



# **Sustainable Agriculture and Food Security Grant Annual Report 2014-2015**



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## 1.0 Introduction

In October 2015, the World Bank announced that less than 10 percent of the world's population will be living in extreme poverty by the end of 2015.<sup>1</sup> This is an astounding statistic considering that in 1990, 37 percent of the world's population lived in extreme poverty. While it is certainly worth celebrating that fewer and fewer people are struggling with daily survival, 702 million people still living on less than \$1.90 a day. In addition, the effects of global climate change will continue to challenge the progress made thus far, as rains become more erratic and growing seasons less predictable. It is projected that climatic changes will leave global GDP per capita 23 percent lower in 2100 than it would be without any increases in temperatures.<sup>2</sup> While this is a sobering statistic, the success of collaborative efforts to eradicate poverty and improve resilience should be celebrated as attention is focused on the new realities of vulnerable populations around the world.

Since 2010, World Renew's Sustainable Agriculture and Food Security (SAFS) Grant has provided country teams and partner agencies the opportunity to try innovative small-scale initiatives in order to assess their sustainability and effectiveness and, potentially, to lead to larger scale programs with broader impact. The Grant was made possible through an estate gift that was designated to enhance food security among rural households by supporting key learnings and approaches recommended in the *Agriculture and Food Security Program Evaluation Report* of 2009. The evaluation, which covered World Renew's agriculture and food security programming from 2000-2009, revealed that there is a need to focus on the most important priorities of smallholder farmers and address key initiatives that will have the greatest impact on rural livelihoods.

Through the SAFS Grant, country offices and partners have the opportunity to submit proposals for up to \$12,000 that address one of seven thematic areas (see sidebar). Twenty five grants have been awarded since 2010, with each program running up to three years. These small grants offer an opportunity to test and improve a new agriculture process or technology or to adapt a process or technology that has been successful elsewhere and not previously implemented with the participant farmers.

The innovative programs made possible through the SAFS Grant are not just improving food security. They are also allowing World Renew and its partner agencies opportunities to fulfil Biblical commandments to love your neighbor and to be stewards of the earth. Improving soil fertility through conservation agriculture techniques serves to increase crop yields while simultaneously enriching the earth for long-term sustainability. Planting fruit trees in Bangladesh prevents soil erosion and provides long-term food availability, even in the midst of poor growing seasons. Giving

### SAFS Grant Priority Themes

#### **FARMER-TO-FARMER EXTENSION AND LEARNING:**

Initiatives that promote farmer-to-farmer extension and the exchange of new knowledge on key agricultural practices and learnings.

#### **CONSERVATION AGRICULTURE/SOIL FERTILITY**

**RESTORATION:** Farming methods that promote a more efficient use of resources and improve soil fertility, productivity, profitability, and sustainability.

#### **MICRO-SCALE WATER RESOURCE MANAGEMENT:**

Initiatives that promote effective use of available water resources.

#### **AGRICULTURAL TECHNOLOGIES:**

The introduction of technologies that enhance food security, including new crops, management practices, and infrastructure development.

#### **MARKET LINKAGES AND VALUE CHAIN**

**EMPOWERMENT:** Initiatives that facilitate connections between producers and consumers and programs that encourage horizontal and vertical value chain integration.

#### **AGRICULTURE-INTEGRATED MICROFINANCE:**

Programs that facilitate sustainable access to savings and credit services for rural households.

#### **AGRICULTURAL-RELATED ADVOCACY:**

Initiatives that promote positive change to systemic challenges faced by smallholder farmers.

<sup>1</sup> World Bank Group. *Policy Research Note: Ending Extreme Poverty and Sharing Prosperity*. 2015, October.

<sup>2</sup> <http://www.nature.com/nature/journal/v527/n7577/full/nature15725.html>

women the opportunity to experiment and succeed with new farming techniques gives them a stronger voice and more respect in their households.

In 2014-2015, the SAFS Grant funded seven innovative projects (selected out of ten proposals submitted to the SAFS proposal review panel) working with smallholder farmers in seven countries, as well as four learning opportunities for World Renew staff and partner agencies in three countries. A total of \$57,374.98 was dispersed, with two of the projects scaling up initiatives which began in 2013-2014 for greater impact in the communities in which World Renew serves.

The following sections highlight the impact of the seven programs supported through the SAFS Grant, with a summary of each project's strategy, key achievements, and lessons learned. The programs supported through the SAFS Grant are impacting individuals, families, and entire communities, with 1,483 individuals participating in SAFS programs in 2014-2015, and 26,355 people indirectly served. The *Voices from the Field* sections give first-hand accounts of the difference these innovative programs are making in the lives of people around the world.



## 2.0 Gaining Experience in Fruit Tree Care in Bangladesh

### Background

Community Centered Development Project (CCDP), one of World Renew's partners, has a twenty-year history of implementing community development programs in Bangladesh. CCDP serves the poor by organizing them into People's Institutions (PIs), made up of primary self-help groups that select representatives for Union Committees. Their programming has helped communities to practice environmentally sustainable agriculture through the adoption of composting and organic vegetable gardening, thereby reducing farmers' dependence on chemical fertilizer and increasing household nutrition. Through community engagement activities, their agricultural programming has reached 1,148 participants in 2013-2014 alone.

The Netrakona District, in which CCDP works, is an underdeveloped area in terms of education, health, and communication systems. Regular floods, lasting three to four months of the year, make farmers heavily dependent on the mono-cropping of rice. This situation has resulted in 70 percent of households living on less than half a dollar a day and high levels of malnutrition, especially among children.

### Project Description

With SAFS funding, CCDP's 'Fruit Tree Project' aimed to identify and reduce barriers that prevent primary group members from growing and eating fruit. Trainings were provided to strengthen the Agriculture Technical Committee (ATC) of the People's Institution and other current and future leaders. Altogether 60 people were trained. The ATC members disseminated information to the primary groups, taught the groups about fruit tree cultivation and monitored the primary groups' activities.

The top barriers identified in the initial stages of the project for growing fruit trees were: unfamiliarity with fruit tree care, lack of knowledge about identifying fruit tree diseases, and the lack of fruits available for seed propagation. After identifying these barriers, the project developed a flipchart in simple language that described fruit tree care and common diseases. The last barrier was addressed by strengthening participants' access to and encouraging them to plant and care for fruit trees. CCDP opted to start with quick-fruited tree species (bananas and papayas), expecting to introduce species that take longer to fruit in upcoming years.

### Results Achieved

As a result of CCDP's year of work, real change is being witnessed in the mindsets of communities around fruit trees. In the local culture there are beliefs about fruit trees that discourage people from planting them, including the belief that if someone plants the Amrita Sagar variety of banana their children might die. In spite of this superstition, all seventeen women surveyed in one primary group are now growing banana and papaya trees. In fact, walking through the village, the team saw over a thousand papaya and Amrita Sagar banana trees that were planted and are being cared for.

#### IMPACTS AT A GLANCE

**Country:** Bangladesh

**SAFS Grant Priority Themes:**  
Farmer-to-Farmer Extension and Learning

**Number of Participants:** 900  
(711 female, 189 male)

**Actual Spending:** \$8,919.79

**Outcomes:**

- 22 community leaders are teaching fellow group members about fruit tree care.
- 900 primary group members and 200 community members are cultivating papaya and banana trees.
- 295 households are already eating fruit from their own trees. Over the next few months the fruit on the trees of the remaining 805 participants will mature.

The seriousness with which the ATC took their responsibilities made the project successful and even led to 200 non-participants adopting the practices encouraged by the project. As a result of their work, community members now also have a new level of respect for the ATC. As people have already begun to harvest fruit, particularly large papaya fruits, they have been asking the ATC to continue to share their knowledge. In addition, the People's Institution has decided to start demonstration plots as part of their education activities, with the profits from the suckers and fruits from these plots going towards funding future educational work.

In total, 711 women and 189 men purchase fruit trees through the SAFS program, and an additional 200 families planted fruit trees on their own initiative. Participants were encouraged to plant the fruit trees close to their homes so that women, who spend most of their time around the home, could easily care for the trees. Because caring for the trees did not take much time or effort, mothers even taught their children how to do the work, ensuring that the next generation knows how to care for fruit trees. At the end of the year, 295 households were already eating fruit from their own trees, with the fruit on the trees of the remaining participants expecting to mature in the next few months.



In addition, CCDP's organizational capacity increased during this 'Fruit Tree Project' as the staff gained experience in planning and managing programming. The new and reinforced skills of CCDP staff members include proposal writing, using doer/non-doer surveys to understand barriers to behavior change, budgeting, program monitoring, and project evaluation.



## Lessons Learned

The SAFS Grant-funded 'Fruit Tree Project' established a foundation for future grant-funded projects by building the experience and skills of the PI and ATC leaders, as well as CCDP's staff. All members present for the evaluation agreed that their confidence to implement a project has increased due to what they learned about project management. Because of interest that the project sparked in the community, CCDP has applied for a second year in order to implement learnings and focus on species that take longer to fruit.

Helping the participants to purchase varieties of fruits they were interested in encouraged them to participate in the project. Also, exchange visits helped to inspire and motivate participants, allowing them to witness successes firsthand. The ATC and PI leaders also did an excellent job of networking with the model farmers and government agriculture officials, who were a tremendous support and resource.

In addition, CCDP learned the importance of researching the targeted population and the environment of the project so that the project goals and activities match the needs. CCDP has decided to research which fruiting species are best for the sandy soils of the drought prone Rongsathi Union.

## Voices from the Field

Despite efforts by the ATC to motivate people to plant fruit trees, attitudes like 'you are just my cousin, what do you know about fruit trees?' made people resistant at first. Although they had been trained on good banana production and tree care, they had never seen it firsthand. When the ATC members had the chance to go on a learning exchange to Modipur, an area known for banana production, they all piled into a van.



Arriving in Modipur, they were surprised at the orderly rows of banana trees, healthy and strong.

One ATC member remarked, "This farmer keeps the banana trees cleaner than I keep my own skin!" On returning home, family and neighbors asked them, "Where did you go last Thursday?" The ATC then had countless opportunities to share what they saw and what they now knew about caring for banana trees. The ATC members laughed about the fact that before the trip they would beg their neighbors to listen to them, and now the neighbors were begging the ATC to share what they knew. The Modipur visit, the ATC members believe, gave them the authority and equipped them in their role.

The oldest member of the ATC, respectfully called Uncle Shamim, returned from the Modipur trip with new energy. He planted new banana suckers in careful rows. He cut the dead leaves off the banana trees, spread cow manure around the bases and watered the trees. The neighbors watched. Putting down his shovel, Uncle Shamim invited them over and said, "Look at the simple things I am doing to care for my trees. You can easily do this too." After finishing his work, Uncle Shamim went through his neighborhood helping others take care of their trees in similar fashion.

During a focus group discussion, a woman named Mashi from one of the self-help groups across the river spoke up and said, "I never thought of watering a tree before." Because the CCDP staff visited Mashi regularly to share their knowledge of fruit tree care with her, Mashi now waters her three banana trees. "One day my sister saw me and asked me why I was watering the trees. I told her it is to keep the trees healthy. It is not hard to water a tree. My sister now waters her trees too!"

### 3.0 Restoring Soil Fertility in Rural Cambodia

#### Background

Rice is by far the most important crop grown in rural Cambodia. In most rural areas, rice seedbeds are sown in May/June as the rainy season begins, and seedlings are transplanted in July/August to be harvested in November/December as the rainy season ends. Some families grow dry season vegetables, but many leave the land fallow for the rest of the year, allowing animals to graze on the rice stubble.

In recent years the incidences of drought and flooding have increased in Cambodia, resulting in poor harvests and food insecurity. Families have also been left vulnerable to money lenders as they borrow funds to purchase expensive inputs like fertilizer and pesticide. According to a survey of households in the areas where World Renew’s partners work, 97 percent of households were worried food would run out before there was money to buy more, and 90 percent of households relied on only a few kinds of low cost foods to feed their families.

Much of this food insecurity can be directly or indirectly attributed to decreasing soil fertility. Less water is retained when soils are hard and lack biomass, and additional inputs are required, driving up the cost of production. As a result of these challenges, interest in composting has risen over the last few years. Yet, although composting produces excellent results, making enough compost to meet the fertilization requirements of a field is time consuming and in most cases not feasible.

The use of green manure cover crops (GMCCs) is not currently a standard practice in Cambodia, but it has the potential to reverse soil fertility challenges and reduce the cost of inputs. With SAFS funding, World Renew Cambodia thus began working with its local partners on the adoption of this sustainable agricultural practice and on teaching farmers experimentation techniques.

#### Program Description

During the first phase of the program, five experimentation plots were identified in the provinces where World Renew’s partners operate. A project coordinator was hired to give additional focus to program implementation. The coordinator and the World Renew Cambodia agriculture team worked with the key farmers to identify several GMCC varieties that could be tried in all the locations, looking particularly at whether or not any local GMCC options might be available.

Forty key farmers (11 female, 29 male) were provided with GMCC seeds and were assisted in designing the experimental plots. Before beginning their experimentation, they received

IMPACTS AT A GLANCE
<b>Country:</b> Cambodia
<b>SAFS Grant Priority Themes:</b> Conservation Agriculture/Soil Fertility Restoration
<b>Number of Participants:</b> 40 (11 female, 29 male)
<b>Actual Spending:</b> \$3,548.13
<b>Outcomes:</b> <ul style="list-style-type: none"><li>Planting green manure cover crops before the rice harvest is better than planting after the rice harvest.</li><li>Mungbean and <i>Sesbania rostrata</i> led to the best results.</li></ul>



*Comparison of plot that had been planted with a GMCC (left) with one that had not (right).*



training on GMCCs in the Khmer language to help them better understand the usefulness of green manures.

Three of World Renew's implementing partners (LNU, OREDA and CFT) each selected farmers to participate in the experimentation. In plots labeled 'A', GMCCs were planted in the rice fields after the rice harvest (December/January). In plots labeled 'B', GMCCs were planted before rice planting (May) and then plowed into the soil before rice was planted. In addition, two Farmer Field School sites (HCC and HTC) were selected to do this second experiment only.

At each location three GMCC varieties were planted and there was also a control plot. The GMCCs experimented with included cow pea, mungbean, *Sesbania rostrata*, and ground nut.

## Results

The GMCCs clearly benefited the soil quality, with a visible difference in the rice plant size and health. However, farmers had to spend more time tending their fields, and when the rains did not come, many did not have enough water to irrigate the cover crops. Because of the history of drought, this was a risk acknowledge before the experimentation began.

It was discovered that planting GMCCs *before* the rice harvest is better than planting *after* the rice harvest. In the plots where the GMCCs were planted after the rice harvest, most of the crops start out well with the residual moisture but did not survive as the land dried up.

In addition, the key farmers learned through the experimentation that mungbean and *Sesbania rostrata* led to the best results. Mungbean is resistant to drought and had a noticeable impact on the health of the rice plants. *Sesbania rostrata* grows quickly and creates a lot of biomass.

Because the idea of controlled experimentation was new to the farmers and the experimentation protocols were not followed with precision, it was difficult in the end to compare crop yields across the experimentation and control plots.

## Lessons Learned

While the potential for using of GMCCs in Cambodia is strong, the greatest challenge will be to change farmers' mindsets. Farmers hold strongly to their traditional farming practices, so the greatest impact of the SAFS Grant-funded program may be in its impact on key farmers' understanding of the importance of experimentation. Additional investment is needed in training farmers in good experimentation practices and record keeping. Experimenting with other GMCC varieties would be helpful in determining the most appropriate species for each area.

In the end, farmers in Cambodia have adopted the practice of making compost, and at this time most continue to prefer compost over GMCCs because of the high risk of drought. While GMCCs have many benefits, compost can be made anytime, incurs no additional costs, and is not as dependent on rainfall.



*A key farmer explains how green manure adds benefits to the soil as he compares the size of two rice plants; the smaller comes from the control plot, the larger from the experimental plot.*

*Photo Credit: Laila S. Berg*

## 4.0 Micro-Irrigation and Conservation Agriculture in Nakuru County, Kenya

### Background

Food insecurity and a lack of alternative livelihoods pose the greatest challenge for people living in communities in Nakuru County, Kenya. This region lies in the Rift Valley and is classified as arid and semi-arid land, receiving less than 750mm of rainfall annually.

Inhabitants of Nakuru County are mainly farmers of maize and beans and pastoralists. Most of them are internally displaced people who formerly worked in Kenya's sisal plantations or in other areas of the country and were resettled by the government. Despite the government's allocation of land to communities for agricultural development, food shortages have been a regular problem because of unpredictable rains, lack of access to capital, the use of traditional farming methods, and high rates of deforestation.

### Project Description

By integrating micro-irrigation technologies and green manure cover crops (GMCCs) with conservation agriculture (CA), this SAFS-funded project sought to address environmental degradation. World Renew's partner NRIDCCS also hoped to increase irrigation possibilities in this low rainfall area through the construction of water pans, which are dug out areas used to collect and store surface runoff from uncultivated ground or roads.

Community field trainings were held for seven farmers groups and area church representatives on the principles of agroforestry and conservation agriculture (CA), including minimum tillage, cover crops and mulching, and crop rotation. A total of 208 people (161 female, 47 male) were trained and 118 of these participants (88 female, 30 male) then expressed interest in becoming registered as 'pilot farmers'. These farmers practiced the new techniques they had learned on small plots of their land, which served as comparisons with the land they cultivate using traditional farming methods. Demonstrations on drought resistant crops, including some edible GMCCs, were also conducted with the registered pilot farmers. Among the supported varieties were lablab, cowpeas, and improved sweet potato vines.

In addition, five drip irrigation kit demonstrations were established in different regions of the project area. Five farmers (3 female, 2 male) were selected by their groups, using established criteria, to receive water pan liners and kits to set up the demonstrations.

As a way of enhancing learning, an exposure visit was facilitated to Mai-Mahiu, which has a similar climate and geography as the project area. Twenty-three participants (13 female, 10 male) visited 'Care for Creation', where they learned about environmental conservation through agroforestry, soil erosion control measures, composting, and CA's benefits in addressing food insecurity and environmental stewardship.

### IMPACTS AT A GLANCE

**Country:** Kenya

**SAFS Grant Priority Themes:**  
Conservation Agriculture/Soil  
Fertility Restoration

**Number of Participants:** 118 (88 female, 30 male)

**Actual Spending:** \$8,464.44

#### Outcomes:

- 118 participants (88 female, 30 male) who were trained on agroforestry and conservation agriculture registered to become pilot farmers.
- 8 water pans constructed, three of which were entirely out of the participants' own initiative.
- Notable increase in the interest of men in on-farm activities.

## Results Achieved

As a result of the SAFS-funded project, 110 farmers (83 female, 27 male) are now practicing CA principles on their farms. In addition, before the project began, very few men were involved in the production of food – particularly vegetables – with most men engaged in non-farming activities such as charcoal production and sale. NRIDCCS saw a significant increase in the interest of men in farming as the new methods were introduced.

Five water pans were constructed through the project and an additional three water pans were dug during the course of the project without project funding as community members began to see their benefits. The fact that farmers are already digging their own water pans indicates a very high level of local interest in micro-irrigation.



*A community member uses a treadle pump to irrigate his garden.*

At the end of the project, participating farmers expressed appreciation for the benefits of crop diversification as a way to ensure food availability in their households during difficult growing seasons. The drought tolerant crops that were introduced by the project, such as the improved sweet potatoes, have created easier access to cuttings and seeds in the communities, as well. Farmers reported that they no longer have to travel as far in search of these inputs and are saving money as a result. Farmers were particularly impressed with how the lablab provided good shade cover to the soil in addition to providing a source of food and fixing nitrogen in the soil.

NRIDCCS also involved the local government in the project, which will help to ensure the sustainability of the project's activities. The government has agreed to oversee the continued implementation of the trainings provided.

## Lessons Learned

NRIDCCS learned early on in the implementation of the project that it is ideal for farmers to start CA on very small sections of their fields, as it is a lot of work to collect enough mulch to cover the soil. In this way, promoting GMCCs in a CA system is very beneficial, as the cover crop decreases the need for mulch.



Establishing model farms and registering interested 'pilot farmers' worked very well in ensuring the dissemination of the methods being taught. It complimented well the farmer-to-farmer learning exchanges that were done. In addition, all participating farmers were visited at least three times by NRIDCCS staff and regularly by the lead farmers in the project, as there was a recognition of the need to ensure that farmers have adequate support when they experiment with a new methods of farming.

NRIDCCS's staff also recognize the importance of integrating micro-irrigation technologies into any program in this arid and semi-arid part of Kenya. Future programming will require increased investments in water access, because without it the success of the entire project is hampered.

Another factor that enabled program success was the involvement of local church representatives during trainings and demonstrations. Because the project team recognized the fundamental role that the church plays in the community's development, they decided to involve the church as a way to reach more people. The church representatives were asked to be mentors with the aim of introducing the new farming methods to members of their congregations, and this has helped to increase the sustainability of the project's impact.

### **Voices from the Field**

Esther was one of the early adopters of conservation agriculture (CA) in the village of Banita. Esther is a member of the Sarkaa Women's Group, a group selected to benefit from the construction of a water pan for harvesting the runoff water. After contributing their labor, Esther's household was provided with a water pan liner, a drip irrigation kit, and trainings on water management.

Through their own initiative, Esther's family then established a container garden using locally available resources, as this requires less water to produce vegetables. After experiencing the increased efficiency and productivity, the family established a second container garden in order to sell excess vegetables to others in their community. During times when water is very scarce, her family pumps water from a nearby river to the water pan, using it as a reservoir for irrigating their crops.

Esther appreciates that she has been empowered economically through vegetable sales, and noted how much her household's food security and disposable income have increased in such a short time because of her use of CA and other agricultural methods she learned through the SAFS-funded project. She said, "I am grateful that now my household does not depend on my husband's income alone. This has helped to improve things between me and my husband, as we work as a team."

In this way, this SAFS project has not only had a significant impact on food security, but has also helped challenge societal traditions in a culture where women are not often involved in household decision making.

## 5.0 Farmer-led Agricultural Research for Higher Millet Yields in West Africa (Year 2)

### Background

The Sahelian ecosystem in West Africa is characterized by an average rainfall of between 200-500mm each year and poor soil fertility. Frequent drought has led to chronic food insecurity and repeated needs for food assistance. The area is projected to continue to be negatively affected in the future by climate change. World Renew's local partner, PAX, has been working in the region since about 2005. Work in the communities involved in this SAFS-funded program started in 2011.<sup>3</sup>

In 2011, in partnership with World Renew, PAX engaged in a large disaster response project to help community members who had migrated in search of work to return to their communities. Improved seed varieties were distributed to farmers, but the 2012 yields were still not sufficient to meet families' food needs. New farming techniques were needed in conjunction with the improved seeds to help people produce more food. Since soil fertility is a major issue in this area of West Africa, the practice of intercropping green manure cover crops (GMCCs) to fix nitrogen in the soil and increase available organic matter is very relevant. In addition, the simple, low-cost practice of seed priming – a process of soaking seeds for eight or more hours before planting, with ideal soaking times depending on the type of seed – is known to improve germination rates and yields by 10 to 25 percent.

### Project Description

In continuation of last year's SAFS-funded project, PAX's goal remained the same—to facilitate and encourage farmer-led experimentation in techniques that would increase soil fertility and crop yields. Out of the new methods presented, farmers selected those they wanted to try and were trained in how to conduct small-scale experiments on their own land. Three local extension agents who had established good relationships with the farmers provided supervision for this project. Farmers were asked to share their observations during community meetings and agreed to promote successful practices and train others. Farmers' successes have also helped guide local World Renew staff toward practices that could be scaled-up and promoted more widely in the region.

During the experiments, extension agents and farmers observed the progress in growth of the plants, took photos, and sampled grain at harvest. Participants were encouraged to visit each other's fields in addition to the community meetings held. In total, seven techniques were evaluated: seed priming, millet/cowpea intercropping, millet/groundnut intercropping, millet/Bambara groundnut intercropping, millet/*Sesbania sesban* intercropping, millet/*Acacia* intercropping, and millet/sesame intercropping.

#### IMPACTS AT A GLANCE

**Country:** West Africa

**SAFS Grant Priority Themes:**  
Agricultural Technologies

**Number of Participants:** 66 (54 female, 22 male)

**Actual Spending:** \$2,494.72

**Outcomes:**

- Experimental plots with millet intercropped with a legume produced 24.02% higher yields than control plots.
- On average experimental plots with primed seed and a legume produced 46.17% more than non-primed control plots with millet.
- Forty farmers have committed to promoting one or more of the new techniques in their communities.

<sup>3</sup> For security reasons, identifiers of country and local partner are withheld from this report and all names have been changed.

## Results Achieved

Overall, experimental plots that had millet intercropped with a legume produced 24% higher yields than the control plot. Experimental plots in Yaya zone produced on average 29% higher millet yields as compared to control plots. However, even within Yaya zone there was a lot of variation, with no difference between the experimental plot and the control plot in one location (mostly attributed to crop failure of the leguminous crop), to up to a 200% increase in yield in another test plot.

Fields with precisely measured planting distances generally performed better than traditionally planted fields. For example, one field of millet intercropped with cowpeas and planted using precise planting distances produced six kilograms of cowpeas and only four kilograms when planted traditionally.

In experimental plots intercropped with legumes, primed seed produced 20% more than non-primed. Within control plots, primed seed produced 12% more than non-primed. Thus, the combination of seed priming *and* leguminous crops had the biggest impact. On average, experimental plots with primed seed and a legume produced 46% more than non-primed control plots with millet alone (0.145 kg/m<sup>2</sup> vs 0.0995 kg/m<sup>2</sup>).

Increased organic matter from the first year's implementation of leguminous crops demonstrated a greater impact in yield, as well. Farmers were more engaged and participative during this second year, and 40 farmers have committed to promoting one or more of these new techniques in their communities. While not all experiments had positive results due to the challenges described below, it was evident that seed-priming is a very valuable technique, as clear differences between primed and non-primed millet were observed by farmers. Also, farmers now have experience growing an experimental plot next to a control plot, which will help them experiment with other techniques in the future.

## Lessons Learned

One lesson from the first year of the project that was reinforced in the second year is that leguminous crops, while useful for improving soil fertility, are still susceptible to insect attacks and irregular rainfall. These problems have been aggravated by lack of fallow as insects stay in people's fields. It would be helpful



*Millet field comparison: on the left with leguminous cover crop and on the right without the use of a leguminous cover crop*



*Millet field intercropped with cowpea in foreground, in comparison to without cowpea in background.*

to learn more about pest life cycles and to research some local varieties that develop later, potentially allowing them to escape pest damage.

Unfortunately soil tests were not done before the project began, and fertility is not necessarily uniform between experiment and control plots. In the future, perhaps soil analysis could be conducted before and after to document fertility changes.

Finally, animals entering fields to eat seedlings have caused major damage. Introducing new techniques must be accompanied by awareness raising that increases communication between farmers and herders.

### **Voices from the Field**

“Here is a small token of appreciation” said DK, as he handed pastor Yan a bundle of sorghum.

DK used to plant millet in his field. When Yan, an employee of World Renew’s partner PAX , started sharing about intercropping, DK was skeptical. With funding from the SAFS Grant, Yan shared with community members about how to try out new agricultural techniques. DK decided to give intercropping a try even though he was not on the “official list” of those doing experiments.

Yan helped him measure out two equally sized plots of 20 x 30 meters. On one side DK planted groundnuts and sorghum together with precise spacing like Yan showed him. On the other, DK planted just sorghum. At harvest time, the results were impressive.

From the side planted with just sorghum, DK harvested only 7.5 bundles of sorghum. The experimental side with sorghum intercropped with groundnuts yielded 15 bundles of sorghum, twice as much! And, in addition to the sorghum, DK also harvested 14 sacks of groundnuts and an additional 18 sacks of leaf matter from the groundnut plants.

DK decided to store the groundnuts and leaves, waiting for the price to go up. He also set aside seed for planting the following year. Four months later he was able to sell his groundnuts for over \$300 and the leaves for \$64! He was ecstatic. He immediately invested the funds by purchasing two bulls. Next he plans to buy a cart for them to pull, so he can transport things more easily.

DK recently stopped by to thank Yan for his help, and for encouraging him to experiment in his fields. Yan’s family members, the only Christians in that area, are happy that the agricultural teaching is showing Jesus’ love to people in tangible ways. And they enjoyed the additional five bowls of grain they obtained from the bundle DK gave them as a thank you gift.

## 6.0 Seed Bank Project for Women Farmers in Sierra Leone (Year 2)

### Background

Agriculture is the primary source of livelihood for people in the Koinadugu District of Sierra Leone. Rice, a staple food, has been impacted by inconsistent rainfall and decreasing yields the past several years. World Renew and its local partner, Christian Extension Services (CES), have been working to improve food security in the district by introducing improved agricultural techniques, focusing particularly on female-headed households and creating social capital in communities to foster peace and development.

CES works towards empowering communities and vulnerable groups. In many communities, there is a persistent, discriminatory belief that women lack in ability and are unable to meet their financial needs. Women, who largely bear the responsibility of feeding and caring for children and paying for school fees, are generally excluded from decision-making and lack access to land, seed, and other farming inputs. A recent survey by CES staff revealed that female farmers are the poorest and most marginalized persons in the communities. Women rely on accessing rice seed on credit, because they run out of food by planting season. With a 100% interest rate on rice seed loans, a large part of their profits are already claimed by paying back the loan, along with paying land rent. This makes achieving any progress out of poverty extremely difficult.

### Project Description

This SAFS-funded project was designed with the goal of equipping women with skills in agriculture and giving them the opportunity to earn an income. Specifically, the project aimed at addressing the lack of affordable access to land and rice seeds that female farmers face in the target communities. The objective was to provide rice seeds to 150 female farmers in the five communities in Koinadugu District at an interest rate of 25%, thus avoiding the need to leave their communities in search of seeds and loans for the upcoming planting season.

Training was provided on growing rice using the method of System of Rice Intensification (SRI) and running a community-managed revolving seed bank. In this second year of the project CES also focused on follow-up visits to the women's fields, and the women's groups were linked to the district agriculture ministry to ensure regular support from government extension workers.

### Results Achieved

During the second year of the project, the impact continued to grow. Women have become more familiar and confident in using SRI techniques, which have resulted in an incredible 80% average yield increase amongst the 150 female farmer participants. All the women were able to repay their rice loans with interest so that more women can benefit from the rice seed loan project. With the establishment of seed banks, other household members in the communities can now exchange their traditional rice seed with the improved variety of rice to enhance their yields. In addition to greater food security, many of the women report that they are now able to send their children to primary school and to pay for books and materials.

#### IMPACTS AT A GLANCE

**Country:** Sierra Leone

**SAFS Grant Priority Themes:**  
Agriculture-Integrated  
Microfinance

**Number of Participants:** 150  
female

**Actual Spending:** \$9,824.88

**Outcomes:**

- 150 female farmers learned the SRI technique and saw an average 80% yield increase.
- Five seed banks have been established.
- All the women were able to repay their rice loans with interest so that more women can benefit from the rice seed loan project.



One of the most significant impacts of this project is the gradual shift in gender roles. Men were involved at the land preparation stage but allowed the women to have control in the harvest and processing. The result was that women were better able to manage some aspects of their farming activities, especially processing. In working together, women had an increased role in decision making, which helped to establish a more balanced role of leadership in the household. Many female farmers have gained the respect of their spouses as a result of the increased food supply in their homes and are now consulted regarding household decisions.

## Lessons Learned

Storage facilities are a problem in all the villages, resulting in some homes being invaded by rats in search of the stored seed. Training on post-harvest storage would benefit the farmers in this program.

In addition, labor is scarce in some communities due to the fact that most young, able-bodied men have gone into neighboring Guinea and other districts outside Koinadugu to work in gold mining. This will have to be taken into consideration with regards to the agricultural techniques being promoted by CES.

### Voices from the Field

Most women in Benduku village find themselves in polygamous homes, with each of the wives bearing the responsibility for taking care of, on average, five children. They struggle to adequately feed and educate their children due to the low income realized from subsistence farming activities in the community.

Madam Fatmata Mansaray, aged 45, was targeted as part of CES's SAFS project in her community. Her husband died three years ago, and she has seven children to care for. Fatmata's life was made more difficult because her late husband's close relatives and other men avoided any connections with her due to the magnitude of her responsibilities.



Fatmata was chosen to be the head of a group of 37 women whose challenging situation qualified them to benefit from the program. The main economic activity of this group is swamp rice farming, upland rice farming, and local vegetable gardening. She and the other group members were each given a loan of two bushels of improved rice seed.

Fatmata said, "The program has really helped us increase our incomes. With the increased harvests we can feed ourselves and have some surplus to sell at market. This year I made Le 710,000 (US \$177.50) from rice sales. I am hoping to purchase a corrugated sheet to replace my thatched roof."

The economic situation of Fatmata Mansaray and her children has dramatically changed for the better over the course of the last two years, and her leadership skills have developed significantly. She is contributing to the Wara Wara Yagala Chiefdom by paying her local taxes and participating in meetings. She represents local women's groups at community workshops and is interested in becoming a local ward representative in her village.

## 7.0 Scaling up Conservation Agriculture practices in Apapai Sub-county, Uganda

### Background

World Renew's partner, Kaberamaido Mission Development Programme (KMDP), serves rural families living in the Kaberamaido District of eastern Uganda. Kaberamaido was severely impacted by the Teso insurgency from 1986 to 1992 and by Karamojong cattle raids during this same period. The Kumam people's culture is tied to cattle rearing, and the loss of these animals had a negative impact on the culture and economy in the district. More recently, much of the population was also displaced by violent Lord's Resistance Army (LRA) incursions in late 2003 and early 2004.

KMDP carries out programs in adult literacy, savings and credit, and food security, particularly around improving production techniques and seed availability. Farmers in the area face many challenges, including climatic changes and decreases in soil fertility, particularly as population pressures impact traditional practices around land fallowing.

### Project Description

With SAFS funding, community volunteers were trained to promote Conservation Agriculture (CA) and serve as model farmers, training and mentoring others in their communities on CA and green manure cover crops (GMCCs). KMDP integrated biblical principles into its trainings and worked to ensure the use of locally available materials as much as possible.

152 farmers (90 female, 62 male) participated in the trainings in Apapai Sub-county. These farmers then created awareness in the three participating communities. Nine demonstration plots were established to help support these farmers, and each was planted with six GMCC varieties: lablab, jackbean, mucuna, rice bean (*Kulumkukwa*), mungbean, and cowpea. These demonstration plots are also serving as multiplication gardens in order to generate more seed, which will be distributed to individual farmers in subsequent planting seasons.

KMDP staff conducted follow-up visits to the demonstration plots and participating farmers' fields in order to interact with the model farmers and to ensure they were continuously being provided with technical guidance and mentoring. KMDP also convened various stakeholders—including technical, political, religious and cultural leaders, project participants, and KMDP staff and board members—in quarterly review meetings in which they talked about the progress of project activities and gave suggestions on ways to improve the work.

### Results Achieved

67 farmers (38 female, 29 male) have already planted GMCCs on their own land, and additional farmers are expressing an interest in doing the same. Out of the 67 that planted cover crops, ten farmers (7 female, 3 male) intercropped maize with lablab and/or mucuna. The other 57 farmers planted GMCCs in order to observe how they grow and their performance and to grow seed for future planting.

#### IMPACTS AT A GLANCE

**Country:** Uganda

**SAFS Grant Priority Themes:**  
Conservation Agriculture/Soil  
Fertility Restoration

**Number of Participants:** 152  
(90 female, 62 male)

**Actual Spending:** \$8,748.00

**Outcomes:**

- 67 farmers (38 female, 29 male) have planted GMCCs on their land.
- Average maize yields increased from 400 kgs to 700 kgs per acre on demonstration plots.
- One female farmer doubled her vegetable sales in one season.

A visible increase in maize yields—from an average of 400 kgs to an average of 700 kgs per acre—was realized at the demonstration plots. In addition, stories of impact from the model farmers are plentiful:

- Madam Atano Christine harvested 400 kgs of maize from her half acre plot after intercropping a GMCC.
- Mr. Erionu James planted 8 kgs of maize on 0.75 of an acre on which he intercropped a GMCC. He was able to harvest 309 kgs of maize. Previously, without intercropping a GMCC, he had harvested an average of 217 kgs from the same plot.
- Madam Apio Dorcas increased sales of her vegetables: previously she earned UGX 80,000 a day, but she more than doubled her earnings over the life of the project, which she attributes to her use of CA techniques.

In addition, testimonies are filtering in to KMDP about how farmers who were not participants in the project are beginning to seek out and plant GMCCs and use conservation agriculture techniques. For example, during a quarterly review meeting a local government chairperson of the Apapai Sub-county, Hon. Ipega Monica, testified that two women who are not connected to KMDP's program have adopted GMCCs and CA techniques in their gardens after learning from the demonstration plots.

## Lessons Learned

All 152 participants were involved in the quarterly review meetings, during which they were able to express their views and concerns. This resulted in a very well-managed cycle of action and reflection and also increased social cohesion among participants from the same area.

Conversely, poor attendance at times during trainings created an uneven knowledge base among participants at the beginning of the project. KMDP learned to schedule trainings based on the times that worked best for farmers, recognizing in particular the importance of communication around and consideration for village social matters.



*A woman displays her gmcc harvest.*

In terms of learning around GMCCs, mucuna emerged as the best exotic GMCC and rice bean as the best local GMCC in terms of their rapid growth, soil cover, suppression of weeds, and yields. Farmers noted the scarcity of and lack of market for mucuna and lablab, and have been encouraged to concentrate on multiplying their own seeds.

Other lessons KMDP noted include:

- Termites were a serious problem as they ate through mulch. And chickens in search of termites also caused damage to the crops. Farmers have been encouraged to re-apply mulch, and thus have been mainly mulching vegetable crops in smaller plots because of the labor burden. They are beginning to intercrop GMCCs in larger fields.
- Biblical teachings about caring for God's creation and stewardship have really motivated participants to conserve their local environment and to work hard to grow adequate food for their households. Studying God's purpose for humankind encourages farmers to appreciate, mobilize, and utilize locally available materials and resources to improve their livelihoods.

## Voices from the Field

Madam Ailo Florence is a 45 year old widow who lives in Apapai Sub-county. She has nine children, six boys and three girls. During the KMDP-led trainings on GMCCs, she learned how they increase soil fertility, smother weeds, and can increase the yields of crops that are intercropped with them. She became very interested in mucuna in particular, as it was grown in a demonstration plot. It quickly covered the soil and had a visible impact on the health and growth of the maize with which it was intercropped.

In the first planting season after she witnessed the success in the demonstration plot, Florence intercropped mucuna with maize in part of her field. She testified, "There's a significant difference in this maize compared to the other I was growing. The maize intercropped with mucuna looks much healthier. Also, while weeding I noticed that the soil texture in this intercropped garden has changed from being rough to much more smooth, and the soil color is changing. It's becoming darker."

Florence is hopeful her efforts will increase her maize yields, since the maize stocks look healthy and are growing vigorously. She says her neighbors are noticing the difference as well.



# 8.0 Mwandi Livestock Development Program in Zambia

## Background

The Mwandi District is an area the size of Portugal located in the Western Province of Zambia, with an approximate population of 35,000. It has one of the most challenging agricultural contexts in Zambia, marked by high temperatures, inconsistent and unreliable rainfall, and sandy and infertile soil. These factors all contribute to the district being a marginal area for growing cereal crops, and therefore chronic food insecurity and malnutrition are prevalent.

The district’s southern boundary is the Zambezi River; its catchment areas and flood plains provide some of the best grazing land in Africa. This makes Mwandi an ideal environment for traditional cattle herding, and the Lozi people run a herd of over 40,000. These animals are a huge and under-exploited resource base for the community, especially considering the herd has an approximate market value of US\$15 million.

However, the livestock industry in Mwandi has been unable to properly develop as cattle owners have not been able to access the resources, technology, and training they require. With a lack of access to drugs and vaccines, the livestock industry has also been beset by disease. This has resulted in quarantining, with farmers in the Western Province unable to import new and improved livestock or export finished animals to the Zambian market for over ten years.

In the past, the poor agricultural conditions that made cereal crops difficult to grow were mitigated as communities could rely upon their bovine resources as an alternative income source. The only way they can now realize the value of their livestock is through middle men who illegally slaughter and transport animals out of Western Province, paying farmers a third of what they would receive if they could access the open market. This has further contributed to food insecurity, as farmers have become over-reliant on growing maize and fishing, which is resulting in the destruction of fish stocks in the river. The decline of the cattle herd has left the poorest region of Zambia with no industry to speak of, creating a cycle of food insecurity, dependency, and depopulation as people migrate to urban areas.

## Project Description

World Renew’s local partner, Mwandi UCZ, began the project by forming the Mwandi Livestock Cooperative, which is focused on unifying farmers in the district to advocate for agricultural improvements (including dip tank renovations and veterinary care), provide low cost access to medicines and husbandry equipment, provide education in a variety of animal health topics, and provide a return on investment in the form of annual dividends to its members.

Using the structure of the cooperative, an artificial insemination (AI) program was then developed for nine households in three communities, with the cooperative used as a means of communication and organization in the communities. This was then adjusted when the cooperative members suggested including a larger number of farmers, giving more people the opportunity to have two or three cows in the program. This did much to establish good will between the cooperative members, leaders, and the communities.

IMPACTS AT A GLANCE
<b>Country:</b> Zambia
<b>SAFS Grant Priority Themes:</b> Agricultural Technologies
<b>Number of Participants:</b> 57
<b>Actual Spending:</b> \$12,000.00
<b>Outcomes:</b>
<ul style="list-style-type: none"> <li>• 170 cattle belonging to 57 households in 7 communities were inseminated.</li> <li>• The Mwandi Livestock Cooperative was formed and already has 100 members and 7 chapters.</li> <li>• 242 farmers were trained on animal husbandry practices.</li> </ul>

Trainings were also provided, with topics determined by the participating farmers. A missionary veterinarian based in Mwandu led the trainings, covering topics about identifying and preventing diseases.

## Results Achieved

The AI program was a resounding success, with a significant level of local interest. The only complaint was that not enough cattle were included. Instead of focusing on only nine households, 170 cattle belonging to 57 households in seven communities were inseminated. Pregnancy rates from the 90-day pregnancy diagnosis visits averaged 50-60%, which is a good result in general for AI and excellent considering the nature of the pilot program and the challenges faced in initiating it. This will result in 85-102 calves being born in December 2015-January 2016, with the breeding stock improvements increasing exponentially over the years.

Veterinary trainings were attended by 242 farmers, with 85-90% of participants being men. Men are typically responsible for the care of livestock in Mwandu, but at least a few women were in attendance at all of the trainings, showing the high level of interest in the topics being covered. In addition, trainings usually went much longer than planned as participants asked many follow-up questions, demonstrating the relevance of the knowledge being shared.



The Mwandu Livestock Cooperative already has 100 members in seven chapters, and interest is growing as farmers recognize the benefits of membership. Through the cooperative, farmers have access to medicines and vaccines, allowing them to maintain the level of care they have been trained through the project to provide. In fact, the cooperative profited approximately ZMK 5,000 in its first five months through the sale of memberships, medicines, vaccines, and animal husbandry equipment. During the first two trips to Lusaka animal husbandry products were purchased using project funding, but now the cooperative has enough capital to purchase the products that are in growing demand.

## Lessons Learned

The importance of cow selection was quickly recognized as critical to prevent spending energy and resources on animals with low chances of conception. In order to get their cow in the program, farmers were saying that their cow had just calved and was therefore not pregnant; however, in a few cases the cows were in fact pregnant and thus aborted when treated in preparation for AI. Other cattle brought for evaluation were not pregnant due to infertility, and so Mwandu UCZ staff learned to ask historical questions of the owners in order to avoid selecting cows that had an inherent low chance of conception and to thoroughly evaluate the cow and be aware of farmers' lack of understanding of physiology. This resulted in the decision to slow down the process of selecting cows and to have a lower number of participants to ensure a high conception rate. Some farmers were displeased with this, but the leadership strived to clearly explain the rationale.

A second lesson learned was also related to the selection of cattle. Initially, three-year-old heifers without a calf that had not started cycling were selected. However, many of these local cattle were still too small to have a potentially larger calf, and their reproductive tracts were often difficult to inseminate due to size. While many of these animals did fit the project's criteria, it was eventually broadened to include many

older cows that had had a calf before and were therefore proven mothers. It is therefore expected that, as the project continues into a second year, AI results will be even more successful.

Trainings were especially valuable to participants, with attendance rates increasing at each training and participants asking thoughtful questions and even passing on the notes and teachings to others who were unable to attend. The idea of having participants select the topics was seen by Mwandu UCZ to have an impact on attendance, indicating that farmers are being provided relevant information that will have a positive impact on food security in the region. The willingness to pay for vaccines and medication further reveals how this SAFS project has been addressing a felt need in the participating communities.

### Voices from the Field

Fred Mubita, an employee of the Mission Farm at Mwandu UCZ, was eager to participate in the artificial insemination (AI) program. AI was not something Fred had ever done before and it is a challenging skill to master, but in order to see the work sustained local people need the knowledge and skills to do it.

Fred was eager for a chance to try, so he accompanied the trainers on all of the initial visits to the farmers, learning and assisting with vaccinations and the palpations of the cows to select them for breeding.

In between the trips, Fred began asking for more reading materials about AI. Seeing his potential, the missionary veterinarian began to have informal training sessions with him and spent extra time teaching him the “art” of AI.



Fred learned quickly and was remarkably good at the process. He was even able to breed a few cows during the program, showing that his learning curve was a quicker than most veterinary students studying in the US. Fred said, “I’m always looking to expand my knowledge of animal medicine and husbandry so I can help teach others.”

Fred is often sought out by other farmers when problems arise with their animals. Next year, Mwandu UCZ is hoping to hold additional AI training for Fred and others to create a group of competent, knowledgeable practitioners in the district.

## 9.0 Capacity Building for World Renew and Partner Staff

While the majority of the funding provided through the SAFS Grant goes toward agriculture and food security programming, each year approximately ten percent of the monies are designated for building the capacity of World Renew and its partner agencies by allowing staff to attend networking events, trainings, and workshops related to agriculture and food security. By learning from other organizations, participants gain a greater ability to build capacity in the communities they serve, which in turn increases the sustainability of the programming. In 2014-2015, World Renew and partner agency staff participated in four learning opportunities funded through the SAFS Grant, as summarized below.

### 9.1 ECHO West Africa Anglophone Forum 2015

ECHO (Education Concern for Hunger Organization) is an international nonprofit organization that exists to reduce hunger and improve lives by providing access to agricultural training and resources. These resources include a vast knowledgebase of practical information, experienced technical support, and an extensive seedbank focused on underutilized plants. ECHO's objective is to build the capacity of international and national organizations and to develop a network for sharing and learning from one another. Their inaugural Anglophone Forum in West Africa was held on March 23-27, 2015 at the Mensvic Grand Hotel in Accra, Ghana.

The intention of ECHO forums is to provide a context and framework that connects farmers, technicians, project staff, and researchers in the full spectrum of agriculture. During the West Africa Anglophone Forum, the many challenges of agriculture in the local context were discussed and a series of best practices were offered based on the experience of participants.

Andrew Gwaivangmin, World Renew's Program consultant for Sierra Leone, attended the Forum with the help of a SAFS capacity building grant. World Renew's work with its partners in Sierra Leone focuses in large part on food security and agriculture. Attending the forum, networking with other development professionals, and learning more about sustainable agriculture increased the scope of skills Andrew can now share with local partners and program participants. In addition, many contacts were established with other development professionals, which will further improve the network and capacity of World Renew's partners in Sierra Leone.

Workshops on permaculture, kitchen gardens, medicinal plants, micro-irrigation, shea butter extraction and processing, live fencing, moringa production and intercropping were all offered at the Anglophone Forum. One of the key topics was learning how to integrate conservation agriculture into existing sustainable agriculture programs, allowing farmers more options for meeting their own needs and those of consumers, while at the same time protecting and conserving environmental resources.

*"This was my first time attending an ECHO Forum, and so I had very high expectations. I am glad to report that I was not disappointed! So much was learned that it could take years to implement."*  
– Andrew Gwaivangmin, World Renew  
Sierra Leone

Some of the key lessons learned at the forum that will impact future programming in Sierra Leone included:

- Focus on connecting smallholder farmers to markets as a way of improving livelihoods.
- Introducing farmers to perennial vegetables that are resilient and nutritious and can be incorporated into common meals.
- Looking at combining ideas around sustainable living with sustainable agriculture through a design philosophy known as permaculture in order to address systemic poverty issues.
- Stronger incorporation of practices related to resilience to climate change in farming systems and environmental protection.



## 9.2 Exchange Visit on Promoting Creole Seed Varieties as a Climate Change Adaptation Strategy in Nicaragua

One of the factors negatively affecting the food security and sovereignty of rural families in places like Nicaragua is their dependence on the supply of improved seeds and genetic material. The awareness of the need to diversify from this dependence is also supported by the work of World Renew's Nicaraguan partners on climate change adaptation. In fact, one of the climate change adaptation strategies that communities in Nicaragua have identified involves reintroducing local 'creole' (otherwise known as landrace, traditional, or heirloom) varieties of corn and beans that have been overlooked in past years due to the heavy promotion of higher yielding, certified seed.



While improved seed has its place, diversifying a portion of the crop with creole varieties, which are known for their drought, wind and heat tolerance and vigor, can improve yields under abnormal growing conditions. Creole plants are generally better able to absorb these shocks of drought, excessive moisture, or wind damage that would normally wipe out a crop during extreme climate events. Even though yields might generally be less with creole varieties in normal growing conditions, one cannot assume what is "normal" any longer. This is particularly true in Nicaragua, which is ranked third amongst nations most impacted by climate change according to the 2013 Germanwatch Global Climate Risk Index, with 44 extreme weather events in the past two decades.<sup>4</sup> In a 2011 study by Unión Nacional de Agricultores y Ganaderos (UNAG), 129 creole varieties of corn and 29 varieties of creole beans were identified that are still cultivated in Nicaragua, albeit on a very small scale.

Recognizing that farmers with diversified cropping systems, with a part of their field planted using creole seed, will be more resilient and food secure, World Renew Nicaragua has sought to support its partners' work promoting creole varieties.

*"It is a challenge for small land holders to select and store seed, let alone understand the complexity of plant genetics. But this exchange visit to Labranza was incredible. The entire community understood the basics of plant breeding and had purified several strains of corn and beans that combined the characteristics of hardiness and respectable yields. We learned a great deal about how this can be done at the community level and doesn't necessarily need to take place in a laboratory."*

–Sergio Palma, agriculture technician with World Renew's partner ACJ

While attending the Agroecology and Social Transformation course in July 2014, thanks to a previous SAFS capacity development grant, World Renew's Nicaraguan partners heard a presentation by Carman Picado. Carman is a member of the program Campesino a Campesino (CaC) from the Unión Nacional de Agricultores y Ganaderos (UNAG) in the community of Labranza, Condega. Her interest in creole varieties began after Hurricane Mitch, when the only crops salvageable from her fields were the cobs of creole varieties. With the support of CaC, her community now has an elaborate system of identifying, selecting, testing, and storing creole varieties of corn and beans.

After the course, Carman invited World Renew and its partner staff for a two-day exchange visit, which took place with the help of SAFS capacity building funds on September 24-25, 2014. Nine staff members in total from World Renew and its

<sup>4</sup> <http://nicaraguadispatch.com/2012/11/nicaragua-ranks-third-for-vulnerability-to-climate-change/>

partners AMC, ACJ, and Fundacion San Lucas Staff participated in the exchange, visiting the community research project in order to see how the creole varieties were doing compared to the improved varieties given the drought situation that Nicaragua was facing at the time. Seeing firsthand how seeds are being bred and tested at the community level was very important as World Renew's partner organizations begin to promote these ideas.

Already, the techniques that partner staff learned about seed selection and seed storage on the exchange visit are being widely promoted. As a result, a farmer field school (FFS) in the community of Masiquito is now testing three varieties of corn to find a variety that has large ears, short stalks (important for wind resistance), and a short growing season. In addition, five of the eight members of a FFS in Yula Catal are experimenting with a creole variety of corn that was traditionally grown in the community of Loma de Cafen. And a FFS in the community of Bambou has created a seed bank specifically dedicated to creole seed. In seed banks in Las Brisas and Los Planos, the use of garlic as an insect deterrent – a technique learned about on the exchange visit – is being experimented with and appears to be quite effective.

### 9.3 ECHO West Africa Francophone Forum 2014

Given that over 80 percent of the population is engaged in agricultural activities, much of World Renew's sustainable development work in Mali focuses on food security and agriculture. The agricultural sector in Mali faces major challenges, including low productivity, post-harvest crop losses, under-developed markets, and vulnerability to climate change. Giving World Renew and partner staff the opportunity to attend agricultural forums that allow for networking with other development professionals and learning about sustainable agriculture techniques that are adapted to the conditions of the Sahel builds their capacity and ultimately benefits current and future programming.

With the help of a SAFS capacity development grant, Harouna Issaka, World Renew's Program Consultant in Mali attended ECHO's Francophone Forum in West Africa, which was held in Burkina Faso on September 20-28, 2014. At the forum, the production of bio-pesticides, such as using the neem powder, was heavily discussed. Emphasis was also placed on building resilience through diversification and agroforestry. Participants were taught how to plant trees using the PLASA technique, which does not require watering, as it could significantly reduce the rate of tree loss during the long dry periods in the Sahel.

Other best practices Harouna gleaned from the ECHO Francophone Forum in West Africa include:

- Rainwater harvesting techniques, including micro-dams, ponds, and sand dams.
- Compost production through the use of animal and human waste, and the general use of biodegradable materials to build up the soil.
- Erosion control methods that include maintaining a vegetative cover on the soil through mulching, green manure cover crops, and crop rotation.
- Techniques for soil protection and restoration through the use of zaï holes, stone bunds, half-moons, and hedges that act as a barrier to erosion.

Harouna is now training World Renew's partners in Mali on these best practices and is optimistic about the impact these new ideas can have on the food security situation in rural communities in Mali. He has a lesson on bio-pesticide production planned and has already led workshops on the PLASA technique. Communities in Boura, Bandiagara, and Koro are already implementing the PLASA technique.

*"I really appreciate being given the opportunity to go to the ECHO Francophone Forum because it provided me with an opportunity to network with other organizations working in sustainable agriculture programming in the region, and gave me many new ideas I can share with World Renew's partners in Mali and beyond. I particularly appreciated how practical the sessions at the forum were. They provided me and the other participants with real hands-on learning that we can now pass on, which will lead to positive impact in the communities in which we work."*  
– Harouna Issaka, World Renew Mali



#### 9.4 Mentoring from the Community Agroecology Network in Nicaragua

In July 2014, a delegation of staff from World Renew’s field offices in Latin America and partner organizations in Nicaragua participated in an Agroecology and Social Transformation course where they were exposed to the principles of agroecology. Agroecology integrates well with World Renew’s approach to community transformation, as it promotes the use of renewable resources; the conservation of soil, water, energy and capital; the management of ecological relationships; crop diversification; the empowerment of people; and a systems approach that maximizes long-term benefits and promotes health.

The framework developed by the Community Agroecology Network (CAN) suggests that there are three levels of transition: 1) increasing the efficiency of conventional practices in order to reduce the use and consumption of costly, scarce or environmentally damaging inputs; 2) substituting conventional inputs and practices with alternative, environmentally friendly practices; and 3) redesigning the agroecosystem so that it functions on the basis of a new set of ecological principles. During the July 2014 course, World Renew’s Nicaraguan partners recognized that most of the communities in their programs are at level one or two on this scale, and they requested that CAN mentor them as they develop indicators for the three levels. In return, the partners would be able to use the CAN logo when they recognize the farmers that attain level three.

CAN willingly offered to mentor the partners at no charge, with the only costs those associated with a two-day exchange visit that took place December 2014, which was supported by a SAFS capacity development grant. Participants visited a community called San Roman which is affiliated with CAN and where a number of farmers have reached the third level of transition. World Renew’s partners were particularly interested in having help defining the criteria that make a participant a ‘model farmer,’ as this term is frequently mentioned in their program’s Results Based Management frameworks.

*“The funding we received to make this mentoring possible was really appreciated by our partner staff. In particular it helped us realize that if World Renew and our partners are going to promote sustainable agriculture, we need to be clear on what exactly we are talking about. We need to research how our interventions fit into the national agriculture policy in the countries in which we work. We have to have clear definitions of what conventional agriculture is and how we can encourage farmers to adopt practices that are more agro-ecologically sound for the local context. Our partner agencies themselves should be encouraged to spend time defining their institutions’ agricultural policies instead of blindly following practices that are currently popular.”*

*–Mark Vanderwees, World Renew  
Nicaragua*



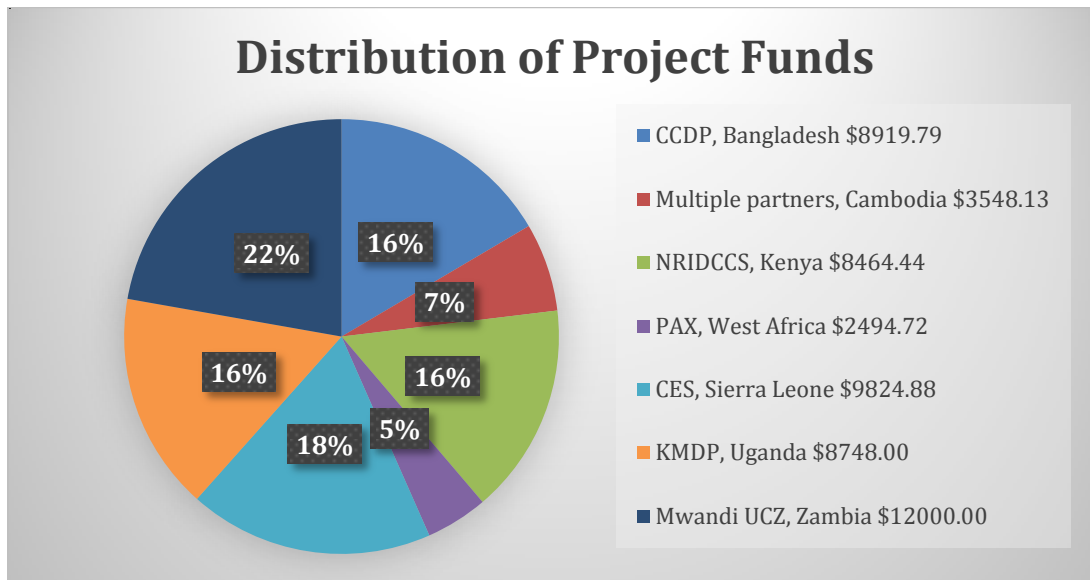
The visit generated a tremendous amount of discussion. At one point, World Renew was asked to share its policy on agriculture promotion, particularly on the use of commercial inputs like fertilizers and pesticides, and there was some surprise that World Renew does not promote an exclusively organic agricultural agenda.

In the end, World Renew's partners agreed to put together a common document that compiles their agriculture and food security strategy from a country perspective. This was completed in January 2015 and includes indicators related to knowledge, attitudes, and skills for each of the three levels of transition. A tool is now in the process of development based on this strategy document, and it is expected to help the partners better monitor the path that smallholder farmers go through as they transition between these levels. This tool will be shared widely within World Renew.

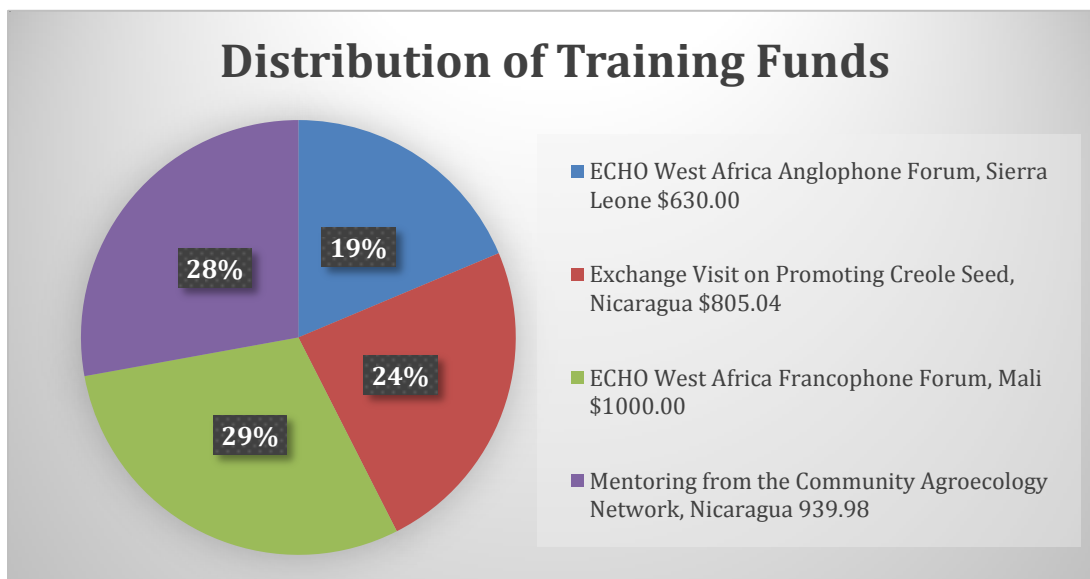
## 10.0 Grant Allocation Summary

A total of \$57,374.98 of SAFS Grant funding was dispersed in 2014-2015.

Grants totaling \$53,999.96 funded seven projects in seven different countries directly benefiting 1,483 participants and 26,355 indirect beneficiaries, enabling communities to discover innovative agriculture solutions help them achieve sustainable food security.



In addition, \$3,375.02 was used to fund four learning and capacity building events directly benefiting World Renew staff and partner agencies in three countries.



## 11.0 Conclusion

The stories shared in this 2014-2015 Annual Report bear witness to the incredible impact of the Sustainable Agriculture and Food Security Grant. These programs are affecting lasting change by improving food security at the same time that they are building stronger communities through gender equality, leadership development, and capacity building. And as farmers share their success with neighboring farmers, more and more people are adopting the techniques that are being promoted. As noted in the Grant Allocation Summary, over 26,000 people were indirectly impacted through the programs being reporting on the 2014-2015 Annual Report alone. This impressive number will continue to grow as successful ideas and skills are passed on.

Funding provided through the SAFS Grant not only impacted the participants and their communities, but also continues to allow World Renew's partner agencies to gain grant management experience resulting in their ability to successfully apply for grants with mid and large-scale funding organizations, creating even further impact. For example, the SAFS-funded work in Kenya reported on above has been integrated into and expanded through funding from Canada's Department of Foreign Affairs, Trade and Development through a 19 million dollar program spanning three countries in the region. Similarly, World Renew will be supporting its partner agencies in seeking out funding to expand the successful programming that the SAFS Grant funded in Zambia and Uganda.

In addition, learnings coming out of the innovative programming funded through the SAFS Grant are being integrated into existing programming with other World Renew partners. For example, the learnings from seed priming and green manure cover crop experimentation funded through the SAFS Grant over the last two years are now being rolled up into a program funded by Foods Resource Bank with another of World Renew's local partners in West Africa, with 2500 participants benefiting over the next three years.

The results of these SAFS Grant-funded programs also clearly indicate that there is more research to be done. Sometimes a crop germinates poorly; in other instances, the rains came too late. Within the ever-changing domain of agriculture, there will always be more experimentation needed. The SAFS Grant helps to make that possible by taking some of the risk away from farmers who do not have a budget surplus or may not have the confidence to do on-farm experimentation. Equipping farmers with the skills and resources to experiment, by establishing small-scale test plots for example, help them and their neighbors see firsthand the impact of trying new ideas.



Through the SAFS Grant, in 2014-2015 World Renew organized a diverse array of programs in a diverse array of places, giving testimony to the holy work happening in effort to till and keep the earth, as God instructed in Genesis 2:15. From Bangladesh to Kenya to Nicaragua, and many locations in between, World Renew's sustainable agriculture and food security programs help to ensure that mandate remains at the forefront.