

USAID Seeds for Development

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Project Name	Seeds for Development Program (S4D)
Implementing Partner	International Fertilizer Development Center (IFDC)
Project Objectives	<p>Strategic Objective:</p> <ul style="list-style-type: none"> Promote broad-based agricultural productivity and economic growth in South Sudan by providing sustainable technology transfer and agro-enterprise development services to farmers <p>Sub-Strategic Objectives:</p> <ul style="list-style-type: none"> Increase food production, food security and income of smallholder farmers Increase use of fertilizers and quality seeds of superior varieties for increased productivity Strengthen trade linkages in input and output markets Increase business and technical skills of input and output market players
Life of Project	October 1, 2011 to July 30, 2013
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Acronyms and Abbreviations

AGMARK	Agricultural Market Development Trust
AGRA	Alliance for a Green Revolution in Africa
CAD	County Agriculture Department
CoP	Chief of Party
CPPs	Crop Protection Products
CSO	Civil Society Organization
DAP	Diammonium Phosphate
FAO	Food and Agriculture Organization of the United Nations
FARM	Food, Agribusiness and Rural Markets Program (USAID-funded)
FICA	Farm Inputs Care Centre
FY	Fiscal Year
ha	hectare
IFDC	International Fertilizer Development Center
ISFM	Integrated Soil Fertility Management
kg	kilogram
MAFCRD	Ministry of Agriculture, Forestry, Cooperatives and Rural Development
M&E	monitoring and evaluation
mt	metric ton(s)
NGO	Non-Governmental Organization
Q2	second quarter
RFA	Rapid Farmer Appraisal
S4D	Seeds for Development
SSP	South Sudanese Pound
TOT	Training of Trainers
USAID	United States Agency for International Development
USG	U.S. Government

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AGMARK, for helping to rapidly scale up implementation, build local capacity, implement demonstrations and field days, and rigorously monitor progress in all project areas.

The private sector in South Sudan, for its willingness to take risks, and its ability to develop and service agricultural supply chains despite severe resource limitations.

1. Executive Summary

The USAID Seeds for Development (S4D) Program concluded in July 2013 after three successful seasons. The program reached over 20,000 smallholder farmers in South Sudan, promoting the use of hybrid seeds, fertilizers and improved crop management practices and creating a network of agribusinesses to supply inputs at affordable prices. It also catalyzed a major shift in national agricultural policy to encourage input use and other modern practices.

Project implementation was led by IFDC and the Alliance for a Green Revolution in Africa (AGRA), in close collaboration with South Sudan's Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD).¹

Activities covered 10 counties in three states: Juba, Kajo Keiji, Lainya, Morobo and Yei counties in Central Equatoria; Torit and Magwi in Eastern Equatoria; Maridi, Mundri and Yambio counties in Western Equatoria. In line with the agreed work plan, all project components were implemented in Central and Eastern Equatoria, while activities in Western Equatoria were limited to field demonstrations.

The voucher program

The centerpiece of the S4D project was a voucher program designed to encourage smallholder farmers to use modern agro-inputs. Hybrid maize seeds and two types of fertilizer – diammonium phosphate (DAP) and urea – were distributed through the voucher program. Farmers who registered for the program received vouchers that could be redeemed (with a small payment) for subsidized inputs sufficient to plant one acre of maize. Results included:

- Over 1,000 tons of fertilizers and 100 tons of hybrid maize seed distributed
- High proportion of women beneficiaries: 30 percent in 2012, 38 percent in 2013
- Three rounds of voucher distributions were implemented, for three planting seasons: July 2012, March 2013 and June 2013
- Over the three seasons, 20,878 farmers received vouchers of which 16,422 vouchers were redeemed

Capacity strengthening

Training programs for farmers and extension staff helped ensure that crops were well managed and inputs effectively used. Ninety staff from the Ministry of Agriculture have been trained, creating a core team equipped with technical skills as well as training materials for extension. Nearly 300 agro-dealers have been trained on input use as well as enterprise management. In addition, the project provided laboratory equipment and training on soil sampling and analysis. A soil survey conducted jointly with MAFCRD has built capacity for a continuing soil testing program that will inform national fertilizer policy.

¹ Now the Ministry of Agriculture, Forestry, Tourism, Animal Resources, Fisheries, Cooperatives and Rural Development



Rufus Bulen from Lainya county – one of many small-scale agro-dealers who have been empowered by the project.

The project also helped build capacity at policy level to design and implement ‘smart subsidy’ programs that use targeted subsidies to make inputs more accessible. Senior government officials from seven counties were sponsored for participation at an international workshop where experts from across Africa shared experiences in smart subsidy programs in their countries. These initiatives were key to a change in mindset of policy makers, and laid the foundation for strategies for agricultural input promotion and private sector development.

Demonstration plots and field days

Demonstration plots and farmer field days were organized in 10 counties across three states, helping to disseminate these new technologies and also provide hands-on training. In all, 732 demonstration plots were established, and visited by at least 6,000 farmers. A total of 113 field days were organized at project demonstration plots at three crop stages: at planting, at top dressing and at crop maturity. Over 3,700 farmers attended; about one-third were women. The project also provided fertilizers and technical support for a demonstration program by the USAID Food, Agribusiness and Rural Markets Program (FARM) which reached 6,000 farmers.

Challenges

Close collaboration with MAFCRD – in planning, in resolving administrative issues and in technical areas such as soil sampling and seed testing – was the key to successful implementation. This partnership was developed over time. Given the country’s lack of experience with fertilizers, the project had to first overcome misperceptions at various levels. The national ministry was always strongly supportive, but this support took time to percolate to state and county authorities, slowing input distribution in some areas. Project staff and an agro-dealer were temporarily detained in the first season. However, in the second and third seasons, project teams began engaging more closely with ministry officials at all levels to dispel misperceptions and build support for the program.

Building on program successes

A series of four stakeholder workshops (three regional, one national) were held in the project's final quarter to discuss how best to build on the successes achieved. Participants included the State Ministers of Agriculture for Western and Central Equatoria, the Director General of Agriculture in Eastern Equatoria and the national Deputy Minister for Agriculture. They all noted that the project had been highly successful and stressed the government's commitment to build on S4D initiatives. The expectation is that future projects, with support from national agencies and donors, will continue to promote the use of agro-inputs, leading to higher yields and greater food security.

Project evaluation

Baseline and interim surveys were conducted in 2012, providing reliable data on farm households, agro-dealers and other enterprises involved in input and output marketing.

A final evaluation was conducted in May and June 2013 (the project's final quarter), to measure increases in yield and farmers' incomes as a result of project interventions, identify constraints to agro-input use and document improvements in knowledge levels among farmers and agro-dealers. Surveys of 257 respondents were conducted in Central and Eastern Equatoria states. The results showed that the project had generated substantial impacts on crop yield, farm incomes, agro-dealer sales and even the range and quality of services offered by agro-dealers to their customers.

Impact on households

- Households who participated in the first two rounds of the voucher program increased maize yields by 140 percent.
- Before the project, farm households consumed most of their harvest. Only small surpluses were available for sale. S4D interventions led to substantial increases in yield, output, and even the percentage of the harvest sold on the market. Beneficiaries sold nearly 45 percent of their harvest after the pilot voucher season, rising to 57 percent after the second season. Non-participants continue to operate at subsistence level, consuming around 80 percent of their harvest.
- The benefit: cost ratio for S4D farmers was estimated at 1.3 after factoring in the actual input costs (unsubsidized market value of voucher inputs). For non-participants, the benefit: cost ratio is around 0.60, i.e. farming is economically unprofitable.

Impact on agro-dealers

- Agro-dealers uniformly reported substantial growth in business. Even more important, every agro-dealer planned to continue to sell seeds even if the voucher program was discontinued.
- Agro-dealer training by the project has substantially improved the range and quality of services offered by agro-dealers to their customers. These services are not only extension related (e.g. offering advice on input use, demonstrating new technologies) but also include more fundamental changes such as offering credit and transport.

2. Project Description

2.1 Project Overview

The USAID Seeds for Development (S4D) project for South Sudan was signed on October 4, 2011 and concluded on July 30, 2013. The project was funded by USAID and implemented by the International Fertilizer Development Center (IFDC) and the Alliance for a Green Revolution in Africa (AGRA). The AGRA component focused on seed industry development and promoting the use of improved (open-pollinated) varieties; the IFDC component sought to develop private sector agribusiness and a sustainable agro-input distribution network. This end-of-project report describes activities under the IFDC component only.

The project targeted three states – Western, Eastern and Central Equatoria. The centerpiece of the project was a voucher program that incentivized farmers as well as private-sector agro-dealers. Through the voucher program:

- Farmers were introduced to the benefits of fertilizer and improved seed.
- These inputs were made affordable and accessible at local agro-dealer shops, so that farmers could (with proper instruction) reap the benefits of their use.
- The private sector was incentivized (through risk reduction and business training) to establish a distribution network that delivers products and services to farmers.

The project enabled farmer beneficiaries to substantially increase crop yields and also linked them to a source of agricultural products and information.

2.2 Project Goal

The goal was to promote broad-based agricultural productivity and economic growth in South Sudan by providing sustainable technology transfer and agro-enterprise development services to farmers. The strategic objectives of the program were to:

- Increase food production, food security and the incomes of smallholder farmers
- Increase the use of fertilizers and quality seeds of superior varieties for increased productivity
- Strengthen trade linkages in input and output markets
- Increase the business and technical skills of input and output market players

2.3 Components

The implementation strategy combined three sets of activities: developing a network of rural agro-dealers to deliver agro-inputs to farmers, strengthening output agribusinesses to purchase from aggregators and small traders, and motivating smallholder farmers through subsidized agro-inputs and reliable market access. Activities included:

- Agro-dealer and agribusiness development
- Demand creation through demonstration plots, farmer field days, media, etc.

- Access to improved agro-inputs through a network of qualified agro-dealers (voucher program to link farmers to agro-dealers)

2.4 Staff Locations

The project operated from two offices in Juba, with full-time field officers stationed in Yei, Yambio and Torit, supported by operational and monitoring and evaluation (M&E) staff in each area. AGMARK, a key implementing partner, had staff/offices in Juba, Yei, Torit, Kajo Keji and Yambio. Staff in IFDC's Nairobi office provided technical backstopping in key areas including communications, M&E, best agricultural practices, agro-dealer development, administration and accounting.

2.5 Key Indicators

Progress was tracked using three key indicators (Table 1):

1. Total number of micro (1-5 employees), small (6-50) and medium (51-100) enterprises receiving services from U.S. Government (USG)-supported enterprise development providers.
2. Value of agricultural inputs distributed/sold.
3. Number of firms (excluding farms) or civil society organizations (CSOs) engaged in agricultural- and/or food security-related manufacturing and services now operating more profitably (at or above cost) because of USG assistance.

Indicators 2 and 3 were measured at the end of each voucher/planting season and end of year, respectively. Indicator 3 was measured against comparable seasons year-on-year.

Table 1. Key indicators

Indicator	Year 1 target	Achieved by Sep 2012	End-of-project target	Achieved by July 2013
1. Number of micro (1-5), small (6-50) and medium (51-100) enterprises (parentheses = number of employees) receiving services from USG-supported enterprise development providers	80	137	160	157
2. Value of agricultural inputs distributed/sold	\$1.8 million	\$1.05 million	\$3.6 million	\$2,296,836
3. Number of firms (excluding farms) or CSOs engaged in agricultural- and food security-related manufacturing and services now operating more profitably (at or above cost) because of USG assistance	*	*	25	22

* This indicator was introduced only in Year 2. In Year 1, a different indicator was used, 'Percent increase in yield of target value chains'. The target was an 80 percent increase; the actual increase achieved was 403 percent.

3. The Voucher Program

The S4D voucher program enabled small-scale farmers to access agro-inputs at subsidized prices, from a nearby location. The program also empowered agro-dealers to trade in these inputs. This has created a platform (farmer demand, market ability to supply) that is the first steps towards a situation where small-scale farmers will invest, and purchase modern agro-inputs (at market prices) to achieve higher yields and larger surpluses to sell.

Vouchers were distributed during three cropping seasons: a pilot program in July 2012, a scale-out in March 2013 and a further mini-distribution in July 2013.

Vouchers provided a subsidy of roughly 95 percent, i.e. farmers paid only 5 percent of the retail price. This level of subsidy is justified for several reasons. First, the region has been receiving humanitarian aid for decades and there is a pervasive relief mentality that can be changed only gradually. Second, fertilizer and hybrid seeds are new technologies. Most farmers in South Sudan have never seen or used these inputs – in fact, until this project, purchase of hybrid seed and fertilizer was banned. Third, farmers are highly risk adverse. Very few farmers will spend their limited savings to experiment with a new technology without seeing the benefits first-hand.

3.1 Pilot Distribution, July 2012

To create awareness about the voucher program, 12 sensitization workshops were conducted at MAFCRD state and county offices in the three states. The workshops were attended by ministers, senior MAFCRD officials, extension staff, farmers, agro-dealers, processors, representatives from financial institutions and others.

The pilot phase involved 26 private enterprises: four wholesalers/distributors and 22 retail agro-dealers. The project imported DAP and urea fertilizers from Kenya. Hybrid maize seed was imported by the four wholesalers, with import procedures facilitated by the project. Inputs were delivered to wholesalers without a delivery fee. Distribution was coordinated by the wholesalers, with the project providing a transport subsidy.

Farmer registration and voucher distribution were conducted primarily through well-publicized community meetings. Seventy-eight community meetings were held in July 2012. Subsequently, registration and voucher distribution continued during August 2012 at agro-dealer shops. In all, 3,855 farmers received vouchers, against the target of 4,000. Of the 3,855 vouchers distributed, 2,896 were redeemed (75 percent, Table 2). Farmers received nearly 290 tons of fertilizer and 29 tons of seed, with a retail value of over \$ 1 million.

3.2 Scale-Up, March 2013

The voucher program was substantially scaled up in 2013. Lessons learned from the 2012 pilot (see page 17) were used to improve the speed and effectiveness of operations to reach a much larger number of farmers.

Farmer registration for the scale-up was completed during the October-December 2012 period, well in advance of the March planting season. The target was 8,000 farmers from seven counties in Central and Eastern Equatoria. Eventually, 15,289 farmers registered, of whom 38 percent were women. This represents a significant increase compared to the pilot (30 percent women). Vouchers were distributed in February 2013. A total of 14,351 farmers – 93 percent of all registered farmers – received vouchers.

Farmers redeemed their vouchers from a network of 56 agro-dealers. Input distribution (voucher redemption) was conducted in stages and completed in June 2013. A total of 11,373 vouchers were redeemed, 94.8 percent of the original target. More than one-third (34 percent) of vouchers were redeemed by women. Details are provided in Table 3.

Special attention was paid to collecting real-time information from the field to resolve problems and quickly reallocate inputs from areas of low demand to areas of high demand. To ensure this, monitors were stationed at each agro-dealer shop to verify input delivery, voucher redemption and assist the agro-dealer with record-keeping. The flow of inputs was tracked on a daily basis.



Voucher redemption in Logo East boma. Stocks were exhausted within two days of delivery to the agro-dealer.

3.3 Mini-Distribution, June 2013

Despite an overwhelming response to the March 2013 scale-up, 2,186 input packages remained unredeemed from the previous distributions. A ‘mini-distribution’ was therefore implemented in consultation with USAID and MAFCRD. The remaining inputs were distributed for the 2013 July planting season, after laboratory analysis to ensure that farmers received only high-quality inputs. Previous stocks of fertilizers were used, while fresh seeds were imported for the mini-distribution.

Because only limited quantities were available, distribution was limited to areas with the best farmer response during the previous distribution. Two counties were selected: Kajo Keji in Central Equatoria and Magwi in Eastern Equatoria. Farmer registration was completed in May 2013, totaling 2,672 farmers. Inputs were distributed in June and 2,149 vouchers were redeemed. Over 107 tons of fertilizer and 10.7 tons of seeds were distributed (Table 4).

Table 2. Input vouchers redeemed, pilot distribution, July 2012

	Counties	No. of farmers who redeemed input vouchers		
		DAP	Urea	Seeds
Central Equatoria	Kajo Keji	1,125	1,125	1125
	Lainya	72	72	72
	Morobo	186	184	186
	Yei	476	476	477
Eastern Equatoria	Ikotos	32	32	32
	Magwi	540	540	540
	Torit	114	114	114
Western Equatoria	Maridi	102	102	102
	Mundri	173	173	173
	Yambio	75	75	75
Total		2,895	2,893	2,896

Table 3. Farmers registered and vouchers distributed/redeemed during scale-up, March 2013

	County	No. of farmers registered	No. of farmers who received vouchers	No. of vouchers redeemed
Central Equatoria	Morobo	2,152	1,820	1,071
	Lainya	1,798	1,795	1,298
	Juba	1,215	1,059	973
	Kajo-Keji	1,814	1,672	2,913
	Yei	2,332	2,232	1,262
Eastern Equatoria	Magwi	4,071	3,742	3,138
	Torit	1,992	1,597	718
	Total	15,374	13,917	11,373

Table 4. Farmer registration and distribution of inputs during mini-voucher distribution, June 2013

Location	No. of registered farmers	No. of vouchers redeemed	Quantities distributed (kg)		
			Seed	DAP	Urea
Magwi (Madi corridor)	966	654	3,270	16,350	16,350
Magwi (Acholi corridor)	550	185	925	4,625	4,625
Kajo Keji	1,156	1,310	6,550	32,750	32,750
Total	2,672	2,149	10,745	53,725	53,725

3.4 Conclusions

The S4D project aimed to introduce modern agro-inputs into a traditional farming system. The voucher program was designed to reach this goal, increasing productivity and farm profitability and simultaneously creating a platform (by empowering small-scale entrepreneurs) for the private sector to continue supplying these inputs.

Feedback from farmer beneficiaries, agro-dealers and ministry partners indicates that program objectives have been met and that future efforts can build on this platform to further modernize agriculture in South Sudan.

4. Capacity Strengthening

Capacity strengthening activities began in the third quarter of 2011, with the development of training materials, drawn from different sources – AGMARK, IFDC and CropLife International, among others – and customized for South Sudan. Samples are shown in Annex 1.

A training-of-trainers (TOT) approach was used, in close collaboration with MAFCRD. Four TOTs were conducted in the first half of 2012. The first TOT, in Yei in February 2012, was an intensive five-day program involving 25 trainers from the three states. These trainers then trained 103 agro-dealers, potential agro-dealers and traders/agents in March and April 2012. The second TOT, also in February 2012, involved 50 lead farmers who subsequently helped train nearly 6,000 farmers from the three states for the FARM project's fertilizer demonstrations. S4D developed training materials for these 50 trainers and for the 6,000 farmers involved in the demonstrations. In the third TOT (April to June) 47 participants, including 38 extension officers, received technical training on agro-input use. They subsequently served as trainers for agro-dealers and farmers. Another TOT on business management training was attended by 15 trainers from the three states.

During the period April-June 2012, three technical training sessions were held for 41 agro-dealers, potential agro-dealers, farmer agents and grain traders. As a direct result of this training, eight new agro-dealer shops opened within the project area.

Training programs were stepped up in advance of the 2013 scale-up. A total of 161 agro-dealers, potential agro-dealers, farmer agents, grain traders and government staff were trained during the period August-December 2012. Three workshops were held at several locations on business management skills (particularly inventory and sales record-keeping), technical knowledge and storage and handling.

Two training programs were conducted in Torit and Yei during February 2013 with 30 participants, mainly agro-dealers and potential agro-dealers, but also farmers and extension staff. The training covered the use and safe handling of inputs, finance, stock management and other areas. Two financial institutions, Equity Bank and Finance South Sudan, also participated, providing the agro-dealers with information on financial products available. Additionally, all 56 S4D agro-dealers took part in a one-day training program (conducted in Torit and Yei) on warehouse management and storage of inputs. In January and February 2013, 58 MAFCRD extension staff participated in an intensive three-day training program conducted in Torit, Yambio and Yei. The training covered input use, agronomic best practices and safety issues.

A final capacity strengthening activity in April 2013 focused on agricultural policy, specifically the use of 'smart' or targeted subsidies to make agro-inputs more accessible. Eight senior government officials from seven counties attended an IFDC international workshop in Nairobi, where they shared experiences with policy makers from several African countries where targeted subsidies had been successful. These interactions contributed to a change in mindset, and laid the foundation for strategies for agricultural input promotion and private sector development.

Table 5. Capacity strengthening: project achievements in relation to targets

	Target	Achieved	% achievement against target
No. of trainers trained in product knowledge	20	25	125%
No. of agro-dealers, potential agro-dealers, MAFCRD staff and farmer agents trained in product knowledge, safety and use	200	216	108%
No. of trainers trained in business management	20	15	75%
No. of agro-dealers, potential agro-dealers and farmer agents trained in business management	200	214	107%
No. of agro-dealers trained in warehouse management	56	56	100%

In addition to these training programs, the project has reached thousands of farmers and hundreds of extension staff through informal training, demonstrations, field days and other interactions.

The goal of the project was to introduce new farming technologies to improve yields, output and food security. Capacity building was an essential component, particularly in the traditional subsistence farming systems common in South Sudan. As a result of S4D training programs, farmers are using modern inputs effectively, agro-dealers are providing technical advice to their customers, and government extension staff are helping to scale out these technologies more widely. Capacity building at the level of administrators and policy makers has helped dispel misperceptions about modern agro-inputs. In summary, S4D has created capacity at different levels, that will serve future agricultural development programs throughout the country.



Rejaf, Juba county: farmers receive hands-on training on spacing, seed depth and other best practices.

5. Demonstrations and Field Days

Demonstration plots and field days helped create farmer awareness and also provide training and advice on the use of inputs and improved crop management practices.

The first round of demonstrations (6,000 plots in the three states) was implemented in March 2012 by the FARM project. S4D provided 14 tons of DAP and urea, as well as training materials and technical advice for the demonstrations.

The first S4D demonstration plots were established in March and April 2012. A total of 33 one-acre plots of maize, groundnuts, cassava and sorghum were established in Central and Western Equatoria, comparing crop performance with improved vs farmer-saved seed, with and without fertilizers. Participating farmers reported that maize yields increased by 270 percent on average, comparing the improved package (seed, fertilizers, improved management) versus traditional practice. During the course of the season (starting in April 2012) over 200 farmers were trained at these demonstration plots on proper planting techniques. Field days at these demonstration plots attracted 843 farmers, including 227 women.

Demonstrations and field days were significantly expanded during the voucher scale-out in 2013. Demonstration plots (10 x 10 meters) were established at 88 sites across Central, Eastern and Western Equatoria (Annex 2), hosted by a local farmer or agro-dealer and managed by project staff. Field days were held at these demonstration plots at three stages during the season: planting (April), top dressing stage (May) and tasseling or crop maturity (June). The field days served multiple purposes: demonstrate correct practice for planting and top-dressing, demonstrate the benefits of agro-input use and good crop management, and provide avenues for farmer training. A total of 57 field days were held in six counties: Torit, Juba, Magwi Acholi, Yei, Morobo and Kajo Keji. A total of 1,527 farmers (including 526 women) attended.

Annex 2 is a list of demonstration plots established during the final season (starting March 2013) and through the project. Annex 3 summarizes the standard protocol for demonstration plots, developed by the project and now being used by MAFCRD.



Demonstration plots illustrated the huge benefits from using fertilizers, improved seeds and good crop management in combination.

In all, 732 demonstration plots were established in 2012 and 2013. A total of 113 field days were conducted, attracting 3,717 participants: 2,542 men and 1,175 women.

Demonstrations and field days covered most project areas. Communities were able to see first-hand, at a nearby location, the benefits of fertilizers and improved seeds. Field days allowed them to interact with other farmers and extension staff at different stages over the season, convincing them that the technologies were useful and easy to implement. This approach was a major factor in the project's success and also helped provide feedback on technology performance as well as community perceptions.

6. Soil Analysis

The project enabled South Sudan's first ever large-scale soil survey, providing information that is essential for developing a national strategy for soil fertility management. The results helped dispel the common misperception among national policy makers and extension staff that soil fertility was adequate in most areas because much of the land is either virgin or has been left fallow for a number of years.

Soil sampling was conducted in early 2013 at 43 locations in Eastern, Central and Western Equatoria. Analysis results are available for 41 sites (Annex 4). Of the 41 sites, 37 were deficient in nitrogen, 33 were deficient in phosphorus and 39 were deficient in boron. Most sites were deficient in two of the three macro-nutrients (N, P, K). Every site, without exception, was deficient in one or more macro-nutrient and one or more micro-nutrient.

The sampling was carried out by a soil scientist from MAFCRD's Research Directorate. IFDC acquired modern soil sampling equipment for the survey (now installed at MAFCRD) and supported specialized training for key government staff. The samples were analyzed and the results shared with the national and state ministries of agriculture in July 2013. MAFCRD now plans to disseminate the results to farmers to encourage them to use mineral fertilizers to overcome specific nutrient deficiencies in their areas.

This project component was critical for long-term planning and policy development. It provided South Sudan's researchers and policy makers accurate data (earlier unavailable) on which future strategies can be based.

7. Cross-Cutting Issues

7.1 Partnership with Ministry of Agriculture

Project implementation was successful largely because of the strong partnership with MAFCRD. There was strong support at the national level and eventually in each state, particularly in Central and Eastern Equatoria. MAFCRD assistance was crucial in ensuring timely import and distribution of inputs. MAFCRD also conducted seed germination tests free of charge. Senior officials as well as local extension staff participated in project activities. During input distribution, MAFCRD intervention helped resolve local or community issues in several cases. A MAFCRD soil scientist was seconded to the project to lead a large-scale soil survey. The Ministry also assigned students from agricultural universities, interning with MAFCRD, to project field stations. Ministry staff officiated or attended all training programs. Directors of Agriculture from all three states participated in radio broadcasts to promote agro-input use.

7.2 Collaboration with Other Partners

The USAID FARM project provided key support. FARM hosted an S4D office in Juba, providing essential infrastructure support. FARM's demonstration program (reaching 6,000 farmers) created points of entry for the S4D project. FARM staff also helped identify target beneficiaries.

The project collaborated with universities through training seminars, participation in demonstrations and field days and sharing of training materials. In addition, students from the University of Juba, Wau Catholic University and Renk University served internships at project field stations. The USAID-funded RHEA project helped identify and second interns from the University of Juba and Wau Catholic University, while in Renk University, this process was facilitated by the Ministry of Agriculture.

There is considerable potential for synergy between the many development agencies active in South Sudan. The project made special efforts to build linkages with the World Food Programme, FAO and other organizations in developing producer-market linkages.

7.3 Gender

The project used various means to encourage women farmers to participate. Half-day training programs were rolled out and longer training programs shortened to allow women to participate and still have time for household duties. Registration and training was decentralized as much as possible to ensure that women had access to a convenient, local point-of-contact. A vigorous campaign was conducted to ensure that women were prominently featured in all presentations, radio messages and videos.

Gender-disaggregated data were collected for each project component. Overall, women accounted for about 25 percent of S4D participants during the scale-up, significantly higher than the pilot. The number of women farmers who registered for the voucher program increased by 16 percent in the scale-out compared to the pilot. However, the number of women agro-dealers did not change; most small-scale businesses continue to be owned and managed by men.



Schedules for training programs were designed to encourage women's participation.

7.4 Promotion and Communications

Given that this was the first time modern inputs were being promoted in South Sudan, a major effort was needed to increase awareness, create demand for agro-inputs and share information with farmers, agro-dealers and other groups.

S4D participated in four trade fairs in 2011 and 2012, setting up booths to display different types of agro-inputs, sponsoring the participation of agro-dealers and input suppliers, and helping to establish demonstration plots.

Various channels were used to increase farmer awareness. Traditional town criers, special efforts by *boma* chiefs and announcements at community meeting places ensured that communities were aware of dates and schedules for registration, voucher distribution etc.

Six local FM radio stations broadcasted messages, in multiple local languages, announcing dates and schedules and providing information on proper agronomic practices, fertilizer application methods, improved varieties etc. A series of radio talk shows were broadcast in February and March 2013, at which prominent government officials – including Ministers and state Directors General of Agriculture – discussed the benefits of agro-input use. A well-received radio drama (six episodes) helped raise awareness and dispel misconceptions about fertilizers and hybrids seeds.

Illustrated flyers and posters were produced for farmers on fertilizer application methods. A series of short video films were made for international stakeholders. Project case studies were published on IFDC's website, quarterly magazine and annual reports. A project newsletter helped keep partners updated. Annex 5 lists the reports and information products produced.

8. Challenges and Lessons Learned

The project was successful despite formidable challenges. This was because of the continuous learning process, using lessons learned from each stage of implementation (even during each month of a season) to improve operations in the next phase.

Support from government agencies

Close collaboration with MAFCRD was the key to successful implementation. At the national level, MAFCRD facilitated procurement of inputs, conducted seed germination tests free of charge, seconded a soil scientist to the project, provided local staff to assist in implementation, and helped resolve administrative issues whenever they arose.

Partnerships with state government agencies and local administration (in some areas) were a challenge initially, but were resolved with strong support from the national Ministry of Agriculture. Given the country's lack of experience with fertilizers, the project had to first overcome misperceptions especially at state and county level, which slowed or prevented input distribution in some areas. Project staff and an agro-dealer were temporarily detained in the first season. However, in the second and third seasons, project teams began engaging more closely with ministry officials at all levels, to dispel misperceptions and build support for the program

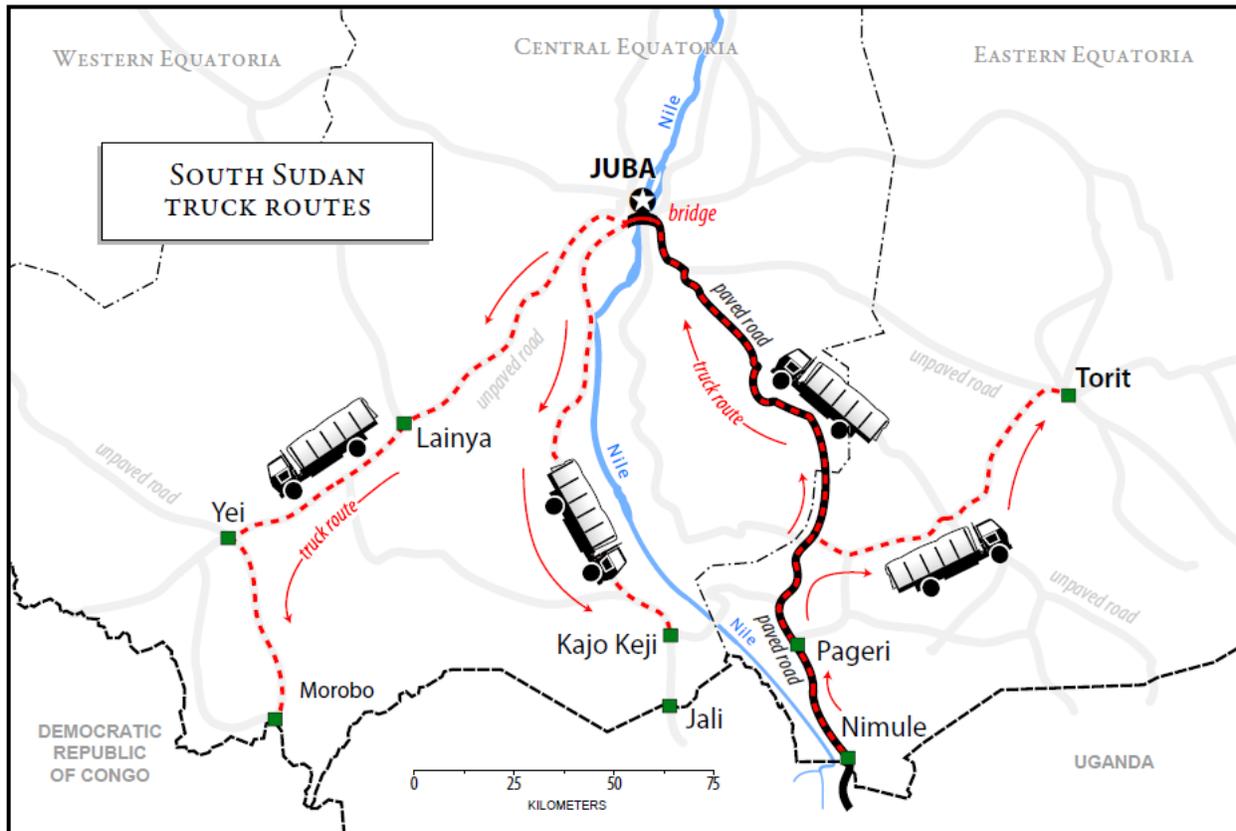
Another challenge was that the lack of clear policy directives. The national policy is still being drafted, and state ministries and county authorities may have to make decisions (including those related to project implementation) based on incomplete information.

Closer engagement with state-level officials led to buy-in and greater support. Senior officials as well as local extension staff from all states participated in project activities. MAFCRD staff officiated or attended all training programs. In 2013, Ministers and/or Directors of Agriculture from all three states participated in radio broadcasts to promote agro-input use. Although there is some reluctance at the county level, there is consensus among senior Ministry staff and policy makers that agro-inputs are essential if the country is to achieve food security.

Logistics

Project activities covered large areas with very poor infrastructure, e.g. roads impassable during some months. This created huge logistics challenges, given the quantities of inputs that had to be imported (mostly trucked from Kampala) and then distributed to remote areas. There is only bridge across the Nile river, at Juba; and this tripled or quadrupled delivery times to some project areas. For example, trucks entering the country at Nimule had to drive north to Juba to reach the bridge, and then back south to reach Kajo Keji (see map). Several adjustments were made in light of experience during the pilot voucher phase. Budgets and schedules were revised. Target areas were also consolidated, focusing on contiguous counties where possible.

The poor road network, large area and lack of mobile phone coverage in many areas also created problems of monitoring and supervision. This was mitigated to some extent by opening additional field offices in Yambio, Torit and Kajo Keji, recruitment of staff in each county, and by support from MAFCRD.



Transportation challenges: trucks entering the country at Nimule had to drive north to Juba to cross the Nile and then turn south to deliver inputs to target communities.

Staff and equipment

Qualified staff were hard to find. Those with the necessary skills demand salaries above those budgeted, or are unwilling to work in rural areas. This was addressed partly with support from MAFCRD, which provided local human resources and, in some cases, seconded staff to the project. Student interns from institutions in South Sudan also worked on project teams, assisting with demonstration plots, field surveys and administration.

Field and office equipment – and especially agro-inputs – frequently had to be imported, leading to high prices and delays. This was addressed in various ways, including renting of equipment and government support for expediting import procedures.

Capacity of implementing partners

A major challenge was late delivery of inputs due to lack of capacity (limited experience and financial/logistics capacity) within the project's private sector partners. These delays were addressed by working more closely with partners – providing advice and monitoring, facilitating credit negotiations with banks and accelerating import procedures with assistance from MAFCRD.

Poor stock management and record-keeping by agro-dealers made it hard to monitor and reconcile inventories. This was largely addressed through agro-dealer capacity building and by assigning project staff to assist agro-dealers in keeping records on product/voucher flows and managing inventories.

Demonstration plots

Establishment of demonstration plots was hampered by unavailability of tractor services, shortages of labor for land preparation and other factors. Based on the first season's experience, the project modified planting methods (e.g. manual or ox-plowing) and planting times (plant earlier, when labor or draft animals are available), and by closer engagement with farmers hosting demonstration plots.

In the second (scale-out) season, an extended drought spell in May 2013, especially in Eastern and Central Equatoria, severely affected germination and crop growth and delayed or prevented the application of urea for top-dressing. Nevertheless, about 45 percent of the plots were successful, demonstrating visible benefits.

Package sizes and vouchers

Package sizes and vouchers were progressively modified in light of past experience. In the pilot phase, inputs for one acre were distributed, with separate vouchers for the three inputs. Subsequently, a single voucher was used, and the package size was reduced by half – each farmer received two vouchers, each providing inputs for half an acre. These changes improved documentation and ease of use, while allowing farmers to redeem smaller quantities if they chose

Voucher redemption

Farmers and community leaders frequently cited lack of cash as a potential reason for low redemption numbers. In addition, farmers are reluctant to pay even subsidized prices, and tend to rely on free assistance – S4D is the only large project in the country where farmers are required to pay. These challenges were satisfactorily addressed, as reflected in the very high redemption rates achieved. This was done through appropriate pricing and clear communication. In several cases where redemption rates were poor, it was decided to re-allocate inputs to other areas. However, when trucks arrived to remove the inputs, redemption increased rapidly, approaching 100 percent.

9. Building on Project Successes

A series of Exit Strategy Workshops were organized in June 2013, during which national stakeholders discussed how best to build on the project's considerable achievements. Three regional workshops in Western (Yambio), Central (Juba) and Eastern Equatoria (Torit) were followed by a national workshop in Juba. The workshops brought together 125 participants from the ministry and other government bodies, researchers and extension staff, international development agencies and the private sector (seed suppliers, retail agro-dealers, banks).

The workshops were opened by senior decision makers (Deputy Minister MAFCRD, State Minister for Agriculture, Director General of Agriculture), reflecting the value of the project and its good fit with national priorities.

Policy makers stressed the importance of agro-inputs in boosting crop yields and commended the project for its achievements. Hon. Beda Machar Deng, then Deputy Minister, MAFCRD, and currently Minister of Agriculture, pledged his Ministry's commitment to operationalizing the recommendations proposed at the national workshop.



Participants at the national workshop in Juba identified a number of priority actions to build on project successes.

Recommendations by workshop participants

Participants at the national workshop in Juba made the following recommendations for further action to build on the successes already achieved.

- It is important to create more awareness on the importance of fertilizers and hybrid seeds.
- Soil analysis should be conducted throughout the country to provide a basis for fertilizer recommendations.
- The government should strengthen research and extension programs to sustain and continue S4D initiatives.
- The Ministry of Agriculture should build the capacity of agro-dealers and provide a conducive policy environment to improve farmers' access to inputs.
- Government should commit adequate resources for subsidized inputs and services as a way of institutionalizing initiatives begun by S4D.

10. Project Evaluation

Since its inception, the project has had a comprehensive Monitoring and Evaluation (M&E) system in place. The M&E team has conducted regular field assessments and surveys, helping to make mid-term corrections in the voucher and agro-dealer development programs. This section summarizes results from M&E studies conducted in 2012, but focuses mainly on the end-of-project evaluation.

Early in the project, as a first step to developing an agro-dealer network, two surveys were conducted during the period January-March 2012.

First, a baseline survey of all existing and potential enterprises in the three Equatoria States was conducted to identify and profile private businesses (including financial institutions) involved in input and output marketing. The survey assessed their technical, management and financial needs as a basis for designing project interventions. Excluding Juba town and Juba county, the survey identified 215 enterprises including 25 agro-dealers, 62 traders with potential to become agro-dealers, and other agents and traders. The survey highlighted the limited number and very limited business and technical skills of agro-dealers.

The second survey looked at the quality of crop protection products (CPPs) available in Juba, the largest market. CPPs were purchased from a sample of agro-dealer shops in Juba and analyzed for content of active ingredients. About 65 percent of CPPs were not on the list of those approved for use by USAID – highlighting the need for agro-dealer training as well as better regulation and monitoring.

A rapid farmer appraisal was conducted in October 2012, with interviews of 92 households in the three states. The appraisal provided detailed information on landholdings, cultivated area, crop and variety preferences, income sources and other factors. Sample results are shown in Annex 6.

An agro-dealer survey was conducted in December 2012, covering a sample of 22 agro-dealers, documenting the effectiveness of training programs, as well as agro-dealer perceptions (stated by 85 percent) that business would increase next season because of the large number of farmers participating in the voucher program.

10.1 End-of-Project Evaluation

A final evaluation was conducted through field surveys of agro-dealers and farmer beneficiaries in Central and Eastern Equatoria, conducted between May 26 and June 10. The survey covered Yei and Kajo Keji counties in Central Equatoria, and Magwi county (Acholi and Madi corridors) in Eastern Equatoria. Three types of farmers were interviewed: those who redeemed vouchers during the 2012 pilot; those who redeemed vouchers in the pilot and the 2013 scale-up; and those who did not participate in the voucher program. Agro-dealer surveys also covered three sub-groups: dealers who underwent project training and participated in voucher programs; those who underwent training but did not participate; and agro-input wholesalers and distributors. The latter group was surveyed for comparison purposes.

Yield increases

Farmers were asked to report their recollection of yields in three seasons: before the S4D voucher program (crops planted in March 2012), first voucher season (planted July-August 2012) and second voucher season (planted March 2013). The last figure is based on farmers' estimates because the harvest was not complete at the time of the survey. Nevertheless, the estimate is likely to be accurate as the crop was already in its reproductive stage. Results are summarized in Table 6.

Households who participated in the pilot voucher program increased their maize yields by 127 percent, from 312.5 kg/feddan in the previous season to 720.3 kg/feddan with the use of inputs. Households who participated in both voucher seasons increased yields by 58 percent overall, compared to the baseline situation prior to the project.

There were large yield differences between counties. For example, average maize yields (harvest after pilot season) were 1,050 kg/feddan in Yei compared to 720 kg in Magwi and 380 kg in Kajo Keji. These differences are related mainly to differences in soil and rainfall, but also suggest the potential for further improvements through training and farmer education.

Market participation by small-scale farmers

The voucher program increased not only yields but also the proportion of the harvest sold. Prior to the voucher program, households sold 35 percent of their harvest; the remaining was consumed by the family. Following the pilot voucher season, voucher beneficiaries sold nearly 45 percent of their harvest – and expected to sell 54 percent after the second voucher season, based on their harvest estimates. Non-beneficiaries sold only 22 percent.

Economic returns

Production cost estimates were obtained through group discussions with farmers in each village. Economic returns and cost-benefit ratios were calculated accordingly (Table 7). Voucher beneficiaries have increased their net returns by 215 percent compared to non-beneficiaries, and by 140 percent compared to their own baseline situations prior to S4D. Benefit-cost ratios are about twice as high among S4D participants compared to non-participants.

Factors influencing farmer participation

The surveys also explored the reasons why farmers participated or did not participate in the voucher program (Table 8). The reasons for non-participation included shortages of funds. That might be expected. In poor smallholder communities, a significant proportion of households might lack the spare cash (at least SSP 30) needed at the precise time when vouchers must be redeemed. However, it is important to note that lack of knowledge – the next most frequently cited reason – can be overcome through well-targeted awareness programs.

Table 6. Maize yields among S4D participants vs non- participants in Central and Eastern Equatoria

	Participants		Non participants	
	Average yield (kg/feddan)	% increase over baseline	Average yield (kg/feddan)	% increase over baseline
Baseline (prior to voucher program)	312.50 (n=186)		232.40 (n=46)	
Pilot voucher program (July 2012)	720.31 (n=153)	130%	240.90 (n=46)	4%
Scale-up program, March 2013 (expected)*	762.61 (n=163)	144%	235.20 (n=46)	1%
Participants in both voucher seasons	750.10 (n=116)	140%	262.47 (n=46)	13%

* Estimated by farmers

Table 7. Returns from maize cultivation, S4D participants vs. non-participants in Eastern and Central Equatoria.

	Prior to voucher (Mar 2012)	Round I (Jul-Aug 2012)		Round II (Mar 2013)*		Both season participants	
	Participants	Participants	Non-participants	Participants	Non-participants	Participants	Non-participants
Cost of cultivation (SSP/fed)	978.3	1790.0	978.3	1450.1	978.3	1516.7	978.3
Yield (kg/fed)	312.5	720.3	240.9	762.6	235.2	750.07	238.1
Returns (SSP/fed)	781.3	1800.8	602.3	1906.5	588.00	1875.18	595.1
Benefit:Cost ratio	0.80	1.01	0.62	1.31	0.60	1.24	0.61

* Expected yield as estimated by the farmer

Returns are based on local market price for maize, 2.5 SSP/kg

Table 8. Reasons cited by farmers for willingness to participate in the voucher program and use agro-inputs

Willing to participate		Non-participants	
Reasons	% of responses	Reasons	% of responses
Higher yields/more food	76	Lack of funds	46
Increased farm knowledge	2	Lack of farm/technical knowledge	44
Improved household income	8	Late supply of voucher inputs	4
Access to quality/cheap inputs	12	Lack of labor	4
Improved soil fertility	2	Other personal reasons	2

Impacts on agro-dealer behavior

Agro-dealer training by the project has substantially improved the range and quality of services offered by agro-dealers to their customers (Table 9). These services are not only extension related (e.g. offering advice on input use, demonstrating new technologies) but also more fundamental changes such as offering credit and transport. This latter category represents a significant shift towards a more effective private sector. Clearly, the S4D program has played a major part, fulfilling its major long-term objective.

At least eight new agro-dealer shops have been opened, as a direct result of S4D activities. Two-thirds of trained agro-dealers in Central Equatoria and 60 percent in Eastern Equatoria continued to conduct regular demonstrations to disseminate improved technologies (hybrid seeds, fertilizers, plant spacing) to farmers. All the 56 trained agro-dealers have opened a bank account, and six out of 22 agro-dealers have taken bank loans to expand their businesses. Many are beginning to offer short-term credit to farmers for purchase of inputs. Some are now also involved in output marketing and transport, e.g. organizing trucks to transport grain to Juba and other markets.

The majority of agro-dealers interviewed (75 percent in Central, 90 percent in Eastern Equatoria) reported a substantial increase in sales due to the S4D voucher program. More interestingly, agro-dealers say they will continue to sell agro-inputs even without a voucher program, although the share of different crops might change. (The voucher program targeted only maize.)

Agro-dealer performance and constraints

The M&E team made their own evaluation of agro-dealer business performance on the basis of feedback and their own observations. There has been encouraging growth and learning in a sector that is new and still developing. However, several constraints remain. The most important, as reported by agro-dealers, are:

- Tough border controls; the majority purchase their inputs from Uganda
- Poor roads, expensive transportation
- Lack of capital for business expansion

Table 9. Effectiveness of agro-dealer training on customer service (percent of dealers offering)

Services offered	Central Equatoria (N=12)		Eastern Equatoria (N=10)	
	Before training	After training	Before training	After training
Transportation of output	42	75	40	70
Over-the-counter advice	92	100	50	90
Credit to customers	90	100	50	80
Output purchase	58	42	60	40
Demonstration of technologies	50	100	20	80

Annex 1. Examples of training materials

USAID SOUTH SUDAN

AGRODEALER SHOP

DAP Fertilizer

UREA Fertilizer

When to weed

At 2-3 weeks

At 4-5 weeks

IFDC

Seeds for Development

When to harvest

Fertilizer can be used for...

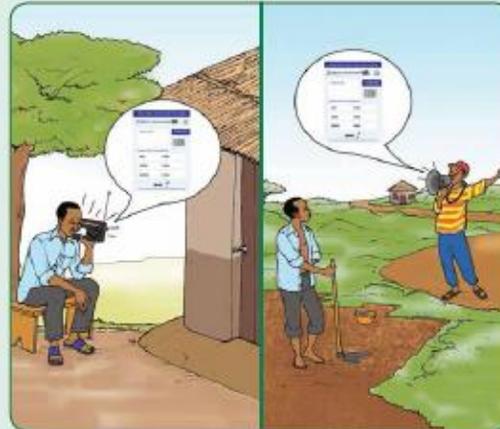
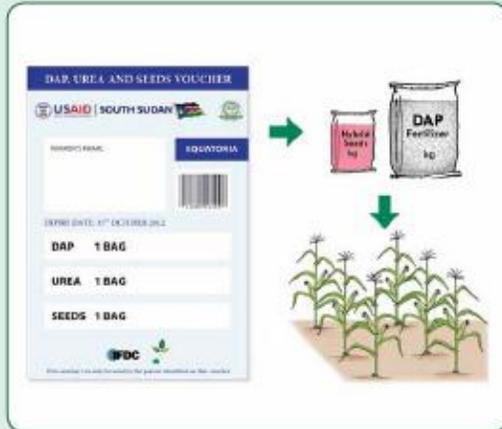
UREA Fertilizer

Fertilizer

Illustrated and designed by Mango Tree



SOUTH SUDAN



Illustrated and designed by
Mango Tree

Annex 2. Demonstration plots and field days

A. Location of demonstration plots in Eastern, Central and Western Equatoria, scale-out season, March 2013

State	County	Payam	No. of plots
Central Equatoria	Juba	Dolo	3
		Ganji	3
		Rajaf	4
	Yei	Lasu	3
		Mugwo	3
		Otogo	4
	Morobo	Gulumbi	3
		Kimba	3
		Lijulo	3
	Lainya	Kenyi	3
		Kupera	3
		Mukaya	3
	Kajokeji	Kangapo I	3
		Kangapo II	3
		Lire	2
Liwolo		1	
Nyepo		1	
Eastern Equatoria	Magwi	Mugali	3
		Pageri	3
		Pajok	3
		Obbo	3
	Torit	Kudo	3
		Lyira	4
		Imurok	3
Western Equatoria			18
Total			88

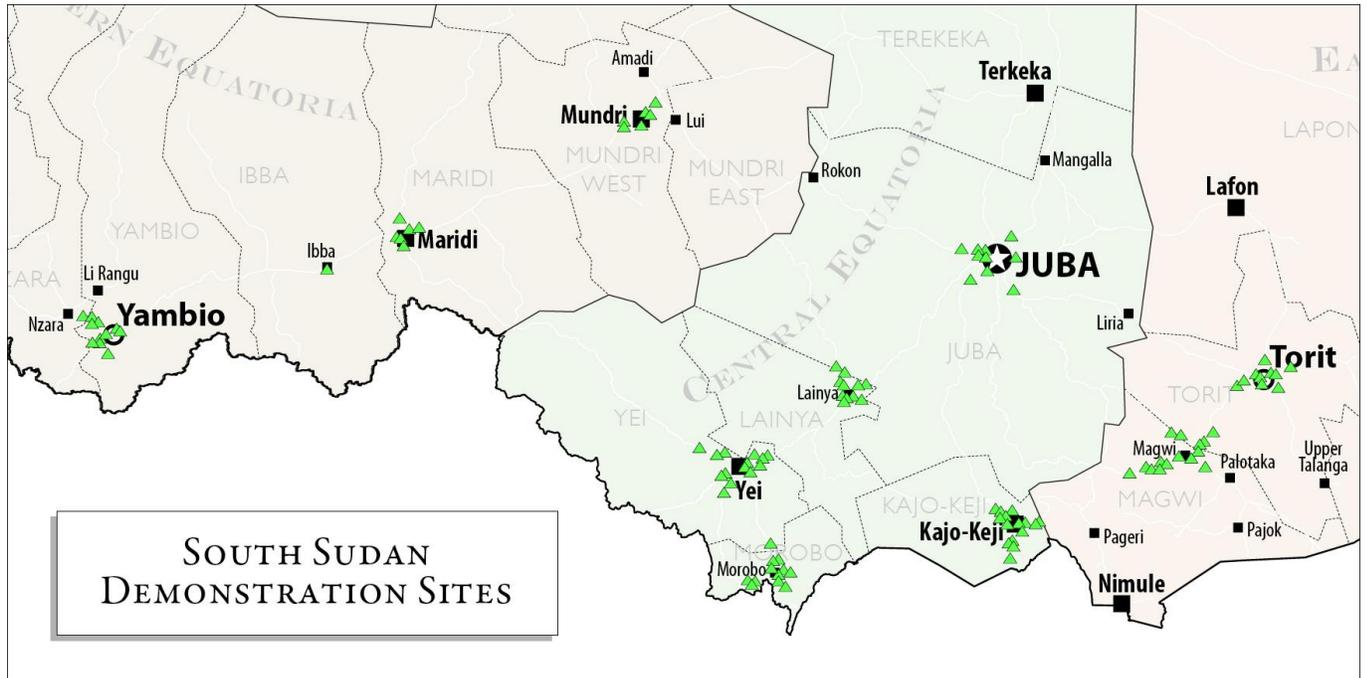
B. Demonstration plots, total project period

	No. of sites	No. of demo plots	No. of farmers participating		
			Men	Women	Total
Central Equatoria	53	361	526	188	714
Eastern Equatoria	34	195	181	107	288
Western Equatoria	26	176	28	15	43
Total	113	732	735	310	1,045

C. Field days, total project period

	No. of field days	No. of farmers attending		
		Men	Women	Total
Central Equatoria	74	1,682	721	2,403
Eastern Equatoria	30	650	380	1,030
Western Equatoria	9	210	74	284
Total	113	2,542	1,175	3,717

Location of demonstration sites, total project period



Note: map shows location of project sites. Multiple demonstration plots were planted at each site, with more than 730 demonstration plots in all.

Annex 3. Simple protocol for establishment of maize demonstration plots

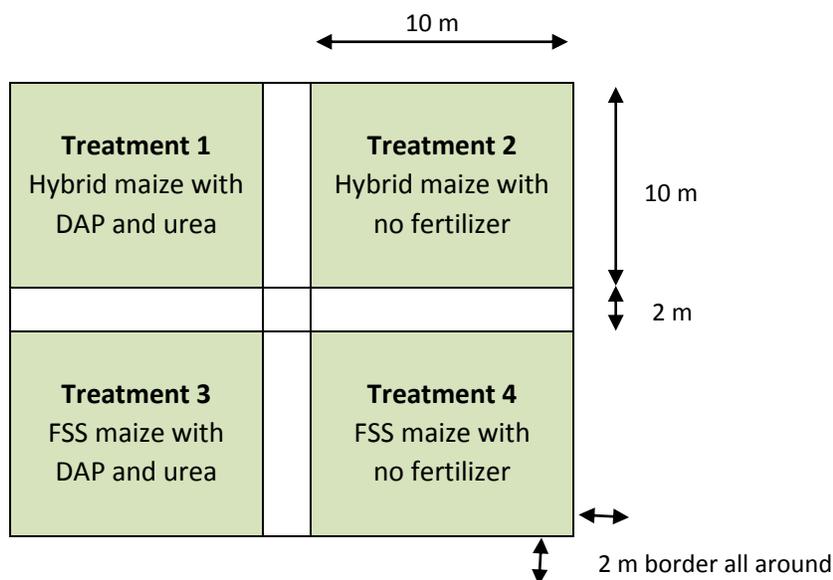
Location

Demonstration sites will be strategically located at a location where they can be easily accessed by farmers in the locality. Where possible, plots will be located near churches, schools, market centers, water wells, administrative offices, etc., or along busy roads.

Treatments

Each demonstration site will have eight treatments: 2 plots of a hybrid maize variety, 2 plots of farmer saved seed, each plot with and without fertilizers (DAP + urea).

Plot layout



Crop spacing and management

- Spacing of 75 x 25 cm. Thus, 12 lines per demonstration.
- One seed per hole, planting depth 5-7 cm.
- Two or three weeding operations during the season.

Fertilizer application

- DAP for basal application, urea for top dressing.
- Fertilizers will be pre-weighed for each plot before going to the field, using a balance with 1 gram accuracy.
- 2.5 kg of urea and 2.5 kg of DAP are to be applied per plot for maize.
- Basal fertilizer is DAP (to be applied at planting). The basal fertilizer will be applied into the planting hole before placing the seed. The fertilizer will be placed on one side of the hole and seed on the opposite side, avoiding contact between the seed and fertilizer. The amount of fertilizer per hole will be approximately 3 grams – this is equivalent to one soda/beer bottle top. Thus, each hole will receive one soda/beer bottle top of DAP.

- Top dressing fertilizer is urea. The top dressing will be ring-application (broadcasted about 10 cm around the maize plant stem) after three weeks of emergence after weeding. About 3 g (one soda/beer bottle top) of urea will be applied per plant.

Data collection

- Date of planting
- Date of top dressing
- Yield in kilograms
- Name and gender of all farmers involved in each activity.

Annex 4. Soil testing results from 41 sites in South Sudan, 2013

CENTRAL EQUATORIA

County	Payam	Boma/ sample site	N%			P ppm			K ppm			Mn ppm			Cu ppm			B ppm			
			L	O	H	L	O	H	L	O	H	L	O	H	L	O	H	L	O	H	
Juba	Rajaf	Logo East/ logo 1	Red			Red				Green			Green			Red			Red		
Lainya	Kenya	Kenya 2	Red			Red			Red			Red			Red			Red			
	Kenya	Kenya 1	Red			Red			Red			Red			Red			Red			
	Mukaya	Lorega 1	Red				Green			Green		Red			Green			Red			
	Mukaya	Lorega 2	Red				Green		Red			Red			Green			Red			
	Mukaya	Biri	Red			Red				Green		Red			Red			Red			
Yei	Otogo	Goja 1	Red			Red			Red			Red			Red			Red			
	Lasu	Lasu 2	Red			Red			Red			Red			Green			Red			
	Otogo	Ombasi 1	Red			Red			Red			Red		Green				Red			
	Worogenen	logo	Red			Red				Green		Red		Green				Red			
Morobo	Gulumbi	Kaya 1	Red			Red			Red			Red			Red			Red			
	Kimba	Kimba 1		Green		Red			Red			Red			Red			Red			
	Gulumbi	Giril/ Loku	Red			Red				Green		Red		Green			Green	Red			
	Gulumbi	Kindi/CAD	Red			Red				Green		Red		Green			Green	Red			
Kajkeji	Nyepo	Kansuk 1	Red			Red			Red			Red			Red			Red			
	Kangapo i	Kiri 1	Red			Red			Red			Red			Red			Red			
	Kangapo i	Litoba 1	Red			Red				Green		Red			Red			Red			
	Lire	Mekir	Red			Red			Red			Red			Red			Red			

EASTERN EQUATORIA

County	Payam	Boma/ sample Site	N			P			K			Mn			Cu			B			
			L	O	H	L	O	H	L	O	H	L	O	H	L	O	H	L	O	H	
Magwi (west)	Magwi	Magwi/ Amika 1	Red			Red			Red			Red				Green		Red			
	Magwi	Pajok 1	Red			Red			Red				Green			Green		Red			
	Magwi	Pajok 2	Red			Red				Green			Green			Green		Red			
	Magwi	Pajok 3		Green		Red				Green			Green			Green		Red			
	Magwi	Magwi/Palwonganyi 1	Red				Green			Green		Red			Red			Red			
	Magwi	Magwi/Palwonganyi 2	Red				Green			Green		Red			Red			Red			
	Magwi	Magwi/Palwonganyi 2	Red				Green			Green		Red			Red			Red			
Magwi (east)	Pageri	Pageri 1	Red			Red				Green		Red			Red			Red			
	Pageri	Loa 1	Red				Green			Green			Green			Green		Red			Green
	Pageri	Moli	Red			Red				Green		Red			Green			Red			
	Pageri	Sau 1	Red				Green			Green		Red			Red			Red			
Torit	Torit	Torit/CAD)	Red				Green		Red				Green			Green		Red			
	Imorok 1	Imorok 1	Red			Red			Red			Red			Red			Red			
	Imorok 1	Imorok 2	Red			Red			Red			Red			Red			Red			
	Iyire	Iyire 1	Red			Red				Green		Red			Red			Red			
	Iyire	Iyire 2	Red			Red				Green			Green		Red			Red			
	Iyire	Iyire 3	Red			Red			Red				Green		Red		Green	Red			
	Kudo	Hutiala	Red					Red		Green			Green			Green		Red			

WESTERN EQUATORIA

County	Payam	Boma/ sample site	N			P			K			Mn			Cu			B			
			L	O	H	L	O	H	L	O	H	L	O	H	L	O	H	L	O	H	
Maridi	Mambe	Mabirindi		■		■				■			■			■			■		
Mundri	Kotabi	Central Boma	■			■			■			■			■			■			
Mundri	Kotabi	Central Boma		■		■			■			■			■			■			
Yambio	Yambio	Gongara Emelia 1	■			■				■		■				■			■		
Yambio	Yambio	Gongara Emelia 2	■			■				■		■				■			■		

Key:

- Low or High content (L or H)
- Optimum content (O)

Annex 5. Reports and information products produced under the USAID Grant

Radio broadcasts

- Modern agro-inputs and farming practices: radio talk show for Eastern Equatoria, February 2013
- Modern agro-inputs and farming practices: radio talk show for Western Equatoria, February 2013
- Radio drama, 6 episodes, March-April 2013
- Series of radio announcements, 2012 and 2013

In the press

- Developing rural agribusinesses to transform South Sudan's agriculture: press release, February 2012
- S4D project media backgrounder: circulated to regional press in June 2013
- Adoption of improved seed and fertilizer could reduce food imports: press release, June 2013
- Farmers commend USAID food security program: The Nation Agricultural Supplement, Juba, June 2013
- Adoption of improved seed and: The Corporate magazine, Juba, June 2013
- Use of hybrid maize seed and fertilizer... demonstrating South Sudan's agricultural potential: online discussion thread on GFAR forum, July 2013
- Unleashing South Sudan's agricultural potential: Africa Review (online), July 2013

General-audience articles

- Grain from the Green Belt: lessons from the S4D project, South Sudan: IFDC Report 37(4)
- Seeds for Development – demonstration plots in South Sudan: IFDC Report 37(3)
- Seeds for Development in South Sudan, 2011-2013: project highlight. IFDC Annual Report 2011
- Seeds for Development in South Sudan, 2011-2013: project highlight. IFDC Report 37(2)

Newsletters

- Project update # 1, January 2013
- Project update # 2, March 2013
- Project update # 3, June 2013

Brochures

- USAID Seeds for Development, November 2012
- Improving food security in South Sudan's Green Belt, November 2012
- Improving food security in South Sudan's Green Belt, June 2013

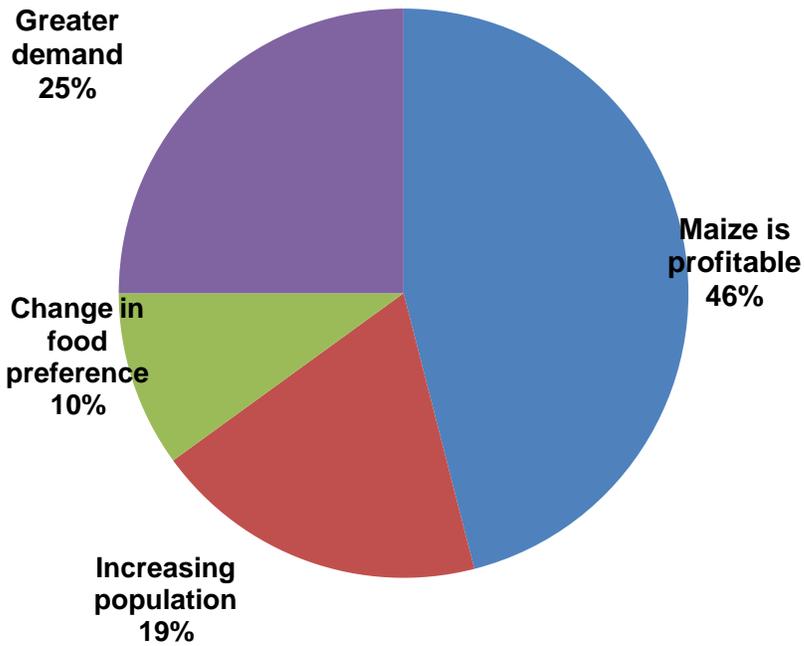
Training materials

- Numerous posters, flyers, leaflets

Progress reports

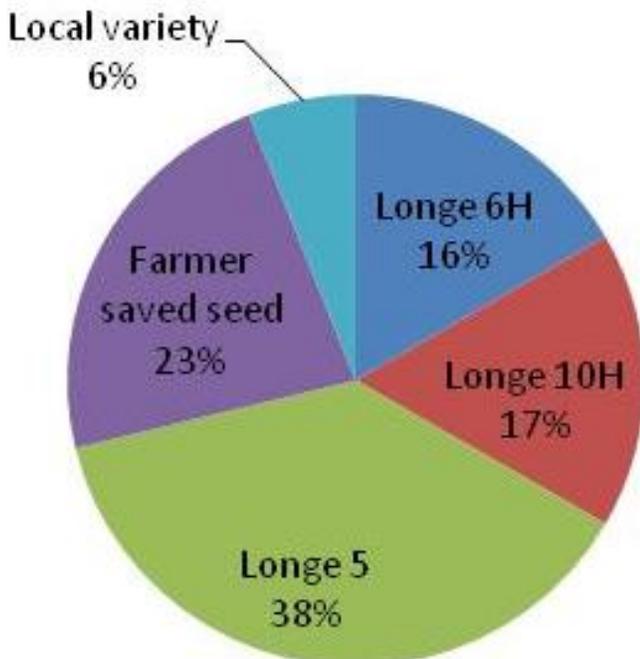
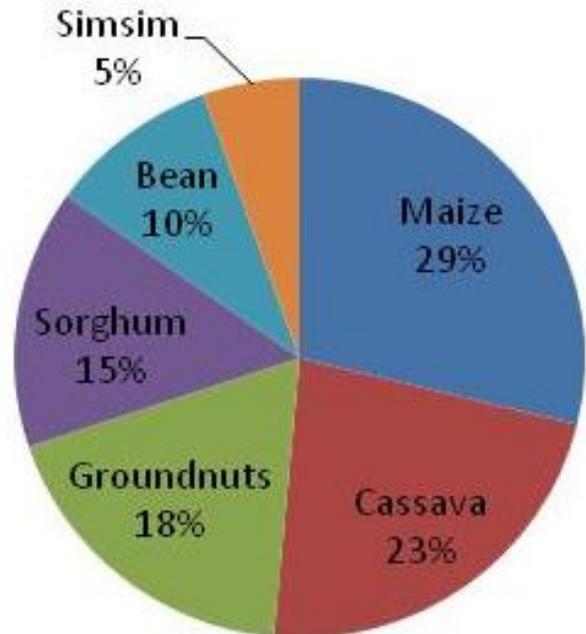
- Quarterly reports: Oct-Dec 2011, Jan-March 2012, April-June 2012, July-Sep 2012, Oct-Dec 2012, Jan-March 2013 and April-July 2013
- Final report October 2013
- Pilot Voucher Program Report, July 2012

Annex 6. Sample results from Rapid Farmer Appraisal, October 2012



Reasons for increase in potential of maize: mainly profitability, but also higher demand.

Most important crops: maize and cassava, but also a mix of other grain and cash crops.



Most preferred maize varieties: the high-yielding Longe 5. However, nearly one-fourth of the crop is of traditional varieties.