing and adapting SRI in this country.

In demonstrating US government support towards promoting SRI farming practices in Zambia, CSRII was funded US 15,000 to hold training workshops to teach SRI methods and provide basic farming inputs and tools in rice farming zones on the west bank of the Zambezi River in Zambezi district.

Summary

Presently, food insecurity is common in the mostly rural Zambezi district, especially west-bank of the area. One of the biggest challenges is geographical location, as sandy floodplains cover most parts and this causes adverse effects for local people who practice rice farming in the area. Most crops are wiped out by floods each year, becoming the source of perpetual hunger and starvation. Every year the Zambian government and international donors, e.g., the Red Cross and WFP, donate thousands of tons of grain (maize, rice cow pea) in food aid to vulnerable people affected by hunger due to the effects of flood and also then drought disasters.

For that reason, CSRII took up the task and responsibility to support the people of Zambezi west-bank through the scaling up and spread of SRI farming practices for improved productivity and incomes.

During the reporting period, the project successfully carried out two assignments that were mandated in the project agreement. The main purpose of these assignments was to conduct workshops to train 300 rice farmers in SRI farming practices and to provide farm inputs and tools to facilitate their initial field preparations. The positive attributes in SRI farming practice derives from the following factors:

- NO NEED to change varieties -- *HYVs and hybrids* can give the highest yields with SRI methods, but *local varieties* can produce 6-12 t/ha with SRI method
- LESS SEED is used, because plant populations (plant density) are greatly reduced; fewer plants if well managed will give more yield than several times more plants casually managed
- NO NEED for use of chemical fertilizers -- while these can raise rice yields with SRI management, the best results are achieved with *compost* or other organic fertilization of the soil
- NO NEED to apply agrochemicals -- pesticides, fungicides, etc., are usually not necessary -- farmers find that these are not economical as SRI plants are usually resistant to pests/diseases
- SIGNIFICANT WATER SAVINGS – usual irrigation water can be reduced by 50% -- but farmers *need good water control* to apply smaller amounts of water reliably, regularly
- MORE LABOR – is needed at first, but as the SRI methods are mastered, SRI management can even become *labor-saving over time*
- MORE SKILL AND MANAGEMENT EFFORT are needed – SRI is intended to *improve farmers' capabilities* – SRI is knowledge-intensive and management-intensive
- Increased TILLERING -- 30-50 tillers/plant, or more, if the soil and water are well-managed
- Larger ROOT SYSTEMS – it can require 5-6x more force to uproot an SRI plant (one evaluation found 28 kg of force was needed to pull up 3 regular plants vs. 53 kg to uproot single SRI plant)
- Bigger PANICLES -- 200-300 grains/panicle, or more. *Positive correlation between the number of panicles and panicle size -- contrary to the negative relationship which is commonly reported – SRI can give more panicles and also bigger panicles.*
- GRAIN QUALITY -- fewer unfilled grains and fewer broken grains when milling the paddy, so one can get a higher milled outturn of polished rice from one's paddy (unhusked) production
- RESISTANCE to pests, diseases, storms and drought as plants remain healthier with their deeper root systems and stronger tillers; LODGING is rare; also RATOON crop is possible
- HIGHER YIELDS -- average 6-8 t/ha, even up to 15 t/ha or more is possible
- *PRODUCTIVITY* gains – from all inputs (land, labor, water, capital); more important than yield

A. **Status of the Implementation with Respect to Target Achievement**

The project design had two important actions to be accomplished within a space of one year involving the following:

#	Action		Components
1.	Provision of farmer inputs and implements	a)	SUPA paddy rice improvement
		b)	Farm power in the context of SRI farming practices
2.	Conduct SRI training workshops	(c)	Training of 300 farmers in 6 catchments areas, involving 12 farmer groups

Action 1: Provision of farmer inputs and implements

a) Paddy rice seed improvement

The first thing to be done when disseminating SRI knowledge to the rice farmers is start by growing rice with good quality seed. On most occasions, the quality of rice seed that is planted in the Zambezi west-bank basin is mixed seed. Mixed rice seed has poor quality in growth, test, colour, and aroma. This affects the rice value chain, especially as marketing of the rice product becomes compromised. To ensure that good quality rice seed is maintained, the source or foundation seed needs preserving and sustaining.

The project had to procure 500 kilogrammes of seed of SUPA rice variety as part of improvement effort so that better quality and quantity of the locally preferred seed was available to 300 small-scale farmers. Through this project, CSRII has helped to address the challenge of inadequate availability of the improved and widely preferred SUPA rice variety in the medium to long- term. As well as SUPA rice seed being collected and purified. this will help to address bottlenecks in the availability of improved inputs, such as rice seed, and in the movement of the rice from the grower to the processors and to the consumers, both local and export.

The distribution was 1.6 kg rice seed to each of the 300 farmers. It expected that these quantities will be reasonable for each farmer to develop ¼ hectare. As a forecast for 2011/12, a total of 450 tons of paddy rice should be produced by the local farmers. This requires farmers' dedication and commitment to the SRI principles to achieve the targeted results. The parameters to be recorded and observed during the breeding and multiplication seasons will involve: date of planting, date of seed emergence, date of tillering, date of first flowering, date of 50% flowering, date of 100% flowering, plant height, tiller number per hill, panicles per hill, spikelets per panicle, % of filled spikelets, flag leaf, grain length, grain width, root system, and threshability.

b) Farm power in the context of SRI farming practices

An enduring feature of farm power in Zambezi west-bank is the dominant and persistent use of hand power for primary tillage. In practice, almost all rice farmers in the Zambezi west-bank confine themselves exclusively to hand power. Tilling by a hand hoe is not only backbreaking but uneconomical. This scenario greatly influences the farming system, food security, and the profitability of rice agriculture for the small-scale farmers.

Through this project, CSRII has acquired relevant farm implements, tools and animals to facilitate filling the gap with an ultimate goal to lower costs, increase efficiency, and availability of services, hence promoting overall rice productivity. Among the implements that have been acquired, the following are included:

(i) Five pairs of oxen, including castration and training
(ii) Five ox-carts, including spares and spanners
(iii) Five ox-drawn ploughs and accessories
(iv) Five rotary weeders ; and
(v) Five field measuring markers

Outcome expected from the farm implements

1.	Pair of Oxen, Ox-carts, Ox-drawn ploughs and accessories	This form of power that has been developed by the project embraces animal traction technologies, together with their associated tools and implements. This power source will be used to the targeted 300 farmers for primary tillage, namely, the activities associated with preparing the land prior to planting. The power inputs and implements relating to a range of field activities in crop production from land preparation, harvest, and transportation, through to marketing.
2.	Rotary weeder	This is model of manually-operated weeders developed for effective weed and soil-aeration management in the 300 SRI farmers' fields.
3.	Field measuring markers	The markers have been developed to maintain uniform spacing between plants in farmers' fields. These markers need to be run over the prepared field lengthwise and then widthwise. Transplanting at the marked intersections gives the required 25 x 25 cm spacing.

Action 2: SRI training workshops

This is a Farmer Field School (FFS) type of training that involved the Training-of-Transformation (ToT) approach to change the mindset of 300 rural small-scale farmers from traditional farming practices to more appropriate methodology involving the SRI for increased productivity and income. A wider group of rural small-scale farmers of Zambezi district that suffer from effects of severe rains and flood disasters that destroy crops had an opportunity to receive SRI training which inspired them and will improve their rice productivity and achieve water savings in the next farming season and beyond. Each training workshop was for four days, conducted with 12 different rice-producing groups in 6 zones.

i. The training workshop lay-out

UNIT	TOPIC (SESSION)
1	Introduction to SRI farming practice
2	Preparing the nursery and starting seedlings
3	Field preparation
4	Conservation fertilization
5	Taking seedlings from the nursery
6	Spacing Transplanted seedlings
7	Water control
8	Weeding
9	Pest and disease control
10	Management after flowering
11	Harvest
12	Storage
12	Field demonstration experimentation (nursery and field management)
13	Marketing and savings
14	Assessing lessons-learned and SRI field trial planning

ii SRI Multimedia Toolkit

The tool-kit used in the training was developed by the World Bank Institute and provided to CSRII by SRI International Network and Resources Centre (SRI-Rice) of Cornell University in the USA. The fundamental six SRI learning applications are:

- Transplant young seedlings (<15 days, with just 2-3 leaves)
- Set out plants singly with wider spacing
- In a square pattern (25x25cm or more) and
- Plant shallow, gently, and quickly
- No continuous flooding during the period of vegetative growth, with either (a) minimum daily applications, or (b) alternate wetting and drying – keeping soil mostly moist but not inundated
- After panicle initiation, maintain a *thin layer of water* (1-2 cm) on field until 10 days before harvest

This learning product uses audio visual tools to illustrate the concepts and practices, as well as advantages and constraints of applying SRI. The links to access the learning products is viewed in the following order:

01 – Overview of SRI: Improving Rice Productivity and Achieving Water Savings - This is a 12-minute multimedia presentation, highlighting SRI principles, key elements, main benefits and constraints for application.

02 – Applying SRI: A How-To Guide for Farmers and Practitioners: An SRI application from the Philippines. This is a 15-minute multimedia presentation, organized as a step-by-step guide for farmers and practitioners, using an example of the System of Sustainable Irrigated Agriculture (SSIA, a local name for SRI) in the Philippines.

03 – Viewpoints – Video and audio interviews with researchers, practitioners, farmers and others involved in SRI. The interviews provide first-hand accounts of experience in adopting SRI, as well as controversies and research results related to SRI.

04 – SRI Toolkit Brochure – the above listed learning tools are compiled into a Toolkit, with a 5-page brochure

Learning Objectives

After completion of this learning product, participants should be able to:

- Describe the six key elements of SRI;
- State the benefits and constraints of applying SRI, under a climate-change context with pressure on nature resources such as water;
- Appreciate that SRI is still evolving, and its application should consider local rice farming practices, as well as soil climate and conditions.

N.B: The learning products were translated by CSRII into the local language found in this area

ii List of farmer groups that have benefitted from the program:

Dates of events	Target farming groups	Participants
06-09.09.2011	o Mize Rice producer group	25
13-16.09.2011	o Sachala Rice producer group	25
05-08.10.2011	o Muswiza Rice producer group	25
12-15.10.2011	o Kucheka Rice producer group	25
18-21.10.2011	o Chinyingi Rice producer group	25
22-26.10.2011	o Muyembe Rice producer group	25
27-31.10.2011	o Kangombe Rice producer group	25
02-05.11.2011	o Chihongo Rice producer group	25
08-11.11.2011	o Likungu Rice producer group	25
09-12.11.2011	o Nyawanda Rice producer group	25
14-17.11.2011	o Mwange Rice producer group	25
19-23.11.2011	o Milomboyi Rice producer group	25
	Total trained farmers	300

In terms of gender, the majority of the participants were women with a lesser number from the men's side. In total, 200 women and 100 men were trained in SRI farming practices.

ii. Training workshop outcome:

The largest and most pervasive requirement for SRI adoption is change in farmers' thinking and willingness to change. Farmers need a certain amount of skill and motivation to use SRI techniques successfully. Overcoming skepticism and mental resistance usually requires some physical demonstration, or visits to see SRI fields that are growing as explained. Visits to demonstration plots and farmer-to-farmer communication are usually the most effective way to overcome resistance, supplemented by illustrated materials and visual displays. The confidence of those communicating about SRI is also a key element in gaining acceptance. This explains it all the effort and knowledge sharing experience the training program had accomplished.

B. Challenges

The implementation of this project faced some challenges, the major ones including:

- Political interference before, during and after the 20th September 2011 General Election that impacted the project activities, especially rescheduling of program dates, and most of the people were kept busy with election campaigns.
- Delays in the transfers of funds into the project account influenced some project activities that had to be temporarily stopped at some stage.
- The completion period of the project was extended to December due to late deliveries from some suppliers, especially training material and farm implements involving oxen, carts, and rotary weeders

C. Conclusions

CSRII would like to express its gratefulness to the Ambassador's investment fund. This gesture will go along away in improving farmers' livelihoods and food security in the Zambezi west-bank.

On the whole, the report calls on all other international donors and Governments to emulate the US government by moving fast in supporting the scaling up of SRI in Zambia, wherever they can.

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