

SECURING WATER FOR FOOD

# Final Report

OCTOBER 1, 2014 – MARCH 31, 2020



SECURING  
WATER  
FOR FOOD:  
A GRAND CHALLENGE  
FOR DEVELOPMENT



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# TERMS & ACRONYMS

<b>AIIS</b>	Ag Innovation Investment Summit
<b>AIWW</b>	Amsterdam International Water Week
<b>Agtech</b>	agricultural technology
<b>AST</b>	Adaptive Symbiotic Technologies
<b>AWP</b>	acceleration work plan
<b>BMZ</b>	German Federal Ministry for Economic Cooperation and Development
<b>BOGO</b>	Buy One, Give One
<b>BOP</b>	Base of the Pyramid
<b>B2B</b>	Business to Business
<b>B2G</b>	Business to Government
<b>CEC</b>	Centre for Environment Concerns
<b>CEO</b>	Chief Executive Officer
<b>COP</b>	Chief of Party
<b>COR</b>	USAID Contracting Officer's Representative
<b>CSA</b>	Conservation South Africa
<b>CSDES</b>	Center for Sustainable Dryland Ecosystem and Societies – University of Nairobi
<b>CUT</b>	Central University of Technology, Free State
<b>DAI</b>	Development Alternatives Incorporated
<b>Desal</b>	Desalination (as in the Desal Prize)
<b>DPT</b>	Drought Prediction Tool
<b>DST</b>	South Africa Department of Science and Technology
<b>ETB</b>	Ethiopian Birr
<b>FAA</b>	Fixed Award Amount
<b>FAC</b>	Future Agro Challenge
<b>FPG</b>	farmer producer group
<b>GAS</b>	Global Agripreneurs Summit
<b>GCD</b>	Grand Challenge for Development
<b>GES</b>	Global Entrepreneurship Summit
<b>GFIA</b>	Global Forum for Innovation in Agriculture
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
<b>GRO</b>	Greenhouses Revolutionizing Output
<b>ICBA</b>	International Center for Biosaline Agriculture
<b>ICT</b>	internet communications technology
<b>ICU</b>	Institute for University Cooperation
<b>IFC</b>	International Finance Cooperation
<b>IIAC</b>	Innovation Investment Advisory Committee
<b>ITIKI</b>	Information Technology and Indigenous Knowledge with Intelligence
<b>IVL SERI</b>	IVL Swedish Environmental Research Institute
<b>Local</b>	For innovator: located in country affected by innovation For vendor: located in Africa or Asia
<b>LL</b>	lessons learned
<b>LOE</b>	level of effort

M&E	monitoring and evaluation
MFA – NL	Ministry of Foreign Affairs of the Kingdom of the Netherlands
MFI	Micro-Finance Institution
MIT/Tata	Massachusetts Institute of Technology, Tata Center for Technology and Design
MNP	Meat Naturally PTY
MOU	memorandum of understanding
MT	metric ton
NGO	non-governmental organization
Nonlocal	For innovator: not located in country affected by innovation For vendor: not located in Africa or Asia
NSPL	Naireeta Services Private Limited
PAEGC	Powering Agriculture: An Energy Grand Challenge for Development
PAS	Pre-Award Survey, an evaluation of a prospective contractor's ability to fulfill a proposed contract
Rd.	Round: Rd. 1, Rd. 2, etc.
RVPM	Rapid Vendor Procurement Mechanism
SAM	System for Award Management, the official U.S. government system that consolidates the capabilities of CCR/FedReg, ORCA, and EPLS
SDG	Sustainable Development Goal
SGE	small and growing enterprise
Sida	Swedish International Development Cooperation Agency
SIWI	Stockholm International Water Institute
SME	small- to medium-size enterprise
SNV	SNV USA
SOCAP	Social Capital Markets
SOW	scope of work
SST	Slurry Separation Technology
STIP	Science, Technology, Innovations, and Partnerships
SWFF	Securing Water for Food
TA	technical assistance (i.e., SWFF TA Facility)
TAHMO	Trans African Hydro-Meteorological Observatory
USAID	United States Agency for International Development
WGI	Water Governance Institute
WE4F	Water Energy for Food





# EXECUTIVE SUMMARY



# SWFF SURPASSES PROGRAM MILESTONES AND TARGETS

Securing Water for Food: A Grand Challenge for Development (SWFF) has now completed six years of activity and has come to an end. The Securing Water for Food program exceeded the expected outcomes envisioned when the program was created. This has now been validated by the final SWFF external program evaluation from Dexis. Dexis noted:

Program Impact: SWFF strongly contributed to outcomes: analysis of surveys find 60 percent of end-users/customers have improved access to water and 60 percent to water efficiency directly due to SWFF's innovations. While the inclusion of the vulnerable depends on the business model, very poor groups and women are universally included and impacted by innovations.

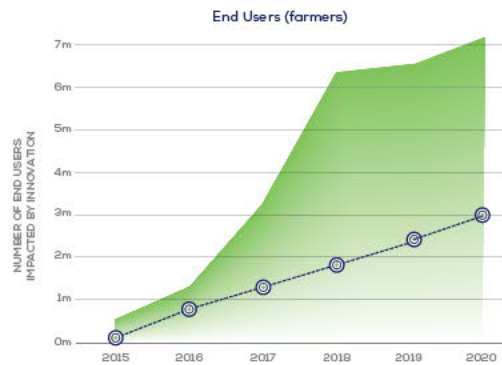
Based on SWFF's Social Rate of Return Analyses on 17 of its investments, the SWFF portfolio returned an average of 41 percent return on investment, which was quite high even for private sector foreign investment. On average, for more than 7 million users, SWFF programs resulted in a net farmer income increase of \$1,833, over the 3 years of SWFF programming and will have added more than \$1 billion over 9 years to the economies of 10 nations, based on a \$35 million investment. This was achieved with a modest increase of 8 percent in input usage for SWFF farmers because of the resulting switch to more lucrative crop production patterns and high initial annual crop yield increases from SWFF technologies. As validated by the SWFF external evaluation, SWFF believed this was due to the milestone-based funding paired with technical assistance.

The next page shows that SWFF innovations impacted more than 7 million farmers, their families, and other customers, helping make them more resilient to economic and climatic shocks and moving them forward on their journey to self-reliance. **For every \$1000 spent by the SWFF program, SWFF innovators impacted more than 265 customers/end-users; produced more than 395 tons of produce; helped farmers reduce their water consumption by more than 1.3 million liters of water (compared to traditional practices); improved water management on 4,304 hectares of grazing lands and 165 hectares of farmland; and generated more than \$626 of sales.**

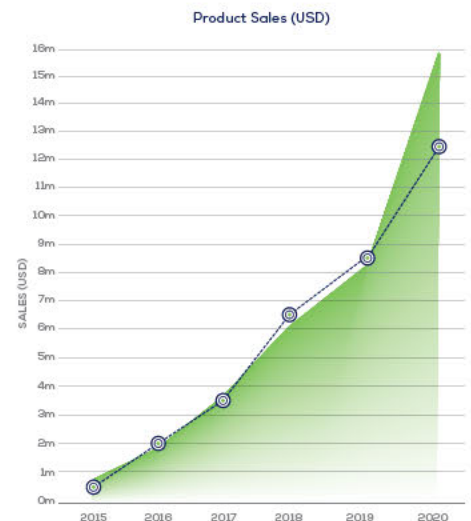
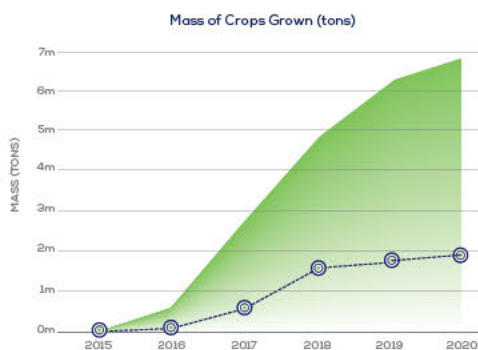
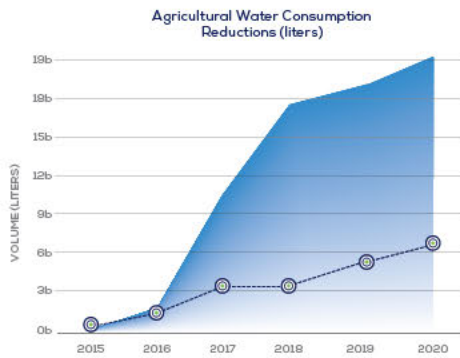
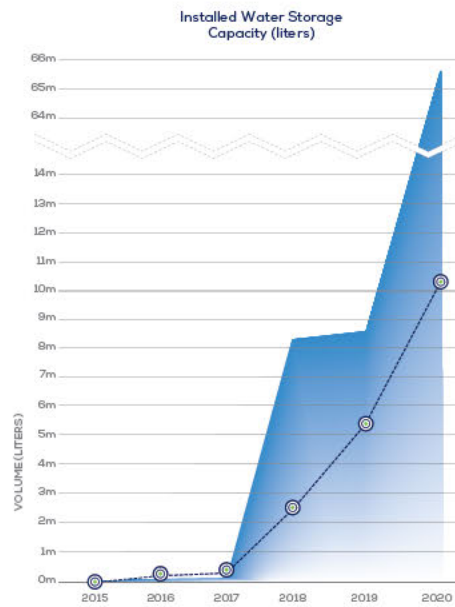
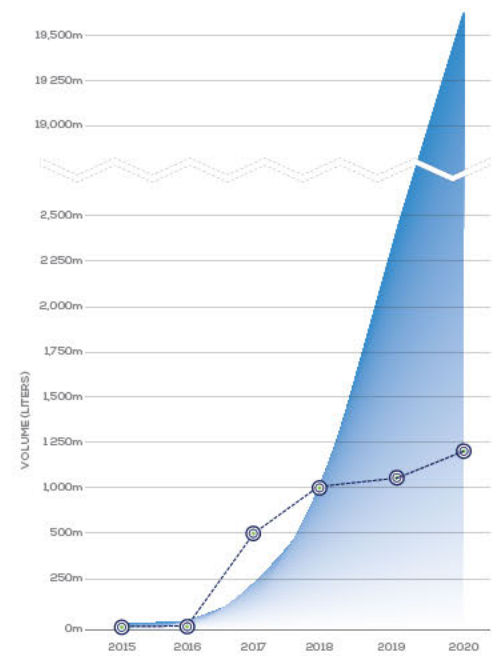
In addition, since the program began, SWFF innovators helped more than 7 million farmers and their families produce more than 6.8 million tons of food on more than 8 million hectares of rangeland and cropland that are under improved practices due in part to SWFF innovations. Those numbers are well ahead of the program's expected targets. SWFF innovations also helped reduce water consumption by more than 19 billion liters compared to traditional practices, nearly quadruple the program's expectation.

## PROGRAM TARGETS AND ACTUAL IMPACT (2014 – 2020)

■ Actual ● Target



**Volume of Water Reallocated**  
2020 Actual: 19,565,363,947 liters





Combined, SWFF innovators sold nearly \$15.9 million in products and leveraged SWFF funding with more than \$25.4 million in additional funding through more than 300 partnerships, which will reduce the need for future donor assistance for those innovations. Of the 23 SWFF innovations that weren't terminated in their first year for not meeting their targets, 21 graduated from the program. With one exception, more than one year after their SWFF awards ended, nearly all graduates are still financially viable and six are now profitable.

However, the SWFF program and its innovators still have room for growth, as noted in the SWFF final evaluation. The SWFF Founding Partners, along with the German Federal Ministry for Economic Cooperation and Development (BMZ) and others, launched the Water and Energy for Food Grand Challenge (WE4F) in 2019 to address SWFF's unmet challenges, including:

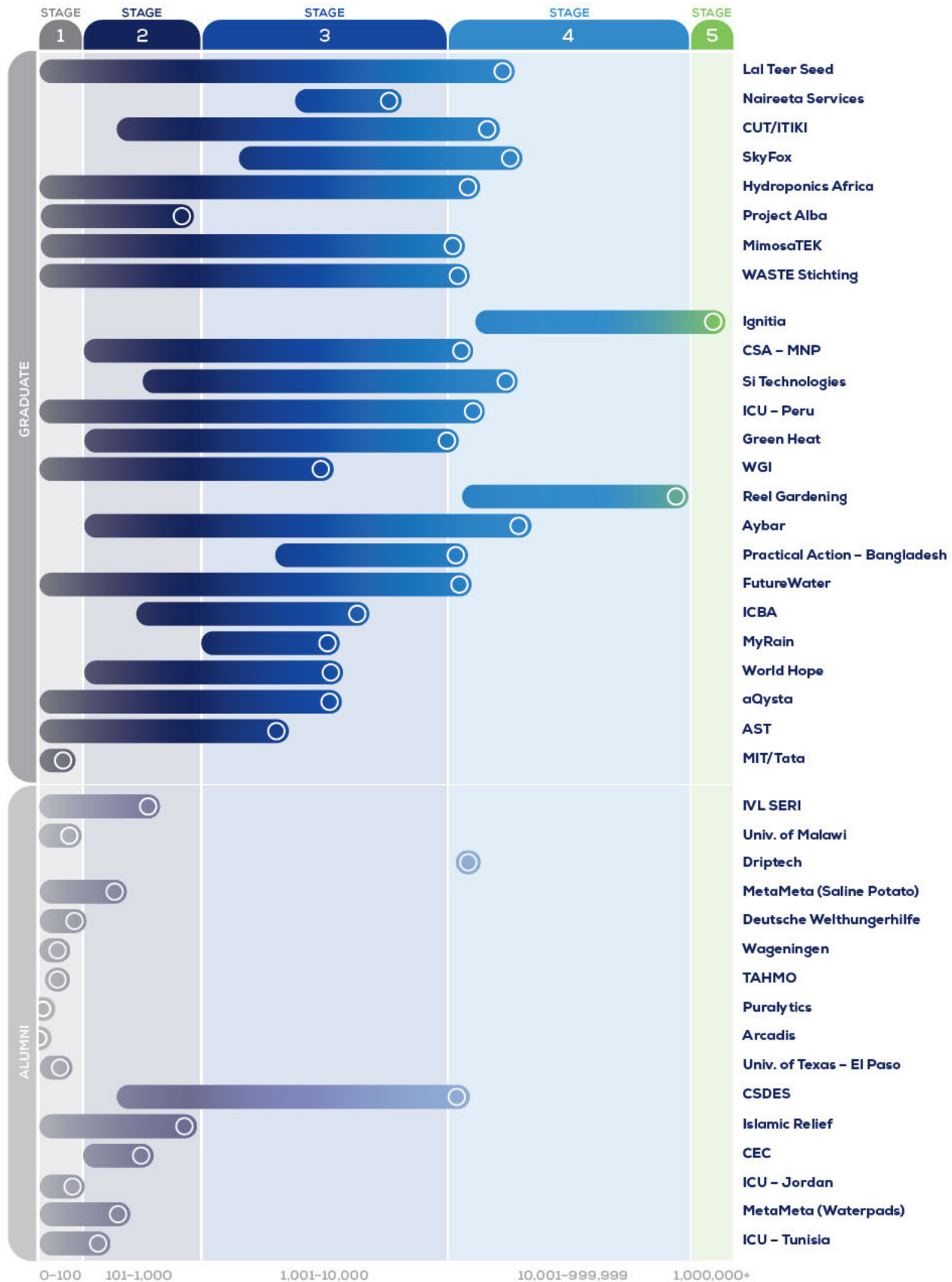
1. WE4F must explore the most effective ways of managing microfinance. There should be greater participation from the governments of developing and emerging economies as partners in WE4F to catalyze more viable innovations and make them self-sufficient.
2. WE4F needs to increase its understanding of the barriers innovators are facing beyond SWFF's activities; solutions should involve wider links with related embassies and other programs.
3. Broaden the membership base of the Founding Partners to locate and support suitable innovators, particularly from Africa.
4. WE4F support should focus on strengthening the enterprise in Year 1 (end-user financing support), moving to scale in Year 2 (additional investment), and consolidating the business plan in Year 3 (viability).

The SWFF program, through the SWFF Technical Assistance Facility (TA Facility), analyzed the overall impact of the program as a whole and the impact of individual innovations. These analyses and lessons learned have helped the program demonstrate the impact of technical assistance and helped innovators pivot to make more cost-effective, efficient choices in order to increase the likelihood some innovations will reach sustainable scale by the end of the program. So far:

- 100 percent of Graduate SWFF innovations experienced increased usage/uptake.
- Over the life of the program, 82 percent of the acceleration support delivered to SWFF innovators, with support from the SWFF TA Facility, has increased innovator technical capacity. (100 percent of support delivered in 2019-20 increased technical capacity).
- Over the life of the program, 79 percent of acceleration support given to innovators was deemed a long-term success (100 percent delivered in 2019-20 was a long-term success).
- 100 percent of SWFF innovators rate the TA Facility as responsive or very responsive.
- 100 percent of SWFF innovators rate the TA Facility's understanding of their needs as good or very good.
- 100 percent of SWFF innovators rate the TA Facility support as helpful or very helpful toward them meeting their overall goals.

## SWFF INNOVATOR PIPELINE (2014 – 2020)

customer base growth over time







# ABOUT SECURING WATER FOR FOOD



# ABOUT SECURING WATER FOR FOOD

Securing Water for Food: A Grand Challenge for Development (SWFF) worked to improve water sustainability and boost food security. SWFF activities were formulated to identify and accelerate scientific and technological innovations and market-driven approaches that help agricultural producers grow more food and increase their incomes.

Since its 2013 launch, SWFF issued four calls for innovation and awarded more than \$27 million in grants and technical assistance to 40 water-for-food innovators around the world. SWFF's goals included: (1) enhancing access to innovations that help farmers grow more food with less water; (2) improving water storage practices; and (3) increasing the use of saline water and soils to grow and process food.

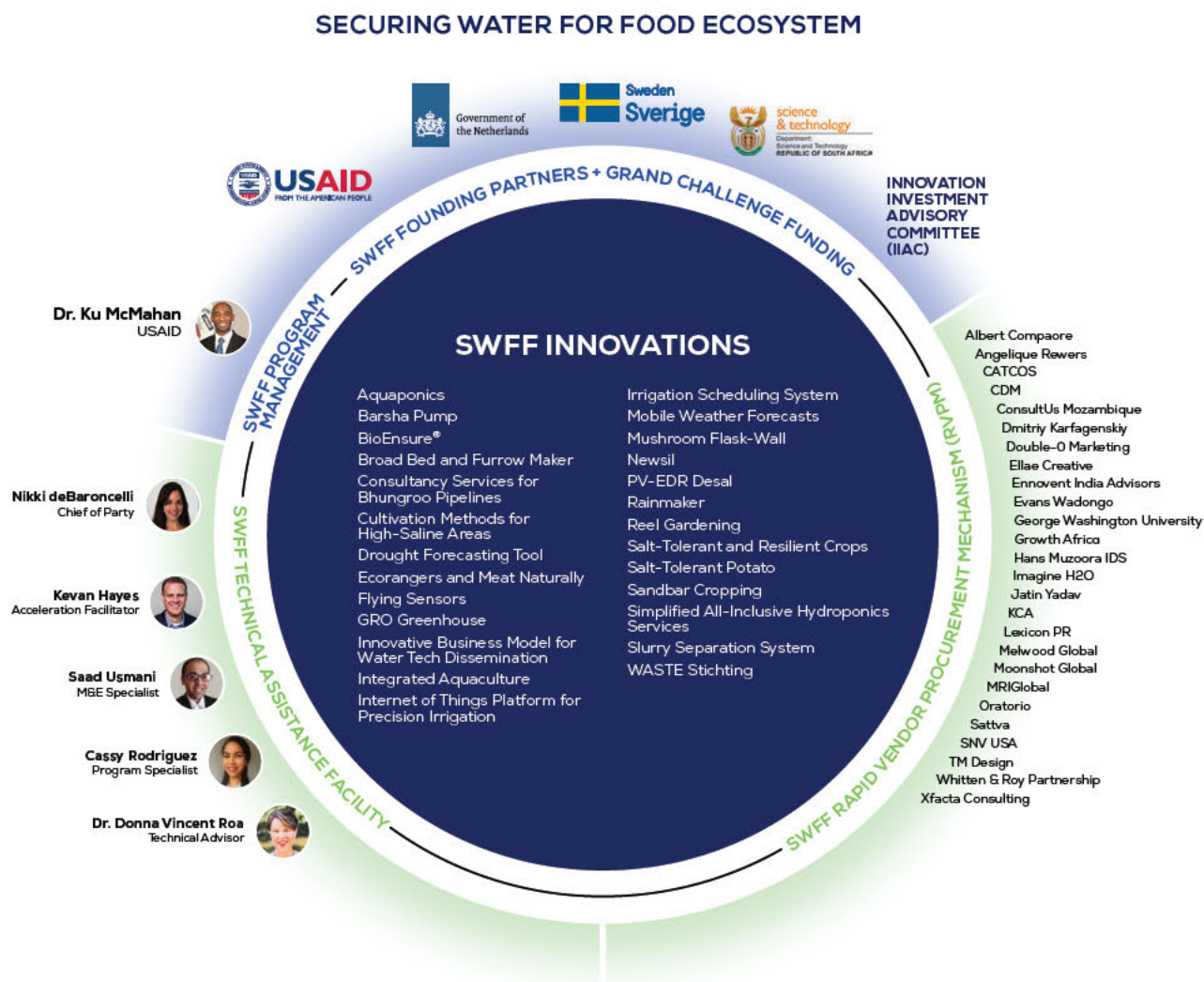
## SWFF INNOVATOR LOCATIONS (35 COUNTRIES) (2014 – 2020)





## The Securing Water for Food Ecosystem

The SWFF ecosystem included four founding partners: the United States Agency for International Development (USAID), Sweden through the Swedish International Development Cooperation Agency (Sida), the Ministry of Foreign Affairs of the Kingdom of the Netherlands (MFA – NL), and South Africa's Department of Science and Technology (DST).



The International Investment Advisory Committee (IIAC) was a critical component of the SWFF ecosystem and a unique advisory board in international development. It was created to aid in the selection of the SWFF innovators and to provide input on innovator technical and financial milestones for initial and future funding tranches. The IIAC was comprised of world-class technical experts, business specialists, sustainable development experts, and researchers with extensive experience in water and agricultural innovation. The committee's critical contributions helped the SWFF Founding Partners ensure that the program supported the most technically sound, commercially viable, and sustainable innovations.

SWFF provided financial and acceleration support through the SWFF TA Facility, an enterprise accelerator supported by a \$10.76 million contract awarded to The Kaizen Company. At the end of the program, the TA Facility staff included Nikki deBaroncelli, Chief of Party; Kevan Hayes, Acceleration Facilitator; Saad Usmani, Monitoring and Evaluation (M&E) Specialist; Cassy Rodriguez, Program Specialist; Melanie Mahlstedt, The Kaizen Home Office SWFF Project Manager; and Sam Weisman and Anna Koontz, Home Office Program Coordinators.

Innovators received services from the TA Facility's SWFF Rapid Vendor Procurement Mechanism (RVPM), which at the end of the program was comprised of 27 firms and individuals that provided business acceleration support to SWFF innovators in 21 distinct service categories. Over six years of the RVPM, the TA Facility engaged a total of 34 vendors based all over the world. The purpose of the RVPM was to provide technical assistance that was not available through the TA Facility or USAID, and in those cases, niche service providers were solicited through the RVPM to develop customized and cost effective proposals in response to the innovator's needs.

Through semiannual and annual reporting, the SWFF TA Facility documented project achievements, major activities, challenges, solutions, and innovators' impact and success stories. This final annual report covers the final year of implementation (June 1, 2019 - March 31, 2020) and provides a more in-depth examination of the project since its inception. It documents programmatic and innovator progress, and provides an in-depth analysis of innovator and program data amassed over the life of the project.

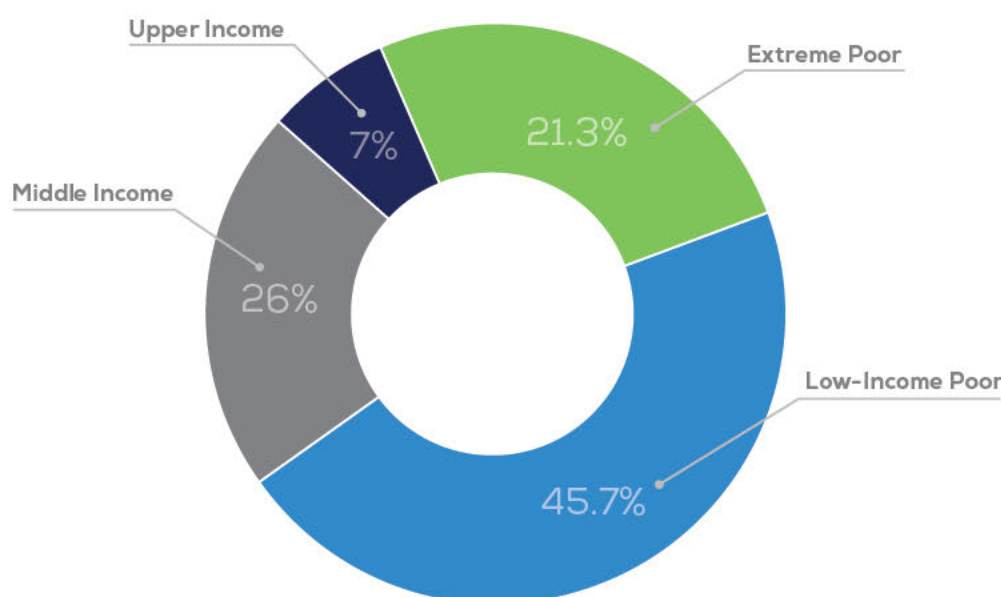
To learn and grow, SWFF periodically performed a program-level analysis of poverty, gender, and environmental sustainability. The next section of this report addresses ways SWFF, through our innovators' work, influenced farmer behaviors, improved livelihoods, helped alleviate and create resilience to poverty, and stimulated gender-inclusive strategies and activities.





# POVERTY

## POVERTY LEVELS OF SWFF END USERS ACROSS ALL INNOVATORS (2014 – 2020)



Through the products and services of innovators, SWFF continued to make progress toward improving incomes and yields of farmers who were at or near their country's poverty lines. As noted in previous SWFF annual reports, measuring poverty for specific innovations and across an innovation portfolio was extremely challenging. To determine the proportion of innovators' customers and end-users who were at or below the poverty line, SWFF used a combination of innovator-provided information, household survey data, monitoring and evaluation site visits, and extrapolations from country-level data. Using those sources, SWFF estimated that 66 percent of innovation customers and end-users in the program were at or near their country's poverty line.

SWFF innovators remained challenged to create financially sustainable enterprises while meeting the needs of extreme-poor and low-income households. SWFF innovators, and therefore the overall program, focused less on the lowest-income subsistence farmers and most often on customers and end-users at or above the poverty line who could fall back into poverty easily with an economic shock or prolonged economic stressors.

However, in the last 3 years, the upper income portion of end-users shrank by 4 percent while the low income poor category rose by 7 percent representing a successful targeting by innovators of base of the pyramid (BOP) customers throughout the program. This was in part due to the technical assistance that SWFF provided innovators on sales and marketing strategies that targeted BOP customers as a potential market segment.





Twenty-one percent of the 7 million SWFF customers and end-users were in the lowest-income category. Those extremely poor farmers rarely earned any income from farming and found it difficult to afford most SWFF innovations. Many non-governmental organizations (NGOs) in the SWFF portfolio initially focused on this group, but modified their operations to focus on the low-income poor who had some basic wealth (homestead, land, livestock, etc.). The assets of the low-income poor were also used as loan collateral for farming inputs, which were the basis for increasing agricultural and aquacultural yields, as well as increasing income from livestock.

Many SWFF innovators focused on working with semi-commercial farmers at or above the poverty line who grew a staple crop in one season and vegetables in another season. A substantial number of the farmers owned their land and had multiple income streams, including animal husbandry, day labor, and income from small retail shops. However, they had very limited income overall, with little to spend on anything outside of their agricultural inputs. Those farmers represented 45 percent of SWFF customers and end-users. In order to target the low income and extreme poor categories, SWFF's follow-on program, the Water and Energy for Food Grand Challenge (WE4F), developed an innovator guidebook that summarizes the key considerations, lessons, and tools to assist innovators in thinking through the dynamics and challenges in serving BOP customers. This included methods on targeting BOP customers, catering to their financial needs and wants, and tailoring market based innovations to them. From the lessons acquired throughout the SWFF program and the innate difficulties in reaching out to BOP customers and making a profit, many innovators became much more efficient in selling to BOP customers.

Central University of Technology, Free State (CUT)/Information Technology and Indigenous Knowledge with Intelligence (ITIKI) helped 12,785 rural households on more than 38,000 hectares of farmland in 3 nations. CUT/ITIKI's benefits went beyond crop production as well. This investment addressed the uncertainty problems faced by farmers in Sub-Saharan Africa in coordinating harvest times and adapting against climate change through combining scientific and indigenous weather knowledge through the use of a web portal, mobile application, and SMS service and a network of weather monitoring sensors. As is often a challenge with smallholder farmers, ITIKI struggled to get farmers to pay for their service directly. However, ITIKI started working with governments and other business interests to pay for their service, which allowed them to become financially viable while also servicing the needs of farmers.

# GENDER EMPOWERMENT AND INTEGRATION

Since 2015, the SWFF Founding Partners strongly advocated for an increased focus on gender in the program. Overall, the program moved from analysis and theoretical considerations to more practical activities and recommendations related to gender. Many of the program-level decisions and technical assistance support offerings were influenced by a gender focus. This included adding gender specific indicators for SWFF innovators, including gender-related service capacity in the SWFF TA Facility acceleration portfolio, providing gender training for innovators, including gender specialists on the IIAC, and removing gender biases in hiring decisions. Moreover, SWFF required the gender component to be incorporated within each scope of work regardless of its primary area of focus and ensured that recommendations and deliverables were tailored to the innovator's context and were recognized as implementable and valuable.

At its inception SWFF supported efforts to address gender programming, by requiring gender specific indicators on customer/end-user adoption. In addition, gender was mentioned to applicants as a thematic area (e.g., as was sustainability) at the concept note stage, and specific questions about gender were asked by the IIAC gender expert during video teleconference interviews for Rd. 1, Rd. 3, and Rd. 4 innovators. However, gender analysis was not integrated into the early budget recommendations for SWFF innovators and this was a key constraint, as most innovators did not budget funds specifically for gender analysis and gender integration.

In 2016, Sida and USAID conducted a gender workshop, which was an important step toward starting to work in a more joint and coordinated manner on gender issues between the agencies. During this event, SWFF was highlighted as one of the most gender progressive programs within the Science, Technology, Innovations, and Partnerships (STIP) collaborations. In 2017, SWFF published the Missing Markets Innovator Workbook, a practical tool for innovators working in the agricultural sector, to help them reach and effectively serve the untapped or missing market of women smallholder farmers in emerging economies.

Over the last few years, SWFF made significant strides and changes to the overall program to effectively address gender empowerment and integration in all aspects of the Grand Challenge. One such example was that USAID required that all technical assistance requests included a gender component and SWFF's donor partners modified the requirements in the calls for innovation to focus more on gender integration. During site visits, SWFF gained further insights into gender issues and found that all Rd. 4 innovators had underreported their gender impact. For example, some innovators directly pursued women customers as a central part of their business model and addressed gender barriers specific to their country's context.



As a result, SWFF Rd. 3 and Rd. 4 innovators expanded the program's overall gender focus, especially compared to Rd. 1 and Rd. 2 innovators. Moreover, more than 3.6 million of the approximately 7.2 million customers and end-users of SWFF-supported innovations were women. This was consistent throughout the entire program where female customers constituted roughly half of all end-users. Emphasis on gender was promoted by Sida with innovators expected to optimize their impact increasing women participation. SWFF's one-on-one gender training was highly rated by innovators. Many of them had not considered gender as a factor in their business model or customer segmentation.

In comparison to non-SWFF innovators, as determined by the SWFF external evaluation team, SWFF's innovators had a larger focus on gender integration, (48 percent vs. 33 percent for non-SWFF innovators) and including women as customers (24 percent vs. 16 percent). The data indicated that SWFF's innovators had a higher percentage of women occupying senior positions than non-SWFF innovators. Many innovators continued to report positive outcomes of gender-related efforts such as the hiring of women field agents, expanding gender-sensitive trainings, increasing focus on women smallholder farmers as customers, and the creation of partnerships to help increase adoption of products and services by women.



Hydroponics Africa used all inclusive hydroponics services that utilized local materials to grow healthy plants and increase crop yields in rural and urban areas. Through their hydroponics units, farmers increased crop yields in small areas without soil and reduced water usage by up to 80 percent. These units came in five hydroponic methods based on crop type and a host of other factors such as water availability and climate and were financed by a 20 percent initial investment by farmers paid monthly over the course of a year. To cater to the low income market and women, Hydroponics Africa did not require an investment for installation. Hydroponics Africa benefited from more than 20,000 end-users on more than 5 hectares of hydroponic production, producing more than 5,000 metric tons (MT) of produce. On average, the units led to increases in crop yields between 36 percent to 95 percent. Women constituted 60 percent of households, and Hydroponics Africa supplemented their income with high quality crop production in predominantly urban and peri-urban areas.



Through an innovation that stores water for drought mitigation and waterlogging issues, Naireeta Services produced water storage units, Bhungroos, which were hand-made pipes (10 to 15 cm in diameter) that filter, inject, and store rainwater for lean periods. In the last year of their SWFF award, Naireeta Services continued to expand their customer base, which consisted of extremely poor farmers in 10 regions throughout India as well as Vietnam, Ghana, and Bangladesh. SWFF support sought to identify and validate the challenges and barriers faced by women farmers using Naireeta Services and recommended actionable steps they could take to address women's needs and make the adoption journey easier for them. Naireeta Services' goal was to install 10,000 units and triple the income of 50,000 women-led families.

In Year 3, Naireeta Services continued to refine its business models to reach farmers more effectively and sustainably.





# ENVIRONMENTAL SUSTAINABILITY

From 2014 to 2020, SWFF sourced innovations designed to decrease agricultural water consumption, re-allocate water to the food value chain, increase water storage capacity, and address the problems of saltwater intrusion and soil salinity. As the program and its innovators grew and matured, SWFF took a more nuanced view of the environmental sustainability of SWFF innovations, based in part on the findings from external evaluations of the program and individual innovator's projects. Throughout this report, SWFF reports each water metric separately, in addition to combined water metrics (below). SWFF tried to balance the need for simplified public information with the need for increased scientific rigor.

Farmers using SWFF innovations experienced yield increases ranging from 10 percent to 80 percent. Combined, the farmers reduced their water consumption by nearly 20 billion liters of water (compared to traditional agricultural practices), re-allocated more than 19.65 billion liters of water to food production, and increased water storage capacity by 63.7 million liters. Based on random samples of SWFF customers/end-users, the SWFF Final external evaluation noted that 84 percent of all SWFF customers/end-users made 2 or more changes in their farming practices, with 64 percent stating they were now more resilient to climatic variations.

Much of SWFF's volume of water reallocated to the food value chain was attributed to Rd. 4 innovator SkyFox Ltd, which offered smallholder farmers an additional source of income from fish sales from aquaculture as well as an estimated 24 percent increase in crop yield from nutrient rich water from their established and/or rehabilitated fish ponds. During their SWFF award, SkyFox reallocated more than 2.1 billion liters of water to the food value chain. SkyFox has helped more than 380,000 farmers and their families, generating more than \$6.4 million in product sales from nearly 232 million tons of fish and produce on more than 4,700 hectares of farmland in Ghana, Guinea, Sierra Leone, and Burkina Faso. In the final year of its SWFF award, SkyFox increased the average annual income per farmer from \$150 to \$253.

Although SWFF innovators made tremendous progress toward increasing water efficiency in agriculture and reducing water consumption, some farmers offset water efficiency gains from innovations when they expanded their fields. Most farmer customers increased crop yields (producing more food) using less water overall than they did before using SWFF innovations. However, some farmers lost their efficiency gains as they continued to expand their fields, which increased both agricultural production and their overall water usage.

In addition to monitoring water savings, SWFF monitored the overall environmental sustainability of SWFF innovations. Of the 7 innovators who graduated this year, all caused little to no environmental harm. Moreover, SWFF's external evaluation found that 55 percent of customers/end-users noted that they reduced the use of pesticides and fertilizers, which are known to cause environmental harm. In addition, the external evaluation noted that none of the SWFF graduates are known to have a net negative environmental harm, and on average 65 percent increased farmer's water savings or efficiency gains significantly/very significantly.









# INNOVATOR UPDATES







## CUT/ITIKI

The ITIKI Drought Prediction Tool, created by the Central University of Technology, created a drought early warning system that integrated both indigenous and scientific forecasting, a web portal, and a SMS service to pool weather information from a network of sensors monitoring weather conditions with great accuracy. During their SWFF award, CUT/ITIKI served 58,942 end users of which 70% were women. The innovator helped farmers increase their crop yields by 10% and produce more than 32,800 MT of produce on more than 38,100 hectares of farmland. Their drought forecasts were 96- 99 percent accurate and reached customers/end-users in Kenya, Mozambique, and South Africa. With guidance and team training from the technical assistance provided by SWFF, ITIKI transitioned from a Business to Customer (B2C) model to a business to business (B2B) model where the opportunity to reach more clients at one time increased exponentially.



## Hydroponics Africa

The Hydroponics Africa system was built from local materials, required no user expertise, and used as many as five different hydroponic methods to help farmers produce maximum yields in small areas, without soil, while using 80 percent less water. The hydroponic method suggested to end-users was determined by crop types, water availability, user type, land area, climate, and culture. The business model was comprised of direct sales of hydroponics units on a fixed fee per month basis, which includes complementary support and maintenance contracts. Hydroponics Kenya also operated a parallel contract farming model with a subset of its clients, pre-purchasing crops grown for markets and other distributors. By 2020, Hydroponics Africa installed 4,132 hydroponic units that benefitted more than 20,000 users, helped grow more than 5,000 tons of produce, and reduced water consumption by more than 214 million liters. Hydroponics Africa's strategy to sell its innovation via local marketers increased conversion rates and helped it stay on track to meet targets. Local marketers also helped ensure that farmers repaid their loans on time.



## Lal Teer Seed

Lal Teer Seed combined locally developed saline-tolerant vegetable seeds with easily adoptable methods of cultivating crops in high-saline areas of southern Bangladesh. The innovator's services included microfinance sourcing, Internet communications technology (ICT) support, and extension advisory services. By 2020, Lal Teer Seed reached more than 200,000 end-users/customers, helped improve more than 10,000 hectares of land and produced more than 350,000 tons of food with its enhanced seed varieties. Lal Teer made significant efforts to bring financing to farmers. The customary repayment timelines and high interest rates offered by many microfinance institutions were not suitable for farmers interested in purchasing Lal Teer seeds. To support the farmers, Lal Teer Seed provided seeds on credit to seed retailers, who also provided the seeds on credit to farmers. However, this credit system made repayment difficult, taking up to six months for Lal Teer Seed to collect payments from retailers.





## MimosaTEK

MimosaTEK's solution – an Internet of Things platform for precision agriculture in Vietnam – monitored and analyzed data on farms using sensors to measure soil moisture, rain, wind, and light, then recommended a precise irrigation schedule to farmers in real time. An end-user could activate an irrigation system or greenhouse equipment via the mobile application anytime, from anywhere. MimosaTEK's crop optimization model combined data from sensors with specific crop models to save on average 20 percent of water and water soluble fertilizer while helping to increase crop yields by an average of 10 percent. MimosaTEK also had strong distributor channels with big players in some typical markets. By 2020, MimosaTEK reached more than 11,000 end-users/customers, helped improve more than 5,760 hectares of land, and helped farmers grow more than 32,300 metric tons of produce.



## Naireeta Services Private Limited

Using handmade pipes 10 to 15 centimeters in diameter, Naireeta Services' Bhungroo rainwater harvesting systems filtered, injected, and stored rainwater underground for use in lean periods. In addition to providing food security during rainy periods and ensuring crop survival in lean periods, Bhungroo systems supplemented household water needs. Naireeta Services trained and empowered women to operate and monitor the Bhungroos. By curtailing desertification, the initiative helped women build resilience to environmental changes. Naireeta Services installed 184 Bhungroo rainwater harvesting systems, reached nearly 7,000 end-users/customers, helped produce nearly 50,000 metric tons of produce, and helped store more than 63,500 liters of water for agriculture.



## Project Alba

Project Alba was a for-profit social enterprise that worked with smallholder farmers in developing countries. Because of the risks associated with new technologies and new crops, farmers in South East Asia tended to fall back on staple crops such as rice, which generated very low income. Project Alba offered a partnership to farmers providing inputs, tools, and technical advice at no upfront cost while guaranteeing to buy farmers' produce at pre-set prices. Project Alba then resold the produce to wholesalers. Project Alba's ability to reduce farmers' risk of change enabled it to work with farmers on new vegetable crops, thus yielding good commercial margins while repaying the upfront costs. During their SWFF award, Project Alba reached more than 900 end-users/customers and helped farmers grow more than 1,400 tons of produce. During a SWFF site visit, 90 percent of farmers interviewed noted an increase in crop yields after becoming Project Alba contract farmers. On average, the farmers sold 99 percent of their crops, reserving the remainder for household consumption. In 2019 and 2020, Project Alba restructured their organization. The shift in focus was to continue to improve market conditions and focus on higher quality markets rather than significantly reaching scale as originally expected in their SWFF award.





## SkyFox

SkyFox Ltd. constructed and leased ponds to resource-poor farmer groups for production. One pond leased to 25 people produced 20 tons of fish and produce per year. Customers/end-users were linked to rural banks, enabling them to purchase feed for the fish. After paying the lease fee and the capital and interest, customers/end-users were able to make a net profit of approximately \$8,080 per pond. To enable poor farmers to participate, SkyFox offered the flexibility to purchase single or multiple shares of 10 kilograms of fish each. By 2020, SkyFox reached more than 380,000 end-users/customers, and as a result more than 4,000 hectares of land were under improved practices. The innovation helped farmers grow nearly 232,000 metric tons of fish and produce. In Year 3, sales improved, but some stock remained unsold. The temporary slow down of sales was due to the innovator's change in sales strategy from farmgate sales to value addition and selling directly to consumers. This was enabled by the technical assistance received from SWFF.



## WASTE Stichting

WASTE Stichting provided a waste-to-resource model for agriculture that was scalable and autonomous using the mobilization of private finance and market-linkage to empower women vegetable farmers in India. WASTE Stichting collected household fecal material for use in producing compost to enhance vegetable garden yield and quality. The second part of the innovation involved recycling of household wastewater (kitchen and bathroom) for irrigation use during dry periods. The business model innovation was the institutionalization of women farmers into producer companies and linking them to an agri-marketing partner who procured crops grown by farmers via advance purchase order. The farmers were also linked to local Micro Finance Institutions (MFIs) for access to loans to procure the innovation. By 2020, WASTE Stichting reached more than 13,000 end-users/customers, helped farmers grow more than 121,000 metric tons of produce, and reallocated more than 73 million liters of water to the food value chain. Given the track record shown over the past three years during the SWFF program, the Nilgiris Government and the State Government of Tamil Nadu expressed interest in replicating the model in new Resource Recovery Parks. An Independent Field Evaluation was conducted and that report was immensely helpful in driving the interest of the State Government to replicate the model.



## Conservation South Africa – Meat Naturally

Meat Naturally PTY (MNP) capitalized on ecological science, job creation investments, and market interest in sustainable meat to incentivize improved communal grazing systems, which resulted in improved water and food security. The system provided a scalable vehicle for African communal farmers to enter into a growing niche market for grass fed and sustainably produced meat and wool. MNP provided livestock production support and solutions to market access barriers that were otherwise unavailable to communal farmers. Meat Naturally had a proven model with financial viability, and positive environmental and social impacts. By 2020, MNP reached more than 19,285 customers/end-users (including EcoRangers and restoration workers paid by the government). Through signed agreements to remove invasive species and implement planned grazing for communal farmers, MNP helped to improve practices on nearly 4 million hectares of land in South Africa, with more than 394 million Liters of water reallocated to grassland ecosystems.





## Water Governance Institute

Water Governance Institute's (WGI) Aquaponics system recycled water from a fish-tank and irrigated horticultural crops growing in grow-beds or gardens next to the fish-tank. The innovation consisted of different design options of 1m<sup>3</sup>, 7.5m<sup>3</sup> and 75m<sup>3</sup> fish-tank sizes for subsistence, semi-commercial, and commercial purposes, respectively, depending on the customers' needs. The system could also be automated with grid-electricity or solar power to pump and circulate water. The Aquaponics unit was made from locally available materials such as timber, bricks, cement, iron-bars, and PVC plastics/sheets, thus making it easy to construct. WGI started with one Aquaponic unit in 2012. After ascertaining the viability of the innovation, WGI piloted it with eight farmers in four districts in Uganda (Kampala, Hoima, Adjumani and Kamul) during 2015 to 2016. Since then, Aquaponics has demonstrated an impressive annual adoption rate averaging 45.5 percent, bringing the total number of customers/households to 189 to date. Based on this adoption rate, it will be possible to reach 600 customers/households by 2022.



## Green Heat Uganda

Green Heat Uganda Ltd.'s innovative slurry-separation system greatly reduced water demand. The system created an easily managed fertilizer product while increasing gas production. Utilizing a solar-powered sewage pump and innovative heating process, slurry was dewatered and converted into solid fertilizer that could be packaged, stored, or applied directly to the fields. Green Heat installed more than 1,000 slurry separation technologies (SSTs), throughout Uganda, Rwanda, and Ethiopia, benefiting nearly 20,000 end-users. The innovation saved time for women and children tasked with water collection and has led to reported increases in crop yields among users. GreenHeat has saved more than 22 million liters of water that would have been otherwise required to operate the systems, and facilitated a 64 percent increase in crop yields for those using the fertilizer produced and impacting more than 1,000 hectares of land. Both of these outcomes are significant for women, who typically are burdened by water collection duties (up to 5 hours per day) and for whom the lighter, drier fertilizer produced by the systems is easier to carry.



## Ignitia

Ignitia's tropical weather forecasting helped farmers coordinate their agricultural activities with suitable weather patterns. Third party research indicated that by providing highly accurate weather forecasts on subscription for 4 cents per day, farmers could increase their yields by 60 percent. By 2019, more than 1.2 million farmers joined the service as paying subscribers. Ignitia reached the break-even point in Ghana. Its B2C product was launched in Nigeria in October 2018, and the number of subscribers was growing by 1,000 new farmers daily. Based on studies of a subset of farmers, the SWFF program estimated that paying farmers had grown up to 284,000 tons of produce, increasing crop yields by 47 percent on 135,000 hectares of land. "Using the forecasts more than doubled my yield last year," said Enoch Addo, one of the farmers that benefited from the service. In 2020, Ignitia added 500,000 end-users to their customer base, two years after they exited the SWFF program.





## ICU – Peru

ICU – Peru provided farmers access to various technologies that increased irrigation efficiency, enabling optimal use of water resources in their crop fields. The ICU Irrigation Scheduling technology, coupled with technical assistance and training on how to use and interpret data, farmers gained knowledge in when and how much to irrigate. Farmers also learned the proper usage and interpretation of parameters from weather stations such as: air temperature, relative humidity, wind speed and direction, intensity of rain and solar radiation, ETO, and soil moisture levels. ICU – Peru’s technology reached over 20,000 end-users, helped produce over 580,000 tons of produce on nearly 14,000 hectares of land under improved practices, and helped farmers reduce water consumption by nearly 19 billion liters.



## World Hope International

In partnership with Pennsylvania State University, World Hope produced and distributed affordable greenhouses that enable a year-round growing season and reduction in water consumption. The Greenhouses Revolutionizing Output (GRO) were constructed in just two days at a price point of \$900. Many of the greenhouses were durable and lasted for more than five years. The GRO Greenhouses allowed farmers to produce vegetables using less water. During their SWFF award, World Hope International sold more than 100 GRO greenhouses to a diverse group of customers, including non-governmental organizations, primary and secondary schools, smallholder farmer groups, and medium-sized commercial farmers. These farmers produced nearly 1,400 metric tons of vegetables through sales of seedlings, as well as growing and selling their own vegetables. As a group, the farmers saved an estimated 8.7 million liters of water.



## ICBA

ICBA established salt-tolerant seed production and exchange chains in Egypt, where freshwater is scarce. Specifically, the innovator focused on key crops such as barley, triticale, fodder beet, pearl millet, sorghum, safflower, and quinoa. In 2017, ICBA completed the installation of a \$110,000 facility in Egypt’s New Valley region that allowed it to centralize refinement and prepare seed for climate-resilient crop varieties. During its SWFF award, ICBA reached nearly 6,500 customers/end-users with more than 550 metric tons of seed. The innovator reduced water consumption by more than 102.6 million liters and more than 110 hectares were under improved practice as a result of its salt tolerant and resilient crops. ICBA demonstrated strong gender integration and progress in their SWFF award. In Year 3, ICBA focused on designing training for women in the New Valley of Egypt that addressed gender inequality in agriculture by examining the areas of crop production that involved women farmers and focused on opportunities for empowerment.





## Aybar Engineering

Aybar's Broad Bed and Furrow Maker (BBM) was a multi-purpose ridger and bed maker used to drain excess water and conserve moisture in dry areas. The tool improved yields by up to 500 percent or as much as \$800 per hectare per year, making an estimated 4 million hectares of previously unused land available for farming. The Aybar BBM cost only \$15, but its benefits (in terms of yield increment) amounted to \$493 per hectare per year. Additionally, the innovation enabled farmers to double-crop, minimize soil erosion, and cut methane emissions by avoiding the annual wetting – drying cycle of the soil. During its SWFF award, Aybar delivered broad bed and furrow makers (BBMs) to more than 80,000 farmers, and by extension 322,844 family users in Ethiopia, allowing farmers who were previously unable to grow crops during the rainy season to drain water from their land and realize an entire extra cropping cycle of wheat. As of 2020, Aybar managed to add 16,125 end-users to their customer base, three years after they graduated from the SWFF program.



## aQysta

aQysta's Barsha pump was an innovative solution for smallholder farmers to irrigate their fields without using any fuel or electricity. The hydro-powered pump was easily implemented anywhere there was flowing water nearby and required little maintenance. aQysta exported 300 pumps to 18 countries globally. More than 5,000 users benefited from the Barsha Pump, which was aQysta's first commercial product. Previously these households could not irrigate because the costs and energy required to pump were too great. The majority of aQysta users were poor. Due to workforce dynamics where men work as laborers and women take on agricultural tasks, use of pumps increased women's agricultural productivity.



## Practical Action Bangladesh

Practical Action's sandbar cropping technique enabled landless families in Bangladesh to diversify their incomes by growing pumpkins and other crops on previously barren land. Practical Action taught farmers how to identify suitable sandbar cropping space, dig pits, fill them with compost, and add pumpkin seeds. Crops thrived and the pumpkins lasted for up to a year, enhancing food security and improving earning potential among extremely poor farmers. Practical Action reached more than 15,000 end-users during the three years of their SWFF award. Their sandbar cropping technique helped produce nearly 30,000 tons of produce, and as a result, more than 400 hectares of land are under improved practices. In addition, the income of farmers increased by an average of \$505 annually. At the national level, the innovation had a great influence in the formulation of a seven-year national plan in Bangladesh to support extreme poverty eradication. At the organizational level, Practical Action used the innovation as a vehicle for change in areas both at home and abroad. The biggest achievement of the innovation was the involvement of rural women to join in productive activities for the greater change of their communities.





## MyRain

MyRain was a wholesaler of drip irrigation products. MyRain's Rainmaker was a point-of-sale and design application that made it easier for retailers to customize drip irrigation systems for small-plot farmers based on entering a few parameters. The app removed the barrier of retailer engineering expertise and increased the ease and opportunity to advise, sell, and order drip irrigation components. Over the three years of their SWFF award, MyRain reached more than 5,300 end-users/customers, and sold more than \$550,000 worth of irrigation and hardware products. Farmers used MyRain-supplied irrigation products on 449 hectares of land and helped achieve nearly a billion liters in water consumption reductions.



## Adaptive Symbiotic Technologies

Adaptive Symbiotic Technologies' (AST's) BioEnsure® was a fungal seed and plant treatment that, when sprayed onto seeds, helped plants to adapt to water-related stress. AST commercialized the product through a B2B model in the U.S, Australia, and Argentina. By applying BioEnsure®, crops grew in sub-optimal conditions and used 50 percent less water. In 2017, AST achieved 85,000 hectares under improved practices and 950,000 hectares in 2018. Over the SWFF award period, AST achieved sales in India, regulatory approval in Argentina, supply agreement with distributors (including Indigo Ag), continued testing with at least a 15 percent yield increase in India. In India, AST reached 395 households, 2,172 users, and expanded the SWFF project and their B2C model.



## FutureWater

FutureWater provided smallholder farmers with insights that were critical to improving their application of limited resources, such as water, seed, and fertilizer. The FutureWater ThirdEye Flying Sensors were equipped with near-infrared sensors that detected crop stress up to two weeks before it was observable by the human eye. Bundling of services proved to be key to the success of FutureWater in two ways: by increasing the number of services customers were likely to purchase, and by increasing sales with the offering of third-party services. In Mozambique, ThirdEye reached more than 17,000 end-users and trained 14 operators, who conducted flyovers on more than 1,700 hectares of land during the SWFF award. A subset of end-users reported that using the Flying Sensor resulted in a 39 percent water use reduction and 10 percent yield increase.



## University of Malawi

The University of Malawi's innovation was a flask-wall mushroom-growing house that reduced moisture escaping and enhanced recycling of water through condensation. The technology produced a micro-hydrological cycle, where the initial water supplied to the house recirculated as water vapor. This prevented excess loss of moisture into the external environment. The design greatly reduced labor requirements and watering frequency, allowing growers, who were mostly women, to attend to other activities. During their SWFF award, the University of Malawi reached nearly 700 end-users and helped to produce 16 tons of mushrooms.





## Reel Gardening

Reel Gardening, a women-owned business, developed a unique seed system that could be grown into a vegetable or herb garden in nearly any region. The innovator pre-packaged a paper strip with seeds and fertilizers so it could be easily planted at the correct depth and maintained. It took just five minutes to plant, used 80 percent less water and could provide months of supplemental vegetables. The products were handmade by previously unemployed mothers. The model focused on servicing the development sector through its school growing program, the corporate sector through its custom branded marketing offerings and the retail sector through its online and in store retail sales. While they actively recruited both male and female garden champions from community workers programs, school faculties, local NGOs, and faith-based communities, the innovator observed higher rates of adoption with women. Reel Gardening implemented their Learn and Grow kits in 2,500 schools and the large 400m<sup>2</sup> Feeding Gardens into 300 schools across South Africa. The take home household gardens have been gifted to more than 300,000 households across South Africa. Reel Gardening had a combined direct impact on more than 800,000 people in South Africa, helped save more than 45 million liters of water, and produced 712 tons of produce on 50 hectares of land.



## IVL Swedish Environmental Research Institute

The IVL Swedish Environmental Research Institute (IVL SERI) SPONGE system was an irrigation technology – a techno-biological system – that improved water use and supply in India and Bangladesh. Using water from fog and dew, SPONGE increased water reliability in a region with abundant, but highly intermittent, water availability. During its SWFF Award, IVL SERI gave particular consideration to women's needs and encouraged women farmers to adopt the technology by offering flexibility and support. SPONGE reached nearly 1,000 customers/end-users, helped produce 200 metric tons of produce, and 1.5 million liters of water were reallocated to the food value chain.



## CSDES - University of Nairobi

CSDES' M-Fodder, a mobile phone application, connected smallholder livestock farmers to high-quality fodder through SMS messages. During their SWFF award, M-Fodder reached 2,196 households in Kenya, with 9,000 SMS messages facilitating the sale of 13,222 tons of fodder between hydroponic producers and local farmers. M-Fodder conducted gender-inclusive focus groups and outreach efforts, though the gender impact was unclear. Since exiting the SWFF program, MFodder expanded to distribute their SMS to Uganda, and reported increases in revenue from sales/distribution.





## Centre for Environment Concerns

CEC-SWAR's underground, gravity-based irrigation system provided moisture to plants at the root level. During their SWFF award, SWAR installed more than 16,400 sub-surface irrigation pots, with 90 customers and 450 users who have saved more than 116 million liters of water on 85 hectares of land in India. To the extent that weeds were eliminated in areas exclusively irrigated from below-ground, this benefited women who typically were responsible for weeding. Since exiting the SWFF program, SWAR sold more than 60,000 units, extending their reach to many water-scarce areas in India where farmers continued to see real water savings.



## ICU – Tunisia

ICU – Tunisia's buried diffuser provided underground irrigation that delivered water to plants at the root level, and lessened the likelihood of water loss from evaporation. During their SWFF award, ICU – Tunisia facilitated the sale of more than 12,500 buried diffusers to 37 customers on 28 hectares of land. Use of this irrigation technology saved 6.5 million liters of water, and based on reported harvests, increased crop yields by 40 percent. ICU – Tunisia faced the challenge of having a technology that was more expensive than end-users were willing to pay and fell short of its SWFF targets on customer adoption. With SWFF technical assistance, the buried diffuser team was able to identify alternative ways to reach some target customers.



## ICU – Jordan

The Groasis Waterboxx, from ICU – Jordan, was a 20-liter box that was placed around a young seedling at transplanting. The box created a water column under the plant through the collection of dew and rainwater and distributed it over a long period of time to avoid evaporation. During their SWFF award, ICU – Jordan sold 335 Groasis Waterboxxes. With 89 overall users growing trees and vegetables at these organizations, the Waterboxxes saved more than 30,000 liters of water and increased crop yields by 20 percent on 3.8 hectares of land. ICU – Jordan faced the challenge of building a strong and trusted working relationship with their technology provider partner. The technology provider did not want to implement facets of the SWFF-supported sales and marketing strategy. Specifically, they did not want to modify the prices which would make them affordable for smallholder farmers and medium sized farmer groups. As a result of this and other issues, ICU – Jordan chose to terminate their SWFF award and end their partnership with the technology provider.



## MetaMeta (WaterPads)

The WaterPads innovation was a sandwich of paper and jute with an inner layer of granular polymers in dry form. The polymer absorbed 100 times its own weight of water, and when placed at the root zone of plants ensured an efficient use of water and nutrients. MetaMeta-Waterpads ran trials in seven locations that involved 226 users of the technology in refugee areas of southern Turkey, 175 of which were of Syrian origin and below the poverty line. Use of WaterPads increased crop yields in cucumbers and peppers by 21 percent. In partnership with Arba Minch University and the Gambella Eco Hub in Ethiopia, MetaMeta started two farmer demonstration trials in Ethiopia. However, MetaMeta faced significant purchase and logistical hurdles during implementation, and was unable to meet their targets for customers/end-users and hectares of land under these improved practices.





## Islamic Relief Kenya

AgroSolar Irrigation was a solar powered drip irrigation system built to support farmer cooperatives in Kenya. Islamic Relief Kenya (IRK) linked potential users to training and financial service providers, who in turn offered loans to cooperative members to acquire the technology. The system was ultra-efficient, saving approximately 80 percent of the water used in furrow irrigation, and delivering water and fertilizer directly to crop roots. The utilization of clean energy services over diesel water pumping practices resulted in a cost and labor savings of almost \$14,000 per acre. The innovator partnered with the technology company, SunCulture, to bring its AgroSolar Irrigation System to farmers located in Mandera County, Kenya. To make the irrigation systems affordable for farmers, IRK organized them into group savings and loan associations (GSLAs). During their SWFF award, IRK reached 134 group members and 804 end-users who fell below the poverty line.



## TAHMO

The TAHMO weather system was the first continent-wide weather network that allowed free data to non-commercial users, including researchers. The innovative, solar-powered sensor system delivered accurate, localized, and timely meteorological and water resource information to farmers multiple times per day via a mobile device. The network aimed to enhance food security and reduced the risk to smallholder farmers that relied on rain-fed agriculture to cultivate crops, though SWFF never received evidence that substantiated this claim.



## MetaMeta (Salt Tolerant Potato)

MetaMeta, a Netherlands-based development consultancy, partnered with SaltFarmTexel to introduce salt-tolerant potatoes to the Pakistani market. Their salt-tolerant potato crop offered an alternative to farmers in Pakistan that lived on salt-affected soil. During their SWFF award, MetaMeta introduced salt-tolerant potatoes on 13 hectares of salt-affected land in Pakistan, involving 381 farmers in production. The project reduced water consumption by more than 75 million liters compared to traditional agricultural practices. In addition, MetaMeta clients produced 147 tons of potatoes that were either consumed by farmers or saved as seed for the next growing cycle. Some of the seed potatoes achieved yields as much as 65 percent higher than conventional varieties grown in non-saline soils. Since exiting the program, MetaMeta and Salt Farm Texel continued to expand the Salt Tolerant Potato project in Pakistan and trialed other salt tolerant crops (carrots and onions) in Bangladesh.





## Wageningen University & Research Institute

Researchers at Wageningen UR created a non-genetically modified salt-tolerant quinoa that grew in saline soils. This high-value super grain was available to farmers in areas impacted by high salinity. Wageningen UR sought to reduce freshwater consumption and food scarcity, reclaim unused or underused agricultural lands, and create new livelihood opportunities for smallholder farmers. Wageningen UR conducted field trials of the salt-tolerant quinoa in China and Vietnam, and set up tests to determine maximum salt level tolerance. In Chile, they harvested 60 hectares and, through their partner, signed an agreement with a production chain management company that licensed them to use the non-bitter varieties in the country. Wageningen submitted an EU-H2020 project proposal aimed to improve productivity of quinoa under abiotic stress conditions, as well as improve agronomy through extensive testing of genotype, environment, and management interactions. However, the organization was not able to meet SWFF targets for growth and scale.



## Puralytics

Puralytics pioneered a photochemical technology for water purification. The Lilypad provided both an environmentally safe and effective water treatment solution for cleaning ponds and managing catchment areas. The reusable, floating purifier continuously destroyed chemicals and micro-organisms and worked in man-made ponds and large diameter open tanks. Puralytics developed a strong relationship with Driscoll's, a berry producer in Mexico. Driscoll's agreed to serve as a demonstration partner to prove the Lilypad product. During the company's SWFF award period, goals included developing the value proposition for smallholder farmers, developing their business model, and identifying the minimum viable system that is affordable for their customers. However, the Lilypad demonstration project in Mexico failed and the total costs were well above what Puralytics expected.



## Deutsche Welthungerhilfe

Deutsche Welthungerhilfe e.V. combined a rainwater harvesting mechanism with greenhouse technology. In their focus country, Tajikistan, greenhouses enabled vegetable production from October to April, and significantly reduced the cost to consumers. They learned that their customers wanted a greenhouse twice their planned size so that multiple families could use the same one and cut down on operational costs. During the SWFF award period, seven greenhouses were completed. However, the organization was not able to meet SWFF targets for growth and scale.



## ARCADIS

ARCADIS's Freshkeeper subsurface water technologies wanted to provide an innovative and practical approach to freshwater management in coastal areas. The concept was that fresh and brackish water were pumped simultaneously from different depths to control the fresh-brackish intercept. During their SWFF award, ARCADIS completed an analysis for a business case in Mexico that highlighted opportunities for their product in the Mexican market. However, the project was severely delayed and never proceeded from planning to the implementation stage.



# SWFF PERFORMANCE MONITORING AND EVALUATION



# INNOVATOR PERFORMANCE MONITORING AND EVALUATION

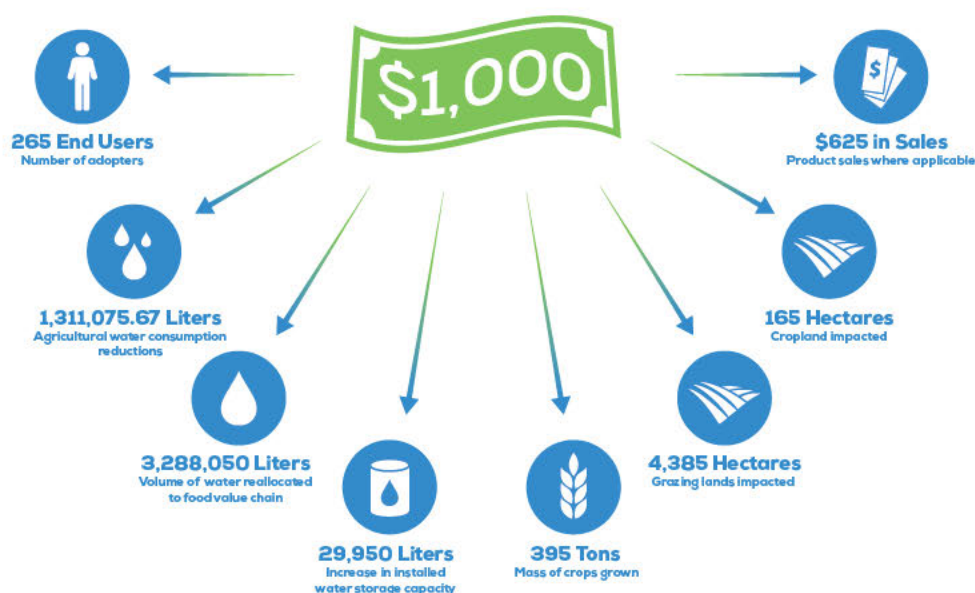
SWFF M&E support was divided into two portfolios. The first portfolio built SWFF innovator performance monitoring capacity and helped SWFF Team Lead Dr. Ku McMahan evaluate data quality and progress reported by SWFF innovators. The second portfolio helped the SWFF Founding Partners monitor the performance of the TA Facility, with results reported in the SWFF TA Facility Performance Monitoring Summary.

The SWFF M&E Specialist completed data quality checks on supporting documentation and conducted program-wide reviews of past data. SWFF also carried out monitoring and evaluation site visits to help innovators better understand end-users' needs and to independently validate reported data.

## SWFF impact per dollar

Since 2014, for every \$1,000 of donor funding spent by the SWFF program, SWFF innovators realized the following: impacted 265 end-users and customers; reduced water consumption by more than 1,300,000 liters; produced 395 tons of crops; improved water management on 165 hectares of agricultural land; and generated more than \$625 in sales. Those numbers are indicative of a high rate of return on investment in terms of environmental benefits, boosting crop yields, reducing water usage and impacting end-users that is not typical in international agricultural development programs. In fact, many other development programs focused on agriculture have significantly smaller returns on investment in comparison to SWFF's expenditures. They also reflect the continued scaling of SWFF impacts, as most of those metrics consistently rose throughout SWFF.

## ACTIVE INNOVATORS' IMPACTS PER \$1,000 OF SWFF FUNDING (2014 – 2020)





# INNOVATOR TREND ANALYSIS

SWFF innovators were required to meet ambitious growth targets, which included reaching significant numbers of customers, reduced water consumption in agriculture, and increased crop yields. Those that did not meet their targets transitioned to “alumni” status and no longer received program funding nor technical assistance.

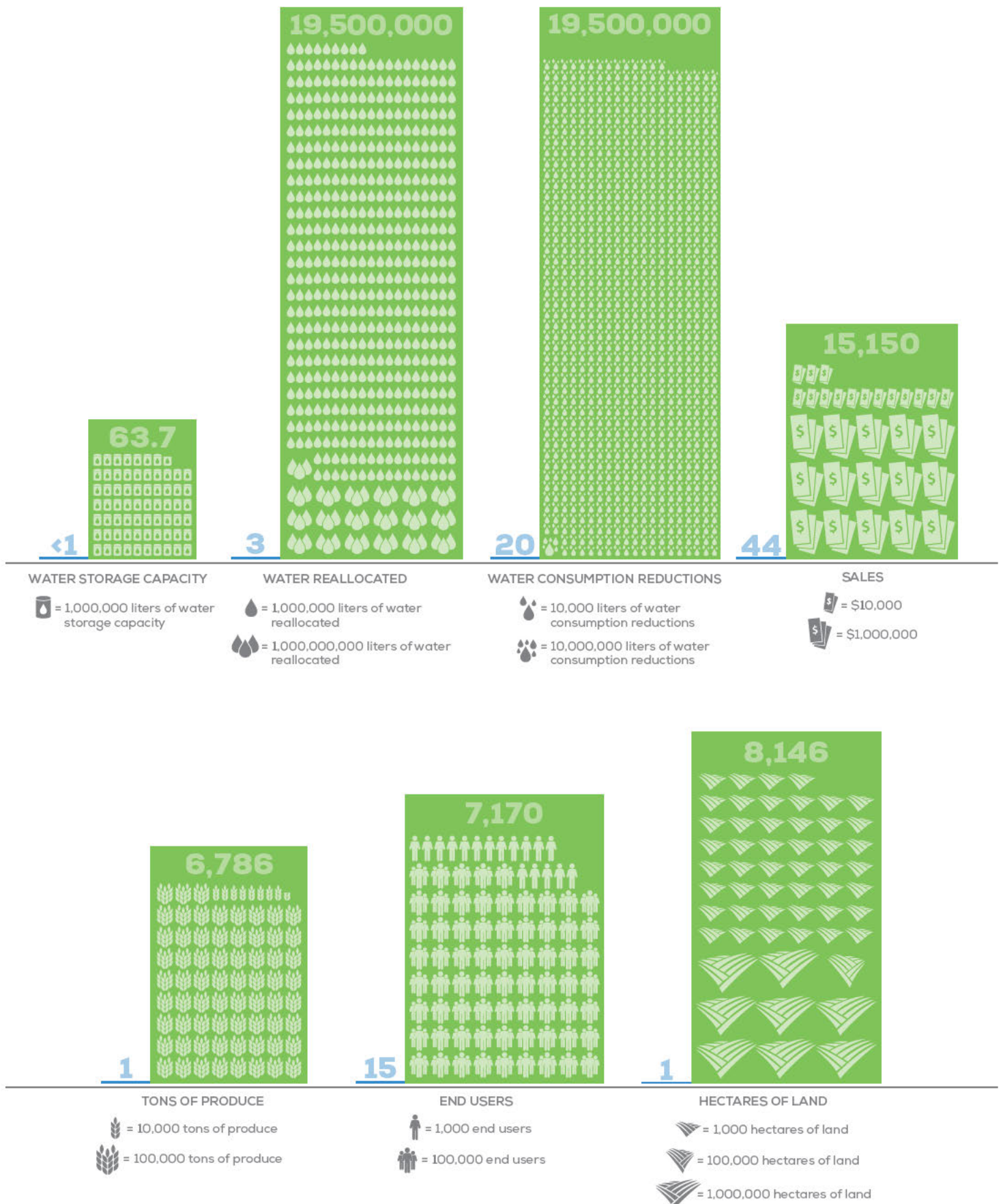
Overall, 18 innovators exited the program and became alumni, and 21 graduated from the program. Looking across seven key indicators noted in the graph below, it was clear that graduate innovators significantly outperformed those that exited the program. Since 15 of the 18 alumni exited the program after one year, the graph below only compares progress of those alumni innovators during their first year in the SWFF program.





## IMPACT OF GRADUATE INNOVATORS VS ALUMNI INNOVATORS (2015 – 2020)

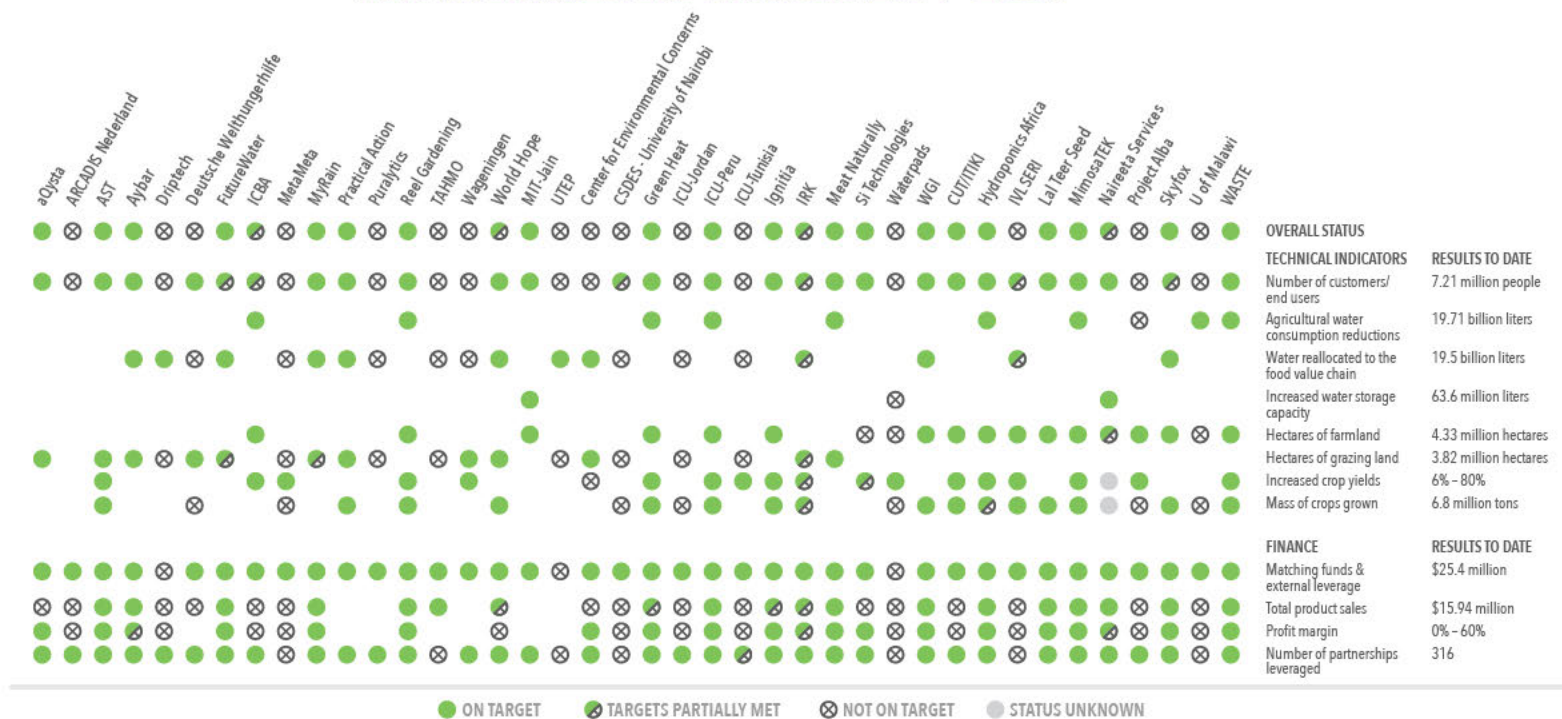
● Alumni ● Graduate





Overall, SWFF innovators have made significant progress toward achieving and reporting their milestones. Innovators are considered to be “on target” if their cumulative results to date meet or exceed their cumulative targets. Out of the six Rd. 3 innovators, five were on target for all indicators except total product sales. For that indicator, all innovators except Water Governance Institute either partially met or did not meet the target. Si Technologies International was the only innovator that did not meet targets on multiple indicators (increased crop yields and hectares of farmland), but the IIAC determined that the organization had made significant progress and deemed it a graduate of the program.

### INNOVATOR MILESTONE PROGRESS (2014 – 2020)



Three Rd. 4 innovators met all targets (Hydroponics Africa, Lal Teer Seed, and WASTE Stichting). Three innovators (CUT/ITIKI, Mimosatek, and SkyFox) missed one target. SWFF is awaiting results from Naireeta Services to determine their target achievements.



# Pivoting to Survive in South Africa: An Unusual Innovation Finds a Way

Dr. Muthoni Masinde ran the CUT/ITIKI program in Bloemfontein, South Africa. Her program also covered farmers in Kenya and Mozambique. An unusual but proven aspect of her business was predicting weather patterns in specific regions by combining scientific forecasting techniques and indigenous knowledge gained over centuries.

As with many businesses, hers has struggled in its quest for sustainability and scalability. Recognizing this, last year Dr. Masinde pivoted to a more aggressive strategy to widen her net. Previously, her company had been signing up farmers for the service mostly on an individual farmer basis. With some guidance and team training from the SWFF TA Facility, ITIKI has moved on to business to business (B2B) and business to government (B2G) models. Her targets were regional governments and institutions such as micro-financing businesses where the opportunity to reach more clients at one time increases exponentially.

"It's a slow and difficult process," said Dr. Masinde, "But we can reach more potential clients. One such area of interest is South Africa's farming province, Limpopo."

"If the local government can subscribe on behalf of the farmers, then we are talking about thousands of farmers in one subscription," she added.

"Food security is the main marketing message we use. In one area we target, 80 percent of the people rely on agriculture and the success of their harvests," said Dr. Masinde. "If they do not have sufficient yields, the government must look to feed the people."

While the idea to pivot to a B2B strategy came to Dr. Masinde early on, the question of just how to accomplish this was a product of the SWFF program, and the experts it employed to provide guidance.

"Getting to the B2B customer has been our biggest challenge, but the technical assistance received—funded by SWFF—has made us ready to reach out," she said.

Dr. Masinde brought in team members from Kenya, Mozambique, and South Africa to guarantee all were up to speed. They also attended meetings with an India development team from one of SWFF's technical support vendors, Sattva.

"Their central idea was to ensure that when we speak to governments or companies seeking partnerships, we sell using the same messages," said Dr. Masinde.

Dr. Masinde was effusive in her praise of the assistance given by the SWFF program.

"It's been so complete. In fact, I keep saying that SWFF has given us as a company everything we needed for success," she said.

"They even helped us with our marketing and our branding. I don't know what we would have done without them. They opened our eyes to almost everything we needed."

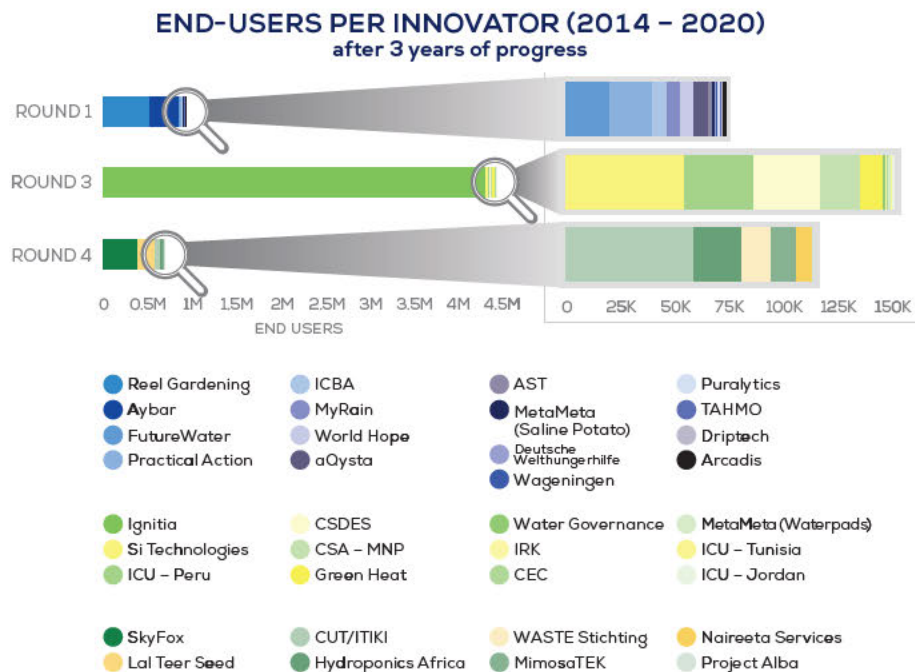




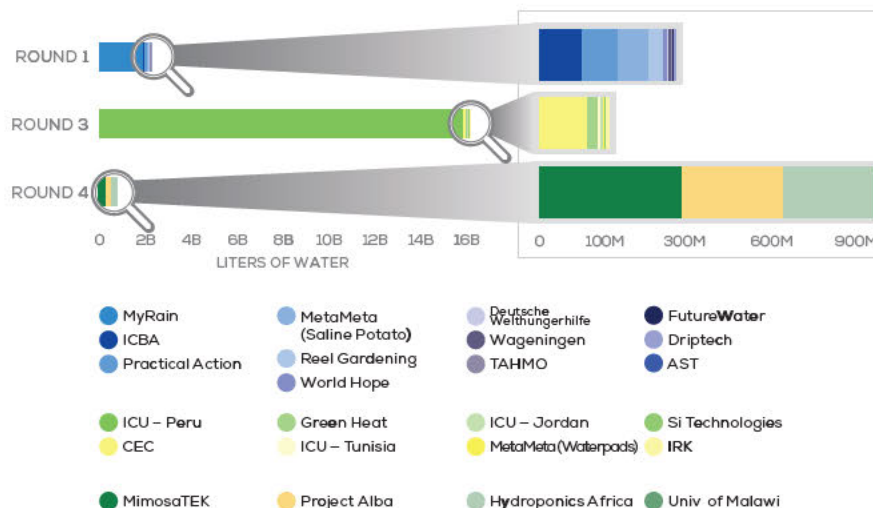
# End-users per innovator

To provide a fair comparison across all three SWFF grant rounds, the following charts tracked the completed three years of progress of graduate innovators. This allowed SWFF to compare and track the progress in various metrics throughout the three years each of the 28 SWFF Rd. 1, Rd. 3, and Rd. 4 innovators. It also allows us to see which innovators were the major contributors to their respective metrics by round and overall.

The chart showed that most innovator impact was achieved by three innovators with a combined 6.4 million customers and end-users: in Rd. 1, Reel Gardening (416 customers per \$1,000 spent) and Aybar Engineering (297 customers per \$1,000 spent); in Rd. 3, Ignitia (1,655 customers per \$1,000 spent); and, in Rd 4, SkyFox (104 customers per \$1,000 spent) and Lal Teer Seed (170 customers per \$1,000 spent). Because Reel Gardening, SkyFox, and Ignitia were Tier 2 innovators that received increased grant funding, it was expected that the organizations would have more impact than smaller Tier 1 organizations.



## AGRICULTURAL WATER CONSUMPTION REDUCTIONS PER INNOVATOR (2014 – 2020) after 3 years of progress



### Water impact of SWFF innovators

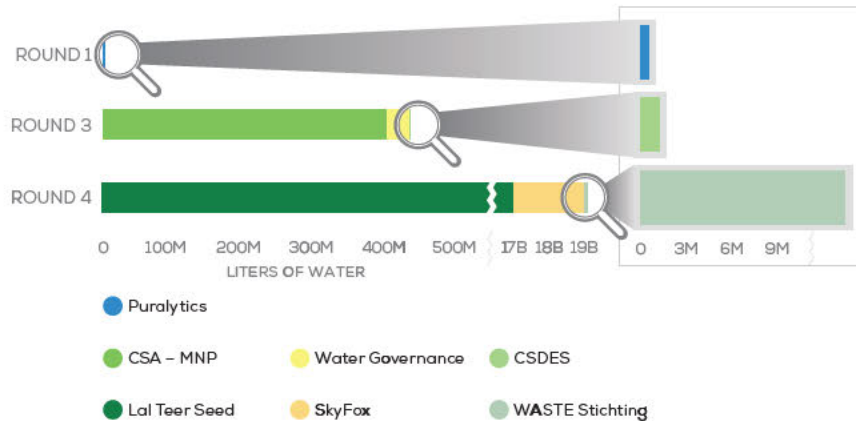
SWFF innovators reduced water consumption and increased the re-allocation and re-use of water via a variety of methods. All but five graduate innovators in the program operated in rainfed areas with innovations that increase crop yield per amount of water input. Those types of efficiency gains were not quantified as water gains per se, but rather as a percentage crop-yield increase, as shown in the Innovator Milestone Progress chart.

To provide a fair comparison across all three rounds, the chart for each water metric examined the water impact for all SWFF innovators. Of the 19 billion liters of water consumption reductions achieved through SWFF innovations during the awarded three years, 17.9 billion liters of the reductions came from two innovators: MyRain in Rd. 1 and ICU – Peru in Rd. 3.

In each of the three rounds, one innovator dominated agricultural water consumption reductions {MyRain in Rd. 1, Institute for University Cooperation – Peru (ICU – Peru) in Rd. 3, and MimosaTEK in Rd. 4} with MyRain and ICU – Peru maintaining dominance and accounting for nearly 85 percent of reductions across all innovators. ICU – Peru and MimosaTEK are both irrigation scheduling systems designed to reduce irrigation water use by more than half for intensive crop production. This suggested that investments in water conservation technologies that have a technical emphasis on saving irrigation wastewater excess have disproportionate results in agricultural water consumption reductions. Moving forward for future programs, this was an important lesson regarding which technologies and investments are optimal for areas of water scarcity and stress.



## VOLUME OF WATER REALLOCATED PER INNOVATOR (2014 – 2020) after 3 years of progress

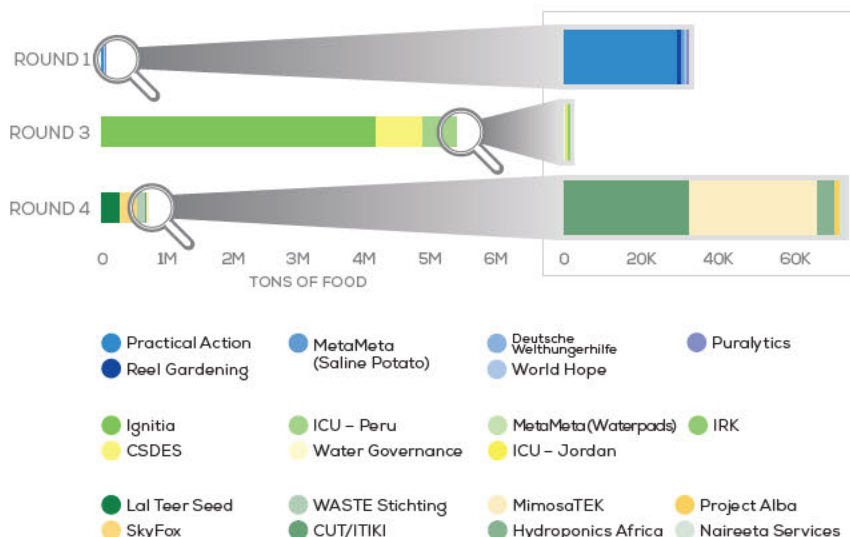


Water reallocation was a SWFF impact in terms of magnitude. Nearly 20 billion liters of water were reallocated in total. Lal Teer accounts for the majority of that amount, having re-allocated nearly 17 billion liters, while SkyFox reallocated more than 2 billion liters of water over three years. These Rd. 4 innovators' improvements were due in large part to the support provided by SWFF IIAC member, Dr. Beverly McIntyre, who helped review water metric calculations.

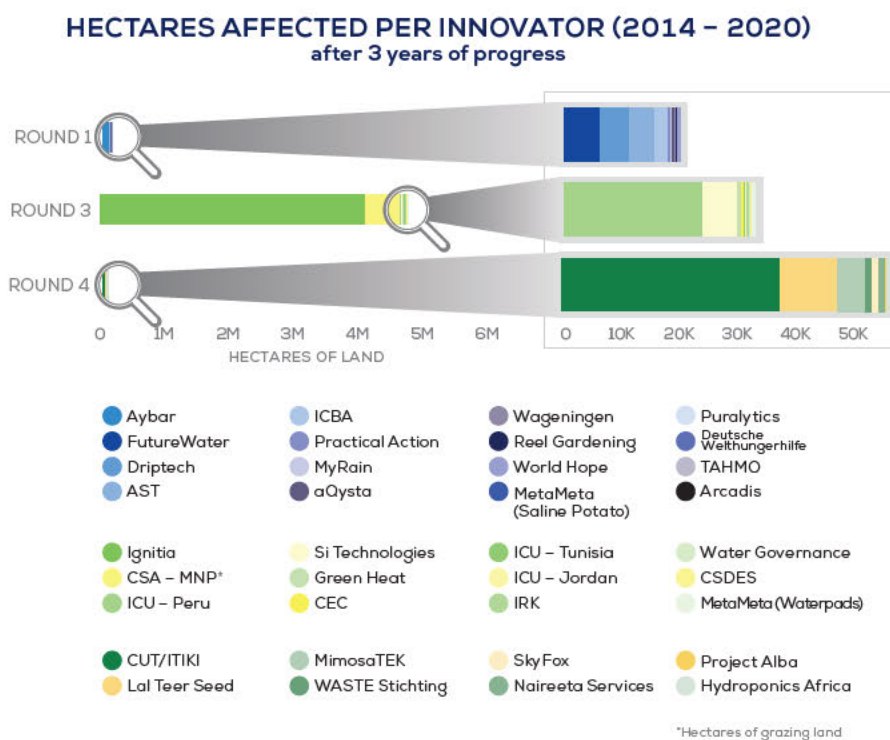
## Agricultural impact of SWFF innovators

SWFF's impact on crop yields was partially determined by the tons of produce that farmers grew using SWFF innovations. The vast majority of SWFF's impact in this regard comes from four innovators, Ignitia, ICU - Peru, SkyFox, and Lal Teer Seed, whose innovations account for nearly 95 percent of the tonnage produced during the SWFF program. ICU - Peru's comparably high tonnage of produce comes from the efficiency of their water scheduling system and their customer base (comprised mostly of commercial, irrigated farmers). Ignitia's scale of impact has reached more than 1 million households in four West African nations through their subscription-based SMS weather forecasting service. In terms of investing for an impact on crop yield and for future programs focusing on food security in particular, irrigation technology and technologies with potentially large subscriber bases are clearly impactful.

## MASS OF CROPS PER INNOVATOR (2014 – 2020) after 3 years of progress



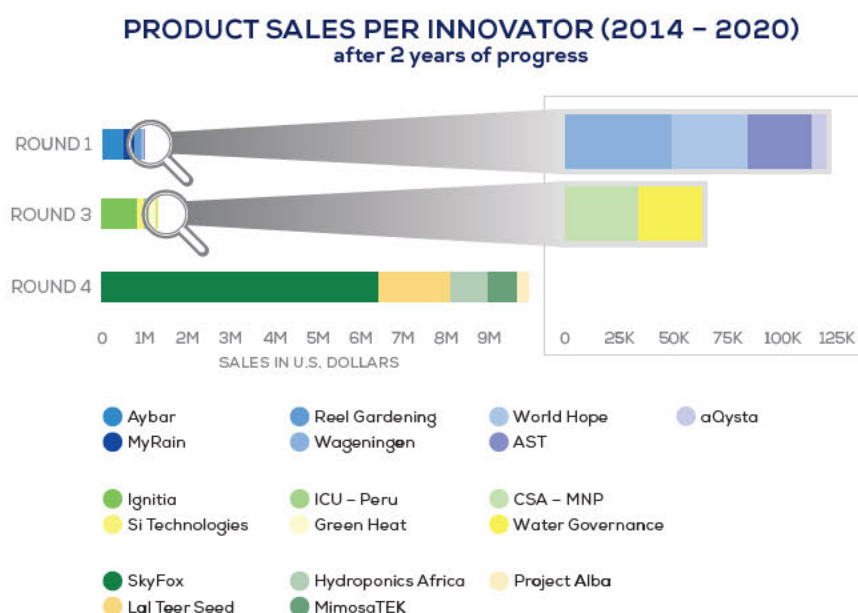
SWFF's impact on grazing and agricultural lands was concentrated among three innovators: Aybar Engineering in Rd. 1 and Meat Naturally and Ignitia in Rd. 3. Aybar Engineering and Ignitia affected agricultural land through their broad user bases, while Meat Naturally's innovation brought vast swaths of communally grazed land under improved management. Meat Naturally greatly expanded rangelands with more efficient management, transport, and slaughter methods throughout South Africa and Botswana, while Aybar (with its broad based furrow maker) utilized row crops with large portions of irrigation farmland. When considering future programming aimed at conservation efforts, investments in rangelands have the maximal impact on improving land usage. Funding technologies that cultivate more soil also brings more land into cultivation and impacts farmers.





## Product sales impact of SWFF innovators

Among SWFF innovators that sold products, sales were much more evenly spread across all innovators as compared to other SWFF metrics noted above. Four Rd. 1 innovators (Aybar Engineering, MyRain, aQysta, and Reel Gardening) and six Rd. 3 innovators (Ignitia, Meat Naturally, Si Technologies International, ICU – Peru, Water Governance Institute, and Green Heat Uganda) each sold a total product volume worth more than \$150,000 over three years of operation. Rd. 4 innovators made more progress than all other innovator groups, with five innovators (MimosaTEK, SkyFox, Lal Teer Seed, Hydroponics Africa, WASTE Stichting) that each sold a total product volume of more than \$500,000. Two out of the seven graduate innovators did not meet their product sales targets. The sales target was the most common target missed. The reasons for this range from not having a marketable product ready (as was the case for CUT/ITIKI); high product sales targets (more than \$7.5 million for SkyFox); and an under-production of rainwater storage units due to high failure rates and adverse weather conditions (Naireeta Services).







Innovators were split into two tiers. Tier 1 winners received awards of \$500,000 and Tier 2 winners received awards of no more than \$2.5 million. There were substantial differences in impact per dollar between tiers.

Excluding technical assistance, SWFF funded \$18.6 million in Tier 1 awards and \$7.1 million in Tier 2 awards. Tier 2 awardees served significantly more end-users and impacted significantly more produce per dollar of donor funding than innovators that received Tier 1 awards. This was likely due to economies of scale, with Tier 2 innovators farther along the commercialization pipeline than Tier 1 innovators.

#### END USERS (2014 – 2020) per \$1,000 of SWFF funding



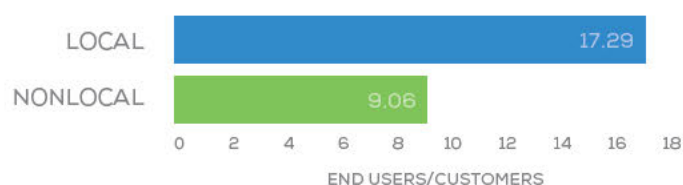
#### TOTAL TONS OF CROPS PRODUCED, BY TIER (2014 – 2020) per \$1,000 of SWFF funding





Receipt of either Tier 1 or Tier 2 funding did not have a significant impact on hectares of land affected or product sales generated per dollar of donor funding. However, Tier 1 innovators reduced water consumption significantly more per dollar of donor funding than Tier 2 innovators. The large Tier 1 reductions in water consumption per dollar were largely due to a single Tier 1 innovator that generated 67 percent of the entire SWFF program's accumulated total. Even with that outlier removed, Tier 1 innovators reduced water consumption by 1,505,087 liters of water per \$1,000 in donor funds. This greatly exceeded Tier 2 water impacts.

### MEDIAN NUMBER OF END USERS IMPACTED, BY LOCALITY (2014 – 2020) per \$1,000 of SWFF funding



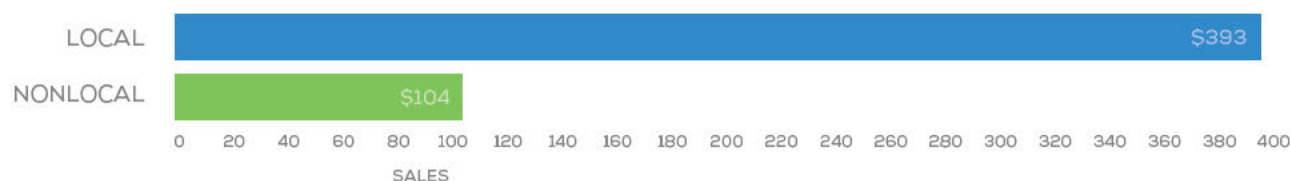
The SWFF program classified innovators as either “local” or “non-local” depending on whether innovators’ headquarters and leadership were located within the country impacted by the innovation.

Among Tier 1 innovators, local innovators served more end-users than non-local innovators, as indicated by median sales. However, there wasn’t a large difference between innovators’ achievements in median tons of crops or hectares per \$1,000 of SWFF funds, with the exception of sales, in which Tier 1 innovators had 48 percent more in product sales than Tier 2 innovators (per \$1,000 of SWFF funds).

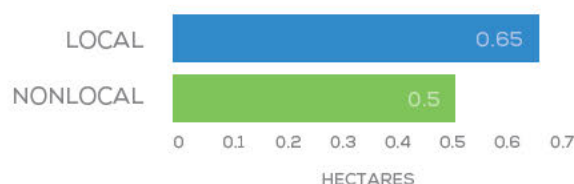




### MEDIAN SALES, BY LOCALITY (2014 – 2020) per \$1,000 of SWFF funding



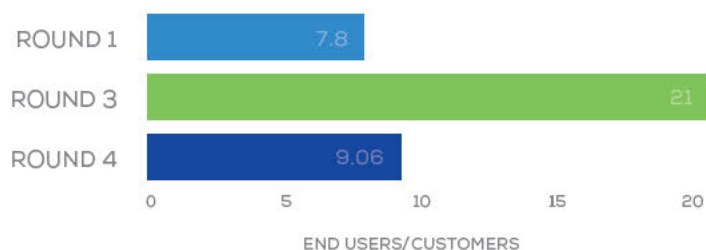
### MEDIAN HECTARES IMPACTED, BY LOCALITY (2014 – 2020) per \$1,000 of SWFF funding



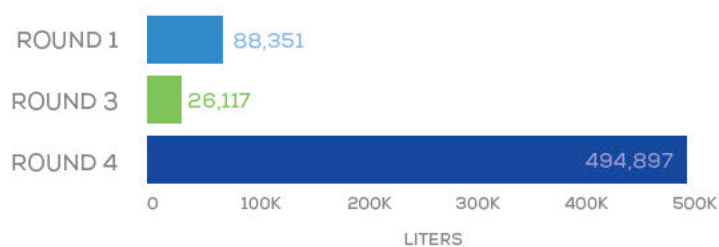
Analyzing innovators by round of entry into the program showed that the median innovator accepted into Rd. 3 of the program served more end-users and affected more land than Rd. 1 innovators. The median Rd. 1 innovator reduced water consumption more than the median Rd. 3 innovator but achieved similar sales. Rd. 4 innovators outperformed Rd. 1 and Rd. 3 in median tons of crops, hectares impacted, sales, and agricultural water consumption reductions. This was due to many factors, including: SWFF's focus on reaching more customers/end-users for Rd. 4 innovators; more targeted technical assistance for sales/marketing strategies for Rd. 4 innovators as compared to Rd. 1 and Rd. 3 innovators; and stronger relationships and more trust between the SWFF staff and Rd. 4 innovators as compared to Rd. 1 and Rd. 3 innovators, which led to the uptake of more SWFF technical assistance recommendations.



**MEDIAN NUMBER OF END USERS IMPACTED, BY ROUND (2014 – 2020)**  
per \$1,000 of SWFF funding

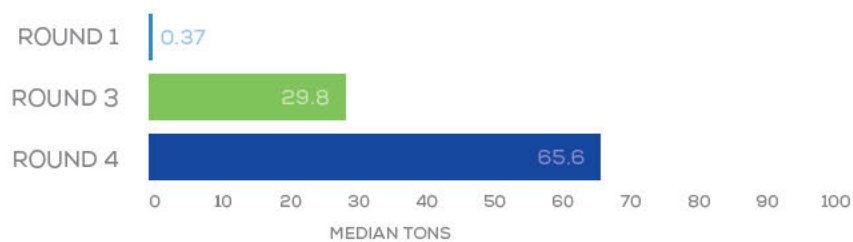


**MEDIAN AGRICULTURAL WATER CONSUMPTION REDUCTIONS, BY ROUND (2014 – 2020)**  
per \$1,000 of SWFF funding



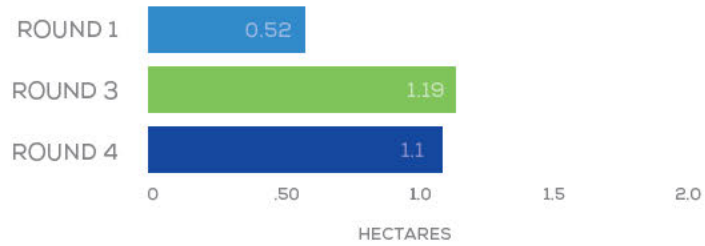


**MEDIAN TONS OF CROPS PRODUCED, BY ROUND (2014 – 2020)**  
per \$1,000 of SWFF funding

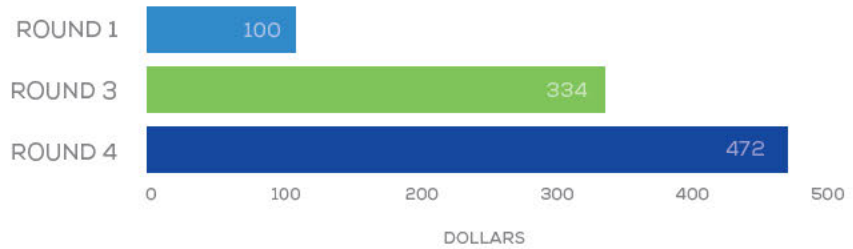




**MEDIAN HECTARES IMPACTED, BY ROUND (2014 – 2020)**  
per \$1,000 of SWFF funding



**MEDIAN SALES, BY ROUND (2014 – 2020)**  
per \$1,000 of SWFF funding





# Feeding a Growing Nation: It's In Lal Teer's DNA

Lal Teer Seed Ltd., a SWFF Rd. 4 Innovator, wanted to make sure Bangladesh's population of 165 million was sufficiently fed. It was no small task for this socially-attuned family enterprise, but they welcomed the challenge. They saw giving back to this mostly rural nation as simply part of their DNA. Bangladesh fostered Lal Teer's ability to grow and expand such that, at the time of this report, it was the largest seed company in the nation.

One of Lal Teer's initiatives was in the area of women's empowerment. By and large, Bangladeshi women fulfill traditional roles as housewives and child caretakers. A decade ago, the Lal Teer leadership asked, "what if we could provide seeds such that each woman could grow sufficient plants around their home to feed families and barter with neighbors?"

The program was launched, and its success was marked by healthier lives, educational opportunities, and more inclusion of women in farming activities. "The women became small stakeholders," said Tajwar Awal, a Lal Teer technical director and business development officer who was active in the company's corporate social activism. "They even provided the family money by selling the product at the market."

Lal Teer got the word out about advances in its seeds and overall best practice farming through various extension programs. Its seeds were distributed two ways—either a few seeds in mini-packets for family use or multiple seeds of the same

variety in a larger packet for selling vegetables at the market. The company's outreach to women was helped along by piggy-backing with a previous USAID project called "Info Lady," in which specially-trained women would go into rural areas on bicycles. They would advise other village women on numerous health initiatives, even connecting them with doctors by email or telephone. Though they were still assessing the project's impact in 2020, they knew that it empowered women to become more prominent in society.

"Our main agenda is to empower the farmers of Bangladesh," said Awal. "The only way we can alleviate poverty is at the grassroots level, helping farmers help themselves," he said. Awal added that Lal Teer doesn't simply look at the bottom line. "We're good business people, but we don't just look at making a profit," he said. "We also consider the social aspect. Fighting for our country is our first priority. This means giving farmers the tools—in this case, seeds—to fight salinity, pests, and too much water, in growing healthy crops so farmers can afford to farm and not flock to urban areas."





## Progress in scaling

SWFF aimed to fund innovations that reached increasing numbers of end-users through market-sustainable channels, so that after donor funding ended, innovations continued to grow, either through the awarded organization or through replication in a local context. Every six months, innovators ranked their organizations along six scaling dimensions. They reported changes in areas such as the policy environment, plans to scale, and affordability of products in their target markets. SWFF reviewed those individual ratings and then combined them into a weighted Solver Scale-Up Score that tracked scaling potential over time. This allowed SWFF to track innovator progress and alter technical assistance when an innovator's progress toward scale faltered.

Composite scores of graduate SWFF innovators after their first year in the program diverged significantly from those of alumni. With a median score of 2.25, half of the graduate innovators had a higher rating than the highest-scoring alumni. This divergence was largely due to reported differences in affordability, cost structure, and customer-base growth.

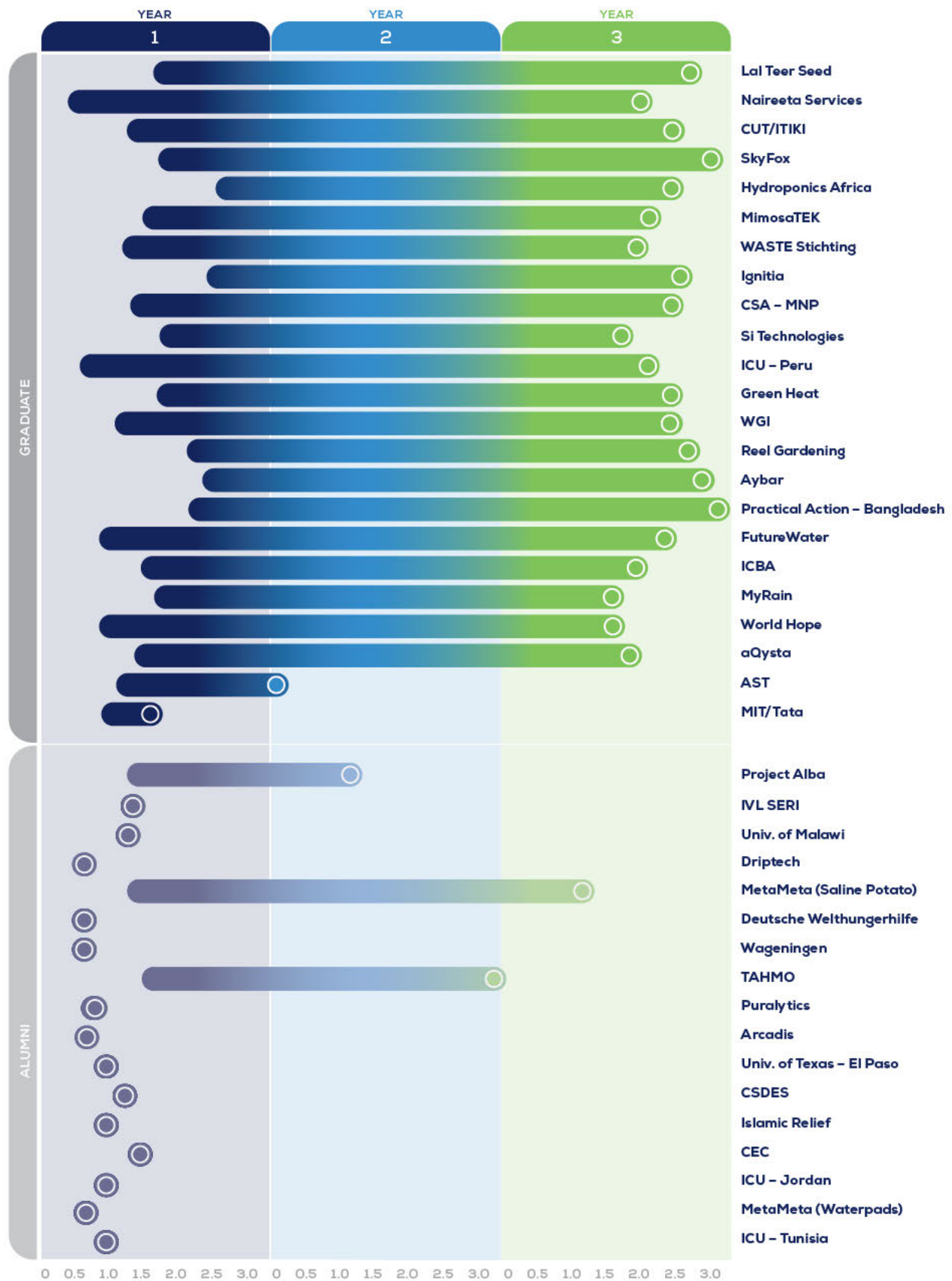
Seventy percent of graduate innovators had a growing customer base with more than 1,000 end-users, compared to only 7 percent of alumni. After Rd. 1, SWFF refined its selection criteria for new innovators, moving away from funding organizations still piloting innovations and toward funding organizations that could serve a minimum of 10,000 end-users within three years.

This shift was apparent in the early progress of Rd. 1 innovators as compared to Rd. 3 innovators. After three years, the median Rd. 1 innovator had a composite rating of 1.5 versus a median of 2.6 among Rd. 3 innovators. Rd. 4 innovators had a median rating of 2.25 after three years, similar to that of Rd. 3 innovators.

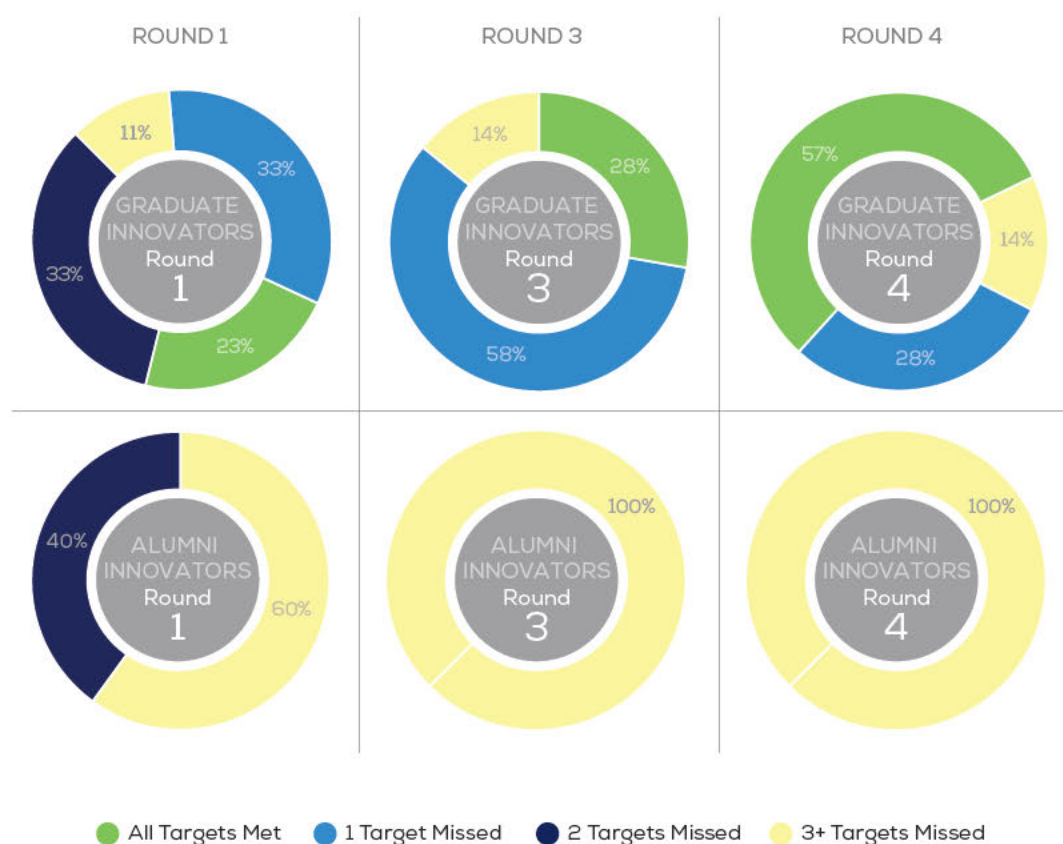




## GROWTH IN INNOVATOR SCALING SCORE FOR LENGTH OF PROGRAM PARTICIPATION (2015 - 2020)



## SWFF INNOVATORS' TARGET ACHIEVEMENT (2014 – 2020) by round



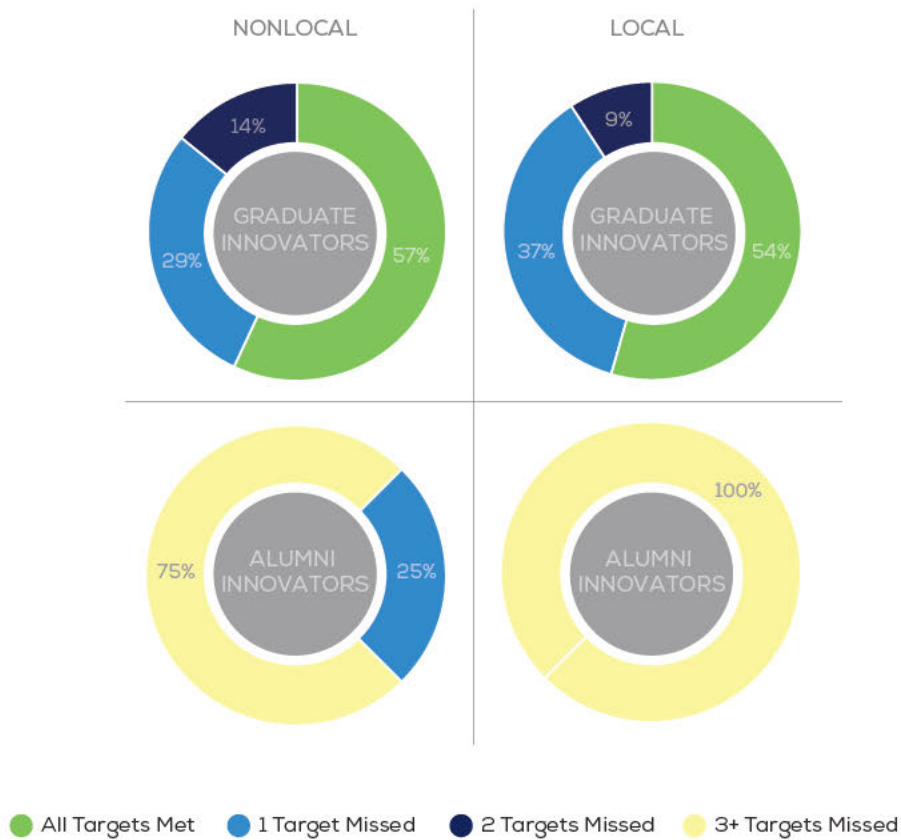
### Target achievement

SWFF monitored progress through 25 program indicators, 10 of which were binding and used to decide whether innovators progressed to the next year's funding. To progress, innovators were expected to achieve 80 percent of each binding target and miss targets in no more than two indicators. This general criteria was used to guide funding decisions, with an allowance for the IIAC and the Founding Partners to deviate from the recommendations where external circumstances negatively impacted otherwise sound innovations.

When viewed according to the round in which innovators entered the program, graduate Rd. 3 innovators excelled, with 86 percent having met all targets or all but one target, as compared to 67 percent of graduate Rd. 1 innovators that met all or all but one target. All Rd. 1 and Rd. 3 alumni missed three or more targets. In contrast, 60 percent of Rd. 1 alumni missed three or more targets. In SWFF's final program reporting period, 85 percent of Rd. 4 graduate innovators also excelled and met all targets or all but one target.



## SWFF INNOVATORS' TARGET ACHIEVEMENT (2014 – 2020) by origin



When categorized according to their origin, local innovators on average achieved more of their targets to date than non-local innovators. Given the special circumstances surrounding the alumni who missed only one or two targets, it is unclear whether their origin played any role in their level of success.

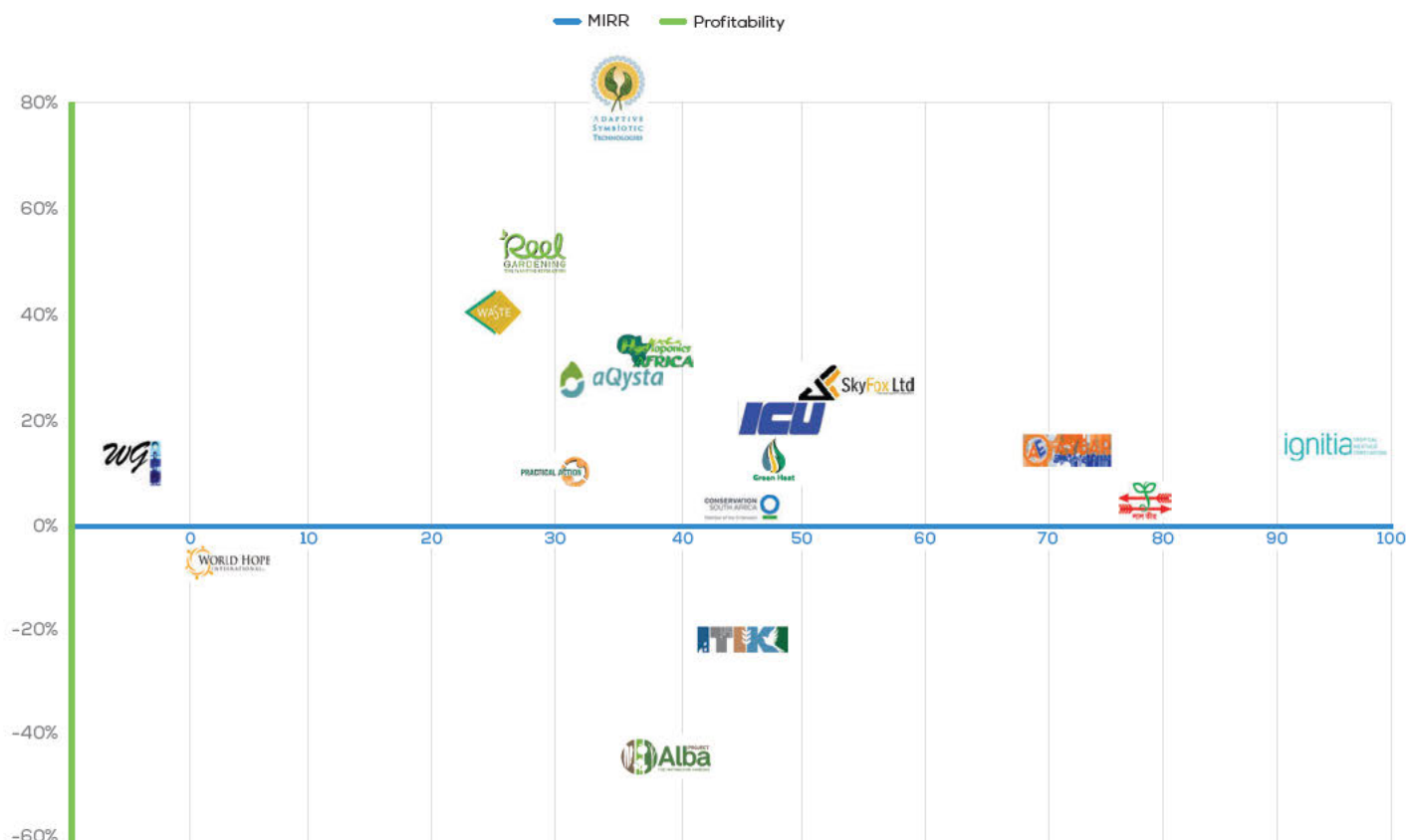
# INNOVATOR SOCIAL RATE OF RETURN

To develop a more scientifically rigid metric to measure the performance of the SWFF portfolio, 17 social rate of return analyses (SRORs) were performed out of the 29 graduate innovations representing 92 percent of total SWFF customers/end-users. SRORs measured, from the individual customer/end-user perspective, both the economic gains and the non-economic benefits from investments into SWFF technologies. An acceptable rate of return for foreign aid programs is between 10 and 20 percent. The SWFF portfolio returned an average of 41 percent return on investment, which was quite high even for private sector foreign investment. On average, for more than 7 million customers and end-users, SWFF programs resulted in a net annual farmer income increase of \$1,833, over 3 years of SWFF programming, and will have added more than \$1 billion over 9 years to the economies of 10 nations, based on a \$35 million dollar investment. This was achieved with a modest increase of 8 percent in input usage for SWFF farmers because of the resulting switch to more lucrative crop production patterns and high initial annual crop yield increases from SWFF technologies. As validated by the SWFF external evaluation, SWFF believed this was due to the milestone-based funding paired with technical assistance.





## SOCIAL RATE OF RETURN



The SROR was calculated by taking the incremental Net Present Value of SWFF's 3-year funding for an innovator annualized over 9 years. This was done by analyzing the change in uptake and attrition, income, crop yield, loan amounts, and input usage/costs (based on individual innovation external evaluations). Most often this data was provided over the 3 years of SWFF programming from farmers using the innovation and combining macroeconomic indicators such as currency exchange rates, domestic and international inflation rates, and crop price sensitivity to determine the Modified Internal Rate of Return which determines the returns on investment of funding.

As can be seen in the Social Rate of Return chart, there was a wide range of modified internal rates of return (MIRRs) for SWFF innovators. Some innovators had extremely high rates of return. Ignitia's (93 percent) high MIRR stemmed from having a low cost, high impact innovation that greatly lowered production costs and increased crop yields and incomes for their beneficiaries. Likewise, Lal Teer Seed with an MIRR of 79 percent had a great expansion in uptake, significantly reduced fuel and water costs, and had a high increase in crop yield and doubling of income made possible by providing small loans to their farmers.

Others had much lower rates of return. WGI (-5 percent) and World Hope (3 percent) ranged from having negligible impact on input usage and incomes for farmers and having low adoption numbers for the former and these factors combined with high attrition rates of 45 percent in the latter. As noted above, the average rates of return for the individual SWFF projects and the SWFF program as a whole were much higher than average agriculture development programs.

# SWFF FIELD EVALUATOR PROGRAM

During the first years of the SWFF program, all monitoring and evaluation activities were conducted by Dr. Ku McMahan and the TA Facility team. Between 2015 and 2017, nearly 30 site visits were conducted. Evaluating all active SWFF innovators was a taxing task and the team had limited bandwidth and time to interview a representative sample of customers/end-users for each specific SWFF innovation. In order to evaluate a larger sample of SWFF innovations with a representative sample of customers/end-users, SWFF piloted the Field Evaluator Program in the spring of 2017. This program brought in Master's and Ph.D. level students or recent graduates from all over the globe to conduct in-country, external field research of a SWFF innovator using SWFF established guidelines and research questions. SWFF successfully implemented the program in the following years, with the number of deployed field evaluators increasing from two in 2017 and 2018, to nine sent to evaluate 11 SWFF innovations in 2019. Evaluators spent up to eight weeks in the field verifying data and directly interviewing a minimum of 50 customers/end-users. At the conclusion of their field research, field evaluators submitted a final thought leader report which was then published on the SWFF website.

The contributions of field evaluators were significant. Field evaluators assisted the program with verification of field data and helped innovators better understand their customers and pivot accordingly in the near-term, as well as enhance their credibility with external sources of private and public assistance in the long-term. Innovators have shared the reports internally within their organizations, including their sales and research and development teams, and shared them with external parties such as investors, funders, and projects that requested verification of the innovations' impact. In 2019, SWFF field evaluators conducted a performance assessment of 11 SWFF innovations.

## aQysta

Field interviews were conducted from July 16, 2019 to August 30, 2019, during which time data was collected on the Barsha pump's impact on end-users' farming activities, income, experiences with and thoughts on the innovation, and suggestions for improvements. The study found that approximately 80 percent of the end-users interviewed felt that the Barsha pump has been beneficial to them. Customers/end-users noted the main benefit was the lower costs of inputs due to the pump using zero energy. More than half the interviewees experienced a positive change in the survival rates, yields, and diversification of their crops. Ninety-four percent said that they would recommend the pump, and plan to continue using it in the future.





## Adaptive Symbiotic Technologies

Interviews with 50 innovation users and field observations were conducted in July and August 2019. The findings showed that a majority of innovation users experienced an increase in crop yields, crop survival rates, and water efficiency. Although increases in crop yields and crop survival rates can be attributed to multiple factors (such as seasonal variations in rainfall, temperature, and wind), comparisons of pre- and post-treatment harvests under similar conditions implied that benefits primarily can be ascribed to AST's BioEnsure innovation.

## Aybar Engineering

Interviews with 50 end-users of the Aybar BBM were conducted in nine villages in the West Shewa Zone of Oromia National Regional State in Ethiopia, where farmers have used the innovation for four years. After the innovation, the average yield of wheat increased by 115 percent (from 0.26 MT/acre to 0.57 MT/acre). The average annual farm income of end-users before the innovation was 10,313 Ethiopian Birr (ETB) (approximately \$362). This increased to 24,155 ETB (approximately \$847) after the innovation. Despite reduced waterlogging, farmers using the Aybar BBM did not diversify their crops. Customers/end-users requested that the unit price of Aybar BBM (currently \$12) be lowered and said more BBMs need to be made available for non-wheat crops.

## Central University of Technology Free State/ITIKI

End-user interviews were conducted with 62 registered ITIKI users (selected through a cluster-randomized sampling design). User perceptions of the innovation were mostly positive. Despite drought in recent seasons, users felt ITIKI intelligence had improved their crop yields compared to what yields would have been without the information because users were able to plant early and plant to more drought-resistant crops and varieties with the Itiki forecasts. However, approximately 20 percent of respondents were unfamiliar with the innovation despite being registered users, which highlights the need to address issues with ITIKI's recruitment and follow-up.

## Green Heat Uganda

Interviews with 57 end-users of the Green Heat Slurry Separation Technology (SST) were conducted in Uganda. Respondents reported that the benefits of the innovation were energy for cooking and lighting, soil fertility and productivity, household income improvement, and improved environmental sustainability. Fifty-four percent of farmers reported very significant improvement in their household income, while 96 percent confirmed improvements in the survival rate of their crops. The innovation's impact on water consumption was promising. Of the interviewees, 61 percent reported their water consumption was increased due to the innovation. This was mainly attributed to the amount of water required to mix cow dung. Biodigesters equipped with SST contributed to achieving most of the UN Sustainable Development Goals (SDGs). However, this survey confirmed that slurry-separation systems were not properly used in the biogas plants visited. No communal or individual negative impact resulted from biogas or the SST.

## Hydroponics Africa

Interviews with 50 Hydroponics Africa customers were conducted in Kenya. Seventy-eight percent of respondents interviewed were female, and 22 percent were male. The report found that farmers were spending less on crop inputs with the introduction of hydroponics technology. The majority of farmers engaging in hydroponics used it for subsistence farming with little or no surplus for sale. In addition, the majority of farmers will continue with their hydroponic units due to the benefits associated with the technology, such as reduced water use, the involvement of women, increased crop yields, and the ability to decide when to plant and which crops to plant.

## Meat Naturally PTY (MNP)

Six locations across Meat Naturally implementation zones were visited and a total of 65 customers were interviewed in July 2019. All 65 interviewed farmers participated in MNP auctions by selling cattle. A significant number of farmers acknowledged the role of MNP as paramount in helping them sell their cattle, thereby improving their income and reducing poverty. MNP and the partners also positively contributed to grassland restoration. Farmers acknowledged a change in livestock health and an increase in their herds, with no mortality as a result of overgrazing. Overall, MNP and its partners (including EcoRangers) revived the grazing land of Umzimvubu and the practice of communal farming by involving farmers and community members and subsequently improving their livelihoods.





### Naireeta Services Private Limited (NSPL)

Interviews with 51 NSPL customers were conducted in India and assessed the Bhungroo system's affects on agricultural practices, water usage, expenses, household income, crop pattern and yield, as well as perceived benefits and expectations from the technology. The report contextualized an important theme of acute water stress in the region, and underscored associated reasons and determined success of the said technology in the community. It factored into account land desertification and degradation, soil impermeability, frequent dry spells, and incessant rainfall and induce overall viability of the innovation. Along with water availability, other benefits identified by farmers came in the form of better income, quality crop yield with greater chance of survival, lesser cost of water and women's empowerment in the selected region. Farmers had an overall positive attitude towards the Bhungroo systems and approximately 96 percent of farmers recommended the innovation and suggested to its use in the next five to ten years.

### SkyFox

A total of 63 end-users of the SkyFox innovation were individually interviewed in Ghana. The field evaluator found an overall reduction in labor inputs of 50 percent, while water usage was reduced by 41 percent and fertilizer input was reduced by 36 percent. In addition, there was a 60 percent increase in the mean annual income of end-users, and the extreme poverty level dropped from 84 to 70 percent. The income benefit was stronger at Dambai, where end-users were newly introduced into dry season farming through the innovation, given farmlands for free, and had some labor costs absorbed by the innovation. The evaluation found that the innovation was a strong strategy for alleviating poverty and improving the livelihood of rural people in West Africa, where more than 70 percent of the people are poor and reside in rural areas. However, there were important aspects of the project that needed reinforcement, including access to loans, adequate maintenance of water pipelines, provision of more irrigation equipment, and extension of the fish pond models to provide more wastewater.



## WASTE Stichting

Randomized interviews were conducted with 50 farmers of Nilgiris, India in July 2019. Respondents were positive about the innovation's ability to become sustainable and scalable. With the introduction of the innovation, farmers could cultivate an additional part of their farmland. The positive impact may influence food security, women's accreditation, income advancement, and soil restoration for the entire region. An additional benefit surfaced when 12 percent of farmers requested the installation of solar pumps to power electric fencing to protect crops from wild animals. In addition, the survey found that the innovation also helped vegetable farmers by improving crop yield through co-compost application, resulting in higher sale prices in the markets.

## Water Governance Institute

Randomized interviews were conducted with 48 Water Governance Aquaponics users regarding their experience using the innovation. While the project has not yet reached a quantifiable impact on poverty and income generation, findings showed more than 80 percent of farmers are consuming much of what is produced and selling very little. In this first phase of the project, farmers displayed a willingness to expand their farms; farm fish commercially; engage in more training to get experience and skills; form groups to tackle fish feeds access and information as a group; and strengthen cohesion among the fish farmers.





# SWFF Field Evaluator Finds Women Empowered and Yields Increased

As an external Field Evaluator for SWFF, Pooja Gupta traveled the muddy, winding roads uphill in India to evaluate SWFF innovator, WASTE. She liked what she found.

Women were being empowered in greater numbers through their involvement in the innovation. As yields increased and more healthy plants flourished, farmers were seeing greater returns and increased bargaining power for crops in the market. What's more, the cultural hurdle of farmers not wanting to use fecal black and household greywater as compost for their crops was being overcome as farmers saw the greener, more vibrant vegetables produced.

The WASTE innovation of multiple holding ponds completed the circle of recycling fecal matter and wastewater into nutrient-enhanced fertilizer. At the end of the cycle, the water is reclaimed for irrigation, thereby saving water.

"It is extremely important to note that this innovation has created women-entrepreneurs," said Gupta. "Before this, the women were day laborers. But they learned the technology and made farming-related decisions and helped support their families. The women we found were more enthusiastic than men about the

innovation because it allowed them to sustain themselves financially."

From her evaluation of WASTE, Gupta was able to see a lot of potential in the innovation in the Nilgiris tourist district. She stated the following crucial takeaways from her evaluation:

- "The compost created brings life back to the soil. This cuts down on buying expensive fertilizers, which are faster but take nutrients from the soil."
- "The farmers now have a better quality of crops, which makes the crops more valuable."
- "Greywater is now becoming indispensable for farmers. Before WASTE, many farmers were leaving their homeland due to poor or failing crops and heading to the cities to look for work. Now they are coming back because they see this new technology is making a difference. Farmers who have used the compost are informing other farmers of its benefits."





# Don't Panic. The Sky Is Not Falling. But Stop Wasting Water, says Expert

Dr. Beverly Dianne McIntyre, was a member of the SWFF IIAC and a consultant with the International Finance Corporation (IFC) and formerly the International Water Management Institute. She noted that the the answer to the planet's climate problems won't be found focusing on doom and gloom, but on how we all can all make a difference. Dr. McIntyre pointed to technical innovations to improve governance, as well as the more effective use of water in agriculture and that putting improved resource management practices in place go a long way toward increasing the ability of farmers everywhere to adapt to a rapidly changing planet.

"But," she quickly added during an interview while on an IFC assignment in India, "most critically we must use water more efficiently and effectively everywhere, from industry to agricultural fields to households. All the dire declarations about food insecurity will not disappear if we get a handle on water waste, but reducing waste is a good place to start. Even in countries of water scarcity, it tends to be wasted."

An Alabama native who lives in Washington, DC, but frequently traveled to developing countries for her work, Dr. McIntyre noted that being on the SWFF review committee was rewarding, working both with innovators as well as the diverse experts on the committee.

One aspect of SWFF that McIntyre was most proud of was that the program focused on social equity and gender equality. "Dr. McMahan wanted to make sure the innovations were capable of actually making a difference in the lives of small-scale farmers," she says. McIntyre applauds the transitioning of the SWFF program from one based on sustainability and scalability to one that seeks innovations that can also attract private investors, such as in the recently announced WE4F program. "This will lead to motivating all innovators to be even more transparent about how they've calculated costs and benefits, because the private sector will not put money into projects based simply on hopes—they will want a return on their investment," she said.





# SUMMARY OF TA FACILITY METRICS

The SWFF TA Facility structured its portfolios to address the following metrics: usage/uptake; technical capacity; financial sustainability; public awareness; and efficient management of milestone-based funds. The table beginning on page 70 summarizes TA Facility progress according to those metrics.

Overall, SWFF innovators' technical capacity increased with assistance from the SWFF TA Facility. In Year 1, 86 percent of innovators demonstrated increased technical capacity as a result of SWFF assistance. That number rose to 96 percent in Year 2 and 100 percent in Year 3 – Year 5.

Uptake of SWFF innovations increased, with 63 percent of graduate innovators showing at least a 20 percent increase in customer base from the previous year. On a five point scale, the average level of documented evidence for SWFF innovators rose from 2.3 in Year 2 to 3.25 in Year 5, reflecting an increasing number of innovators that demonstrated impact with real-world customers.

The TA Facility made significant improvements in many categories of acceleration support it provided to innovators, exceeding the target for promoter scores. On-time service delivery increased from 41 percent to 44 percent between Year 1 and Year 2, rising to a high of 93 percent in Year 3 before sliding down to 80 percent of services delivered on time in Year 4 and back up to 100 percent in Year 5.



## TA FACILITY PROGRESS INDICATORS

### TECHNICAL ASSISTANCE & SCALING

#### 1.2.1 Average Net Promoter Score received on innovator service delivery surveys

The Net Promoter Score is a rating of how likely how likely a given innovator is to recommend to other innovators the service they received on a 10-point scale from "Not at all likely" to "Extremely likely."

#### 1.2.2 % of SOWs started and completed within the time frame agreed with the innovator during the support planning discussions

Scopes of work (SOWs) that each have a clearly defined time frame for delivery that is agreed upon when they are created. The TA Facility measures how many have been completed within the agreed-upon time frame.

#### 1.2.3 % of SOWs with providers from emerging markets

When SOWs are awarded, they are classified geographically to determine if the provider is based in the same region as the innovator being served. Target was set at 65% in Y3 to balance the goal of increased capacity of support delivery in emerging markets and quality of service delivered to the innovator, and increased over time.

#### 1.2.4 % of innovators with increased technical capacity from SOWs

Increased "technical capacity" is defined as: a) technical improvements in the product/approach, b) improvements in selling the product/approach to stakeholders (i.e., customers, investors, donors), c) improved understanding of the needs of customers/stakeholders in a sustainable way, and d) improvements to business processes and organizational structure. During quarterly calls the team determines if, after an SOW has completed, the innovator has actually increased their technical capacity. If at least 50% of a given innovator's SOWs have increased their technical capacity, they are tallied as an overall success toward this indicator.

#### 1.2.5 % of innovators with increased usage/uptake of SWFF innovations

"Increased usage/uptake" is defined as an increase in the current customer base of at least 10% in a given year. "Customer base" is defined as both primary customers and associated family members/users. Innovators with a customer base (users) under 1,000 are not be considered to have "increased."

#### 1.2.6 % of SOWs where defined "desired outcomes" were met

All SOWs have a section specifying measurable "desired outcomes" to be completed by the end of the engagement. The post-engagement survey includes the question: "Did the service achieve the desired outcomes?" with a 5-point scale from "Not at all" to "Completely," with the target set at "4 - To a great extent," for a tallied success.

### GRANTS & FINANCIAL MANAGEMENT

#### 2.1.1 % of innovators reporting positive effects of PAS process on their organization

Question: "Did the Pre-Award Survey requirements have a positive impact on strengthening organizational administrative and financial systems?" Answers: Yes/Neutral/No

#### 2.2.1 % of innovators with an increased rating of awardee financial systems from TA Facility (Poor/Acceptable/Strong)

Upon entering the SWFF program, innovators' financial systems are graded on a scale of Acceptable/Operational/Advanced. The % is calculated by tallying all awardees who have increased their rating with TA Facility assistance.



Y1 TARGET	Y1 ACTUAL	Y2 TARGET	Y2 ACTUAL	Y3 TARGET	Y3 ACTUAL	Y4 TARGET	Y4 ACTUAL	Y5 TARGET	Y5 ACTUAL	TARGET MET?
6/7	6.93	8/10	8.06	8/10	8.45	8/10	8.88	8/10	9	Yes
50%	41%	50%	44%	88%	93%	85%	80%	85%	100%	Yes
25%	21%	30%	30%	65%	56%	75%	78%	80%	88%	Yes
75%	86%	80%	96%	80%	100%	80%	100%	80%	100%	Yes
50%	62%	60%	81%	80%	80%	90%	100%	95%	100%	Yes
75%	50%	80%	88%	90%	84%	90%	100%	90%	100%	Yes
75%	65%	80%	100%	50%	92%	75%	82%	n/a	n/a	n/a
25% of Acceptable move to Operational	0%	25% of Acceptable move to Operational	100%	100% of Acceptable move to Operational	100%	100% of Acceptable move to Operational	100%	n/a	n/a	n/a
13% of Operational move to Advanced	13%	10% of Operational move to Advanced	10%	13% of Operational move to Advanced	31% (10%Y1+ 21%Y2)	25% of Operational move to Advanced	74%	30% of Operation move to Advanced%	74%	Yes

## TA FACILITY PROGRESS INDICATORS

### MONITORING & EVALUATION

#### 3.1.1 Average level of evidence of SWFF innovators

The level of evidence is a 5-point scale that tracks the degree to which outcomes can be attributed to an innovator intervention. Given that the current awardee average is 3, the target is set at 2.75 overall to factor in the new Rd. 4 innovators. For reference, the ratings for 2 and 3 are as follows: 2 - Capturing positive changes in outcomes, but unable to establish causal attribution; and 3 - Using a treatment and control group, a reasonable case for impact can be claimed when there is a direct relationship between an innovation and a known beneficial good with proper usage.

#### 3.2.1 % of innovators using M&E data to advance their innovation or business

Innovators are surveyed to determine whether their data collection for SWFF supports the following aspects of their business/enterprise: publicizing impact, strategic decision-making, managing partners, customer analysis, sales/marketing, and others. Those that identify themselves as using their SWFF data collection to support any of the above uses are tallied as a success.

### COMMUNICATION, VISUAL IDENTITY & PARTNERSHIPS

#### 4.1.1 # of LL/communication materials produced by TA Facility (including reports, stories, case studies, etc.) that are shared

Lessons Learned (LL) documents and communication materials shared with external audiences (general public, donors, investors, other stakeholders) are tallied and disaggregated by type.

#### 4.2.1 # of partnerships leveraged by TA Facility to address the critical barriers of the SWFF Grand Challenge (Gin 6)

Partnerships that serve more than one innovator or have a benefit that is determined to be program-wide by the USAID COR are counted. Voucher vendors are not counted, unless they provide a probono/discounted service.

#### 4.2.2 % of innovators with increased partnerships

Innovators who increase the number of partnerships due to acceptance into the SWFF program, or during the SWFF program, are tallied. Those with partners where a prior ongoing working relationship existed are not counted.

#### 4.2.3 \$ and % of outside funding beyond SWFF award funding

Outside funding is counted from both public and private sources, from both in-kind and cash equivalents.

### TA FACILITY ADMINISTRATION

#### 5.1.1 % of innovators that rate TA Facility responsiveness at 6/7

Overall TA Facility responsiveness will be rated on a 7-point scale from "Very unresponsive" to "Very responsive." Target: 80% of innovators rate the TA Facility at a 6/7 or higher.

#### 5.1.2 % of innovators that rate TA Facility understanding of innovator needs at 6/7

Overall TA Facility responsiveness will be rated on a 5-point scale from "Very unresponsive" to "Very responsive." The target will be that 80% of innovators rate the TA Facility at a 6/7 or higher.

#### 5.1.3 % of innovators that rate TA Facility as helpful toward awardee goals at 6/7

Overall TA Facility helpfulness toward innovator goals are rated on a 7-point scale from "Very unhelpful" to "Very helpful."

#### 5.2.1 \$ value of volunteer services/\$ value of paid services (ratio)

The value of free services and the value of discounts are compared to the value of paid services provided through the SWFF voucher system. Note: Metric discontinued due to change in USAID instruction.



Y1 TARGET	Y1 ACTUAL	Y2 TARGET	Y2 ACTUAL	Y3 TARGET	Y3 ACTUAL	Y4 TARGET	Y4 ACTUAL	Y5 TARGET	Y5 ACTUAL	TARGET MET?
1.50	1.65	2.00	2.25	2.75	3.3	2.9	3.46	3.2	3.25	Yes
n/a	n/a	80%	86%	80%	92%	80%	100%	80%	100%	Yes
16	22	75	124	175	216	75	158	75	197	Yes
2	3	2	2	1	1	n/a	n/a	n/a	n/a	n/a
50%	75%	50%	45%	50%	54%	75%	100%	100%	86%	No
\$3,000,000 120%	\$6,092,064 254%	\$7,000,000 140%	\$10,600,000 163%	\$12,000,000 175%	\$13,271,923 135%	\$13,000,000 200%	\$19,023,238	\$14,000,000 n/a	\$22,222,000 n/a	Yes
80%	95%	80%	100%	80%	92%	80%	100%	80%	100%	Yes
80%	95%	80%	100%	80%	92%	80%	100%	80%	100%	Yes
80%	79%	80%	76%	80%	84%	80%	91%	80%	100%	Yes
0%	0%	5%	4%	25%	0.00%	n/a	n/a	n/a	n/a	n/a





# ACCELERATION SUPPORT



# OVERVIEW AND ANALYSIS

SWFF established the TA Facility to provide acceleration support services to complement the grant funding that SWFF innovators received. Overall, the TA Facility delivered more than 160 business service engagements directly to innovators. The total value of the services delivered was more than \$1.6 million. The approach to and means of delivering support services evolved over the course of the program based on innovator feedback and performance metrics.

At the beginning of the program, acceleration was delivered through a consortium of three vendors. The Kaizen Company selected SNV, MRIGlobal and Imagine H2O for their ability to deliver a variety of support services at the launch of the program, without the benefit of a history of acceleration support requests guiding a selection of specialties. The role of the Acceleration Facilitator was primarily to take in support requests from SWFF innovators and match those requests as closely as possible to the capabilities of one of the three providers in the consortium.





In the first year, the TA Facility was primarily oriented toward responding to innovator requests for support. As the program progressed, the TA Facility evolved to be more of a proactive advisor to SWFF innovators. Rather than a small consortium of providers to meet a variety of needs, the TA Facility transitioned to a network of many vendors (including the consortium members) based on geographic location and specialties that would compete to deliver scopes of work.

The Acceleration Facilitator transitioned into a more active advisor regarding support needs and utilized a diagnostic tool to help identify critical performance gaps and needs that may not be obvious to the innovator in the daily work efforts. The Acceleration Facilitator also played a more active role in scoping the support to be delivered and acting as a resource to both the support provider and the innovator to ensure timely delivery and satisfaction with the outputs.

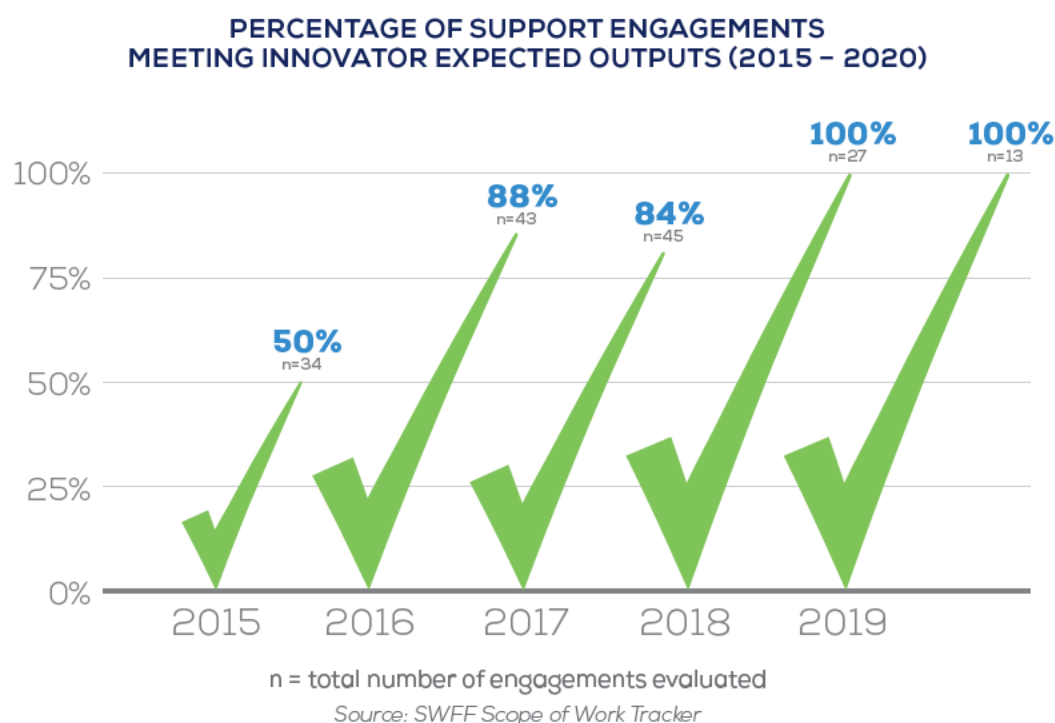
Over the life of the program, the TA Facility took decisions to strengthen the areas that were seen as lacking in their ability to provide value to the innovators, including: increasing the number of local providers; expanding the support capabilities available through the vendor network; and making strategic and operational recommendations based on the Acceleration Facilitator's deeper knowledge of innovator needs.

Some weaknesses still remain that will be more fully addressed in the follow-on program, WE4F. In particular, SWFF was not very successful in making meaningful investor connections on behalf of its innovators. WE4F will create a more comprehensive strategy to identify investors, investment firms, and foundations that have funding strategies that align to the focus areas, geographic regions, and organizational maturity of the innovators participating. WE4F will also more formally engage the investor community to bring them in as active partners for purposes such as mentoring and networking in addition to investment deals.



## Short-term success and long-term value of SWFF technical assistance

The TA Facility assessed both short-term success and long-term value of each support engagement. Short-term success was determined simply by answering the question “Did the innovator receive what it expected to receive from the acceleration support?” Short term success was important to measure because it indicated if there was a misalignment between the innovator’s expectations and the vendor’s, it often led to innovators not fully integrating the TA into their business activities. In the first year of acceleration support, the TA Facility found that in some cases the vendor’s understanding of what was to be delivered was very different than the innovator’s understanding. The TA Facility took steps to ensure that expectations were aligned in all cases. Short-term success served as an indicator for misaligned expectations.



In 2015, only 50 percent of business services delivered by the TA Facility met innovator expectations. This outcome was most often the result of incorrect assumptions held by both the innovator and the vendor from the beginning of the support delivery. This experience was well-reflected in a comment from Alison Padgett of World Hope, who, after receiving business model support, said, “The relationship between World Hope and the support provider wasn’t clear...we ended up with a report that was not tailored to our needs.” In another example of misaligned expectations of support outcomes, Zachery Gray of Adaptive Symbiotic Technologies commented, “We were hoping the vendor would help with fundraising and that never materialized.” In that instance, the innovator had the expectation of securing deals, while the vendor assumed a positive outcome was introductions and connections to potential investors.





The TA Facility assessed where in the acceleration process there were communications breakdowns, added an objective tool to identify innovator needs and increased the comprehensiveness of the scoping activity, and ultimately improved its ability to meet support expectations across the life of SWFF. By 2018, 100 percent of the 27 support engagements delivered met expectations. That level of performance continued into 2019, with all 13 of the support engagement delivered meeting innovator expectations. (Note: For many charts in the Acceleration Section, the number of support engagements in 2018, 2019, and 2020 is lower than all other years because Rd. 1 and Rd. 3 innovators have graduated, with very few continuing to receive technical assistance.)

The improvement in meeting expectations was likely a result of enhancements made to the acceleration support planning process in Year 2, when SWFF introduced and implemented the Innovator Needs Diagnostic Tool. That tool systematically identified organizational, strategic, and operational gaps at the beginning of the acceleration support process. It enabled a highly focused support discussion with the innovator and resulted in very specific support goals and expected outcomes.

The TA Facility also revised the work plan template in Year 2. Before delivering acceleration support, the TA Facility used the template to document specific activities, deliverables, assumptions, and stakeholder commitments. The work plan itemized what was and was not in the scope of the project to ensure its proper orientation and clearly outlined time commitments expected from innovator staff and the support provider. The revised template allowed the Acceleration Facilitator to play a more proactive role in focusing the work plan for greater specificity and clarity. SWFF made these changes with the intention of removing ambiguity in deliverables and increasing the likelihood innovators will receive the services they expect.

Over the course of the SWFF program, the vendors most consistently receiving high ratings from the innovators won and delivered an increasing percentage of the call orders released through the RVMP. Also, the top-performers were competing and being selected for subsequent engagements with innovators they had previously assisted. In those cases, the prior experience increased continuity with the innovator and enabled the vendor to deliver assistance from a deep base of knowledge of the innovator's goals and the challenges they faced. This was likely a strong contributor to the 100 percent scores in 2018 and 2019.

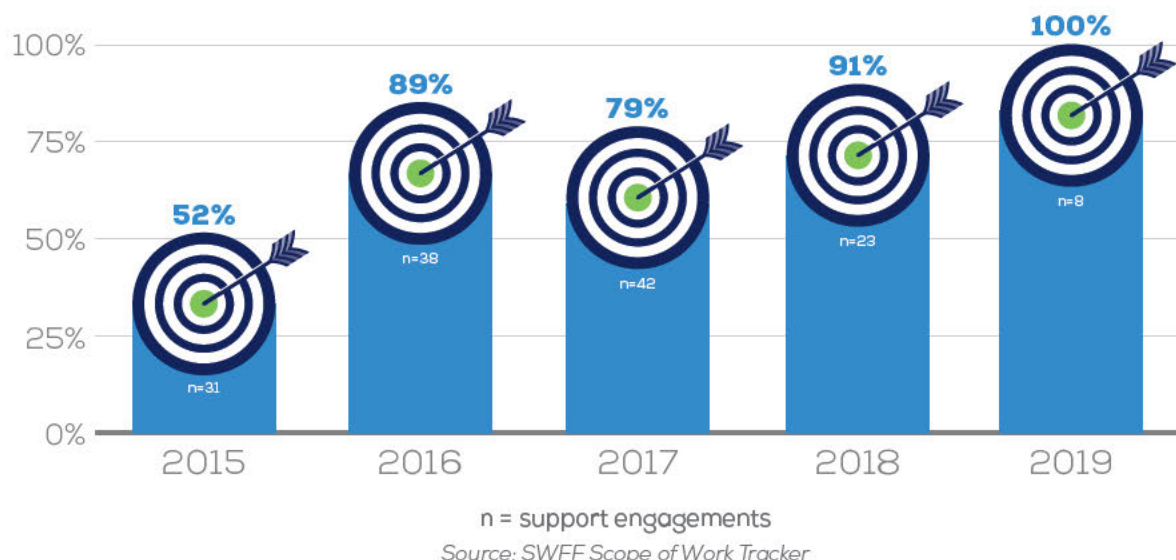
A similar overall trajectory was seen in SWFF's measure of long-term success and impact. A support engagement was rated as a long-term success if the innovator adopted and applied the technical assistance and advice delivered—and—if the support resulted in recognized valuable outcomes such as a shift in strategy, an effective partnership, additional funding, new financial forecasting capabilities, or an improved manufacturing approach or product design. In 2015, only 52 percent of TA Facility support engagements resulted in long-term success. In 2016, long-term success rose to 89 percent. For 2017, the program-wide assessment found that long-term success remained strong, at 78 percent. The drop from 2016 was related primarily to two issues. First, SWFF made several connections to third parties that did not lead to valuable partnerships. Second, some innovators believed that SWFF advisory sessions on business model enhancements to improve gender equality outcomes, though highly useful, were too brief to influence long-term thinking in those areas. In 2018 and 2019, long-term success improved to 91 percent and 100 percent of support engagements, respectively.

This positive trend was most likely related to the steps the TA Facility took to improve its ability to meet the expectations innovators held regarding support. Improved clarification of innovator gaps through the needs diagnostic; greater specificity of the scope and expected outputs as documented in the work plan; more engagements delivered by the highest performing vendors; and in many cases, a vendor's prior and deep knowledge of an innovator, all contributed to improved long-term value delivery. Support beginning in 2017 was more intentionally designed to address innovators' specific needs and context through strategies, implementation plans and tools created for ease of adoption and actionability. Those results were reflected in feedback from Priska Prasetya of WASTE, after receiving support from Jatin Yadav to develop a sales and marketing strategy. Priska said, "Jatin invests time to fully understand the situation in the field; he and Venus listened to our needs on the ground and tailored the support to our circumstance."

It is worth noting that gender advisories, which were particularly criticized in the early days of SWFF, received much more positive feedback as the program progressed. As mentioned earlier, SWFF's approach to help innovators address gender equality gaps had been primarily through relatively brief, seminar-style convenings. One innovator described it this way: "In the past, gender support was data driven on a high level and quite frankly only reiterated the problems rather than providing new insights." This approach was not effective in helping innovators translate generally regarded practices into actionable plans to fit their specific needs. Beginning in 2018, gender advisories were scoped to assess specific opportunities over a longer period of time. Innovator feedback for those engagements has been much more positive overall. Scopes of work to assess specific opportunities for gender impact provided more tangible outputs and insights based on a deeper dive into the individual innovator's market context and objectives.



## PERCENTAGE OF SUPPORT ENGAGEMENTS LEADING TO VALUABLE INNOVATOR OUTCOMES (2015 – 2020)



By the second half of SWFF, natural attrition and/or the TA Facility's decision to discontinue its relationship with a vendor because of under-performance or lack of exceptional feedback resulted in a network exclusively comprised of high performing vendors. Many of these vendors delivered multiple support engagements to the same innovator. Additionally, at that point, the Acceleration Facilitator and SWFF program generally had much deeper and historical knowledge of an innovator and their business models. As a result, the program generally, and the Acceleration Facilitator and remaining vendors specifically, were seen as credible and trusted advisers. Support delivered in the second half of SWFF was far more nuanced to individual innovator needs and circumstances and therefore the support and recommendations given were more likely to be adopted and applied.

### Innovator satisfaction: local vs. non-local vendors

The TA Facility expanded the number of support providers approved to work with innovators for the purpose of increasing depth of expertise across support types and increasing localized knowledge and context within the pool of vendors delivering support. In the TA Facility's first year, business support services were delivered through a consortium of three vendors, which included SNV USA, Imagine H2O, and MRIGlobal. SNV and Imagine H2O brought expertise on the business strategy and operations side. MRIGlobal brought expertise in product development and engineering. During that first year it became clear that three support providers would not be able to adequately address the wide variety of innovator needs. While each of those vendors was highly capable, many innovators required specialists that truly added value. But more importantly, innovators consistently told the TA Facility that they required vendors that knew their local marketplace and brought experience of doing business in their local environment.

Similarly, the SWFF Founding Partners believed support provided by local vendors was more valuable than support delivered from a distance by a vendor with limited or no firsthand experience in-country. The TA Facility responded to all of this feedback and worked to increase the number of local vendors in the vendor network where possible. For SWFF purposes, a vendor was considered local if it was based in Africa or Asia, where most innovators operated.

Progress to address this concern was substantial. In 2015, local providers accounted for 21 percent of SWFF business service engagements. In 2017, that percentage more than doubled, to 56 percent. By 2019, local providers delivered 85 percent of the support engagements. And in 2020, 100 percent of the engagements are being delivered through locally based vendors.

Additionally, the TA Facility shifted from delivering support engagements through three consortium members to delivery through the RVPM. Vendors were pre-qualified to deliver support in 21 different specialties. Once in the system, vendors were able to submit proposals for scopes of work within their pre-qualified areas. At the program's peak, there were approximately 35 different vendors (14 local and 21 non-local) available to deliver support services. This shift greatly expanded the expertise available to the TA Facility to support SWFF innovators.

### PERCENTAGE OF SUPPORT ENGAGEMENTS DELIVERED BY PROVIDERS BASED IN AFRICA AND ASIA (LOCAL, 2015 – 2020)



Two metrics (promoter score and innovator satisfaction with support received) confirmed the shifts the TA Facility made to open up the vendor network beyond the initial consortium and to increase the participation of local vendors. Promoter scores indicated the degree to which SWFF innovators would recommend a provider to other SWFF innovators. Based on innovator feedback surveys, the average promoter score for local vendors delivering support engagements across 2015 and 2016 was 6.73, well below the target of 8.0. There was marked improvement in the scores after that time. The average promoter score for local vendors across 2017, 2018, and 2019 was 8.73, a 30 percent improvement from the initial two years of support delivery.



## AVERAGE PROMOTER SCORE, BY YEAR (2015 – 2020)

local and non-local providers

likelihood an innovator would recommend a service provider to other SWFF innovators  
(1 = would not recommend, 10 = would highly recommend)



n = total number of local and non-local support engagements

Source: Post-support engagement innovator feedback surveys

Promoter scores for non-local vendors showed a more modest 12 percent improvement when comparing the average across the first two years with the average across the final three years. The average promoter score across 2015 and 2016 was 8.11; average score across the final three years was 9.10. While the innovator perception was that local vendors added more value, the promoter scores they gave indicated strong performances by the non-local vendors across the program. Improvements in scores for both the local and non-local vendors can be associated with the expansion of the vendor network and the increase in local vendors. The expanded network improved overall alignment between innovators' business needs and support providers' expertise and regional knowledge. But the staying power of the strongest local providers and the removal of providers that were not performing to SWFF innovators' satisfaction also was a contributing factor. As SWFF moved from the consortium to the RVPM, local vendors in particular learned the rhythm and expectations of the program, deepened their knowledge of the innovators through multiple support engagements, and became trusted, dependable providers. Non-local vendors continued to excel in support categories such as business model development and marketing materials design, including website and infographic development, for which local context was less critical.

A similar trend existed in overall innovator satisfaction with support received. Satisfaction with support delivered by local vendors increased steadily since 2015. Overall satisfaction with support delivered by local vendors in 2015 was 3.83 out of 5.00. In 2018, overall satisfaction with locally delivered support hit its peak, at 4.81. In 2019, overall satisfaction remained strong at 4.73.

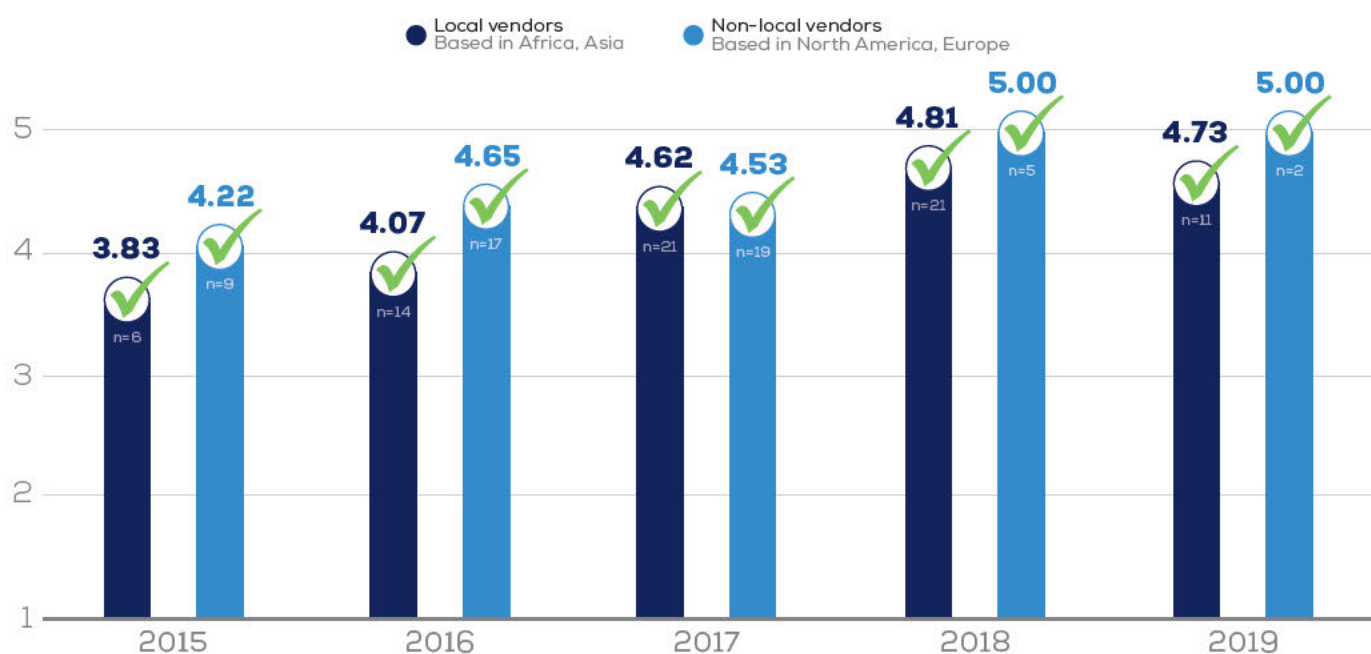
Overall satisfaction with support delivered by non-local vendors also improved throughout the life of SWFF. In 2015, overall satisfaction was 4.22 out of 5.00. In both 2018 and 2019, overall satisfaction was a perfect 5.00.

There were several factors that likely contributed to the improved overall satisfaction scores for both local and non-local vendors. Early in the SWFF program, the TA Facility frequently received requests from innovators to utilize vendors with whom they were already familiar or had worked with previously. While this was a reasonable request when seen through an innovator's desire to have fewer relationships, there were government procurement rules in place to ensure that a minimum amount of competition occurs to prevent conflicts of interest. To address innovators' requests while also complying with procurement rules, the TA Facility took two steps. First, the "best and final" process for vendor selection was revised to include an innovator interview. The TA Facility scored proposals submitted by vendors against a standard rubric to narrow down the candidates to the top two, and in some cases three. The innovator then had the opportunity to interview the top scoring vendors to learn first hand about the expertise each brought to the assignment, assess each vendor's knowledge of the marketplace, and gauge their ability to work well with the vendor. In this revised selection process, the innovator made the final choice of vendor.





## AVERAGE OVERALL SATISFACTION SCORE BY YEAR (2015 – 2020)



n = total number of local and non-local support engagements

Source: Post-support engagement; innovator feedback surveys

Second, the TA Facility requested vendor recommendations from the innovators. Those vendors were then invited to go through the application process to join the network. Initially, invitations were made at the same time as formally scheduled calls for vendors. The TA Facility later revised this piece of the process to allow recommendations and vendor consideration on a rolling basis, which better aligned to the innovators' support needs.

Beginning in Year 2, the Acceleration Facilitator took a more active role in ensuring greater specificity in each support engagement work plan. A stronger emphasis on specificity led to a more realistic expectation of the time commitment required of each innovator's internal team and reduced the risk of misaligned expectations regarding deliverables.

The TA Facility made one additional change that assisted in maintaining high satisfaction scores and required vendors to review previous technical assistance deliverables and then use that applied knowledge to improve their proposals, to speed up vendor completion of SOWs, and reduce redundancies during the innovator interview process.

In addition to these specific shifts, the course corrections previously mentioned also contributed to improved overall satisfaction with the support delivered. The expanded network better aligned with specialized support needs, engaged more locally based vendors, and left the strongest providers in the network that contributed to more positive outcomes and better innovator experiences.

From the standpoint of the identification of support needs and scope development, course corrections such as implementation of the needs diagnostic and greater specificity of the scope and expected outputs documented in the work plan also improved innovator satisfaction.



### Emerging high-performance vendors

Over the course of SWFF, more than 160 business service engagements were completed. Certain vendors stood out in terms of the degree to which innovators recommended them to other innovators. Others left the program for reasons such as: failing to consistently win scopes of work; failing to provide high quality support; their business development processes did not align well to the SWFF procurement process; or the contract values sought by support providers were outside the typical SWFF range. Two-thirds of the vendors shown in the chart below all achieved promoter scores at or above the program target of 8.0, when taking their average score across all the support engagements they delivered.





## PROMOTER SCORE BY VENDOR ACROSS ALL SUPPORT CATEGORIES (2015 – 2020)

likelihood an innovator would recommend a service provider to other SWFF innovators  
(1 = would not recommend, 10 = would highly recommend)



n = support engagements

Source: Post-support engagement; innovator feedback surveys

With a minimum of five support engagements, the TA Facility was able to determine if each vendor could deliver at a high level consistently and be considered a premier provider in the SWFF network. While other vendors certainly delivered high value, the following four consistently earned high promoter and overall satisfaction scores across a large body of work: MRIGlobal, Sattva, Whitten & Roy Partnership, and Jatin Yadav.

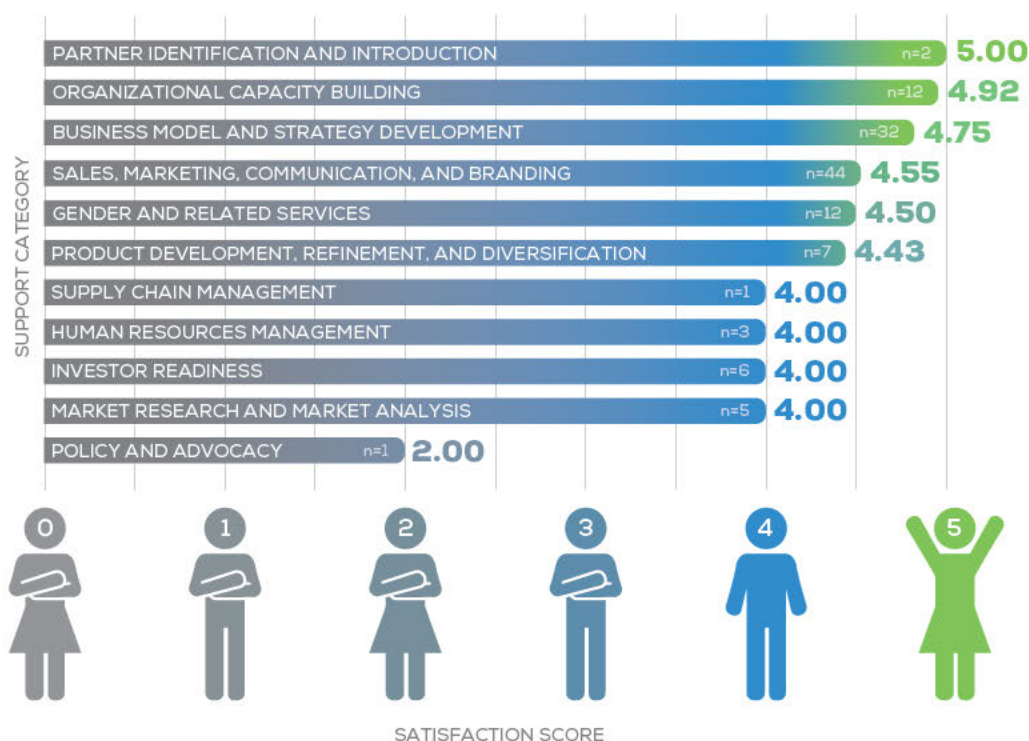
MRIGlobal consistently delivered highly regarded support in business modeling as well as on technical questions. Rusty Rodriguez of Adaptive Symbiotic Technologies commented, “very knowledgeable and helpful; we are still using their advice for the set up of our systems two years later.” Sattva and Jatin Yadav earned high scores for their work to create sales and marketing strategies, business model refinement, and market analyses. Each earned an average promoter score of 8.30 and 9.25, respectively. Per innovator feedback, Sattva consistently went “above and beyond to deliver value.” Innovators have appreciated Mr. Yadav’s “practical approach to fully understand the situation on the ground.” Whitten & Roy was regarded as the go-to SWFF provider for sales training and sales activity planning. The Whitten & Roy team received compliments for their ability to “simplify the concepts and connect with the trainees” for improved adoption of their recommendations.

A key lesson learned in the first year of SWFF acceleration support delivery was that there were limits to a “we can support all of your needs” customer service approach. The TA Facility sought to support SWFF innovators with any requested technical assistance. However, for some support requests, a vendor that could deliver with SWFF’s expected high quality just did not exist in its network. In several instances, the TA Facility attempted to provide agronomy support. However, there was not a strong agronomist in the vendor network to deliver the work. The TA Facility attempted to use a vendor in the network that reported to have the capability; however, the innovator quickly learned that the vendor lacked the depth of knowledge necessary to truly provide value. In another case, the TA Facility used a vendor in the system to support an innovator to navigate the Indian government channels and approval processes to secure the necessary licenses and permits to sell its product across the country. Again, the vendor did not truly have the knowledge of the network and processes to successfully deliver. In each of these examples, the TA Facility would have better supported the innovator by advising them to find other resources to help in these areas.



## AVERAGE OVERALL SATISFACTION SCORE BY SUPPORT CATEGORY (2015 – 2020)

how satisfied the innovator is with the acceleration support delivered  
(1 = very dissatisfied, 5 = very satisfied)



n = support engagements

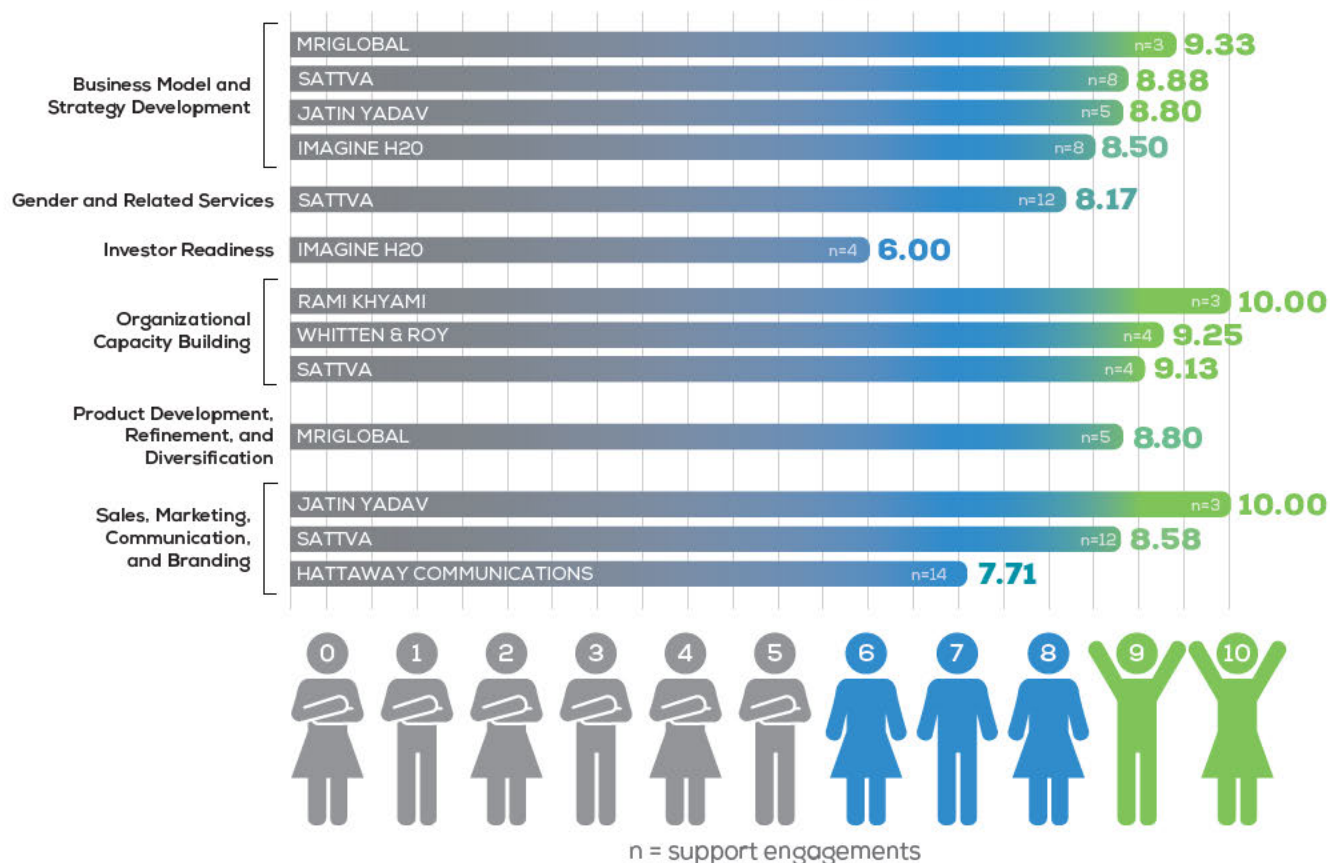
Source: Post-support engagement; innovator feedback surveys

Service categories in which the TA Facility built a significant body of work (five support engagements or more) and proved to be consistent strengths included: Organizational Capacity Building; Business Model and Strategy Development; Sales, Marketing, Communication, and Branding; Gender-related Services; and Product Development, Refinement, and Diversification. In each of those categories, support engagements averaged well above the 4.00 target for overall satisfaction. Knowing the support strengths of the vendor network, the Acceleration Facilitator was able to better advise SWFF innovators regarding the assistance they could count on from the TA Facility and assistance that they would be better to receive from other sources.

## PROMOTER SCORE BY CATEGORY AND VENDOR (2015 – 2020)

minimum of three engagements delivered by vendor in a support category

likelihood an innovator would recommend a service provider to other SWFF innovators  
(1 = would not recommend, 10 = would highly recommend)

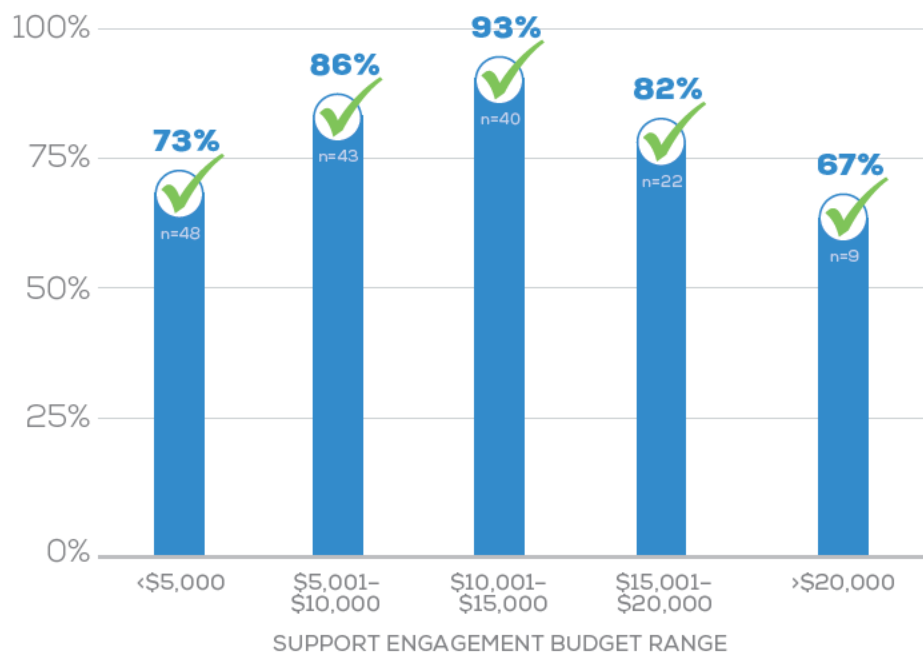


Source: Post-support engagement; innovator feedback surveys

The four vendors mentioned above that received strong endorsements from innovators were the backbone of some of the TA Facility's strongest support areas. Sattva stood out for its support in Business Model and Strategy Development. Sattva also brought strong capabilities when delivering Gender-related Services; Organizational Capacity Building; and Sales, Marketing, Communication, and Branding. MRIGlobal was the strength of the TA Facility's support in Product Development, Refinement, and Diversification engagements. Jatin Yadav was a valued provider in the areas of business model development and sales and marketing.



**PERCENTAGE OF SUPPORT ENGAGEMENTS MEETING  
OUTPUTS INNOVATORS EXPECTED (2015 – 2020)**  
by funding level



n = support engagements

Source: SWFF Scope of Work Tracker

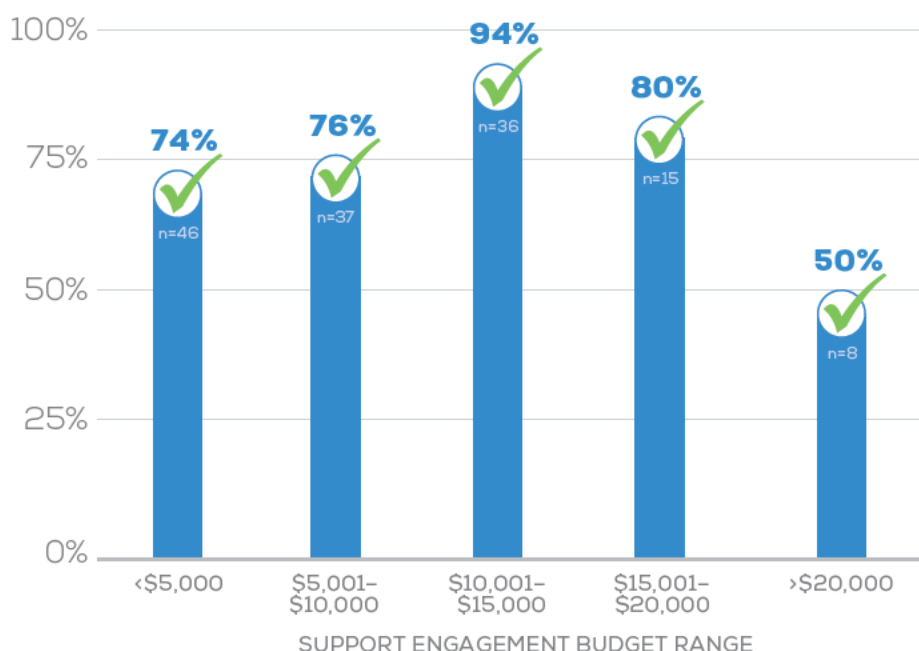
### Support engagement size and scope

Over time, the SWFF TA Facility learned that the size of the budget of a support engagement was a factor in both its short-term and long-term success as it reflected both its degree of focus and complexity. From both an immediate and a longer term perspective, the TA Facility learned there was a financial sweet spot at which an engagement could address a narrow or broad need. This was in part because innovators at the early stages of commercializing and scaling cannot afford to miss on the impact of support on their businesses. Therefore, proper needs identification and support scoped correctly and delivered in a timely manner are critical.

SWFF found the strongest success rates for both short-term expectations and long-term value occurred with support engagements budgeted at \$10,001 to \$15,000. Engagements in this budget range successfully met short-term expectations 93 percent of the time, while also delivering on long-term value 94 percent of the time. Given SWFF's experience working with innovators at all budget levels, the organization determined that defined and focused projects with budgets of \$10,001 to \$15,000 were large enough to comprehensively meet well-scoped innovator needs in a relatively short time but not so large that objectives were too complex and outcomes more difficult to tie to the support received.

# **PERCENTAGE OF SUPPORT ENGAGEMENTS LEADING TO MEANINGFUL CHANGE IN INNOVATOR OUTCOMES (2015 – 2020)**

by funding level



n = support engagements

Source: SWFF Scope of Work Tracker

The next most effective engagements fell within the \$5,001 to \$10,000 budget range. Engagements in this range met innovator expectations 86 percent of the time, while delivering meaningful long-term value 76 percent of the time. SWFF hypothesized that these engagements likely were successful because they were tightly focused on a very specific objective – such as development of a business model canvas, a website, or an infographic that could be completed quickly for a short-term result.

Engagements budgeted above \$20,000 were the least successful. SWFF believed these projects were too complex and too time-consuming to see short-term results. Also, in a startup environment, entrepreneurs need quick wins to meet milestones and build momentum for success. With this lesson learned, the TA Facility broke up larger scopes of work into smaller, sequenced support plans to ensure that the innovator received value at an accelerated rate.



# ACCELERATION SUCCESS STORIES







## Reel Gardening

When Reel Gardening first joined the SWFF program, its business model was designed to partner with Unilever to get a foothold within schools and then expand. Unilever donated Reel Gardening seed tape to South African schools and the Reel Gardening staff worked with the students and administrators to plant the seeds and harvest the produce. The students' positive experience should create a pathway to convert their families into Reel Gardening customers.

After the first year in SWFF, Reel Gardening realized it would be challenged to achieve their program customer/end-user and sales targets while pursuing this business model. A major issue was overdependence on a single partner in Unilever. A second issue was the realization that the target customer segment they envisioned – the students' families – did not have a financial profile that would enable Reel Gardening to become a revenue-sustained company.

The company's focus in Year 2 was to increase sales, then increase re-sales. With help from TA Facility support vendor Sattva, Reel Gardening developed a "Buy One, Give One" (BOGO) model and worked it into costing models and sales for the second half of 2017. Through this model, Reel Gardening donated gardens to 33 schools and 1,200 households. Claire Reid, Reel Gardening founder, said, "We believe the BOGO playbook will help us improve internal operations; provide guidance on implementing, monitoring, and adapting a new financial and marketing strategy; and ultimately increase revenue and social impact."

In Year 3, Sattva worked with the Reel Gardening team to rethink the company's target customer segments and created a sales and marketing strategy and implementation plan. A financial scenario testing tool enabled the team to improve their forecasting capabilities and better manage their business toward break even and profitability. As a result, the company shifted its primary customer segment to a wealthier audience, using a portion of the profits to maintain its mission of ensuring South African schoolchildren have access to high quality, healthy food. With this new sales and marketing focus and the financial management tools to better guide its business, Reel Gardening was able to achieve break even two years ahead of expectations and is now seeking outside investment to further scale within South Africa and to additional markets.





## Hydroponics Africa

When Kenya-based Hydroponics Africa first joined SWFF, the company had two primary challenges. The first was a business model challenge regarding the smallholder farmers' ability and willingness to make the capital investment in the hydroponics units without financing assistance. The second was a dual logistics issue: how would Hydroponics Africa create semi-custom construction for each unit's installation and how would the company ship the product to customers over challenging roadways.

Initially, the TA Facility focused its support on addressing the customer affordability challenge. Hydroponics Africa had to demonstrate to its customers that a profitable market exists for the farmers' produce, with a compelling return on investment. RVPM member, Sattva, worked with Peter Chege, head of Hydroponics Africa, to assess the financial viability of a contract farming model, which would relieve the customer from the burden and uncertainty of building a market for the produce. Hydroponics Africa would share the risk with its contract farming customers.

Hydroponics Africa has now entered into supplier contracts worth approximately \$300,000 annually. And with a customer base for the produce established, banks were more willing to lend to the farmers. "With contracts in place, the banks were more confident that the farmers would be able to turn a profit and pay back loans. This made securing financing easier," said Chege.

In Hydroponics Africa's final year in SWFF, the TA Facility, through RVPM member Jatin Yadav, worked with the company to address the logistics challenge: whether to establish distribution centers and where to locate them.

Mr. Yadav and his team assessed concentrations of customer segments across Kenya, the cost effectiveness of single versus multiple distribution centers and their strategic positioning. Hydroponics Africa plans to establish a set of distribution centers across the country that will leverage its partnership with local government entities. Mr. Chege commented, "Our distribution strategy will allow us to work hand in hand with our government partners to get the hydroponics units in the hands of those that need them." Additionally, distribution will be streamlined by shifting from a customized unit to a prefabricated modular unit.





## MimosaTEK

**MimosaTEK came into SWFF with an engineering mindset. The company's tendency to focus on further refinement of the technical components and engineering of its product line instead of committing resources to selling and scaling the solution was a major challenge.**

A SWFF site visit by Dr. Ku McMahan and the TA Facility team noted that MimosaTEK was in danger of missing its unit sales and revenue targets and its continuation in the program was at risk. The SWFF TA Facility, through RVPM member Sattva, provided emergency support to enhance MimosaTEK's selling skills and create a strategy and a plan to implement a more formal approach to sales. A sales training and a sales and marketing strategy focus on high potential customer segments helped to increase conversion rates. Following this support, MimosaTEK took some key organizational decisions, shifting priority from further engineering and design work to its sales efforts. A portion of the engineers' time was then dedicated to customer technical support.

With sales on an upward trend and its business model in Vietnam stabilizing, MimosaTEK turned its attention to expansion outside of its home country. Given the trend in the agriculture industry for Internet of Things technologies, MimosaTEK needed to position itself to favorably respond should a project opportunity present. Mr. Jatin Yadav, RVPM member, worked with the MimosaTEK team to create a due diligence checklist with activities, roles, and responsibilities that the MimosaTEK team follows when presented with an opportunity outside the country. Those guidelines ensured that MimosaTEK took a comprehensive look across all inputs when reaching a decision on whether or not to pursue the opportunity. With roles and responsibilities in place, each team member knew his/her responsibility and could respond to each opportunity in a timely manner. Mr. Yadav also created a rubric by which to consistently assess each opportunity and objectively score them according to likely operational and strategic impacts. Lan Anh Le, Chief Operating Officer at MimosaTEK, said, this support "provided us a logical method for evaluating overseas expansion opportunities. After the support, we are more confident to explore possibilities in our initial expansion market, Malaysia."





## WASTE

**WASTE Stichting (WASTE), a SWFF Grand Challenge award winner for its approach to recycling grey and black water to create compost for agricultural purposes, transitioned its India-focused local development projects into self-sustaining entities with the help of the TA Facility.**

When WASTE first entered the SWFF program its staff, in partnership with local organizations such as LEAF and RDO Trust, were attempting to mainstream a process to use household waste water and human waste as inputs to create a rich compost for distribution to local farmers to improve the quality and yield of the fruits and vegetables they were growing. To get their system launched and operational, WASTE was completely dependent on grant funding in addition to its own investment.

SWFF's TA Facility supported WASTE/RDO Trust as they transitioned to self-sustaining revenue generation and away from dependence on grant and donor funding. In its first SWFF award year, WASTE received support to fully define its business model. In its second year, the TA Facility assisted WASTE to create a formal sales and marketing strategy to promote the uptake of the compost it produces. In the third year, WASTE received support to build the business and organizational capacity of the Farmer Producer Groups (FPGs) it worked with so that they can act as a true business entity, independent of financial support from WASTE and donors. The business modeling and sales strategy support helped WASTE better define the target customers for the compost, the most cost effective way to produce it, and the roles and responsibilities required for production and sales. Additionally, the support helped WASTE identify the correct sales price point as well as branding and valuable add-on services.

By WASTE's third year in SWFF, the organization was ready to transition ownership of the model over to the FPG for long-term sustainability. Success required a degree of business acumen within the FPG that did not exist. RVPM member, Mr. Jatin Yadav, trained the FPG leaders in basic business education and transitioned the FPG to an organizational structure reflective of a business entity. With this support, FPG members took responsibility for roles such as marketing and sales, financial management, and compost production.



# SWFF THROUGH THE SUPPORT PROVIDER LENS: THREE SNAPSHOTS

The Acceleration section of previous annual reports focused on the SWFF experience from the perspective of the TA Facility staff and the SWFF innovators. The vendors that delivered the support to SWFF innovators have their own stories to tell. The following snapshots provide the insights gleaned from three support providers after their extensive work with SWFF innovators, and their motivations for doing so. Taken together, Jatin Yadav, Sattva, and Whitten & Roy Partnership delivered more than 60 scopes of work to SWFF innovators. From this extensive working relationship with the TA Facility and SWFF innovators, each brings a unique perspective on the challenges start-up enterprises face when attempting to build a scalable, sustainable operation in an emerging market context.



## Jatin Yadav, Independent Consultant

Mr. Jatin Yadav, an independent consultant since 2018 based in Bangalore, India, advised on such varied SWFF innovation projects as a unique gardening model in South Africa, a hydroponics entrepreneur in Kenya, and a circular economy NGO effort in India, among others.

"A key step with all SWFF innovators with whom I have worked was to show them that being fixated on one aspect of the business at a time will not make their product any better, nor will they be able to sell," said Yadav, reflecting on a challenge he has seen consistently. "They became out of touch with the bigger picture. What I have done is show them how to step back from their day-to-day routine and take an objective look at their business as a whole."

Reflecting the TA Facility's "roadmapping" approach to deliver comprehensive but phased support over the innovator's life with SWFF, Yadav described his work with SWFF Rd. 4 Innovator WASTE, which focused on creating a circular economy where animal and human waste were collected in holding ponds and turned into co-compost. "My first assignment was to design their business model so that they could be sustainable while being financially viable in that region of India," he said. "A year later, I carried out a sales assignment for their main product, co-compost. I worked on pricing, sales strategy, and marketing ideas. And finally, in the third year, the challenge was designing their business model for integration into a farmer producer group, and establishing a sustainable model of the actual Farmer Producer Organization (FPO)."

This last assignment was to actually design the FPO and to train the farmers on how to run it in a sustainable and scalable manner while catering to the community side as well as the market side.

Helping innovators in developing markets is fulfilling Yadav's career dream.

"Farmers form the biggest chunk of people in poverty in any emerging market, and I have always been interested in this work. It's my calling, and I am passionate about it," he said. "It never feels like work. These are the people who are actually reaching the communities. These are people who say 'even if we have to lower our price or give some units away' we will serve."





## Sattva Consulting

Since 2016, Sattva Consulting has worked hand-in-hand with the SWFF program in sub-Saharan Africa and Southeast Asia on technical assistance. Ms. Manasi Parvatikar, an engagement manager at Sattva, shared her team's experience working with SWFF Rd. 3 Innovator Green Heat to address gender-related challenges – a priority objective of the SWFF program overall. Green Heat is a for-profit company with a mission to help Ugandan farmers improve their crop yield while bringing clean-burning fuel to their homes.

“What we wanted to do was to get more women involved in the Green Heat model,” said Ms. Parvatikar. “Traditionally, men tend to make purchasing decisions for the house. We wanted women to also participate in decision-making. We also wanted women to become advocates of the Green Heat systems.”

The obvious message was to convince women that biogas was a clean and efficient cooking method, and would prevent their daily trips to gather wood and water. For the purposes of selling to this critical customer segment, Ms. Parvatikar and her team advised Green Heat to utilize young, female volunteers to communicate the benefits of biogas to the women managing the domestic household duties.

“We suggested to Green Heat, in essence, to kill two birds with one stone,” said Ms. Parvatikar. “We recommended a strategy to enlist young female volunteers from nearby colleges. They could go into the communities and talk to the women—it was women talking to women about the benefits of cooking with biogas.”

Regarding the potential pushback from Ugandan men in response to the more active role of their wives, Ms. Parvatikar commented, “Interestingly, the men became supportive; there was more hesitation from the women. They worried about how safe the product was and that it would be too technical to use—who would understand it.”

“No one had previously thought of getting volunteers from colleges to reach out and mobilize women in the community,” she added. “This becomes sort of a low cost, highly effective pilot with impact.”

It was, in essence, a cultural breakthrough and progress for gender equality in Uganda.

For Ms. Parvatikar, achieving outcomes is why she is in the business of helping to solve development problems in some of the poorest regions of the world.

“This is absolutely rewarding,” said Ms. Parvatikar, who has been working with SWFF innovators for nearly three years. “When you work with social innovators, you find they are extremely passionate and have a propensity to take risks. They push the boundaries of what can be done.”



## Whitten & Roy Partnership

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Whitten & Roy has worked with SWFF innovators since 2017 helping them develop the skills and techniques to hit their annual program sales targets and progress toward revenue sustainability.

One client that Mr. Matt Seitz, a sales strategist with Whitten & Roy, and his team worked with was Lal Teer, a large seed producer in Bangladesh, which is doing pioneering work to combat the impact of salinization in low-lying and coastal areas.

“We presented a methodology to make sure the company’s sizable sales force was on the same page when delivering messages to farmers,” said Seitz. “They didn’t have a systematic way of walking a farmer through these challenges.”

In other words, the sales team was failing to create a link between the product and the company; specifically, how and by how much the company’s seeds could help the farmer have a more substantial crop and increase profits.

“When we spoke to them, every team member was selling in his or her own way, and with a large organization like Lal Teer, that makes it hard to scale,” said Seitz. “We streamlined the sales conversation.” This was not a script, but rather a framework from which to draw sales messages to help the customer to be comfortable and confident with the buying decision.

“We approached sales from the standpoint of what we call ‘decision intelligence’ or DQ,” he said. “If a potential buyer is going to purchase, they first need to understand their problem, and what the cost would be if that problem is not solved.” For the Lal Teer customer, the cost of the problem was lower crop yield without saline resistant seeds, which resulted in lower profitability for the farmer.

Seitz said one of the most important factors in selling—whether in developing markets or mature ones—was creating trust.

“Once a customer is lied to or feels they have experienced something shady, you have ruined the relationship,” said Seitz. “It’s important in sales to have repeat customers. If that doesn’t happen, you’ve lost.”



# GRANTS MANAGEMENT OVERVIEW



# INNOVATOR CAPACITY BUILDING AIDS COMPLIANCE AND ENHANCES INNOVATORS' FINANCIAL OPERATIONS

## Grants & Finance Overview and Analysis

SWFF provided capacity building and support through the grants and contracts portfolio to Rd. 1, Rd. 3, and Rd. 4 SWFF innovators. The SWFF TA Facility Grants and Contracts Specialist, Rami Khyami, provided assistance and support to SWFF innovators to help them comply with USAID standard rules and regulations. He streamlined the Pre-Award Survey (PAS) and created an easy-to-use online assessment tool. The improved PAS assessment tool and financial management support provided by the Grants and Contracts Specialist helped SWFF innovators establish appropriate accounting and financial management practices and enhanced innovators' overall capacity to organize and manage finances and operations, which facilitated upscaling and led to sustainable growth.

When SWFF began, the program issued USAID cooperative agreements to Rd. 1 innovators. A cooperative agreement is a grant with substantial USAID involvement in certain programmatic elements of the project during the award period. The logic for using this type of agreement was that SWFF officials felt there was a need for additional review and oversight of the awards given the experimental nature of the program. However, this contract type proved to be challenging and burdensome for both the innovators and SWFF.

The agreements included complex legal language and required innovators to have extensive administrative capacity. SWFF innovators were small enterprises with limited resources and limited capacity and were not able to fully comprehend or meet all of the requirements of their awards, even with extensive training from USAID and the TA Facility's Grants and Contracts Specialist. On average, it took organizations six months (sometimes even a full year) to understand the procedures, provisions, and requirements of their contracts to be able to fill out the required forms correctly and request and receive their payments.

During the SWFF process for Rd. 1, there were both language and cultural differences that required applicants and awardees to spend more time in the application process than the program intended. Major discrepancies in the contracting system that needed immediate solutions included: difficulties with getting access to US-affiliated bank information from foreign banks; getting clarity on the exchange rate calculation method; and the milestones, which were mentioned in the contract, had not yet been quantified.

In response to the feedback from innovators and other donors, SWFF switched to Fixed Amount Awards (FAA) and milestone based-funding for all Rd. 3 and Rd. 4 awards. This shift significantly simplified the contract process, reduced the administrative burden on awardees and the program, and reduced the time it took for businesses to receive their payments (decreasing it from (on average) no more than six



months, to (on average) no more than six weeks}. The FAA structure helped SWFF get grant award money to businesses faster. It also helped push some innovators toward significant impact and scale.

The goal of the PAS was to assess the organization's financial and organizational strength in the following areas: organization structure and legal status; internal controls and segregation of duties; standard written, policies and procedures; current financial and accounting systems, budgeting, annual audits; and staff general experience and knowledge of USAID policies and procedures.

Importantly, Mr. Khyami helped improve innovators' management of internal financial processes and their ability to respond to USAID requests and requirements. He created a monthly financial reporting spreadsheet where innovators would input information that could be converted into a form that would meet USAID requirements. The innovator's monthly tracker also indicated when innovators and Mr. Khyami needed to contact USAID for budget modifications or budget revisions (when their actual expenditures by category were not in alignment with their budgeted expenditures).

The TA Facility Grants and Contracts Specialist also provided direct assistance in developing solutions to address current weaknesses in awardees' systems and increase innovators' grants capacity building. Support provided to SWFF innovators included: (1) conducting an information and instructional webinar to familiarize innovators with financial reporting requirements and standard USAID processes; (2) one-one-one training sessions via conference calls and in some cases in person on-site visits; (3) guidance materials, an instructional guide, and explanations of specific requirements; and, (4) responding to ad hoc inquiries.





One such example was Aybar Engineering, whose accounting operations struggled in the beginning of the SWFF award due to a host of issues, including incompetent accountants and a lack of established policies and standard operating procedures. Mr. Khyami worked closely with Aybar and provided accounting and financial templates; training on how to use the templates and Quickbooks; direct support in searching for and hiring a new accountant; and training the newly hired accountant on SWFF policies and procedures. Mr. Khyami also provided a monthly financial review of Aybar for the entirety of their award. Through this direct support, Aybar's financial systems went from "Acceptable" to "Operational" in Year One.

From 2015 to 2018 Mr. Khyami earned a perfect promoter score of 10 across the four support engagements he delivered. Innovators' feedback was very positive and indicated that Mr. Khyami's support had been extremely helpful and resulted in improved internal operational capabilities and financial systems that can potentially be helpful when dealing with investors.

Overall, SWFF helped organizations make fundamental changes in the way they do business – whether they were non-profits, for profits, or research centers. The program helped identify gaps in organizations' financial systems and helped to strengthen them, making it easier to conduct financial forecasts and for organizations to get funding from other investors. In some cases, even with all of SWFF's assistance, some innovators did not fully advance, and, at best, SWFF helped them move to be fully operational.

Many of the pivots pioneered under the SWFF Grants and Finance model have been taken up in USAID's new Acquisitions and Assistance Strategy. In addition, WE4F has capitalized on the multitude of resources and lessons learned for the grants and finance portfolio and now utilizes some of the systems, tools, and templates created in SWFF. The WE4F regional innovation hubs are responsible for the identification of innovators, managing the grants, supporting innovators in maintaining proper financial systems, accompanying payment processes, implementing audits, and monitoring functions as well as investigating and reporting on irregularities.





## SWFF innovators' organizational sustainability

The "SWFF Innovators – Organization Type by Round" chart below illustrates graduates as well as alumni innovators. Overall, for-profit innovators were more successful and better able to meet annual targets than their counterparts at non-profit organizations and universities.

### SWFF INNOVATORS – ORGANIZATION TYPE BY ROUND

number of innovators by type, round, and status  
(Active, Graduate, or Alumni)

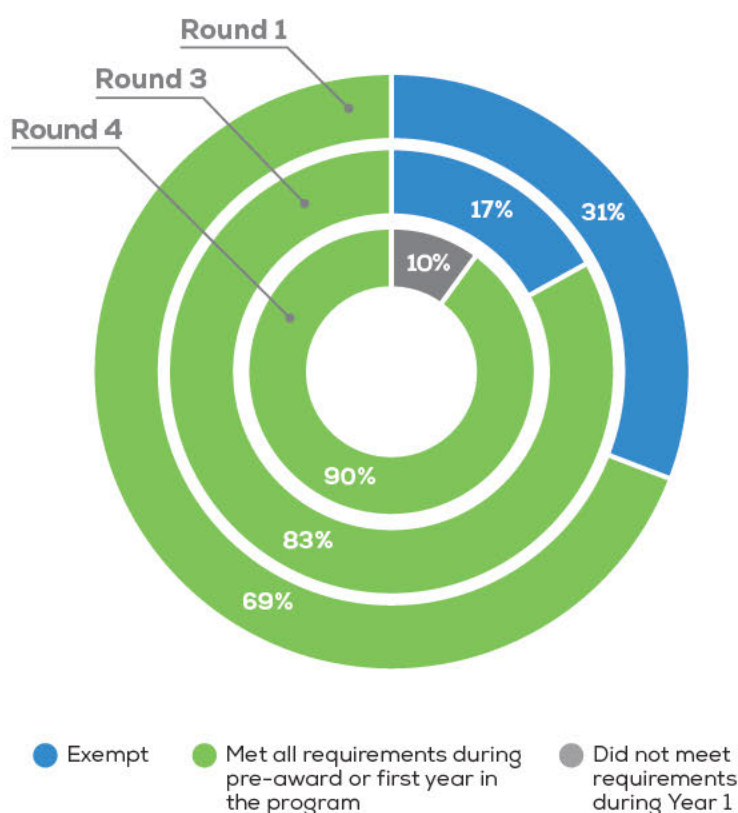
ROUND	INNOVATOR TYPE	GRADUATE	ALUMNI	TOTAL
RD. 1		10	6	16
	Non-Profit	2	1	3
	For-Profit	7	3	10
	Research Center	1	0	1
	University	0	2	2
		GRADUATE	ALUMNI	TOTAL
RD. 3		6	6	12
	Non-Profit	2	4	6
	For-Profit	4	1	5
	University	0	1	1
		GRADUATE	ALUMNI	TOTAL
RD. 4		7	2	9
	Non-Profit	1	0	1
	For-Profit	5	2	7
	University	1	1	2
		GRADUATE	ALUMNI	TOTAL
ALL ROUNDS		23	15	38

## Status of Innovators' financial readiness and compliance

2020 was the final year for Rd. 4 innovators. Two innovators – Naireeta Services and Project Alba – were granted no-cost extensions. Naireeta Services met the required targets to advance to the final year and graduate from the program. Project Alba did not advance and became a SWFF alumnus. The remaining five Rd. 4 innovators met the required targets and graduated from the SWFF program. Six Rd. 3 innovators successfully met the required targets of their awards and graduated from the SWFF program in November 2018. In 2017, seven Rd. 1 innovators successfully met the required targets of their awards and graduated. Two innovators – Reel Gardening and ICBA – were granted no-cost extensions. Both graduated from SWFF during the first half of 2018.

The chart below illustrates the status of Rd.1, Rd. 3, and Rd. 4 SWFF innovators' readiness and financial systems' strength upon their entry into the program. Readiness is defined as having reliable basic systems in place.

**INNOVATORS' ORGANIZATIONAL READINESS FOR MANAGING A SWFF AWARD**  
percentage of innovators by round that met SWFF award requirements prior to joining the program



For-profit innovators showed a higher percentage of readiness than non-profit and research organizations. (Note: the 10 percent of Rd. 4 innovators highlighted in gray represents one innovator that did not meet the standard requirements during its first year.)



## SWFF innovator financial strengths

The SWFF TA Facility monitored the strength of innovators' financial systems throughout their tenure to assist them with capabilities assessments and improvements as needed. The table below presents the level of the innovators' financial system capability on entering the SWFF program, as well as improvement (movement from one stage to another) throughout their tenure in the SWFF program.

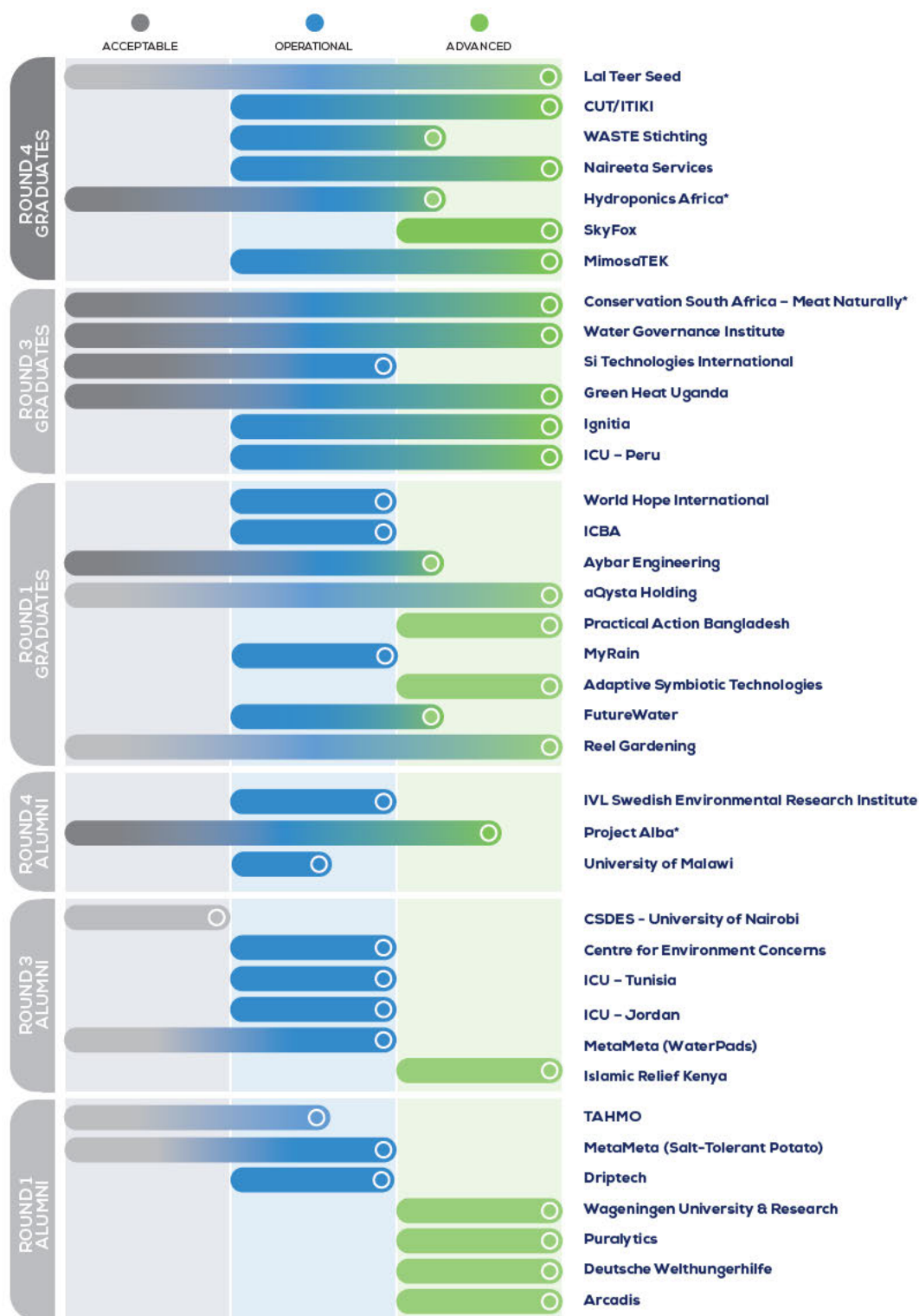
SWFF evaluated the innovators' financial system readiness using the following criteria:

- Acceptable: Basic accounting and financial reporting functions were in place.
- Operational: Standard accounting procedures, periodic financial reporting, basic budgeting, and an annual audit were in place.
- Advanced: Standard accounting procedures, periodic financial reporting, basic budgeting, an annual audit, and standard three-to-five-year financial forecasting and analysis were in place.



## STRENGTH AND ADVANCEMENT OF INNOVATORS' FINANCIAL SYSTEMS (2015 – 2020)

innovators' financial system strength and improvement by round from time of entrance into the SWFF program through May 2020



\*Advanced level progress underway



The SWFF team strongly believed that readiness of financial management systems was essential and had a direct impact on organizational growth and sustainability. All of the Rd. 4 graduates (8 of 8) and 83 percent of all Rd. 3 Graduates (5 of 6) moved from Acceptable or Operational financial readiness in their first year in the SWFF program to partially or fully Advanced by the end of their last year in the program (Year 3). Most Rd. 4 alumni (2 of 3) remained in Operational financial readiness and a majority of Rd. 3 alumni (5 of 6) remained in Acceptable or Operational financial readiness. Three Rd. 1 graduates moved from Acceptable to partially or fully Advanced. One Rd. 1 graduate moved from Operational to partially Advanced, while three graduates remained in Operational, and two moved from partially Advanced to fully Advanced financial readiness.

Throughout their tenure in the SWFF program, innovators continued to advance their systems, deploying three-to-five-year financial forecasts and regular financial analyses, as well as contracting CPA firms to complete annual financial audits.



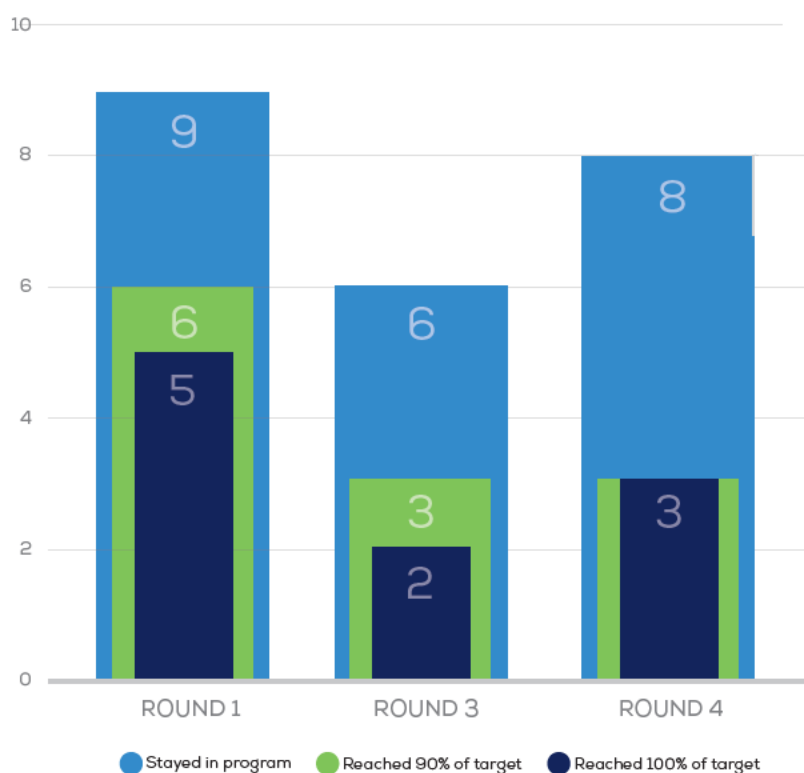
## SWFF innovator revenue results

Evaluating innovators' annual sales and revenue results was quite important in SWFF's assessment of SWFF innovators and technical assistance provided to innovators to help them accelerate scale-up. Many SWFF innovators demonstrated sustainable growth in sales and worked very hard to meet the rigorous targets set at the beginning of the program.

Aggregated annual sales results reported by innovators are summarized and presented in the following charts titled "Sales Targets by Rounds," "Sales Achievements by Rounds," and "Targets and Revenue Streams."

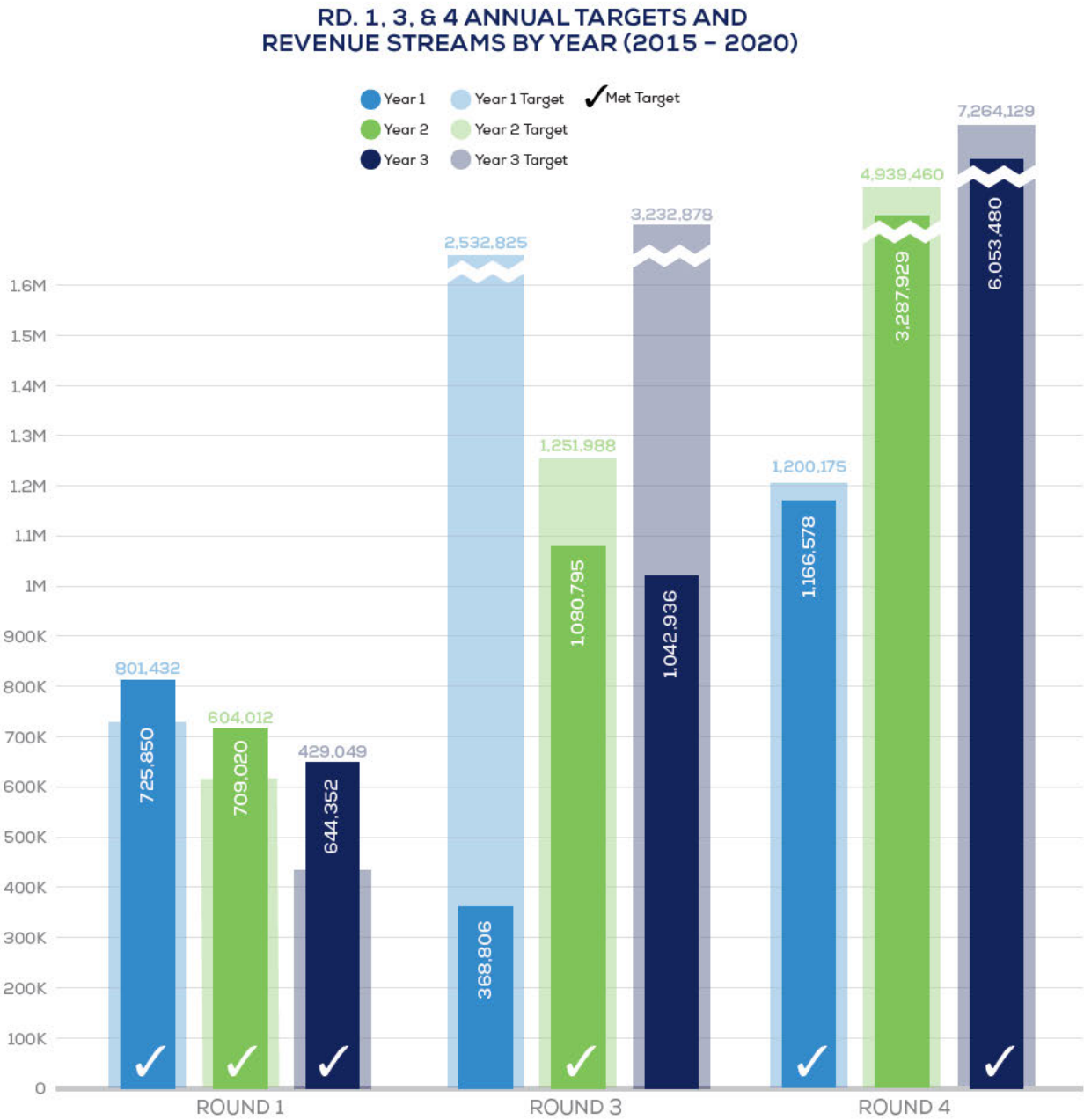
The "Sales Achievements by Rounds" chart illustrates the total number of innovators by round. By the end of their SWFF awards, six of nine Rd. 1 innovators that graduated from the program, met at least 90 percent of their sales target, and of these six innovators, five met 100 percent of their sales target. Three of six Rd. 3 innovators met at least 90 percent of their sales target and of the three, two met 100 percent of the target. For Rd. 4, of the seven that graduated from the program, three met 100 percent of their sales target.

**SWFF INNOVATORS' SALES, BY ROUND (2015 – 2020)**  
number of innovators that stayed in the program and reported annual sales  
of at least 90 percent or 100 percent of target





The Rd. 1, 3, & 4 Annual Targets and Revenue Streams by Year (2015 - 2020) chart illustrates the reported aggregated sales values by round and by year.



The results presented in the Rd. 1, 3 and 4 Annual Targets and Revenue Streams by Year (2015 - 2020) chart above shows that Rd. 1 innovators met 90 percent of their Year 1 sales targets reaching \$725,850 collectively in sales, exceeded their Y2 targets by 17 percent with a total of \$709,020 reached in sales, and exceeded their Y3 targets by a staggering 50 percent with \$644,352 in sales reached. Rd. 3 innovators only met 15 percent of their Y1 sales targets with \$368,806 reached in sales, met 86 percent of their Y2 sales target reaching \$1,080,795 collectively in sales, and missed their Y3 sales targets by 68 percent with 1,042,936 in sales reached. Rd. 4 innovators met their Y1 sales targets reaching \$1,166,578 collectively in sales, missed their Y2 sales targets by 33 percent with \$3,287,929 in sales reached, and met their Y3 sales targets with \$6,053,480 in sales reached.

While Rd. 1 innovators were they only cohort of SWFF innovators to meet or exceed all of their yearly and overall sales targets, it is important to highlight that the yearly and overall sales targets for Rd. 3 and Rd. 4 innovators were significantly higher than for Rd. 1 innovators.

Rd. 1 innovators reported total sales across the 3 years of \$2,709,222, which was 48 percent more than the total sales target of \$1,834,493. Rd. 3 and Rd. 4 innovators set very aggressive targets, especially in Year 2 and Year 3 of the SWFF program. Rd. 3 innovators reported total sales of \$2,492,537, achieving 36 percent of their overall target of \$7,017,691. Rd. 4 innovators reported total sales of \$10,507,987, achieving 78 percent of their overall target of \$13,403,764. This represented a significant accomplishment, as Rd. 4 innovators set very ambitious targets.





# Pivot To Survive: Lessons of an Ethiopian Engineer

It is not a stretch to suggest Melesse Temesgen—an Ethiopian engineer who invents more efficient plows—was the John Deere of Ethiopia. We're not talking huge combines, but simple plows. His invention, the Aybar BBM (Broad-Based Furrow Maker), was an oxen-pulled plow used only once per year to till the land. While this may seem strange in the modern world to see oxen still being used to till the land, in the wet soil of Ethiopia, it was the only practical way to farm. More oxen are sold than tractors.

Temesgen was helped along in his business by the SWFF program. He ran into a few difficult furrows to plow through along the way, but the inventive engineer kept pace by pivoting with the advice of SWFF consultants and his own imagination. The SWFF TA Facility Grants and Contracts Specialist, Rami Khyami, specifically provided support with human resources, such as supporting the hiring process of finance staff and drafting the employee handbook; providing financial capacity building; and budget modifications.

"Rami [SWFF Grants and Contracts Specialist] was extremely helpful in all the grants/finance support areas, including in helping to improve our internal operational capability," Temesgen said, noting that he would not have had the time to complete the employee handbook on his own.

Temesgen added, "The SWFF advice proved on target, especially when it came to pivoting away from exclusive government channels. I wish I had

implemented it sooner. This caused us to have losses in the first two years. We've worked to reverse that situation now."

In Ethiopia, much of the farmland was finely textured and exhibits poor drainage. Too much water suffocated the crop, leading to poorer yields or even crop failure. The BBM was the only known effective device capable of creating drainage furrows for excess water while building a broad bed for planting. As of 2020, Temesgen said his business could face more ups and downs as he struggled to connect with farmers. His new strategy was to engage the unemployed rural youth to retail his products.

In a land where oxen work better than tractors, Temesgen kept churning out more and better plows. Without his inventions, up to five million hectares can't be farmed in Ethiopia. "The market is there," said Temesgen. "And I am connecting the dots."









# MAJOR ACTIVITIES AND EVENTS



# SWFF COMMUNICATION AND OUTREACH

Since the launch of SWFF in 2014, communication and outreach has been an integral part of project implementation, with the goal of increasing SWFF innovators' visibility among potential partners and investors to help them reach sustainable scale. To achieve this, SWFF engaged multiple communications firms and consultants to support the development and execution of a communications and outreach strategy, each year drawing on innovator feedback and lessons learned to ensure that the strategy met the needs of the program.

In 2015, SWFF engaged Development Alternatives Incorporated (DAI) as a subcontractor to provide initial hands-on support for communications, outreach, and platform development. Through on-going communications and outreach, DAI raised awareness around the first and second calls for innovation, the innovators, and the Grand Challenge. While this support was necessary in laying the foundation for the program, it became clear that DAI did not have the personnel resources or the constant innovator interactions to execute a comprehensive strategy focused on the social impact of each innovator. Therefore, the program brought communications and outreach in-house, engaging communication vendors only when needed. To streamline the transition, SWFF enlisted Melwood Global to create a media and outreach strategy consisting of an analysis of the previous approach, revised communications goals, audience and media targets, and suggested changes. These changes included broader communication support, innovator communication surveys, innovator-specific training and assistance, and a greater focus on storytelling and pitching.

In 2017, due to a realignment of program priorities, the SWFF TA Facility transitioned from Melwood Global to Hattaway Communications, Inc., a strategic communications firm. The Hattaway team analyzed internal and external communications from both SWFF and innovators. This process delved deeper into SWFF communication trends, generating more detailed recommendations for communicating the program more clearly. During their contract, Hattaway also conducted two-hour strategic storytelling training sessions with 14 SWFF innovators to help them think strategically about communication goals and priorities, as well as communicate values and demonstrate impact through human interest and stakeholder stories. As a result of this engagement, the firm was able to produce 15 stories and narratives for innovators.

While Hattaway's innovator-focused approach towards social impact storytelling and outreach was successful, SWFF determined that it did not go far enough in telling the program's story and sharing lessons learned with a larger global audience. To achieve this, the TA Facility revised its strategy to include both an expanded social impact storytelling initiative and pay-for-performance media contract to maximize program content and visibility.



Through an extensive procurement process, the TA Facility brought on the Florida-based firm Willard Global Strategies to harvest story ideas, interview the innovators, and write and edit feature stories, producing a remarkable 125 stories. To support this initiative the TA Facility also hired the agency INK, Inc., under a unique pay-for-performance contract model to support efforts in gaining visibility for SWFF innovators through feature article and press release placement in a variety of media and industry trades, blogs, and popular media channels. INK placed stories with four prominent media outlets, including CNN, ABC, Forbes.com, and Bizjournals.com. Through these two vendor contracts, SWFF was able to create a robust “content machine” that streamlined the documentation, production, and placement of stories that feature SWFF innovators’ journeys and impact: improved livelihoods, food security, poverty resilience, and women’s empowerment.





# ANNUAL SWFF CONVENINGS

Since its inception, SWFF has valued the importance of bringing innovators and program stakeholders together through its annual convenings. With Founding Partners, SWFF innovators (current, graduate, and alumni cohorts), members of the IIAC, and TA Facility staff members all in attendance, each convening offered innovators a unique opportunity for program engagement through a variety of activities. Those activities included: investor matchmaking sessions, in-person one-on-one expert technical support, panel presentations, and innovator-led discussions known as an “Unconference.” Following each convening, SWFF assessed event successes and failures through surveys and informal discussions to ensure that the convenings proved useful and valuable to the innovators.

## 2015 Global Forum for Innovation in Agriculture (GFIA), Abu Dhabi

In February 2015, SWFF Rd. 1 Innovators attended the GFIA to meet with the TA Facility staff for the first time, finalize their intake into TA Facility activities (annual work plan discussions/ PAS clarifications), network with potential agriculture and water investors, and positively promote their work to a wider network of actors. Innovators also received demand-based business and finance capacity building as a group. Overall, the forum was viewed as a success, with 83 percent of innovators rating the quality of the experience as “Very Good” or “Excellent.”





However, a key innovator concern was that most innovators made investment pitches with no investors in the audience. In addition, the SWFF TA Facility and donors delivered multiple expert-led acceleration support seminars related to investor financing, business model canvassing and gender. Innovators noted that the technical assistance provided wasn't tailored to meet their needs because they were too "high level" and didn't tie directly enough to the local context of the innovator. As a result, SWFF determined that GFIA was not the best platform for innovators seeking investment opportunities or technical assistance and did not return to the event.

## **2015 Amsterdam International Water Week (AIWW), The Netherlands**

In November 2015, SWFF publicly announced the Rd. 3 Innovators at the annual AIWW in Amsterdam. More than 60 people, including the SWFF innovators, the TA Facility team, DAI communication staff, USAID interns, Founding Partners, speakers, special guests, dignitaries, and social impact investors were in attendance. During the event, the TA Facility organized a dynamic matchmaking session with social impact investors, as well as a "Pitch and Picture" session, which featured 10 SWFF innovators highlighting their innovations and how partners could engage with their organizations. Communication support was hailed as one of the greatest value-adds of the program according to the innovator feedback survey.

Based on lessons learned from Abu Dhabi, the event also featured acceleration workshops more tailored to the innovators' needs. The workshops focused on metrics and milestones, partnerships, business model development and legal, investment, and gender equality. While the content of the presentations improved, SWFF once again failed in making impactful connections to innovator goals. The gender presentation was particularly challenging. In the program's first year, the importance of integrating gender into innovator business models lacked buy-in, resulting in two types of negative innovator responses about the presentation – "I know this is important, but why is it important to me?" and "How does this information help my numbers?"

## **2016 Ag Innovation Investment Summit (AIIS), Washington, DC**

Co-hosted by SWFF, 30 innovators as well as 25 other recipients of other USAID agriculture innovation grants were invited to Washington, DC for a series of activities and workshops in June 2016. A primary objective of the AIIS was to introduce these entrepreneurs to the 37 potential investors that attended the event, including an investor panel, a pitching competition and a "speed dating" activity for innovators to meet investors. The Summit also held a series of TED Talks given by innovators and other thought leaders in the field. Feedback after the event was generally positive, with survey results showing that 70 percent of innovators connected with at least one investor. However, the event did not meet all expectations. For example, prior to the event, innovators spent hours conducting research on potential investors without meeting them in person. In addition, while the "speed dating" activity was an interesting idea, it was poorly managed, resulting in missed opportunities for the innovator.

After the initial Summit, SWFF also held its first “UnConference.” Based on the failures of the past two events, the TA Facility pivoted from expert-led, lecture-style workshops to innovator-led, informal discussions, allowing innovators to engage with peers in a loosely structured conference setting. With topics determined prior to the event, innovators were given the option to either lead or participate in the conversation. This new approach gave participants the opportunity to learn from one another and connect the knowledge gained to their work on the ground. The consensus view of the innovators on the UnConference was that the activity was “interactive,” “informative,” “educational,” “informal,” “valuable,” and “useful.”

### **2017 Global Agripreneurs Summit (GAS), South Africa**

SWFF partnered with the Future Agro Challenge (FAC) to host the GAS in Johannesburg, South Africa in March 2017. The Summit offered a varied program, including an innovation marketplace showcasing SWFF innovations to an estimated 5,000 visitors; one-on-one investor matchmaking sessions; a coaching camp; and an awards ceremony. One hundred percent of the innovators who completed surveys stated that the conference fulfilled their reason for attending (networking and funding were the main reasons to attend) and 81 percent said that they would attend a similar conference in the future. At the “Matchmaking Zone,” select innovators met one-on-one with an average of four investors for 15 minutes each. A total of 27 investors participated in the one-on-one investor matchmaking sessions. Overall, 58 percent of the innovators met up to five new potential partners, and 42 percent met more than six (6 percent met more than 10). After the Summit, SWFF innovators once again participated in the UnConference, this time crowd sourcing potential topics with innovators ahead of time to ensure that the innovator-led discussions were both relevant and valuable.

The TA Facility also prioritized gender during this Summit. Applying lessons learned from previous events, SWFF brought in two gender specialists to meet with innovators individually and provide guidance on how to diversify their customer base to include smallholder women farmers. By providing this one-on-one attention, the specialists were able to understand innovator needs and adjust their guidance based on innovator local context.

### **2018 Stockholm International Water Institute (SIWI) – World Water Week, Sweden**

SWFF convened its annual innovator summit during SIWI World Water Week in August 2018, one of the largest global events focused on water-sector and development-related challenges. The SWFF delegation included more than 70 attendees. The event kicked off with the SWFF UnConference, which included nine formal discussions, during which innovators shared their experiences with various entrepreneurial processes, as well as lessons learned through both successes and failures. At the conclusion of the day, SWFF Rd. 1 innovators gathered onstage to share their experiences during and after the SWFF program and offer words of wisdom to their peers. The event also included a SWFF showcase presentation titled, “Hype or Groundbreaking: Has Securing Water for Food Delivered?”, composed of a diverse panel of SWFF innovators, customers or end users, external evaluators, and partners. Johan Kuylenstierna, Vice Chair of the Swedish Climate Policy Council, moderated the discussion.





### 2019 Global Entrepreneurship Summit (GES), The Netherlands

In June 2019, SWFF brought together its innovators at the GES in The Hague. Hosted by the United States and the Netherlands, the event was a major opportunity for innovators to connect with investors and other entrepreneurs. With more than 30 attendees (including 20 innovators), the week began with the annual UnConference. Led by the innovators, topics included: enhancing women's participation in agriculture; end-user financing; standing out in a saturated market; recruitment; and investor pitching. A team from Resonance Global presented their initial framework to a landscape study on business models for "Base of the Pyramid" consumers. Conversations started at the annual convening and continued throughout the week. Innovators also engaged in one-on-one sessions with TA Facility staff, a storytelling team, a Dexis external evaluator, and the Resonance team.





# SWFF LESSONS LEARNED AND WE4F





# OVERALL PROGRAM LESSONS LEARNED

Overall, SWFF was an extremely successful program as multiple SWFF innovations reached wide-scale adoption and many others reached more than 10,000 customers and other end-users. A key factor in SWFF's success was the program's ability to measure, monitor, learn, rapidly pivot, and adapt when either an innovator- or the program as a whole- faced challenges. To truly understand SWFF's six years of lessons learned, one should visit SWFF's website. This website houses more than 20 reports, workbooks, and guides; more than 200 program and innovator stories; and many hours of SWFF's webinars, all of which contain key lessons learned that can be extrapolated to provide a strong basis for the WE4F Grand Challenge.

One notable publication, SWFF's Failures, Pivots, and Lessons Learned Report, provided a close analysis and examination of the factors that caused programmatic failures, the corrective actions taken by SWFF, and the resulting lessons learned and recommendations for future development projects and other Grand Challenges, including WE4F. Several of these failures and pivots are addressed throughout this report. Other notable lessons learned are documented below.





## Practical and actionable gender recommendations can facilitate gender-inclusive programming

In some countries, women are 70 percent of smallholder farmers. However, innovators working at the nexus of water and agriculture sometimes struggled to reach women as customers, clients, and employees (at both the staff and management levels). As has been previously noted in this report, SWFF's original gender recommendations were based on principles and policies rather than being practical and action-oriented for SWFF innovators.

As a remedy, SWFF released the gender publication the Untapped Market for Agricultural Innovations in Emerging Economies: A Practical Workbook to Help Innovators Reach Women Smallholder Farmers in May 2017. This workbook served as a practical tool for innovators working in the water-agricultural sector to help them: (1) reach and effectively serve the untapped or missing market of women smallholder farmers in emerging economies; (2) target business growth with a focus on women smallholder farmers; (3) highlight resources for designing and marketing products, services, and technologies to reach this market; (4) guide the assessment of barriers and opportunities to reach the missing market of women smallholder farmers; and (5) create a framework for expanding to other countries and markets.

As noted in the Gender Empowerment and Integration Section of this report, multiple SWFF innovators became profitable in part because they incorporated design and marketing feedback from women to address the specific challenges women face. In many cases, women using SWFF innovations benefitted more than men because of the time savings realized in cooking, collecting water and performing other on-farm labor.

## Helping alleviate poverty was extremely challenging for SWFF innovators

As noted in the Poverty Section of this report, poverty alleviation was an extremely challenging endeavor for SWFF innovators. Often, SWFF innovators faced competing needs to create financially sustainable enterprises while meeting the needs of people who are often neglected or ignored by water/agricultural technology providers. In many instances, the innovators created credit and end-user financing systems that allowed farmers to place a down payment and then pay the remainder of the cost in installments. SWFF innovators made significant progress on working with BOP customers as 21 percent of SWFF customers and other end-users were the extreme poor, but more needs to be done in WE4F.

To provide more support to innovators, WE4F created the BOP Innovator Guidebook to help enterprises seeking to work with BOP customers.

## **Clear communication and detailed expectations led to successful implementation**

In the SWFF's first few years, failures to communicate often led to misaligned expectations. Initially, USAID, Sida, and MFA-NL were not aligned on the program's gender requirements. To strengthen the partnership, SWFF's Founding Partners committed to a consensus driven process where all partners were involved in all major SWFF decisions through email, weekly calls, and periodic in-person meetings. USAID – who managed the day-to-day aspects of SWFF – shared all programmatic and budget documentation with the other Founding Partners and encouraged partner engagement in all key decisions. Through consensus and collaboration, the SWFF partners developed a common understanding of the strengths and weaknesses of SWFF's gender programming and improved upon them in WE4F.

This was also true of interactions between the donor partners and the SWFF TA Facility. In Year 1 of the program, the SWFF Founding Partners believed that SWFF reports were "too promotional". The donors felt that rather than just describe what was working, the program needed to also talk about its key challenges. On the other hand, the SWFF TA Facility's mandate was to increase awareness and uptake of SWFF innovations, and so the TA Facility wanted to promote each innovation in a positive way to meet its objectives. Over time, both the donors and the TA Facility came to a common understanding on the level and quality of analysis required from SWFF reporting the sharing of lessons learned.

This theme was most evident in the TA SOW interactions between the TA Facility, service providers and innovators. As noted in the Acceleration Support section, there were many mismatches between the expected outputs or outcomes of acceleration support engagements and the actual outcomes (see World Hope and AST examples). To address this misalignment issue, SWFF was forced to be creative when imagining all the ways the objectives of a scope of work could be interpreted differently by different parties and stakeholders, clarifying them upfront. The SWFF Acceleration Facilitator then became more involved in the interaction between service providers and innovators to facilitate those shared expectations.

## **Acceleration support services must increase an innovator's technical capacity and the milestones must be realistic but ambitious**

Milestone-based funding, paired with acceleration support services, delivered greater program and individual innovator impact than development dollars alone. Before the start of the SWFF program, many donors believed that medium to large donor grants were the best mechanism to support innovation. However, USAID's experiences with other Grand Challenge for Development (GCD) programs demonstrated that grant funding alone did not lead to very many innovators reaching sustainable scale. Rather, from both awardee surveys and program reporting from other GCD programs, there was little to no evidence that grants contributed to strengthening innovator's operations (i.e. by expanding innovator market shares, product development, etc.) beyond providing an influx of cash.

USAID did see strong evidence from the investment community that milestone-based funding worked well if paired with technical assistance. SWFF's theory of change was that if combined together, GCD programs could achieve more success than just funding alone. SWFF's external evaluation demonstrated that this was, in fact, the case. In general, the grants alone didn't strengthen SWFF innovator's operations. Rather the combination of technical assistance and funding helped innovators reach more target customers and other end-users. Moreover, without technical assistance, many SWFF innovators did not possess the internal infrastructure to grow and sustainably scale.



# ACCELERATION LESSONS LEARNED

## **In order to scale, innovators must define their customer segments and validate their assumptions on the value they deliver to customers, distribution channels, and cost structures**

A key challenge for SWFF innovators was that they often didn't know their customers nor understand their customers' needs. In some cases, an innovator would request sales and marketing support, but they did not have a clear understanding of the value proposition of their product or service from the perspective of their customers. In multiple instances, innovators had not conducted the customer surveys and interviews to get a large enough data set to clarify the pain points and did not create a value proposition that addressed those pain points. SWFF's technical assistance helped innovators recognize that their products and services needed to be demand-driven, rather than supply-driven.

## **NGOs and nonprofits need to develop viable business models early in development**

In SWFF's experience, NGOs and nonprofits that focused on financial sustainability and developed viable business models in the earliest stages of their innovation's development were more likely to have reached their milestones. As noted by Practical Action, SWFF helped NGOs shift farmers from a charity mindset to an ownership mindset, and farmers were often willing to pay for goods and services of value.

## **Roadmap of support drove innovators' tenure with the Challenge program**

Drawing on its experience, the TA Facility built and provided a roadmap of support that painted a clear picture of organizational development and guided each innovator's tenure with SWFF. In the first year, SWFF supported and helped solidify an innovator's foundational business requirements. During this period, each innovator generally received business model support to either create a business model canvas or review its existing business model for opportunities to integrate other pieces of the value chain and better appeal to customers' interests. In Year 1, SWFF frequently provided support focused on customer validation to ensure that the innovator had an accurate understanding of the target customer profile and proper customer segmentation.

Often, in the second and third years of an award, innovators received support in sales and marketing. As a result of the business model support, innovators better understood how to engage with customers and which problems needed to be solved. Sales and marketing support included assistance with drafting and piloting strategies, refining the strategy over time, and providing sales training to the innovator's staff.

Drawing on lessons learned from the many times SWFF delivered those kinds of support, the TA Facility developed core offerings for each service support category that could be tailored to the specific needs and context of each innovator. SWFF learned that, for an innovator to be successful, at least 20 percent of the support provided should be contextualized to the specific needs of the innovator. The greatest value of this evolved suite of support services was that it provided each innovator with a clear picture of the benefits it would receive while collaborating with SWFF's Acceleration Facilitator, which made it more likely that the engagements led to realization of the innovator's goals. Applying this approach from the outset of WE4F will enable an innovator to envision the multi-year plan to develop the enterprise toward scale and to adapt and deviate from that plan as necessary given realities on the ground over time.

### **Sequenced and incremental acceleration support where innovators experience meaningful short-term results can build momentum for success and help innovators meet milestones at an accelerated pace**

The TA Facility provided a wealth of resources on a shared Google Drive available to vendors as background context to inform their proposals to innovator support scopes of work and project implementation. The innovator's original application to SWFF was stored on that shared drive along with their acceleration work plan, their responses to the Needs Diagnostic, and deliverables from previous support engagements.

The goal of sharing those documents with vendors was to help them get up to speed on the innovator's business model, progress and challenges to date, upcoming milestone targets, and advisory outcomes provided previously. This helped first-time vendors come to an engagement with a body of knowledge that enabled them to ask more informed questions earlier in their interactions with the innovator. The innovator was then spared the burden of covering ground and answering questions that they had addressed with prior vendors.

When conducting vendor proposal assessments for innovator support scopes of work, the evaluators looked for specific evidence that the vendor had reviewed available background documentation and that it had informed their proposal responses. During the innovator interview phase of vendor selection, when the innovator spoke with the top two finalists, the innovator was specifically seeking to understand how much background and context the vendor was bringing to that initial interaction. A vendor able to ask second-level questions and integrate contextual knowledge into the discussions was looked upon more favorably.

Applying this lesson learned at the outset of WE4F should enable innovators to experience a unique and tailored customer-orientation from both the Regional Hub staff and the vendors delivering support services. From their first interactions with the people tasked with helping WE4F awardees overcome barriers to scale, they should come away with the sense that "they know us."



### WE4F should introduce a preferred-vendor mechanism

In the final full year of the program, the TA Facility implemented a rolling admissions mechanism to qualify and onboard vendors recommended and requested by SWFF innovators as needed. During the annual acceleration support planning process, if an innovator suggested a preferred vendor outside of the SWFF network to deliver the work, the TA Facility had the means to invite the vendor to apply to the system and qualify them for membership. For those situations, an additional step was added in the qualification process to avoid potential conflicts of interest. This rolling admissions mechanism enabled the TA Facility to better align to the timing needs of the innovator, rather than force them to wait until another formal call for vendors was conducted. In the WE4F context, awardees should enter the program with the confidence that the program places a priority on utilizing innovator-preferred vendors when vendors currently available in the system do not best fit the need.

### SWFF was unable to formalize an investor network, WE4F must do so

One gap in the SWFF suite of innovator support offerings was the lack of a formal strategy to engage the investor community and create a variety of partnership mechanisms. The TA Facility attempted to create investor-innovator connections through bespoke support engagements as well as matchmaking events held during annual innovator convenings. None of those efforts achieved the desired outcomes, for several reasons. In the case of bespoke support, the connections were made through a single support provider, which did not bring an investor network directly relevant to the technology and geographic circumstances of the SWFF innovators. In the case of the matchmaking events, the investor audience participating was composed of the networks of mostly SWFF innovators which, again, were not consistently appropriate for these specific innovators.

From the launch of WE4F, there was a strategic and targeted effort to understand the investor landscape in the regions of focus for the program and to identify investors and investment firms that are likely to have an interest in the pipeline of innovators that will come through the regional hubs. Beyond identification, WE4F created a variety of opportunities for investors to partner with the program, ranging from mentorship to providing first access to deal flows to conducting due diligence prior to investment. Selected investors were formalized into a cohort actively engaged with the WE4F Secretariat, the Regional Hubs, and the individual innovators for multi-directional value add.



# MONITORING AND EVALUATION LESSONS LEARNED

## Without baselines, evaluations are hindered

In many cases, SWFF innovators did not provide, nor did the program collect, initial baselines. Thus, it was very difficult to recreate an accurate view of an innovator's impact in Year 1 of their award. However, SWFF managed to collect data where it otherwise would have proven difficult by incorporating questions related to the SROR in field evaluation surveys for a number of innovators.

In the future, for similar programs or international development projects, baseline measurements should be proactively gathered. This can be done by requiring the innovators at the onset of a program to provide a baseline themselves or to answer a tailored questionnaire with all the needed baseline data included to determine the average income levels, level of crop production, and other necessary information. This baseline data can then be tracked with updates to the information provided in subsequent questionnaires to determine a more accurate return on investment for a program in relation to its economic impact on customers/end-users. As innovators expand rapidly at times and fundamentally change choices of crop selection and production patterns, semi-annual reporting should include any new farmers and establish baselines for any large number of incoming customers/end-users of a particular region or country. This also would improve data monitoring and collection methods for innovators.

## SWFF pivoted to improve awardee reporting, but WE4F can improve upon SWFF's efforts

Due to the number of indicators involved in data reporting, initial data and backup documentation provided incrementally throughout the three year award cycle proved difficult for many innovators. Since most innovators were private businesses with no history or need to collect impact data from their farmers, they were new to the process and it proved cumbersome to collect the data being requested semi-annually. There were many instances in which SWFF innovators provided insufficient backup documentation that severely delayed the disbursement of funding and the continuous selection process. When it existed, backup documentation was sometimes in other languages or was not translated well enough for adequate comprehension. Other times, there would be confusion as to what constituted sufficient proof for harder to quantify variables such as water savings measurements. Moreover, there were also many reporting irregularities. Due to the delay or discrepancy between reporting times and harvest times for farmers using innovations, SWFF innovators would sometimes report hypothetical crop yields and hectares in anticipation of harvest rather than actual harvest numbers.



To address this issue, a number of processes were implemented and streamlined to more efficiently report impact data and to verify backup documentation in a more organized and thorough manner. A questionnaire with all the relevant data requested from innovators was developed through the Cognito Form, a web survey tool with tailored questions, whereby innovators could report their incremental numbers for indicators and annotations for their reasoning for meeting or not meeting their targets. This Cognito Form standardized all questions for data collection and allowed innovators to succinctly state their impact numbers along with annotations explaining any inadequacies, setbacks, or other reasons they anticipated not reaching targets. That helped in developing mitigating measures to keep innovators on track in meeting goals.

The SWFF Awardee Results Database was segmented and streamlined to make it easier to input information. Spreadsheets were designed to store the majority of indicator data in a series of labeled and segmented tabs allowing for easy data entry. A Google Drive folder was created for each innovator to upload all their M&E supporting documentation, arranged by folders for each indicator. These folders were further segmented by time of reporting. As a result, the review and verification of backup documents and data entry into the database itself became much more efficient, as did communication with innovators regarding missing or insufficient backup documents or off track target numbers.

### **While SWFF was more successful than most agriculture programs, WE4F should strive to surpass SWFF in measuring the impact on BOP customers**

In their applications, SWFF innovators typically claimed to benefit low to middle income farmers. However, SWFF faced significant challenges in helping its innovators measure the innovation's impact on customers from the base of the pyramid or the lowest income groups, especially with innovators whose customers/end-users are not exclusively the extreme poor. In many cases, SWFF innovators focused on middle income customers, with about 25 percent of their customer base being poor customers. The disincentive to invest in working with the extreme poor, who may lack the resources to fund and/or maintain an innovation or may not be able to reap a significant enough profit for investment, was strong.

Quantifying the number of extreme poor that SWFF innovators worked with was difficult because farmers were often wary of reporting exact incomes to an outsider like SWFF, did not remember their previous harvest quantities and profits, or in some cases overreported those belonging to the extreme poor income group out of a perception that this qualified them for subsidies, discounts, or future benefits. This bias was observed by external field evaluators when questioning customers/end-user reporting as extreme poor but having access to amenities and possessing appliances that suggested otherwise. Some customers/end-users reporting little to no income (subsistence farmers) may have had off-farm income or may not necessarily have been of the extreme poor grouping.

To gain more insight, SWFF hired external evaluators with a mandate to focus on questions that asked which income group customers belonged to, and their previous, current, and expected incomes. Evaluators were prepared to discern income groups through observation and logical deduction. Questions were also included related to income, but in many cases, farmers did not self-report their income. Customers/end-users of each innovation were segmented into income groups to focus on those that targeted the extreme poor. This led to the ability to know the income segmentation of most innovators and thus the numbers of extreme poor customers and end-users impacted by SWFF innovations.

# WATER AND ENERGY FOR FOOD: A GRAND CHALLENGE FOR DEVELOPMENT

Due to the successes achieved and the vast resources and lessons learned from SWFF, the Donor Partners decided to merge the SWFF model with its sister program, Powering Agriculture: An Energy Grand Challenge for Development (PAEGC) and forge a new grand challenge program. In late October of 2019 at the Social Capital Markets (SOCAP) conference in San Francisco, the German Federal Ministry for Economic Cooperation and Development (BMZ), Sida, and USAID launched WE4F, a \$65 million four-year program.

WE4F's mission was to expand the sustainable scale of small and growing enterprises (SGEs) that impact the sectors of food and water, food and energy, or all three sectors at the nexus (food, water, energy) to increase the sustainability of agricultural food value chains and address environmental and climate resilience in developing countries and emerging markets – with a particular focus on the poor and women.

WE4F capitalized on the vast resources and learnings from SWFF and Powering Agriculture and adopted the most promising innovations/innovators identified and nurtured in those programs and support those innovations to grow and scale. The aspects of SWFF and PAEGC incorporated into the design of WE4F included: milestone-based funding, paired with acceleration support services; sequenced and incremental acceleration support where innovators experience meaningful results; practical and actionable gender recommendations integrated into all scopes of work; and lastly, WE4F capitalized on the regionally implemented donor and investor mappings, the Base of the Pyramid Study, and the Missing Markets Report.

The overall structure for the WE4F Grand Challenge was a steering structure consisting of a Donor Steering Committee, one Secretariat with two units managed by USAID and Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ), and one regional innovation hub per region. A key feature of WE4F was its local focus through the implementation of the regional innovation hubs. The hubs' activities fell under four main pillars: grants and contracts management; technical assistance provision/capacity building; improvement of the enabling environment of WE4F innovations; and support innovators with financial brokering, investment facilitation, and end-user financing solutions. Four regional innovation hubs were established around the world in West Africa (headquarters: Cote d'Ivoire), East Africa (headquarters: Kenya), South/Southeast Asia (headquarters: Thailand), and the MENA Region (headquarters: Lebanon). The two regional innovation hubs in Africa were managed by the GIZ unit of the Secretariat and were operational by May 2020. The regional innovation hubs in South/Southeast Asia and the MENA region were managed by the USAID unit of the Secretariat and were operational by late summer of 2020.



With a stronger focus on private investment, SWFF's follow-on program WE4F conducted investor landscape assessments in East and West Africa, MENA, and the S/SE Asia region. Two firms specializing in surveying enterprises, investors, and service providers, CrossBoundary and Intelicap, were hired for the separate regional assessments. Both firms spent months in each region interviewing dozens of stakeholders to determine viability of various innovations.

In East Africa, Crossboundary noted that various enterprises were ready for expansion, but it was difficult to achieve the desired scale without active intervention. This was due to the challenges around small investment amounts, the lack of local bank participation, and nascent business model structures.

In West Africa, the CrossBoundary assessment indicated there was a high concentration of activity in the irrigation sector due to the especially dry climate. There was a demand for enterprises to aid in year-around productive land use. A particular attribute of West Africa was that the enterprises surveyed were distributed over a larger geographical area and were often located in the challenging and under-penetrated markets compared to their East African peers. The assessment found that while most of the companies have at least one female in a management position, challenges remain in creating an equitable investment landscape across genders.





In the MENA region, Crossboundary found that both equity and debt investors did not cater to start-ups or less mature enterprises. Most investors focused on mature or growth stage companies due to lower risks: on average, SME loans accounted for only 7.6 percent of finance to the region. However the younger enterprises tended to have more inclusive work-forces, with more women and youths in leadership positions. These firms also had higher long-term potential for revenue growth and end-user reach.

Intellectap's assessment of the South and Southeast Asian investor landscape found that most investors preferred to have a local presence in the regions they seek to invest in and have multiple fund vehicles either differentiated by geography or type of capital. Of the 100 enterprises surveyed, 59 enterprises demonstrated scale potential in terms of customers reached. Intellectap also found that while enterprises co-founded by women showed growth rates similar to men-founded enterprises, on average, enterprises co-founded by women had greater revenues than wholly men-founded enterprises.

WE4F's donor partners also wanted to better understand already ongoing donor activities that may be connected to the water-agriculture-energy nexus in WE4F implementation countries. In collaboration with Master's level students, WE4F Donor Partners created an online donor database and dashboard so that they could see each other's water, energy, and agriculture programming in each region and could collectively determine how to engage with existing programming to reduce redundancies and increase efficiency.





# ANNEX A: SWFF INNOVATORS



# SWFF INNOVATORS

INNOVATOR	INNOVATION	PRODUCT SUMMARY
SWFF INNOVATORS, RD. 4 GRADUATES		
CUT/ITIKI (University)	Drought Prediction Tool	Early warning system integrates indigenous and scientific drought forecasting using a mobile application, web portal, and SMS service to pool weather information through a network of sensors that monitor weather conditions for small-scale farmers
Hydroponics Africa (For-Profit)	Hydroponics Services	Simplified, all-inclusive hydroponics services leverage use of local materials to grow healthy plants and help smallholder farmers produce maximum yields in small areas without using soil, while using 80 percent less water
Lal Teer Seed (For-Profit)	Salt-Tolerant Vegetable Cultivation Methods	Locally developed salt-tolerant vegetable seeds, combined with easily adoptable cultivation methods in high-saline areas of southern Bangladesh – innovation package includes microfinance assistance, information and communication technology (ICT) support, and extension advisory services
MimosaTEK (For-Profit)	Internet of Things Platform for Precise Irrigation	Internet of Things (IoT) platform for precision agriculture monitors and analyzes farm data using sensors (to measure soil moisture, rain, wind, and light) and then recommends a precise irrigation schedule in real time
Naireeta Services (For-Profit)	Bhungroo Rainwater Harvesting Technology	Handmade pipes 10 to 15 centimeters in diameter are used to filter, inject, and store rainwater underground for use in lean periods to provide food security – also can supplement household water needs
SkyFox (For-Profit)	Integrated Aquaculture and Crop Production	Top-of-hill aquaculture ponds capable of producing two tons of catfish twice a year, as well as enough nutrient-rich water to irrigate 25 acres of land at the base of the hill – services include leasing ponds and irrigation land and providing extension services to resource-poor farmers
WASTE Stichting (Non-Profit)	Circular Economy with Black and Grey Water Recycling	Circular recycling system for black and grey wastewater aids in exotic vegetable cultivation
SWFF INNOVATORS, RD. 3 GRADUATES		
Conservation South Africa – Meat Naturally (For-Profit)	Communal Grazing Systems and Ecorangers	Services combining ecological science, a government job-creation program, and market interest in sustainable meat help implement communal grazing systems that result in improved water and food availability
Green Heat Uganda (For-Profit)	Slurry Separation System (SST)	Slurry separation system vastly reduces water demands of anaerobic digesters, creates an easy-to-handle solid fertilizer, increases gas production, and improves removal of contaminants in the bio-slurry
Ignitia (For-Profit)	Mobile Weather Forecasts	Accurate weather forecasts help farmers sow, fertilize, and harvest at the optimum time, manage their daily activities, improve crop yields, and optimize food production



# SWFF INNOVATORS (CONT.)

INNOVATOR	INNOVATION	PRODUCT SUMMARY
Institute for University Cooperation (ICU) – Peru (Non-Profit)	Irrigation Scheduling System	Irrigation scheduling system provides farmers with direct indications of when and how much to irrigate – using a climate station, the system measures air temperature, humidity, wind speed and direction, intensity of solar radiation, and rains
Water Governance Institute (Non-Profit)	Aquaponics Farming System	All-in-one aquaponics system allows for crop production and fish rearing at home – closes the loop between fish and horticultural crop farming to provide nutritional supplements and alternative incomes to farmers
SWFF INNOVATORS, RD. 2 (DESAL PRIZE)		
Center for Technology and Design (For-Profit)	Electrodialysis Reversal (EDR) System	Desalination process separates salts from water by applying electric potential to electrodes and pulling dissolved salt ions through ion-exchange membranes
SWFF INNOVATORS, RD. 1 – GRADUATES		
Adaptive Symbiotic Technologies (For-Profit)	BioEnsure Microbial Inoculant	Fungus found in Yellowstone National Park reduces water consumption, increases drought tolerance, and enhances crop yields with no negative impact when applied to seeds
aQysta Holding (For-Profit)	Barsha Pump	Low-cost, hydropowered irrigation pump requires no fuel or electricity, has no operating expenses, and does not emit polluting greenhouse gases
Aybar Engineering (For-Profit)	Broad Bed and Furrow Maker (BBM)	Cultivation equipment reduces planting time and drains excess water away from crops – made of lightweight materials appropriate for farmers
FutureWater (For-Profit)	ThirdEye Flying Sensor	Drones carrying sensing equipment provide smallholder farmers with insights critical to improving their application of limited resources, such as water, seed, and fertilizer
International Center for Biosaline Agriculture (Non-Profit)	Salt-Tolerant and Resilient Crops	Non-GMO, salt-tolerant quinoa enables significant food production in saline soils without the need for freshwater
MyRain (For-Profit)	Rainmaker Custom Drip Irrigation System	Customized irrigation system design tool helps small agro-retailers across India avoid the complexity of drip irrigation design and installation – enhances water efficiency by as much as 50 percent
Practical Action Bangladesh (Non-Profit)	Sandbar Cropping Technique	This low-cost cropping technique transforms previously unused sandy islands appearing after each rainy season into productive large-scale farms
Reel Gardening (For-Profit)	Biodegradable Seed Tape	Simple, quick, and effective biodegradable paper tape encases organic fertilizer and seeds at the correct depth and distance apart, resulting in potential savings of 80 percent in water consumption
World Hope International (Non-Profit)	Affordable Greenhouses	Affordable greenhouses enable a year-round growing season, address food insecurity, conserve water, and promote the equal participation of women in the economy

# SWFF INNOVATORS (CONT.)

INNOVATOR	INNOVATION	PRODUCT SUMMARY
<b>SWFF ALUMNI</b>		
Arcadis (For-Profit)	Freshwater Management System	Sustainable, innovative freshwater management system prevents groundwater salinization in coastal areas
Center for Sustainable Dryland Ecosystem and Societies – University of Nairobi (For-Profit)	M-Fodder Mobile Ordering System	Mobile phone SMS system enables smallholder livestock farmers to send an SMS and receive high-quality hydroponically produced fodder for livestock
Centre for Environment Concerns (Non-Profit)	SWAR Subsurface Drip Irrigation System	Subsurface drip irrigation system spreads moisture at plant root zone, improving cultivation of vegetables, flowers, and fruit/forestry trees and using only one-fifth the water of other drip irrigation systems
Deutsche Welthungerhilfe (Non-Profit)	Greenhouse Technology	Combination of low-cost rainwater harvesting and greenhouse technology allows farmers to produce vegetables during colder months when no water for agricultural production typically is available
Driptech (For-Profit)	Affordable Drip Irrigation	Low-cost drip irrigation system uses an innovative laser punching technology to ensure uniform water application at the root zone of all crops in a field – provides the same benefits as drip irrigation used by large-scale farmers at a lower cost
ICU – Tunisia (Non-Profit)	Buried Diffuser Irrigation Technique	Patented underground irrigation technique for field and greenhouse trees, shrubs, and vegetables enhances efficiency of water resources, increases crop productivity, and makes rainfed agriculture sustainable
ICU – Jordan (Non-Profit)	Groasis Waterboxx Planting Technology	Integrated planting technology allows farmers to plant fruit, fodder, trees, and shrubs in degraded farmland and rangelands in Jordan
Islamic Relief Kenya (Non-Profit)	SunCulture AgroSolar Irrigation Kit (ASIK)	Off-the-shelf, no-frills, cost-effective solar-powered drip irrigation technology
IVL Swedish Environmental Research Institute (Research Organization)	SPONGE Irrigation Technology	Techno-biological irrigation system greatly improves water use and supply – uses water from fog and dew to increase water reliability in a region that has abundant but highly intermittent water availability
MetaMeta/Salt Farm Texel/Jaffer Brothers (For-Profit)	Salt-Tolerant Potato	Non-GMO, salt-tolerant potato requires very little freshwater for cultivation – scaling up access to this potato will contribute to better use of lands and waters with high salinity and will reduce pressure on freshwater resources
MetaMeta (Non-Profit)	WaterPads Water Buffering Technology	Sandwich of paper and jute with a 0.5 mm inner layer of large granular polymers in dry form – granules retain water at binding tension, absorbing 100 times their own weight in water (7 grams of granules absorb one liter of water)



## SWFF INNOVATORS (CONT.)

INNOVATOR	INNOVATION	PRODUCT SUMMARY
<b>Project Alba</b> (For-Profit)	<b>Technology and Farming Practices Advisory Services</b>	Business model addresses barriers related to both technologies and practices for efficient water use and increased crop yields – allows for rapid dissemination of water management technologies to smallholder farmers in Cambodia
<b>Puralytics</b> (For-Profit)	<b>LilyPad Water Treatment System</b>	Reusable, chemical-free, solar-activated water treatment product floats on a body of water where it kills viruses, bacteria, and protozoa in water used for agriculture
<b>Trans-African Hydro-Meteorological Observatory</b> (Non-Profit)	<b>Weather Sensing Stations and Mobile App</b>	Weather stations measure meteorological and water resource variables (rainfall, radiation, temperature, humidity, wind speed/direction, soil moisture, etc.) and send the data via GSM networks to a data server – provides accurate, localized, timely weather information to farmers via mobile devices
<b>University of Malawi</b> (University)	<b>Flask-Wall Mushroom-Growing House</b>	Water-efficient flask-wall mushroom-growing house is designed for smallholder farmers in Malawi
<b>University of Texas – El Paso</b> (University)	<b>Zero Discharge Desalination (ZDD) Technology</b>	Hybrid process uses reverse osmosis (or nanofiltration) as the primary desalter and electrodialysis metathesis (EDM) to recover additional water from desalination brine
<b>Wageningen University &amp; Research</b> (Research Organization)	<b>Salt-Tolerant Quinoa</b>	Non-GMO, salt-tolerant quinoa enables significant food production in saline soils, without the need for freshwater





# ANNEX B: SUPPORT ENGAGEMENTS



The table below is a summary of Year 4 and Year 5 support engagements assigned to the TA Facility's lines of support, which include USAID staff, the SWFF vendor network, TA Facility staff, and other vendors.

INNOVATOR	SUPPORT RECEIVED	SUPPORT PROVIDER
ADAPTIVE SYMBIOTIC TECHNOLOGIES		
	Investor Readiness	Imagine H2O
	Policy and Advocacy	SkyQuest Technology Group
	Product Development, Refinement, and Diversification (3)	MRIGlobal
	Human Resources Management	TA Facility
	Gender Advisory	Sattva
AQYSTA		
	Sales, Marketing, Communications, and Branding	Jatin Yadav
	Business Model and Strategy Development	SNV
	Product Development, Refinement, and Diversification	MRIGlobal
	Investor Readiness	Imagine H2O
	Sales, Marketing, Communications, and Branding	SNV
	Sales, Marketing, Communications, and Branding	Sattva
	Market Research and Market Analysis	Jatin Yadav
	Sales, Marketing, Communications, and Branding	Jatin Yadav
ARCADIS		
	Business Model and Strategy Development	Imagine H2O
AYBAR ENGINEERING		
	Sales, Marketing, Communications, and Branding	Open Capital Advisors
	Business Model and Strategy Development	Imagine H2O
	Organizational Capacity Building (3)	TA Facility
	Investor Readiness	I-Dev International
	Partner Identification and Introduction	Moonshot Global
CENTER OF CSDES – UNIVERSITY OF NAIROBI		
	Investor Readiness	Oratorio
	Sales, Marketing, Communications, and Branding	The George Washington University



INNOVATOR	SUPPORT RECEIVED	SUPPORT PROVIDER
CENTRAL UNIVERSITY OF TECHNOLOGY, FREETOWN		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Gender Advisory	Sattva
	Sales, Marketing, Communications and Branding	TA Facility
	Business Model and Strategy Development	Imagine H2O
	Sales, Marketing, Communications, and Branding	Jatin Yadav
	Sales, Marketing, Communications, and Branding	Sattva
	Sales, Marketing, Communications, and Branding	Jatin Yadav
CENTRE FOR ENVIRONMENT CONCERNS (CEC)		
	Market Research and Market Analysis	Sattva
CONSERVATION SOUTH AFRICA		
	Organizational Capacity Building	Intellectap
	Business Model and Strategy Development	Intellectap
	Sales, Marketing, Communications and Branding	Double O Marketing
	Gender Advisory	Sattva
DEUTSCHE WELTHUNGERHILFE		
	Business Model and Strategy Development	Imagine H2O
DRIPTech		
	Investor Readiness	Imagine H2O
	Sales, Marketing, Communications and Branding	Imagine H2O
FUTURE WATER		
	Legal Services	SNV
	Business Model and Strategy Development	SNV
	Organizational Capacity Building	Whitten & Roy Partnership
	Sales, Marketing, Communications, and Branding	Whitten & Roy Partnership

INNOVATOR	SUPPORT RECEIVED	SUPPORT PROVIDER
GREEN HEAT UGANDA		
	Sales, Marketing, Communications, and Branding	Imagine H2O
	Investor Readiness	Imagine H2O
	Sales, Marketing, Communications, and Branding	Double O Marketing
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Gender Advisory	Sattva
	Organizational Capacity Building	Whitten & Roy Partnership
HYDROPONICS AFRICA		
	Gender Advisory	Sattva
	Sales, Marketing, Communications, and Branding	Jatin Yadav
	Business Model and Strategy Development	Sattva
	Business Model and Strategy Development	Jatin Yadav
	Sales, Marketing, Communications, and Branding	Jatin Yadav
ICBA		
	Business Model and Strategy Development	MRIGlobal
	Business Model and Strategy Development	Imagine H2O
	Gender Advisory	Sattva
ICU – JORDAN		
	Business Model and Strategy Development	Imagine H2O
	Sales, Marketing, Communications, and Branding	Imagine H2O
ICU – PERU		
	Product Development, Refinement, and Diversification	TA Facility
	Business Model and Strategy Development	SNV
	Market Research and Market Analysis	Biosfera Desarrollos
	Business Model and Strategy Development	SNV



INNOVATOR	SUPPORT RECEIVED	SUPPORT PROVIDER
ICU – TUNISIA		
	Business Model and Strategy Development	Imagine H2O
	Sales, Marketing, Communications, and Branding	Imagine H2O
IGNITIA		
	Human Resources Management	TA Facility
	Sales, Marketing, Communications, and Branding	I-Dev International
	Sales, Marketing, Communications, and Branding	Ellae Creative
	Sales, Marketing, Communications, and Branding	Sattva
	Gender Advisory	Sattva
	Sales, Marketing, Communications, and Branding	Sattva
ISLAMIC RELIEF KENYA		
	Product Development, Refinement, and Diversification	TA Facility
	Sales, Marketing, Communications, and Branding	Innovision
	Business Model and Strategy Development	Imagine H2O
IVL		
	Gender Advisory	Sattva
	Business Model and Strategy Development	Sattva
LAL TEER SEED		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Gender Advisory	Sattva
	Sales, Marketing, Communications, and Branding (2)	Sattva
	Sales, Marketing, Communications, and Branding	Whitten & Roy Partnership
METAMETA SALINE POTATO		
	Partner Identification and Introduction	TA Facility
	Partner Identification and Introduction	USAID

INNOVATOR	SUPPORT RECEIVED	SUPPORT PROVIDER
METAMETA WATERPADS		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
MIMOSATEK		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Sales, Marketing, Communications, and Branding (2)	Sattva
	Business Model and Strategy Development	Jatin Yadav
	Sales, Marketing, Communications, and Branding	Jatin Yadav
MYRAIN		
	Partner Identification and Introduction	USAID
	Market Research and Market Analysis	Ennovent
	Market Research and Market Analysis	Imagine H2O
	Sales, Marketing, Communications, and Branding	Sattva
	Organizational Capacity Building	Sattva
NAIREETA SERVICES		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Gender Advisory	Sattva
	Business Model and Strategy Development (2)	Sattva
	Business Model and Strategy Development	Jatin Yadav
PRACTICAL ACTION		
	Market Research and Market Analysis	SNV
	Environmental Review	USAID
	Sales, Marketing, Communications, and Branding	Innovision
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Business Model and Strategy Development	Sattva



INNOVATOR	SUPPORT RECEIVED	SUPPORT PROVIDER
PROJECT ALBA		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Gender Advisory	Sattva
	Organizational Capacity Building	Sattva
	Organizational Capacity Building (2)	Whitten & Roy Partnership
	Sales, Marketing, Communications, and Branding	Michael Hanna Design
REEL GARDENING		
	Sales, Marketing, Communications, and Branding	MRIGlobal
	Business Model and Strategy Development	Sattva
	Human Resources Management	TA Facility
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Sales, Marketing, Communications, and Branding	Sattva
	Business Model and Strategy Development	Sattva
SI TECHNOLOGIES INTERNATIONAL		
	Investor Readiness	Imagine H2O
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Product Development, Refinement, and Diversification	MRIGlobal
	Organizational Capacity Building	Sattva
SKYFOX LTD.		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Gender Advisory	Sattva
	Business Model and Strategy Development	Open Capital Advisors
	Sales, Marketing, Communications, and Branding	Sattva
	Market Research and Market Analysis	Whitten & Roy Partnership
	Sales, Marketing, Communications, and Branding	Jatin Yadav
TAHMO		
	Business Model and Strategy Development	SNV

INNOVATOR	SUPPORT RECEIVED	SUPPORT PROVIDER
UNIVERSITY OF MALAWI		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Gender Advisory	Sattva
	Business Model and Strategy Development	MRIGlobal
WAGENINGEN UNIVERSITY		
	Supply Chain Development	SNV
WASTE STICHTING		
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Gender Advisory	Sattva
	Sales, Marketing, Communications, and Branding	Jatin Yadav
	Business Model and Strategy Development	Sattva
	Business Model and Strategy Development	Jatin Yadav
	Sales, Marketing, Communications, and Branding	Jatin Yadav
WATER GOVERNANCE INSTITUTE		
	Partner Identification and Introduction	Open Capital Advisors
	Product Development, Refinement, and Diversification	Global Good
	Sales, Marketing, Communications, and Branding	Hattaway Communications
	Business Model and Strategy Development	MRIGlobal
	Sales, Marketing, Communications, and Branding	Sattva
	Sales, Marketing, Communications, and Branding	Jatin Yadav
WORLD HOPE		
	Business Model and Strategy Development	SNV
	Product Development, Refinement, and Diversification	USAID
	Sales, Marketing, Communications, and Branding	SNV
	Product Development, Refinement, and Diversification	BASIX
	Organizational Capacity Building	Sattva





SECURING  
WATER  
FOR FOOD:  
A GRAND CHALLENGE  
FOR DEVELOPMENT

Securing Water for Food has sourced and invested in a portfolio of innovative solutions that aim to help farmers use water more efficiently and effectively, improve water storage for lean times, and remove salt from water to make more food. Our cohort of innovators are helping people in 35 low-resource countries with tools they need to produce more food with less water.

To learn more about Securing Water for Food,  
visit [www.securingswaterforfood.org](http://www.securingswaterforfood.org).