

**2nd Peace Corps West Africa  
System of Rice Intensification (SRI) Training of Trainers**  
Kakanitchoé, Ouémé, Republic of Benin  
April 29<sup>th</sup> – May 1<sup>st</sup>, 2013



Summary Report  
November 2013





## Introduction and Background

This report covers the second three-day West Africa regional training of trainers on the System of Rice Intensification—or SRI as it is commonly known—in the framework of a multiyear SRI collaboration. Funding for the training was provided by the West Africa Food Security Partnership (WAFSP), and by the SRI International Network and Resources Center (SRI-Rice). The WAFSP is a 4-year regional collaboration between Peace Corps and the United States Agency for International Development (USAID) to support synergistic food security programming opportunities as part of USAID’s Feed the Future initiative. The WAFSP works in four West African Feed the Future focus countries: Ghana, Liberia, Mali and Senegal; and seven non-Feed the Future focus countries in West Africa which have active Peace Corps programs: Benin, Burkina Faso, Cameroon, The Gambia, Guinea, Sierra Leone and Togo. SRI-Rice, based at Cornell University in Ithaca, New York, is a global center dedicated to promoting SRI adoption, and enhancing and sharing technical knowledge and research on SRI.<sup>1</sup>

This series of trainings is jointly organized by the WAFSP, SRI-Rice, Peace Corps Benin, and the Consultative Council of Rice Producers’ Organizations of West Africa (a member of ROPPA<sup>2</sup>). The WAFSP is responsible for coordinating logistics; SRI-Rice is the technical partner; and ROPPA has hosted the first two trainings at the organization’s affiliated farm school, Solidarité Agricole Intégrée (SAIN). Songhai Center, an integrated agricultural development center based in Porto Novo, Benin, participated in the both trainings as a partner organization of Peace Corps Benin, and as the host organization for one of the Peace Corps organizers/trainers.<sup>3</sup> Three staff members from Songhai were trained with the intent of setting up SRI trials at Songhai sites throughout their system, including sites in Benin and Nigeria.

## Objective and Rationale

This multiyear collaboration seeks to increase the adoption of SRI across West Africa as a means of contributing to food security throughout the region. SRI is a rice production methodology<sup>4</sup> that focuses on natural means of enhancing soil health and providing more space and better conditions for each individual rice plant. Instead of dense planting, inundated fields and relying on chemical inputs to control weeds and boost fertility, SRI uses a very low planting density (wide spacing with only one plant per space), aerobic soil management (alternate watering and drying where possible), applications of organic matter, early and careful plant establishment, and manual weeding. The result is better soil health, better plant health, and typically higher yields. For farmers this translates to: 80-95% reduction in seed use; potentially significant water savings; reduced cost for inputs; and much less exposure for farmers and the environment to potentially toxic chemical fertilizers and herbicides. Furthermore, since SRI is a methodology and not a specific technology, it allows farmers to increase yields while still using local varieties of rice they already have, yet is also compatible with modern rice varieties, such as the Nerica varieties now in use throughout the region.

Developed in Madagascar in the 1980’s, SRI has since the late 1990’s been adopted and adapted by farmers in over 50 countries throughout the world, notably in Vietnam, India, Indonesia, China, Mali and the Philippines.<sup>5</sup> As a system of practices that work synergistically, SRI needs to be adapted to each farmer’s

---

<sup>1</sup> For more information on SRI-Rice, see the Resources section in Appendix I on page 15

<sup>2</sup> The West African Farmers and Agricultural Producers Network – [www.roppa.info](http://www.roppa.info)

<sup>3</sup> See Songhai’s website for more – [www.songhai.org](http://www.songhai.org)

<sup>4</sup> For more information on SRI methods, see Appendix III on page 18

<sup>5</sup> Source: SRI-Rice – <http://sri.ciifad.cornell.edu>

local conditions, thus SRI's adoption across regions depends heavily on promotion of farmer experimentation and local adaptation. Peace Corps volunteers are uniquely situated to work with farming communities to assist them in learning and adapting the basic principles of SRI. This series of trainings then is aimed at building a technical capacity for SRI training and extension amongst Peace Corps countries throughout the West Africa region, and fits within USAID's Feed the Future framework of promoting targeted crops to enhance food security in strategic regions, with rice being one of the Feed the Future target crops for West Africa.

Rice plays an important role in West African economies and cultural identities, one that is easily understated. Since the domestication of *Oryza glaberrima* (one of only two domesticated rice species in the world) in Mali's inland Niger River delta some 3,500 years ago, rice has come to be grown in almost every part of the region—with a wider distribution than any other crop. Today West Africa leads the continent, producing 66% of all rice grown in Sub-Saharan Africa.<sup>6</sup>

Rice accounts for an increasing proportion of national diets across the region, though especially so in the western part. Thus, annual per capita consumption is highest in countries like The Gambia (117kg/258lbs),<sup>7</sup> Sierra Leone (104kg/229lbs),<sup>8</sup> and Guinea (100kg/220lbs),<sup>9</sup> and as a region, rice consumption is higher than for any other part of Africa. Exacerbating this, as populations grow and become increasingly urban, purchasing habits shift away from other staple starches in favor of rice.

Following patterns with consumption, rice has a large economic footprint throughout the region, again particularly in the western part. In Sierra Leone, for example, rice production accounts for 50% of the GDP,<sup>10</sup> while in Guinea, rice accounts for roughly two-thirds of all national cereal production.<sup>11</sup> As rice consumption continues to grow at a faster pace regionally than for other crops, West Africa as a whole has grown increasingly dependent on imported Asian rice, with potentially serious repercussions for national economies and governments. Senegalese rice imports make up 16% of the country's balance of trade,<sup>12</sup> and according to 2007 data, the country was producing only 20% of its rice demand, despite an excellent growing environment and a strong cultural identity with rice (their national dish is rice with fish).<sup>13</sup> The Gambia, as of 2000, was producing only 12% of its rice demand, even though rice is the single



Fig. 1 - Comparison of one conventional plant (left) and one SRI plant (right), both planted at the same time with the same variety of rice by staff at the training site in Kakanitchoé, Benin.

<sup>6</sup> Source: 2007 Africa Rice Trends 5th Edition, AfricaRice

<sup>7</sup> Source: Battaye A, J Kathrine, E Drammeh. 2002. Economic impact assessment of the rice research program in The Gambia. Serekunda: National Agricultural Research Institute; Bamako: Institute du Sahel.

<sup>8</sup> See Sierra Leone's National Rice Development Strategy (NRDS) report – [www.riceforafrica.org/downloads/NRDS](http://www.riceforafrica.org/downloads/NRDS)

<sup>9</sup> Guinea NRDS – [www.riceforafrica.org/downloads/NRDS](http://www.riceforafrica.org/downloads/NRDS)

<sup>10</sup> Sierra Leone NRDS – same as for footnote 7

<sup>11</sup> Guinea NRDS – same as for footnote 7

<sup>12</sup> Senegal NRDS – same as for footnote 7

<sup>13</sup> *Ibid*



most important staple crop in the country.<sup>14</sup> In 2012 Nigeria became the world's largest rice importer, and is the 12th largest consumer in the world.

Regionally, West Africa imports up to 42% of its rice,<sup>15</sup> creating trade imbalances that result in huge debt burdens for governments and represent a very real and problematic drain of cash from already impoverished communities across West Africa. According to a 2011 report, rice imports to West Africa from Asia and elsewhere account for a full 20% of globally traded rice.<sup>16</sup> As global food prices become increasingly volatile, consumers throughout West Africa will become potentially more vulnerable to food insecurity. The record high prices witnessed in 2008 resulted in just this sort of pressure, which in turn placed political pressure on national governments to develop effective responses.<sup>17</sup>

This situation, however, is far from unavoidable or inevitable. West Africa has plenty of land and resources for increasing rice production, and a large population of rural producers capable of increasing their yields.<sup>18</sup> Efforts to increase production in recent years, however, have largely led to increases in land area under cultivation (extensification)—which in turn puts pressure on other crops and land uses—and except in limited instances, haven't generated large increases in yields (intensification).<sup>19</sup> As a result, rice yields in the region have remained far lower than in other parts of the world. Thus, any major success in increasing rice yields in West Africa will be a major contribution to food security and economic, political and social stability as well.

At least two major regional initiatives seek to create just such an increase in rice productivity: the West Africa Agricultural Productivity Program (WAAPP), for which rice is one of several crops; and the Coalition for African Rice Development (CARD) program, which aims to increase yields through a broad-reaching suite of interventions. The WAAPP has chosen to use SRI as the major driver of yield increases, reinforcing the potential of this methodology to effectively address West Africa's rice production challenges. The WAFSP sees rice as an important part of its food security portfolio, and SRI as an approach that is particularly well suited to the strategic advantages that Peace Corps volunteers bring to the table.

<sup>14</sup> Source: Battaye, et al. 2002

<sup>15</sup> Source: 2007 Africa Rice Trends 5th Edition, AfricaRice – [www.warda.cgiar.org/publications/2007%20Africa%20Rice%20Trends%205th%20edition.pdf](http://www.warda.cgiar.org/publications/2007%20Africa%20Rice%20Trends%205th%20edition.pdf)

<sup>16</sup> OECD. 2011. Rice crisis, market trends, and food security in West Africa – [www.oecd.org/dataoecd/38/38/47853480.pdf](http://www.oecd.org/dataoecd/38/38/47853480.pdf)

<sup>17</sup> *Ibid*

<sup>18</sup> *Ibid*

<sup>19</sup> 2007 Africa Rice Trends - see footnote 14



## Training Conception, Organizers and Trainers

The idea for a series of West Africa SRI trainings originated from meetings between Erika Styger (Director of SRI-Rice – Cornell University, Ithaca, NY), Stephanie Tack (West Africa Food Security Coordinator – Cotonou, Benin), and Pascal Gbenou (President of the Consultative Council of Rice Producers' Organizations of West Africa – Adjohoun, Benin, and Founding Director of SAIN) during meetings in Benin in early 2012. A first training, conducted in French, was held in September 2012 at SAIN (see below in this section), with Pascal Gbenou and Jean Apedoh (coordinator of GRAPHE, a Togolese NGO) as lead trainers, with training and logistical support from Peace Corps Response volunteer Devon Jenkins (Songhaï Center - Porto Novo, Benin) and logistical support from Stephanie Tack and Peace Corps volunteer Suzie Ahn (Peace Corps Benin Food Security Volunteer Coordinator – Cotonou, Benin). The second training, which this report covers, provided for English-speaking Peace Corps volunteers, Peace Corps staff, and counterparts, was held in late April 2013 to precede the primary rice-planting season in West Africa.

**Erika Styger**, lead trainer for the second training, is the director of the SRI International Network and Resource Center (SRI-Rice) at Cornell University, in Ithaca, NY. Erika first learned of SRI in the late 1990's while conducting her doctoral research in Madagascar, near where SRI was first developed in the 1980's. While living in Mali in 2007, Erika began working with rice farmers in the Timbuktu region, in what developed into the first large-scale SRI adoption in West Africa. This project, spearheaded by Africare, became a launching point for broad-based SRI promotion and adoption across Mali, and has had spillover effects throughout the region.

**Daniel Saidu**, trainer, is a resident of Sierra Leone, and a rice agronomist for the West African Rice Company. He started working with SRI in early 2012, and has been working since to test, evaluate, promote and commercialize SRI in Sierra Leone.

**Devon Jenkins**, trainer, was a Peace Corps Response volunteer based at Songhaï Center in Porto Novo, Benin during the time of the training. Devon served as an agriculture sector volunteer with the Peace Corps in Niger in 2004 and 2005 and learned of SRI during his graduate studies at Cornell University. His work at Songhaï included carrying out trials and trainings on SRI, and he is presently back at Cornell University working on SRI projects with SRI-Rice.



SAIN, the host site for both of the initial trainings, is an integrated farm school located in the village of Kakanitchoé, about one hour north of Porto Novo, Benin. Eleven students spend 18 months at the school, rotating out to affiliated sites in the region. Students receive theoretical instruction alongside running farm activities, which includes rice, banana, plantain, papaya and vegetable production, and raising rabbits, chickens, ducks, turkey, guinea fowl, snails, quail and an aquaculture operation. The site uses an integrated production model, with wastes from one system being incorporated into other parts of the farm. SAIN founding Director **Pascal Gbenou** served as a lead trainer for the first SRI training in this series, and was the first person to conduct SRI trials in Benin, following a trip to Madagascar to study the methodology. He finished his PhD in October 2013, with a dissertation on the ability of SRI to contribute to Benin's food security goals.

A special thank you is due to: the staff at SAIN for their dedicated support; to the participants for their active and enthusiastic engagement in the course; and to **Angèle Katary** (WAFSP Assistant) and **Stephanie Tack** (WAFSP Coordinator), who provided invaluable coordination and logistical support for the training.

## Training Format

As a regional training of trainers, the program<sup>20</sup> was carefully designed to provide: 1) a thorough introduction to SRI principles and practices; 2) hands on experience with some of the key steps of SRI; 3) a rigorous self-analysis of participants' rice growing conditions and exploration of methods to adapt SRI to their local environment; 4) a framework for regional planning and networking; 5) tools for tracking and reporting data; and 6) techniques for developing demonstrations and trainings with counterparts and local farmers. Core SRI principles were introduced at the outset, and reintroduced at subsequent stages of the training in greater detail to enhance retention and understanding. Fieldwork demonstrated positive and negative applications to promote problem solving by participants, and help them anticipate challenges they may face in applying and extending SRI in their communities.

The first day focused on a broad introduction to SRI basics, followed by breakout group sessions to sketch out differences in regional rice production systems and what adaptations would be required for implementing SRI in each of these. These group sessions brought together participants along agroecological lines, often crossing national boundaries, which helped draw parallels and highlight differences between rice growing systems across the region. Day two followed up with detailed technical instruction in SRI, hands-on fieldwork in nursery establishment, field preparation and transplanting, and group work to create technical action plans for each country.

Day three saw the conclusion of the group action plans, sessions on working with farmer groups, data collection, network building, and incorporating SRI into Peace Corps training programs. Lastly organizational visits on the return to Cotonou brought participants to CAFROP, a local rice processing, packaging and marketing organization aimed at making locally produced rice more competitive in urban markets, and Songhai Center, a regional agricultural/manufacturing organization and UN-designated Center of Excellence.

Peace Corps staff members from each country were invited to the training to ensure sustainability and facilitate the incorporation of SRI into the technical training programs in participating countries. To strengthen impact and post-training collaboration, PCVs were selected from clustered regions within their respective countries whenever possible. Participants developed country action plans to assist in creating national frameworks for incorporating SRI into their training curricula, and to coordinate and plan trials, demonstrations and trainings within their communities.

---

<sup>20</sup> See Appendix II on page 16 for a copy of the agenda

## Monitoring and Evaluation

As part of the Feed the Future initiative, the West Africa Food Security Partnership (WAFSP) utilizes a series of indicators to determine the impact and efficacy of each intervention. The WAFSP has three key objectives:

1. To increase the **availability** of healthy foods, especially for women and children
2. To increase the **accessibility** of healthy foods by decreasing poverty and increasing incomes
3. To improve the **utilization** of available foodstuffs to improve the nutritional status of women and children.

This SRI training directly or indirectly addresses all three of these objectives, with a specific focus on the first two. While rice is generally not considered to be a highly nutritious foodstuff, it is the caloric backbone of many diets, and the livelihood of many farmers throughout the region. As previously discussed in the Objective and Rationale section, increasing dependence on rice importation is becoming a growing challenge for local communities and state governments alike, leading to greater food and economic insecurity. Thus, strategies to increase local production of rice can help secure availability of a foodstuff that forms the caloric backbone for many families.

SRI contributes to this by allowing farmers to increase their production without increasing the land under cultivation (thus intensification, as opposed to extensification—increasing production through increased land area under cultivation), without having to purchase additional inputs, and while still allowing farmers to use whichever variety of rice best suits their needs. On a national level, SRI doesn't require additional demands on water resources, and can increase rice production without requiring construction of extensive irrigation schemes. In short it allows farmers and countries to produce more with what resources currently exist, or to more efficiently utilize additional investments that are made. The result is increased self-reliance and lessened vulnerability from a family to national level. Urban consumers benefit by having a more stable supply of rice that is locally grown, using fewer petrochemical-derived inputs whose prices are increasingly volatile on international markets. Farming communities benefit as well by becoming less dependent on these same inputs, and by increasing their yields at the same time.

These same qualities also allow SRI to address WAFSP's second objective, as farmers can increase their rice production without borrowing money to purchase inputs or lease more land to do so. This increases available income for other purposes. Furthermore, SRI has been shown in other regions to be more economically efficient per unit of rice produced, thanks both to increased productivity and







decreased input and seed use.<sup>21</sup> In regions where rice production is carried out primarily by women, this means more income directly available to women and children, which has been shown to have a greater positive impact on family nutritional security than when earnings are kept by male family members.

The SRI training addressed this second objective as well through a site visit to CAFROP, a rice processing organization which buys paddy rice from farmers in the surrounding Ouémé Valley region of Benin and processes it into both polished white rice and parboiled rice, for sale to urban markets. While not as nutritionally healthy as brown rice, parboiled rice represents something of an in-between, as the process transfers some of the nutrients from the bran to the starch, so that after polishing the white rice retains some of the nutrient value lost from removal of the bran, but still possesses the storage, cooking and marketing benefits of white rice. This indirectly addresses the third objective—increasing utilization of healthy foodstuffs.

The training of trainers approach aims for a multiplier effect, by impacting more producers through the enabling of subsequent trainings. To this extent a good portion of the training was spent on developing networks and a resource base to facilitate follow-up with participants. Where possible, participants from each country were selected from clustered regions, a strategy that was designed to enable follow-up planning and trainings to be done collaboratively, thereby increasing their odds of successfully carrying out trainings and evaluations in

each community. Counterparts were included for the same reason, but also to help ensure the sustainability of the initiative—the knowledge of SRI won't be leaving with the volunteers at the end of their service—and to bring a greater understanding of local conditions to the training to enable more detailed planning on local adaptation. Peace Corps staff members were involved for sustainability reasons as well, and to ensure that participating countries could develop SRI modules to incorporate into their technical training programs for new volunteers in the future, which will contribute to the continuity and dissemination of the SRI practice. Follow-up support to participants will be essential to ensure their compliance with training objectives and expectations, and proper monitoring and evaluation once their projects get under way.

When follow-up trainings and SRI demonstrations are conducted, the resulting data will be compiled and transmitted to Stephanie Tack, the WAFSP Coordinator. The two most quantitatively relevant indicators for this will be 4.5.2-5 and 4.5.2-7, both of which follow under WAFSP objective number one:

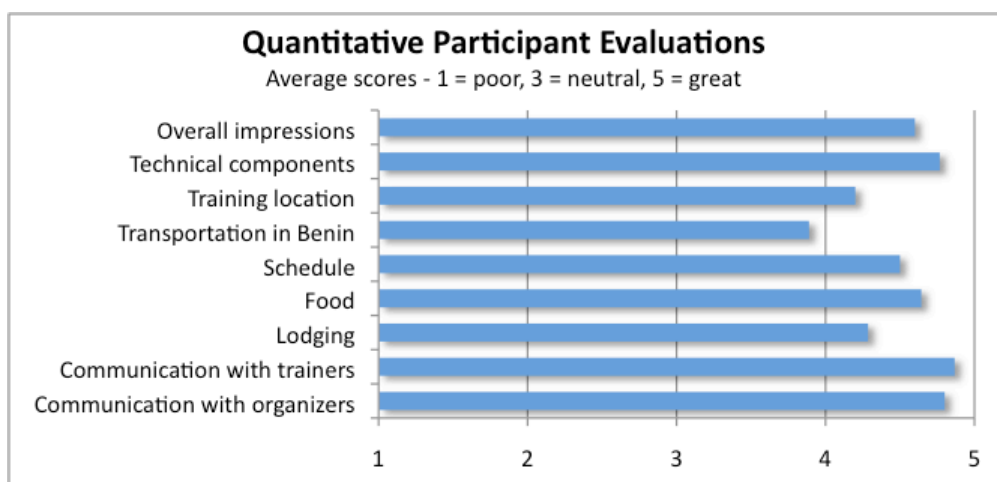
<sup>21</sup> For more see: Uphoff, Norman. 2006. How to help rice plants grow better and produce more: teach yourself and others. Madagascar: Association TefySaina and CIIFAD. Available at: <http://sri.ciifad.cornell.edu/extmats/engmanual.pdf>

- **Indicator 4.5.2-5:** Number of farmers and others who have applied new technologies or management practices as a result of USG (US Government) assistance
- **Indicator 4.5.2-7:** Number of individuals who have received USG supported short-term agricultural sector productivity or food security training

The first is an outcome indicator and does not track results until SRI is effectively applied by farmers. The second is an output indicator that can easily be measured at each training (figures are to be supported by signed participants lists), and can be expected to increase significantly with subsequent trainings conducted by participants in each country.

## Participant Feedback

Below is a summary of feedback given in participant evaluations on the final day of the training. Qualitative answers are given first, followed by a chart showing average scores for the responses to the quantitative questions.



### Strengths:

- Trainers understood material, and communicated it effectively
- Many responses indicated that the training was at or above expectations
- Enthusiasm for a Facebook group to keep participants connected and share ideas/information
- Hands on sessions were well received; there was a good balance between theory and practice
- Length of sessions was well received
- Opportunities to make detailed action plans
- Timeliness of sessions
- Participants felt well prepared to conduct trials and trainings at post
- Strong praise for Pascal, his staff, and the beauty of the training site (though with recommendations for improving the lodging); particularly strong praise for the fresh food
- Erika's technical knowledge was helpful in discussing adaptations to different conditions
- The timing within the rice planting year was appreciated

### Weaknesses:

- Lengthen the training to allow for farmer visits in the region
- Warn participants with sufficient advance time to bring work/rainy season clothing
- Prevent visa challenges from occurring (as happened to the two PCVs from The Gambia) by



- ensuring that all PCVs have visas prior to arrival
- Transportation in Benin scored the lowest marks, and this was a logistical challenge due to both the conditions of the road leading to the training site, and the fact that it was rainy season, and a large rainstorm hit Southern Benin on the arrival day
- Occasional disagreement between trainers during practical sessions, though this was recognized for providing interesting discussions
- A suggestions to install demonstration plots next to conventional plots in neighboring farmers' fields, to allow for a better visual comparison of SRI and non-SRI
- Participants had suggestions for facilities improvements, such as the provision of pillows/sheets
- More suggestions for alternatives/adaptations if some of the practices of SRI aren't available; this was particularly true for rain-fed systems
- A lesson on approximating a mechanical weeder with a hand hoe was requested
- Expand and formalize the selection process to make it available to more volunteers
- Shorten the review of forms
- Several responses mentioned an interest in rice processing, which was included as an organizational visit to a local rice processing and marketing organization (CAFROP) after the evaluations were collected; discussions with participants afterward indicated that they were satisfied
- Some 'unavoidable' communication difficulties due to varying degrees of language proficiency

## Next Steps

Stephanie Tack is engaged in on-going communication with each country point of contact to assess their ability to implement their respective action plans and to determine what additional support/resources are needed for each group. Planning is currently underway for a second year of the initiative, potentially including the following actions:

1. **Providing additional support to countries that are already well established** – This includes Benin, The Gambia and Senegal—countries which have trained Peace Corps staff, volunteers and counterparts, and have begun some level of in-country trials and informal trainings
2. **Reinforcing the capacity of countries which are partially trained** – This includes Guinea and Togo—two countries that have trained volunteers and counterparts, but have not yet sent Peace Corps staff to participate in a training
3. **Exploring possible training options for countries that have not yet participated** – This includes Burkina Faso, Cameroon, Ghana and potentially Sierra Leone

Additionally, in order to address the need for a uniform training and implementation curriculum, WAFSP and SRI-Rice are exploring possible options for developing materials for Peace Corps countries to use during trainings with volunteers, and for technical trainings with counterparts. If developed, this toolkit would contribute greatly to the sustainability and potential scalability of the project beyond the three-year time frame initially agreed upon.

## Participant Updates

Participants returned to post with a good level of enthusiasm to get started before the rainy season, and to share what they learned with other PCVs and counterparts in country. During the network establishment session of the training participants suggested the creation of a Facebook group to facilitate sharing experiences, photos, materials and other resources. Since then participants have posted or emailed updates of their experiences in the field:

## Quick up-dates from Senegal:

*Mary:* Lorraine, Luke, and I presented Devon's introductory presentation on SRI at the PC/Senegal Sustainable Agriculture Summit. The volunteer response was overwhelming enthusiastic. Our rice season starts in July and it looks like we'll be busy introducing SRI in our villages and in a number of other PCV sites.

*Lorraine:* On May 28th a pre-training for 10 SRI demo farmers was held by myself, Youssoupha Boye, and a local extension agent Ablaye Seck south of Kaffrine. There were also 16 women and 14 men who attended just to hear about the technique basics and the plan for the demonstrations. The meeting covered SRI basics with some simple visual aids, as well as the how and why of demonstration plots. The demo farmers come from 4 different villages and each has rice fields in the same flooded pattern, so none of the demos will be more than a kilometer apart. The demos will be one of three SRI adaptations; seeding 2 seeds by hand; transplanting; and machine seeding and thinning to 1. An in-depth hands-on SRI training will be held either at a nearby Master Farm or Women's Group space in mid to late June. This training will be for up to 50 rice farmers, whether they will be involved directly in my demos or not.

On May 31st there will be an SRI training for 50 farmers at the Master Farm of Samba Lee south of Kaolack. There, myself, Samba Lee and Arfang Sadio will hold a morning-long session split into three stations: seed selection and pre-germination; nursery creation; and transplanting/direct seeding in a grid. Demonstrations will remain at this Master Farm throughout the rainy season for the community to see and learn from.

In mid-late June the same training will be held at the Master Farm of Ibou Sarr in the Djilor region, south of Kaolack. His demonstrations will serve to teach that community about SRI throughout the rainy season as well. I have spoken with government extension agents (ANCAR) in the area and at that training we will come up with a plan for monitoring and evaluation of past SRI work they have done.

Peace Corps volunteers in the Sustainable Agriculture sector will receive field crop seed in the next few weeks. Those who farm rice have already been given SRI training at their in-service training and Summit and have been told to contact any of the SRI team for help with demos/interested farmers. I will also be working with 2 other Peace Corps volunteers to help farmers in their communities try SRI.

[In August Lorraine produced a report of SRI trainings and field work in Senegal up to that point, which has been made available online at: [http://sri.ciifad.cornell.edu/countries/senegal/Senegal\\_PeaceCorpsTraining%20\\_2013.pdf](http://sri.ciifad.cornell.edu/countries/senegal/Senegal_PeaceCorpsTraining%20_2013.pdf)]

## Quick up-date from Benin

*Bethany:* Immediately following the SRI training, Ed Wasainen and myself each invited two people from our villages for a Technical Exchange at SAIN farm school. I invited my official counterpart from village (an agricultural technician) and a farmer who grows rice and enjoys trying new techniques. Ed invited two members of a women's group that cultivates rice. We watched one of the videos from the training about SRI with our guests, had a classroom session from one of the SAIN employees, and visited the field to see the SRI test plots and the nursery we had prepared during the training. With Pascal's help we made plans for SRI trials in our respective villages.



In my village in the northern Borgou, the rains have just now started. Members of my village have already started to plant crops, including rice. The farmer who attended the tech exchange has begun to plow and prepare his fields using his cattle. In the next few weeks we will begin our SRI trial. We plan to install three plots side by side: a control using traditional methods, an SRI plot using transplanting, and an SRI plot using direct seeding.



*Antonin:* In May, shortly after the training, Antonin (a homologue of Devon and a graduate of Songhai Center's agricultural farm manager training program) led a series of trainings in northern Benin for the local NGO DEDRAS (see images at right). In all, 22 villages and 154 farmers participated in the 10-day series, covering three clusters in the Banikoara and Tchaourou areas. Impressed with this first experience with SRI, DEDRAS has decided to scale up the project, and conduct follow-up sessions in the seasons to come. Antonin's excellent training report can be found here: <http://sri.ciifad.cornell.edu/countries/benin/BeninSRIRapportBanikoara2013Fr.pdf>



#### Quick up-date from The Gambia

*Seth:* The challenges that come with SRI are that it is encouraging farmers to utilize techniques that go completely against conventional wisdom and practices. For example a typical Gambian rice farmer would space at 12x12 instead, that way he can have more plants. In addition that farmer would transplant after twenty days, as well as planting three or four seedlings per hill. We would like to start an SRI demo at the training center so we may train both volunteers and their counterparts, in addition we would like to do one at the village level.



On the village level we will treat it as a pilot project. We will try to construct trainings there and basically apply some of the concepts of a farmer field school (FFS). During this time we will be creating a training module that we can give to future volunteers so that if they want to bring SRI to their village they will have an idea of how to start. We will refine our module based of the successes and shortcoming of the Dobong Kunda pilot.

Our long-term goal would be to have an SRI demo plot at the Basse Training Center where volunteers and counterparts can participate in detailed SRI trainings. We would also like to be able to produce a detailed and simple training module for volunteers to take to their village so they can start their own demo gardens/FFS. Most volunteers live in rice producing regions so

this is an area most volunteers can have work in. Thus we will make SRI principles a staple of all future pre-service (PST) and in-service (IST) trainings. The methodology is highly effective and could go a long way towards improving food security in villages if implemented properly.

## Conclusions

As the second in an iterative series of regional trainings on SRI, input from the first training helped inform changes that improved the experience for participants this time around. Indeed, conversations with participants revealed a high degree of enthusiasm for the material, and a generally high level of satisfaction with the training itself. Feedback on the evaluation forms confirmed this, while also providing additional suggestions for improvement for future trainings.

The subject matter was widely embraced, and a clear majority of the participants felt well prepared to conduct trials and trainings at post. Participant evaluations at the end of the course were positive, with an average score of 4.5 out of 5 for all of the quantitative questions. The timing within the rice-planting year was appreciated because it will help participants to implement what they learned shortly after returning to post. The trainers scored high grades for their understanding of the topic and for communication with the learners. Participants were enthusiastic about creating a Facebook group to keep them connected and share ideas/information (and idea that was proposed by participants). The hands-on practical sessions were well received, and many participants appreciated the opportunities given to them to make detailed action plans. The action plans themselves will serve as a framework for guiding participants as they incorporate SRI into their training programs at post, and initial follow-ups with trainees showed a strong desire and readiness to develop in-country training curricula.

As the WAFSP/SRI-Rice collaboration enters into a second year, further efforts will be aimed at developing region-specific training and implementation materials, and reinforcing each country as they continue to incorporate SRI trainings and demonstrations into their work at post.





## Appendix I: Resources

The **SRI International Network and Resource Center** (SRI-Rice) at Cornell University (Ithaca, NY) maintains a comprehensive list of resources for the adoption and understanding of SRI, including academic and practical research databases, up-to-date information on SRI adoption in over 40 countries around the world, links to SRI producer groups/networks in Asia, Africa, the Middle East and Latin America, and training materials. All of this can be found on their website at <http://sri.ciifad.cornell.edu>. SRI-Rice also manages a Ning social networking site dedicated to facilitating dialog and exchange for SRI practitioners and promoters in West Africa: <http://sriwestafrica.ning.com>. The full academic research portal can be found at [www.mendeley.com/groups/1178631](http://www.mendeley.com/groups/1178631).

Contact Erika Styger at [eds8@cornell.edu](mailto:eds8@cornell.edu), or by phone at +001 607 255 8087 for more information.

The Peace Corps SRI West Africa Facebook group ([www.facebook.com/groups/peace.corps.sri](http://www.facebook.com/groups/peace.corps.sri)) is open by invitation, or by an approved request. This group is a forum for sharing resources—such as guides, photos and articles—and asking questions of other members. Feel free to send a request and join in the conversation!

The West Africa Food Security database on Dropbox ([www.dropbox.com/sh/3axu1bn1r6c54a4/JU9bapRI-hs](http://www.dropbox.com/sh/3axu1bn1r6c54a4/JU9bapRI-hs)) has a folder on “Rice – SRI” which includes all the materials from this training and many other resources on SRI and rice in general.

## Appendix II: Training agenda

### 2nd System of Rice Intensification (SRI) West Africa Training of Trainers Kakanitchoé, Ouémé Region, Benin, April 29th – May 1st, 2013

*West Africa Food Security Partnership (USAID/West Africa - Peace Corps)*  
*SRI-Rice (Cornell University)*  
*Consultative Council of Rice Producers' Organizations of West Africa*

#### Travel Day – Sunday, April 28<sup>th</sup>

16:00 Departure from Cotonou  
17:30 SAIN farm tour (optional)  
18:30 *Dinner*  
19:30 Video – World Bank SRI video

#### Day One – April 29<sup>th</sup>: Introduction to SRI; rice production systems; nursery

7:30 *Breakfast*  
8:00 Intro of participants, intro to training, review of objectives and expectations  
8:30 Intro to SRI: Why SRI; history and context  
9:00 Primary components of SRI  
9:45 Intro to adaptation: SRI under different conditions

- Synergy and variability
- West Africa context: what has been done, AEZ variability, etc.

  
10:30 *Break*  
10:45 **Field visit:** Compare SRI and conventional plots; uproot plants  
11:00 **Field activity:** Seed soaking  
11:30 Assign group presentations: PCVs must bring completed questionnaires, and work in groups from their (sub-)national clusters (see handout)  
  
12:30 *Lunch*  
13:30 Presentations on rice production systems  
14:30 Questions/discussion/guidelines to prepare for group work  
15:00 *Break*  
15:15 Group work

- Step by step: Propose technical adaptation of the current system in order to integrate SRI practices (by identifying how SRI differs w/ current practices)
- Identify constraints and bottlenecks with SRI in local context
- Problem: How are you going to solve/address this?

  
16:15 Present back to group  
17:00 **Field activity:** Prepare the nursery bed  
17:45 **Field activity:** Prepare the field for planting  
18:30 *Dinner*



**Day Two – April 30<sup>th</sup>:** Nursery sowing; field preparation; transplanting; weeding; setting up a trial

7:30	<i>Breakfast</i>	
8:00		Step-by-step technical presentation on SRI: Interactive, including discussion on adaptation started the day before
10:30	<i>Break</i>	
10:45		<b>Field activity:</b> Nursery sowing
11:30		Setting up a comparison trial/data collection
12:30	<i>Lunch</i>	
13:30		Farmer stories/exchange
14:00		Developing a technical plan
15:30	<i>Break</i>	
15:45		<b>Field activity:</b> Transplanting
17:00		<b>Field activity:</b> Weeding
18:30	<i>Dinner</i>	

**Day Three – May 1<sup>st</sup>:** Technical plans; conducting trainings; M&E; plenary

7:30	<i>Breakfast</i>	
8:00		National/regional collaborations
8:30		Training of Trainers (ToT) principles: Training and follow-up with farmers
9:00		Data collection, documentation and reporting
11:00	<i>Break</i>	
11:15		Additional resources, networking and distribution of USB thumb drives
12:30	<i>Lunch</i>	
13:00		Presentation of certificates
13:30		Evaluation
14:00		Departure from SAIN farm to Adjohoun
14:30		<b>Organization Visit:</b> Meet with CAFROP (Cooperative d'Amélioration de la Filière Riz dans l'Ouémé Plateau) rice cooperative in Adjohoun to talk about processing, branding and marketing local rice
15:30		Departure from Adjohoun to Porto Novo
16:00		<b>Organization Visit:</b> Songhaï Center in Porto Novo
17:00		Departure from Porto Novo to Cotonou
18:15		Arrival in Cotonou

## Appendix III - SRI Methods

*The System of Rice Intensification, known as SRI -- le Système de Riziculture Intensive in French and la Sistema Intensivo de Cultivo Arrocerero (SICA) in Spanish -- is a climate-smart, agroecological methodology for increasing the productivity of rice (and more recently being used with other crops such as sugar cane, wheat and tef) by changing the management of plants, soil, water and nutrients.*

Information in this section was adapted from the SRI-Rice website, and can be found at: <http://sri.ciifad.cornell.edu/aboutsri/methods/index.html>

### SRI Principles

SRI methodology is based on four main principles that interact with each other:



**1 Early plant establishment**  
Transplant very young, single seedlings



**2 Reduced plant competition**  
Increased spacing between rows/plants



**3 Organic matter use**  
Preference organic matter over chemical fertilizers



**4 Reduced water use**  
Alternate wetting and drying where possible

When used together, these principles create a synergistic effect, increasing crop yields while paradoxically decreasing inputs, including water (often by 50% for irrigated rice), seed (typically by 80-95%), and chemical fertilizers (30-50%, or even 100% for organic SRI), herbicides and pesticides. With extra space, each plant grows broader, taller and stronger. By using a soil rich in organic matter and oxygen, plant roots grow deep and full, creating a stronger base for above-ground growth and helping the plants better resist drought and excessive winds. Transplanting young seedlings (8-12 days versus 25-45 days) gives each plant more time in the field to take advantage of these better conditions.

Based on these principles, farmers can adapt recommended SRI practices to respond to their agroecological and socioeconomic conditions. Adaptations are often undertaken to accommodate changing weather patterns, soil conditions, labor availability, water control, access to organic inputs, and the decision whether to practice fully organic agriculture or not.

*The most common SRI practices for irrigated rice production are summarized on the following page.*

Even though SRI was developed with irrigated rice, the SRI principles have been applied to rainfed rice and to other crops, such as wheat, sugarcane, teff, finger millet, pulses, showing increased productivity over current conventional planting practices. When SRI principles are applied to other crops, it is referred to as the System of Crop Intensification or SCI.

A full set of instructional videos on SRI can be found at: <http://goo.gl/2q09eq>

## Recommended SRI Management Practices for Irrigated Conditions

**Rice Plants** › seedlings are transplanted:

**at a very young age** › at the 2 leaf-stage, usually between 8 and 12 days old

**carefully and quickly** › protecting the seedlings' roots and minimizing the transplanting shock

**singly** › one plant per hill instead of 3-4 together, to avoid root competition

**widely spaced** › to encourage greater root and canopy growth

**in a square grid pattern** › 25x25 cm, or wider, in good quality soil

*Note: Adaptations for direct-seeding and mechanical transplanting have been undertaken in a number of countries.*

**Soil** › The soil is enriched with organic matter to improve soil structure, nutrient and water holding capacity, and favor soil microbial development. Organic matter represents the base fertilization for the crop and is complemented if needed by fertilizer.

**Water** › Only a minimum of water is applied during the vegetative growth period. A 1-2 cm layer of water is introduced into the paddy, followed by letting the plot dry until cracks become visible, at which time another thin layer of water is introduced. During flowering a thin layer of water is maintained, followed by alternate wetting and drying in the grain filling period, before draining the paddy 2-3 weeks before harvest. This method is called 'intermittent irrigation' or 'Alternative Wetting and Drying' (AWD). Some farmers irrigated their fields every evening, other leave their fields drying out over 3-8 days, depending on soil and climate conditions.

**Nutrients** › As soils are improved through organic matter additions, many nutrients become available to the plant from the organic matter. Additionally the soil is also able to hold more nutrients in the rooting zone and release them when the plants need them. Depending on the yield level and on the farming system, some farmers use exclusive organic fertilization for their SRI plots. The majority of farmers complement the organic matter amendment with chemical fertilizers, most often urea, in order to achieve a balanced fertilization of the crop.

**Weeds** › While avoiding flooded conditions in the rice fields, weeds grow more vigorously, and need ideally be kept under control at an early stage. A rotary hoe - a simple, inexpensive, mechanical push-weeder - is most often used starting at 10 days after transplanting, repeated ideally every 7-10 days until the canopy is closing (up to 4 times). The weeder has multiple functions and benefits. i) It incorporates the weeds into the soil, where they decompose and their nutrients can be recycled, ii) it provides a light superficial tillage and aerates the soil, iii) it stimulates root growth by root pruning, iv) it makes nutrients newly available to the plant by mixing water with organic matter enriched top soil. A re-greening effect of the plants can be observed 1-2 days after weeding, and v) it redistributes water across the plot, contributing to a continuous leveling of the plot and eliminating water patches in lower laying areas in the field that create anaerobic conditions for the plants. The use of the weeder contributes to homogeneous field conditions, creating a uniform crop stand and leading to increased yields.

For more information, see the SRI-Rice website at: <http://sri.ciifad.cornell.edu/aboutsri/methods/index.html>